Decolonised Innovation

Designing Needs, Dreams, and Aspirations Under Resource Constraints

Rasouli, M. Idrees

Innovation Design Engineering
School of Design
Royal College of Art

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In the name of the Most Compassionate, Most Merciful.

For Zarmina & Zoya,
Qader & Rabia,
Designers &
Thinkers.

AUTHOR'S DECLARATION

This thesis represents partial submission for the degree of Doctor of Philosophy at the Royal College of Art. I confirm that the work presented here is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

Mohammad Idrees Rasouli

Date: 25.08.2023

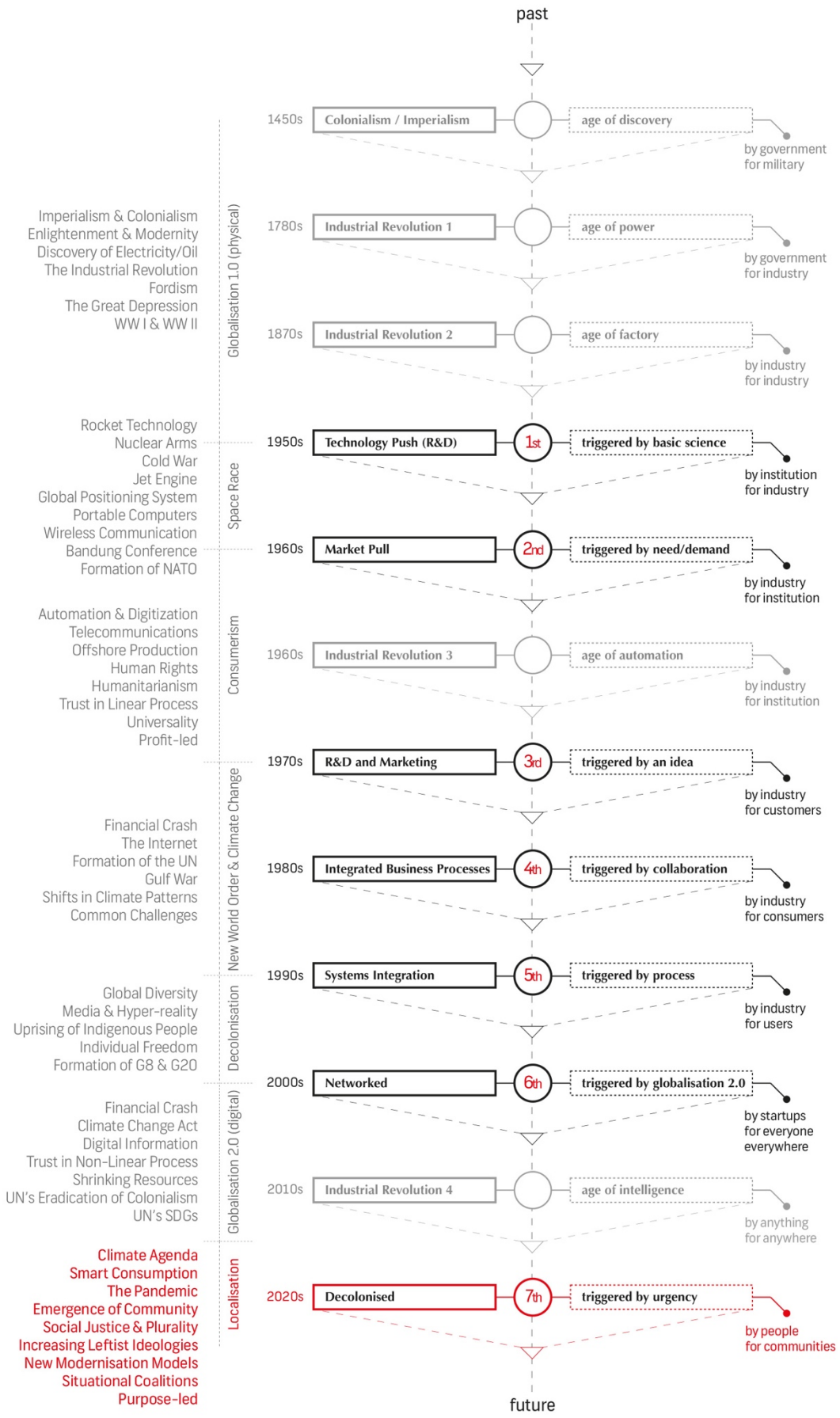

Figure. 1.1: *The Seventh Generation of Innovation*

ABSTRACT

Conventional innovation—traditional processes of inquiry and action for introducing and implementing a new idea—involves substantial psychological and physical resources, a shared cultural mindset, and functional social systems to address urban challenges through critical thinking and creativity. However, designers that lack such resources and systems require the method of innovation to be modified accordingly to meet global differences in needs, dreams, and aspirations.

This practice-based research project examines the activity of innovation *with* and *for* resource constraints and explores it through global cultural flows, context-specific circumstances, and cross-border movement of people while considering design as a transformative practice for uncertain states of mind and the unpredictable and fluctuating world where responses are influenced by necessity rather than by choice.

Through critical reflection on the author's design practice and the initiation of new collaborative design projects, this research project develops and tests the concept of Decolonised Innovation as the seventh generation of innovation (Figure 1.1) through the notions of human-connected design, autonomous design, design in emergencies, and design under resource constraints, and examines the role of transnationalism, specifically borders, as a site of conjunction between identity, imagination, and practice.

Decolonised Innovation, in the context of this research, proposes *methods of innovation*—systemic procedures of inquiry and action for introducing and implementing a new idea—that liberate the individual from the constraints of a world that is already made. Generated and acknowledged collectively, they allow the designer to work against the assumption that there is only one path to modernisation by designing within the context that the people and the environment afford while approaching the construction and suitability of new

ideas through socio-economic adaptation to the constraints of specific cultural contexts.

The author's practice is situated in the context of transformative design that crosses geographic, cultural, and political borders. Drawing on theories of transnationalism, in particular Cowen's crosscultural and Friedman's cross-border exchanges, and theories of cultural and transformative interaction, in particular Appadurai's suffixscapes and Fry's sustainment, this research project sets out a framework for experimenting with and analysing the effects of social context and relationships, environment, and cultural differences on innovation in resource-constrained conditions.

Collaboration across different characters is established as a key mode of thinking, with a closer analysis between the local, migrant, and foreigner bringing to light the effects of difference in design outcomes. Kabul, Istanbul, and London are the locations for a series of projects that are investigated through designing research and researching through design methods.

New knowledge is articulated through the way in which the design projects allow for the testing and reflection upon theories while the design methods employed in the projects help demonstrate the concept of decolonised innovation.

The value of this research for individuals and collectives lies in the understanding of the effects that specific contexts and transnational and cross-cultural exchanges can have on innovation and the possibilities for designing practically, desirably, and delightfully under resource constraints.

Keywords: Decolonised Innovation; Human-Connected Design; Resource Constraints; Autonomous Design; Design in/for Emergency

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Situating Knowledge

Chapter 1
Introduction

1.1 THE AGE OF TRANSFORMATION AND UNSETTLEMENT

In a world of rapid and profound transformation—climate change, inequality, overconsumption, and diminishing natural resources—the urgency of global crises has made *innovation's role in transformative change* ever more important to achieving sustainable, resilient, and just futures. As a way to recast innovation and look *beyond the established processes of inquiry and action for introducing and implementing a new idea*, we must delink from the universalised and colonial model of innovation in favour of *another* innovation. In so doing, we need to unsettle the European Enlightenment tradition and *decolonise* innovation through a cultural approach that involves the reimagining and restructuring of innovation theories, processes, and practices in a way that respects, incorporates, and empowers diverse cultural perspectives, knowledge systems, and ways of knowing and doing.

According to Tony Fry, a design theorist who writes on the relationship between design, unsustainability, and politics, *"the European Enlightenment tradition brought a particular modern world system into being"* that enabled the appropriation of resources, technology, mass production, and political-economic global colonisation (Fry, 2011, p. 22). In this research, *decolonisation* is concerned with *"having a more critical understanding of the underlying assumptions, motivations, and values"* (Smith, 2012) that inform innovation practices. Thus, by focusing on cultural diversity and local knowledge and fitting the specific cultural, social, and environmental

contexts of different geographic locations, this research seeks to undo the dominance of a single cultural perspective in the innovation space.

For innovation to realise its potential and address the urgent need for structural as well as epistemological and ontological transformations, its agenda and agency must move from foraging and consumption to *more contextual, intentional, directional, and ethical* improvisation. Moreover, for innovation to become futural, its practice must become *informed by the worldview of others* and adaptive to conditions that are contextually and relationally linked (Figure 1.2).

In the pursuit of *another* innovation, this research explores the *methods of innovation*—systemic procedures of inquiry and action for introducing and implementing a new idea—*that confront destructive productivism and resource-dependent ways of life* projected by the eighteenth-century Industrial Revolution; approaches that break free of linear thinking towards context-specific ways of knowing and doing (Fry, 2014, p. 32). Therefore, a thorough understanding of the disconnections between the conventional methods of innovation and the changing global cultural and contextual needs must be established, which is explored in the following sections.

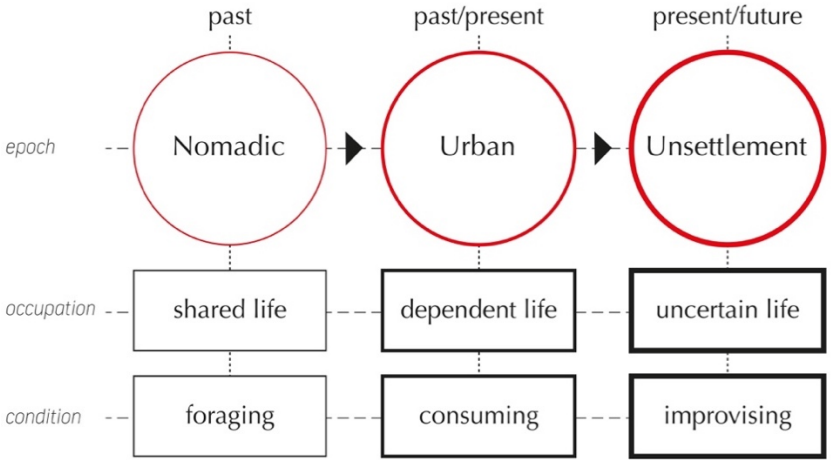

Figure. 1.2: *Worldly Transformations*
(based on Fry, 2011)

1.2 CULTURAL DISJUNCTURE AND CROSS-BORDER DIFFERENCES

The Silk Roads were the very foundations of civilisations throughout history (Figure 1.3), which triggered globalisation (Frankopan, 2015, pp. 7, 8, 12)—a time when balanced cultural exchange broadened minds and became the means of transferring new ideas, concepts, and resources, and to varying degrees, forced locals to change their philosophy and embed multiple global influences in their daily lives (Cowen, 2004, p. 6). The Industrial Revolution, however, gave rise to a new society and culture through the *process of re-globalisation* (Figure 1.4), which in turn created large gaps in knowledge between the producer and the consumer.

Tyler Cowen, a theorist in cultural studies, argues that as human knowledge in innovation, production, and technologies significantly expanded, these successes however, did not involve exchanges on equal terms and gave the *West* (primarily Europe and North America) technical superiority, scientific know-how, and the urge for global expansion (Cowen, 2004, p. 7).

The issue of *unequal exchanges* is further discussed by Arjun Appadurai, an anthropologist and theorist in globalisation studies, who asserts that new forms of inequality have since been created through the *cross-border flow* (movement or transfer) of ideas and images (Appadurai, 2002). This has led to cultural conflict rather than cultural pluralism, promoting certain standards that sacrifice long-term benefits for short-term gains for specific populations through colonialism rather than mutual understanding (pp. 9-15).

Cowen further argues that these unequal exchanges over time have resulted in the formation of *'hybridity'* across most of the developing and least-developed economies—the in-between space where the locals synthesise their own culture to suit the more superior (developed economies) and reach the same level of modernity or contemporaneity (Cowen, 2004, p. 10).

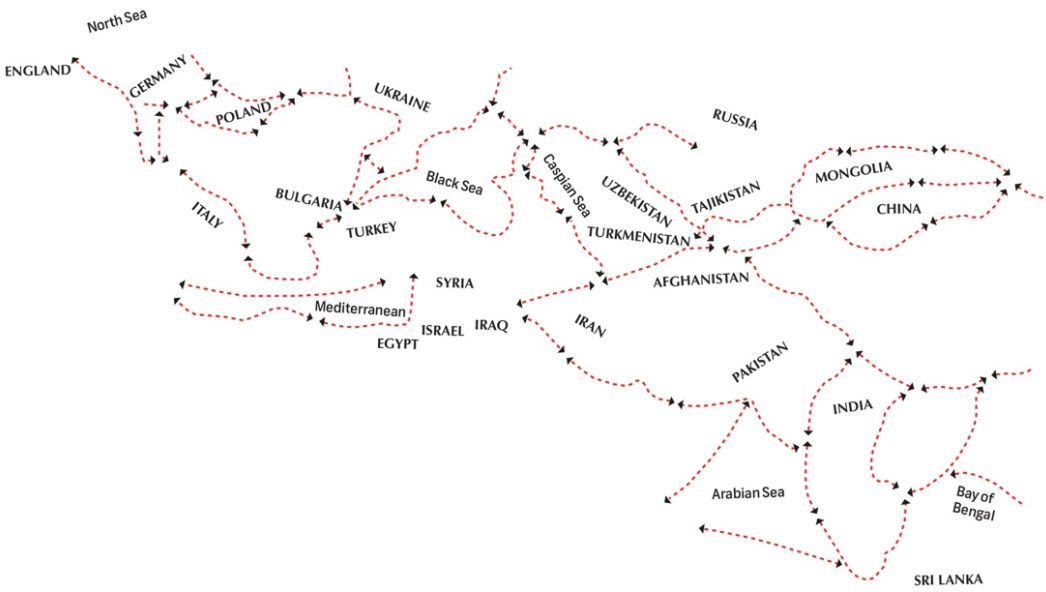

Figure. 1.3: *Exchanges Through the Silk Roads c. 850 AB*
(adopted from Frankopan, 2015

Figure 1.4: *The Age of Discovery and Exploration* (1910)
Courtesy of the University of Texas Libraries, The University of Texas at Austin

In the words of Homi Bhabha, a cultural theorist who writes on colonial and postcolonial theory, cultural change, and power, this is the *'third space'* which creates a cutting edge of translation and negotiation (Bhabha, 2004)—an ongoing struggle of belonging along alienated identities that creates a lack of being and consequently a lack of representability within one's own context (Figure 1.5). This situation mobilises the *local into the other* (Steyn, and Stamselberg, 2014, pp. 97, 101, 102), which further devalues self-discovery and independence, whilst intruding into the everyday life and impinging upon the habits of the self.

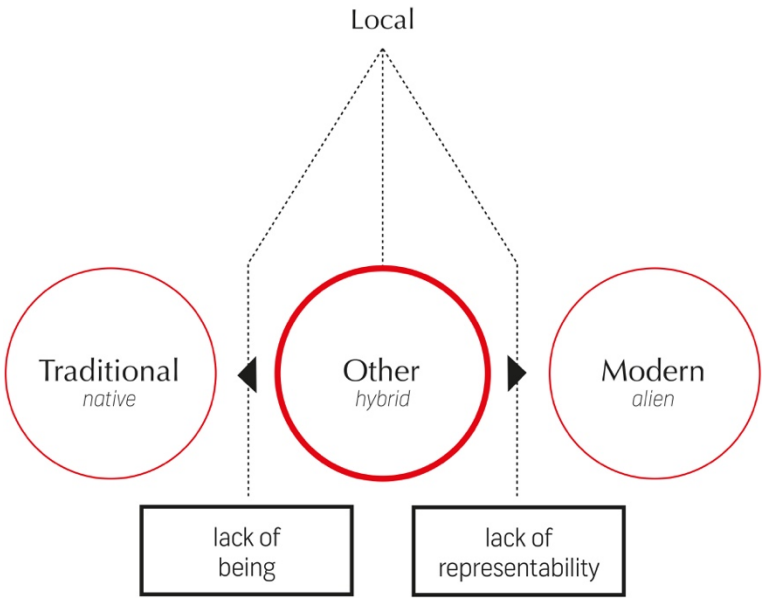

Figure 1.5: *The Third Space* (based on Cowen, 2004, Bhabha, 2004, Steyn and Stamselberg, 2013)

Thus, a better understanding of how we become redundant through the contemporary preoccupations of consumerism, order building, and economic growth is required. Furthermore, these findings highlight the need for understanding how innovation has become universal and harmful; responsible for imported, displaced, and mass-produced wants that are appearing at the expense of serious design (Fry, 2011, p. 50).

1.3 NEEDS, DREAMS, AND ASPIRATIONS UNDER RESOURCE CONSTRATINTS

In the *East* (primarily the Middle East and Asia), *designers*—those who engage in creative problem-solving and innovation across various disciplines (Norman, 2013, p. 13)—with their *"flexible way of thinking and making"* (Gunn, and Donovan, 2012, p. 13) follow methods that are simultaneous and integrated into their way of life (Kasturi, 2005, p. 76). However, with the arrival of *European colonialism*—the psychological and physical domination and control by Europeans upon non-European people and their behaviour (Horvath, 1972, p. 46)—came organised processes and techniques that valued perfectionism, resulting in the colonised losing confidence and the will to develop new modes of interaction with the world (Harvey, 1990, pp. 135-6). Moreover, the provision of design education during colonial rule was intended only to produce *'copyists'*, resulting in the destruction of local design talent (Balaram, 2005, p. 12) across these locations.

In response, this research explores design for the *'third scenario'* (Figure 1.6), which is circumstantially and critically responsive to the feelings, material conditions, dispositions, values, and belief systems of people within the world they inhabit. This scenario can be considered (in the words of Fry) as *"localised desires for viable futures"* to displace imported wants (Fry, 2014, p. 101) under resource constraints based on a reflective decision-making process and a more deliberate approach to innovation.

Resource constraints, in this research, refer to *personal limitations* (encompassing our cultural, social, and environmental circumstances, such as lack of access to knowledge and skill, limited budget, and availability of funds) as well as *geographic restrictions* (encompassing our technological, economic, and political circumstances, such as shortage of tools and equipment, limited infrastructure, and access to electricity) that are essential for accomplishing a particular need, dream, or aspiration. Resource

constraints are *"powerful tools for the designer"* (Norman, 2013, p. 85), and are thus seen as a catalyst for bringing multiple factors into relationship with one another (Nelson, and Stolterman, 2012, p. 21) to stimulate innovation in specific cultural contexts.

Designing needs is defined as an approach to address a particular challenge and solve a *functional* problem. Designing dreams, on the other hand, is defined as an approach to speculate and make something *delightful*. Whereas, designing aspirations is defined as an approach to intentionally delivering a *desirable* outcome. This approach further builds upon Marcus Vitruvius Pollio's *'three principles of good architecture'* (Szacka, 2019)—*firmitas* (durability), *utilitas* (convenience), and *venustas* (beauty). In his influential guide *De architectura*, Vitruvius, a Roman architect and engineer during the 1st century BC, asserts that durability (*designing needs*) is assured when materials are wisely and liberally selected; convenience (*designing dreams*) is assured when the end-use is suitable and appropriate to the end-user; and beauty (*designing aspirations*) is assured when the appearance of the outcome is in accordance with the local culture and context (Warren, 1960, p. 17).

Thus, a better understanding of how localised thinking and making help develop new methods of innovation is required. Furthermore, these findings highlight the need to understand how resource constraints enable reflective decision-making and a more deliberate approach to innovation.

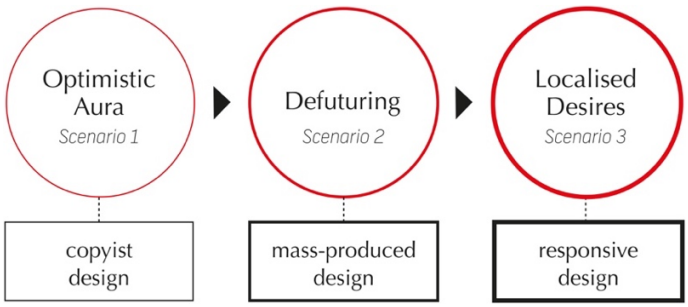

Figure 1.6: *Design for the Third Scenario* (based on Fry, 2011)

1.4 SITUATING THE RESEARCH

Considering the origins of conventional innovation methods and the motivations behind them calls for the development of new ones that do not depend on generalised and unsustainable ways of life, and this is the way that I approach the field in this research, which is explored in the following sections (design under resource constraints as *another innovation* is specifically explored in Chapter 3).

Methods can be a powerful resource for design researchers and practitioners to deliver appropriate and tested outcomes. Therefore, this practice-based research project is carried out through the exploration of the main ***Research Objective:*** **What methods are suitable for designing decolonised innovation under resource constraints?** and explores *the practice of innovation as a design action* for introducing and implementing a new idea in a distinct cultural context and environment. It aims to examine the influence of resource constraints, physical location, and socio-cultural factors in achieving *context-specific* methods of innovation.

Thus, the *Decolonised Innovation Proposition* (Figure 1.7) illustrates the approach taken in this research to understand the opportunities and drawbacks behind cross-cultural and cross-border exchanges, especially the role that these exchanges play in balancing and promoting creativity. My aspiration is that the Decolonised Innovation Proposition will provide us with the current and future possibilities of innovation. It approaches innovation from a much broader perspective than the development of new objects, products, and services because *decolonising innovation* (the process of rethinking, reframing, and reconstructing the ways of inquiry and action for introducing and implementing a new idea that preserve the Western-centric, colonial lens) requires a more diverse and inclusive understanding of its theories and practices (Tunstall, and Agi, 2003, p. 11).

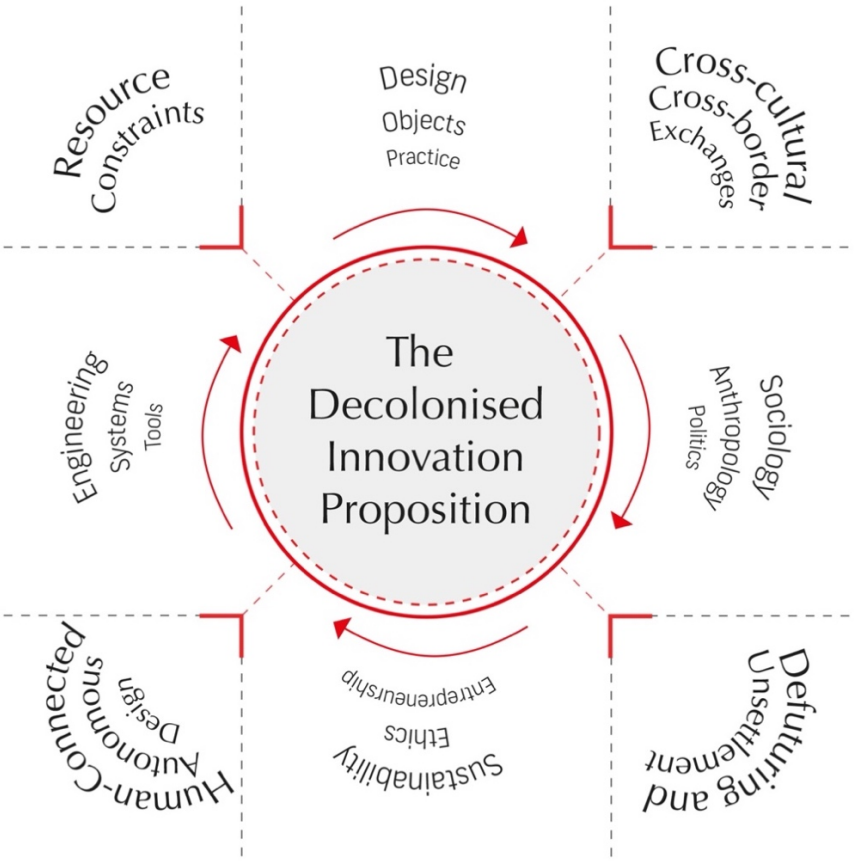

Figure 1.7: *The Decolonised Innovation Proposition*

Cross-cultural and cross-border studies emerged from sociology and design anthropology are influenced by politics. Confined within cross-cultural and cross-border studies is the emerging area of unsettlement and defuturing, which focuses on the ethics and practice of design beyond the project of sustainability.

Sustainability and systems studies emerged from engineering are influenced by resources. Confined within sustainability and systems studies is the emerging area of human-connected design and autonomous design, which explores design as a process for connecting to cultures, situations, and settings (Mandeno and Baxter, 2019), as a form of independence and autonomy (Escobar, 2021), and as an alternative to the modern world system (Ansari, 2021) (connected, autonomous, and alternative design as *decolonised innovation methods* are specifically explored in Chapter 5).

1.4.1 THE RESEARCHER IN THIS RESEARCH

To address the research objective and research questions (discussed in Section 3.4.1), I will be situated both internally and externally in several collaborative design projects involving professional designers in Turkey, Afghanistan, and the UK. The aim is to contribute to how innovation can be understood across geographic, cultural, and political borders and tested through theoretical cultural and transnational design frameworks; to capture aspects of the ways in which innovation is being practiced across locations.

The motivation for this practice-based PhD is a combination of my personal instincts, interests, and concerns as well as findings from my personal experiences as a migrant and transnational designer who has lived and worked across the least developed, developing, and developed economies. Born in Afghanistan during the emergence of postcolonial perspectives in the late 1980s and raised across several countries throughout Asia and Europe during the roaring globalisation of the 1990s and 2000s, I have been developing an understanding of social and cultural transactions and subsequently formulating complex political subjectivities and new ways of thinking through interchangeable personal characteristics (Friedman, 1994, pp. 190-92) moving between abstract and concrete worldviews since childhood **(see Appendix D, D1)**.

1.4.2 THE MOMENT OF NOW

In this research, the *'moment of now'* is explored from two positions: *shared now* and *solo now* (Fry, 2011). The former is concerned with the global environmental conditions, socio-political situations, and unbalanced economic situations experienced by everyone. The latter is personal and experienced in a specific situation. At one level, the experience is geographically, biologically, and politically different from the rest of the

world; at another level, it is uneven in economic development and natural cycles, defined as:

> *"… my nation is not at the same 'stage' of development as yours; my culture is older or newer than your culture; my seasons are not your seasons; and my body may have more or less time than yours." (pp. 31, 49)*

Considering these two distinctive but inter-related positions, this research explores *'improvisation'* as *a distinct approach to action-led inquiry, one that is conscious and based on intentional action* (Nelson, and Stolterman, 2012, pp. 20, 21, 29) to find new directions towards innovation.

1.4.3 THE LOCAL, MIGRANT, AND FOREIGNER

In this research, characters are explored as part of the design practice to help with problem-setting in specific contexts. Approaches to designing needs, dreams, and aspirations by these characters are tested alongside features of the practice situation.

The *local* is explored as someone whose ideas, imagination, and practice are rooted in their cultural identity and fixed (Schön, 1991, p. 8) in the traditions of their context. The *migrant* is explored as someone whose ideas, imagination, and practice are rootless and unfixed and who can re-orient themselves by receiving culture and gaining new knowledge from the host country (Schiller et al., 1992, pp. 63-66). In contrast, the *foreigner* is someone who makes multiple relationships across many borders because of their multiplexity and migratory practices constituting familial, economic, social, organisational, religious, and political dimensions, and therefore, synthesises and finds a mutual ground between the local and the foreign thoughts, life, and practice. The *foreigner* is explored as someone who is concerned and has a strong sense of cultural identity; however, their ideas, imagination, and

practice are informed by outside influences and can evolve on the go (Cowen, 2004, p, 63).

This research acknowledges the possibility that the local's practice may get contaminated through the agency of the migrant and the foreigner, which may result in the abolishment of boundaries between cultural practices, nations and disciplines, subsequently calling for a need to decolonise and liberalise old practices (Schiller et al., 1992, pp. 66-69). Therefore, participatory research methods are kept the same across all cultural contexts, but the location of research is different for each character.

1.4.4 ROLE OF GEOGRAPHY AND RESOURCE CONSTRAINTS IN THIS RESEARCH

Three distinctive geographic locations have been identified as design contexts to carry out this practice-based research. Historically tied with each other through the Silk Roads (Figure 1.8), the route connects the East and the West through cultural, political, and religious interactions since the 2nd century (Elisseef, 2001, pp. 14-16). These locations represent a cross-section of the continual global flows and exchanges and are chosen based on their unique geographic constraints (see Chapter 5 for further detail), as well as their historical and development trajectory and global social and political positioning. These locations are on opposite sides of the economic and social spectrums—from most developed to least developed and most socially and politically stable to least stable.

In Europe, and more precisely, *London* (United Kingdom) represents the upper end of the economic spectrum, whereas in Asia, *Kabul* (Afghanistan) represents the lower end. In the Middle East, *Istanbul* (Turkey) represents a mediator between the two extremes—a context that links the East with the West and acts as a rich melting pot where ideas are borrowed, refined,

repackaged, and transferred (Frankopan, 2015, pp. 24-27).

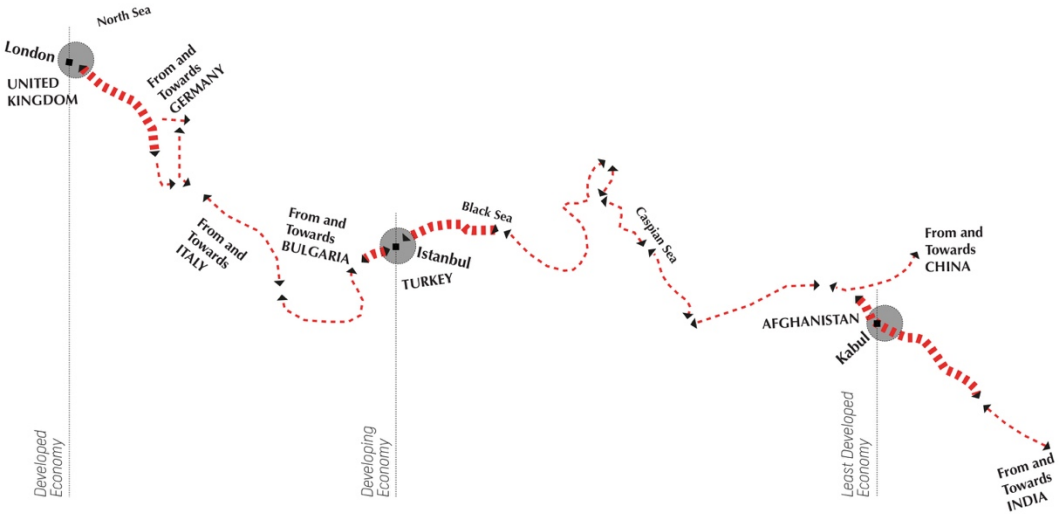

Figure 1.8: *Project Research Contexts and Locations* (based on Frankopan, 2015)

Returning back to resource constraints, in certain parts of the world they are understood as *an accepted way of life* and seen as a barrier that limits us from achieving freedom (Sahin and Robinson, 1980, pp. 85-95), in other parts they are referred to *as a shadow* between cause and effect (Hale, 2012, pp. 117-148). In the context of this research, however, resource constraints are considered from two perspectives simultaneously: personal constraints and geographic constraints.

At a *personal level*, we are constrained by certain inhibitors that require overcoming to allow us to integrate diverse worldviews and ideas, thinking processes specific to the culture and context, and local design approaches in our response. These are *internal constraints* that restrict us from solving tasks in new and innovative ways and act as vertical (psychological) and horizontal (contextual) blocks. Victor Papanek, in his most influential publication, *Design for the Real World* (1995), lists *'seven inhibitors'* (p. 158), which are summarised here:

1. **Emotional Block:** *unable to express the limits of our knowledge or afraid to a accept lack of experience.*
2. **Intellectual Block:** *ignoring the emotional or psychological significance of the problem and prioritising personal knowledge.*
3. **Professional Block:** *reaching an outcome based on a process or approach specific to our field or specialism.*
4. **Perceptual Block:** *unable to perceive the problem or acquire the information needed to solve it, and relying on stereotyping, limiting the problem by saturating or overloading information.*
5. **Associational Block:** *being fixated on particular functional, aesthetics, and experiential experience.*
6. **Cultural Block:** *unable to look beyond the set of patterns, habits and practices that we have been exposed to for a long time.*
7. **Environmental Block:** *being influenced by our environment in how we approach and solve a problem.*

At the *geographic level*, we are constrained by certain traps that require us to be adaptive to uncertainty and unavailability of materials and tools, socio-political instability, the uniqueness of the environment, and a fluctuating economic situation. These are *external constraints* that restrict us from solving tasks in new and innovative ways and are distinctive to each country's geography and cultural context (Collier, 2008, p. 79; and Bhatti and Ventresca, 2013, pp. 13-14), illustrated in Figure 1.9 **(see Appendix K)**.

These perspectives are a range of values and norms that this research will consider in revealing how decolonised innovation emerges under resource constraints, as detailed in Chapter 3 and 5.

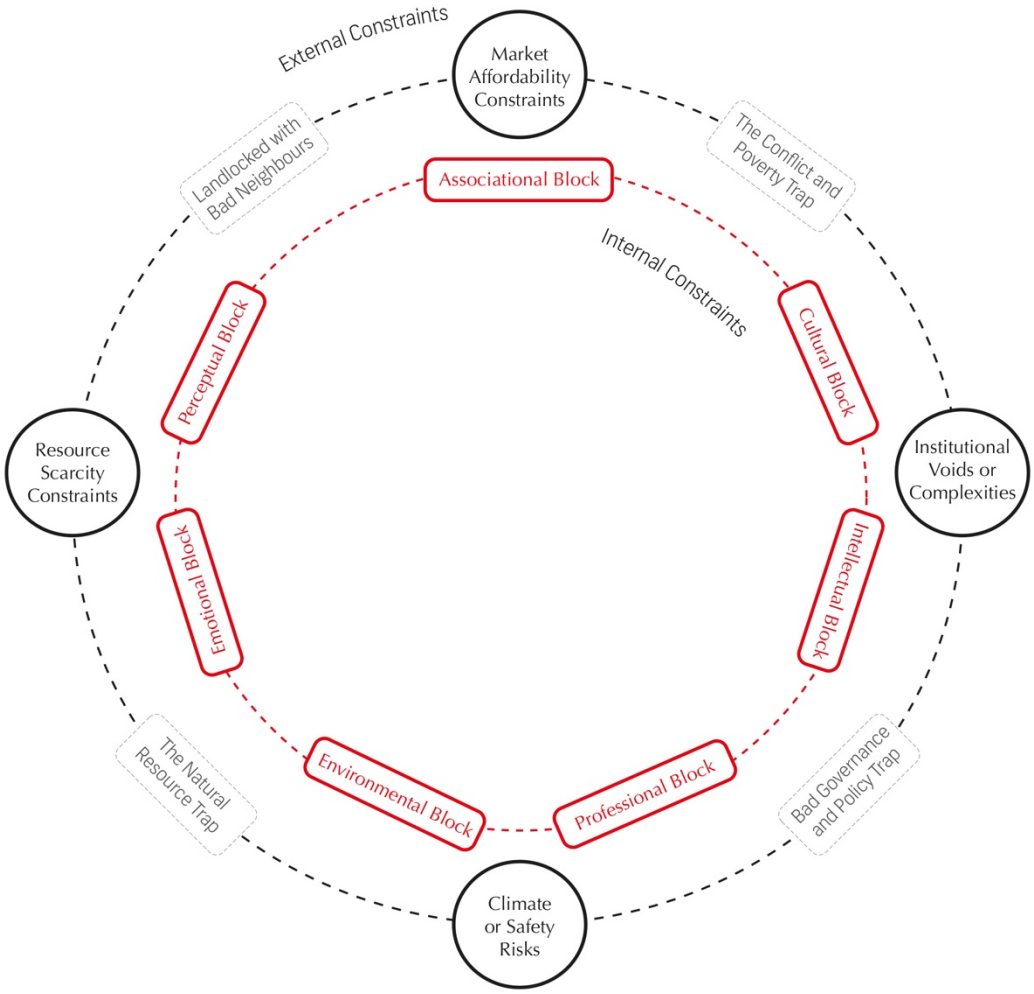

Figure 1.9: *Resource Constraints Framework* (based on Papanek, 1985; Collier, 2008; and Bhatti and Ventresca, 2013)

1.4.5 RESEARCH THROUGH DESIGN AND ACTION RESEARCH

In this thesis, the research is described as a form of systematic research through designing—developing, articulating, and communicating new design knowledge through processes and products designed by people and my own designing, processes, and products (Pedgley and Wormland, 2007, p. 72). According to Nigel Cross, a pioneer in design research and methodology, design research falls into three main categories when based on people, processes, and products (Cross, 1999, p. 5):

Design Epistemology

(study of designerly ways of knowing)

Design Praxiology

(study of the practices and processes of design)

Design Phenomenology

(study of the form and configurations of artefacts)

It is this approach to design research, and of course research through design (Frayling, 1993, p. 3), which is demonstrated in this work—primarily by '*Action Research*' approach, applied to the field of innovation, with a focus on industrial design and engineering, where I am the observer and the participant who is actively designing until he arrives at something satisfying that is stable, recognisable, and repeatable. This circular process, argues Ranulph Glanville, a pioneer in cybernetics and design theory, is a design process where we are always present as *active agents* to make, test, and, where necessary, modify (Glanville, 1999, p. 89).

In the context of this research, *design* indicates the primacy and centrality of both an object of study and a means of carrying out that study (Glanville, 1999, p. 90). My focus as the researcher, characterised by research through design, is on knowledge and a tangible product as an outcome, which is achieved by reflection-in-action (Schön, 1991, pp. 49-69). Thus, design allows for the opening of known parameters; to ask questions, posit answers, and expose the intricacies of relationships (Vaughan, 2017, pp. 1-18).

1.4.6 MY APPROACH IN THIS RESEARCH

This research takes into consideration the above fields, while the focus is on people, processes, and products, and not on efficiency, usability, or optimisation. The tools that I employ in my research are like those employed

in these fields, such as informal and formal observations (collecting), in-context interviews (codifying), design exercises (categorising), self-documentation (analysing), and reflection (interpreting findings).

As illustrated in Figure 1.10, in this research, there are three constants: context, character, and motivation. The method of design, available resources, and location of practice are the mediators that allow for the exploration of the subject. *Transformation* (a marked change or alteration) is researched through the understanding of the variation in the type of action undertaken by me or the participant in different contexts. Exchange, on the other hand, is evidenced through designed objects and the influence of cultural flows across borders.

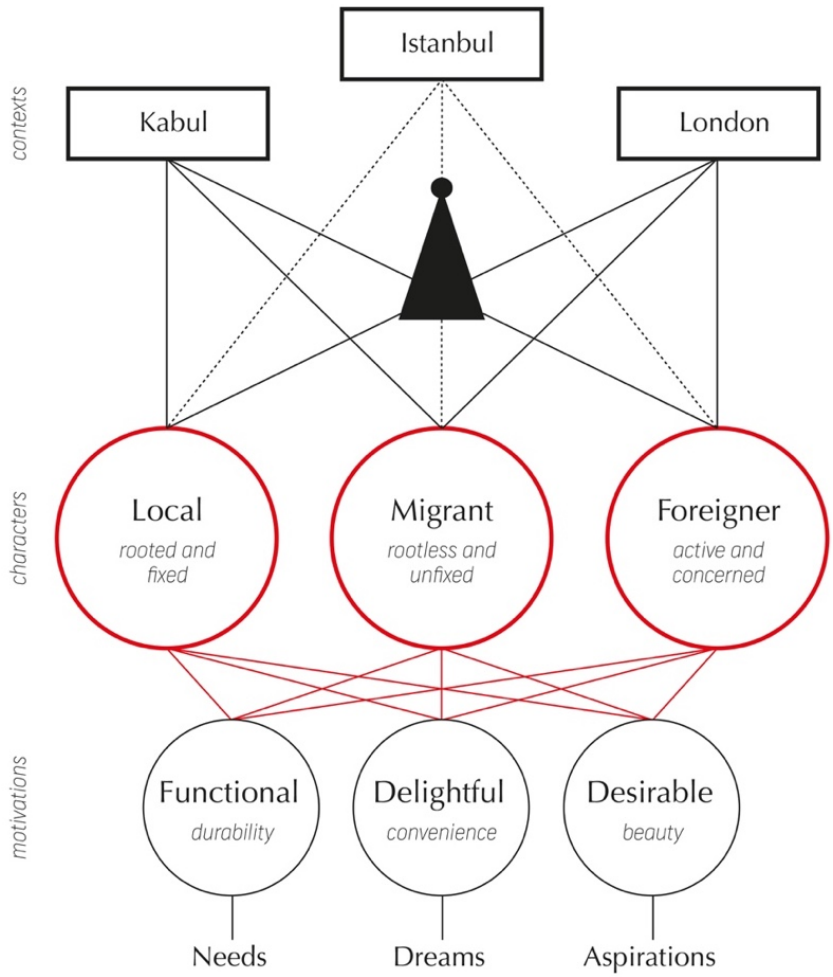

Figure 1.10: *Project Research Setup*

Contexts are spread across three separate geographies and are chosen based on their economic, cultural, social, and environmental differences. Character is defined as local, migrant, and foreigner, where the local and migrant are participants, and I am the foreigner. Needs, dreams, and aspirations are explored as motivations to understand how design is practiced in different cultural contexts in conjunction with the available resources (waste materials, found objects, and local tools) *to achieve Decolonised Innovation* by revealing and reconstructing alternative design knowledge and understanding as a counter-discourse to Western methods of innovation (Ashcroft, Griffiths, and Tiffin, 2007, pp. 56-59).

Western methods of innovation, which have been developed and refined in Western societies, particularly in the context of business and technological advancement, such as the 1950s Technology Push, 1960s Market Pull, 1970s Coupling, 1980s Interactive, 1990s Systems Integration (Rothwell, 1994), and 2000s Networked (Hardy, 2003), lack to acknowledge the cultural, historical, and socio-economic factors associated with the current worldly conditions as well as the non-Western societies and geographic locations, as illustrated in Figure 1.1 and discussed in Chapter 2.

1.4.7 THE STRUCTURE OF THIS RESEARCH

The thesis is structured through seven chapters and divided into three sections, as visualised in Figure 1.11. Section one (Chapters 1 and 2) sets out the theoretical background. Section two (Chapters 3, 4, 5, and 6) of the thesis is focused on answering the research questions, while the third section (Chapter 7) synthesises and summarises the main research outcome.

Chapter 1 sets up the main concerns, aims, and motivations of the research project. Chapter 2 frames the research and takes us deeper into the concerns raised through the interrogation of theories and the researcher's previous

practice, and makes the case for rethinking current methods of innovation. Chapter 3 is focused on research through design, and highlights the knowledge gap in literature, and brings forward new knowledge that demonstrates the various methods of innovation under resource constraints. By forming a new theoretical framework and translating it into design practice, it answers Research Question 1.

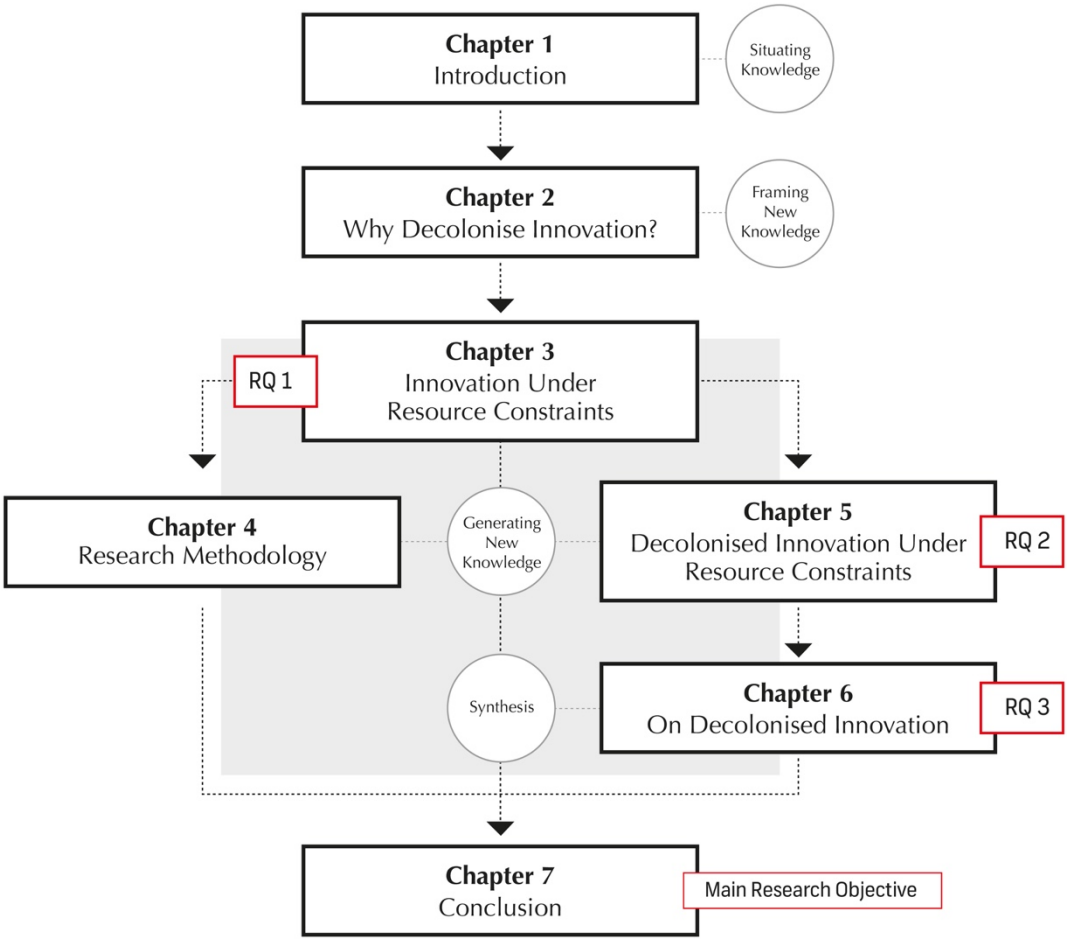

Figure 1.11: *Thesis Outline*

Chapter 4 summarises the composition of Decolonised Innovation Proposition and describes the research design, including the research paradigm and methodological choices, and highlights the position of the researcher in the project and the approach to ethics.

Chapter 5 is focused on action research and the field research undertaken across three different cultural contexts and tested through three different characters and motivations. It highlights the knowledge gap in both literature and practice and brings forward new knowledge that demonstrates designing decolonised innovation under resource constraints. By forming a new theoretical framework and translating it into design practice, it answers Research Question 2.

Chapter 6 fills in discovered knowledge gaps by comparing the findings from Chapters 3 and 5, with a focus on finding the most suitable approach to innovation ethically, culturally, and environmentally that enables decolonisation from externally imposed conventional methods and perspectives. By forming a new theoretical framework that can be replicated and applied across different fields, it answers Research Question 3.

Chapter 7 brings Chapters 3, 4, 5, and 6 together by discussing the implications and limitations of the research findings. It also concludes the thesis by presenting answers to the research questions, evaluating their validity, highlighting academic and industry contributions, and providing recommendations for further research and policy change.

1.5 AUDIENCE FOR THIS RESEARCH AND CONTRIBUTION TO KNOWLEDGE

This research is aimed at both academic researchers and practitioners in design and innovation, mainly industrial design and design engineering, and emergent critical fields examining the relationship between innovation and new unarticulated needs under resource constraints. Contributions to knowledge are made in the following three ways to address the gap in literature, theory, and practice.

Firstly, to address the knowledge gap in how resource constraints, global cultures, and transnational flows help trigger *another* innovation and why. Thus, offering the **contribution to knowledge in innovation theory by centring on a systematic research inquiry into methods of innovation under resource constraints** (Chapter 3) and providing a framework for influencing alternative design approaches that are culturally suitable and context-specific, as described in Chapters 5 and 6.

In the second place, to address the knowledge gap in how innovation is understood and practiced from the *perspectives of a local, migrant, and foreigner* across geographic, cultural, and political borders with an ethical and decolonial approach. Therefore, offering the **contribution to knowledge in design methodology and methods by demonstrating and positioning the researcher as a foreigner and the participant as a local and migrant** while centring on a practice-based research method to engage with cross-cultural and cross-border contexts, alongside a methodological approach to designing under resource constraints through action research, as described in Chapter 5.

Last but not least, to address the knowledge gap in identifying *suitable approaches to innovation ethically, culturally, and environmentally* that enable decolonisation from externally imposed conventional methods and perspectives. Hence, offering the **contribution to knowledge in innovation**

practice by centring on insights and understanding for individuals and organisations involved in designing for least developed and developing economies, and subsequently informing their practice by providing examples of the epistemological and praxiological implications and methodological approaches as well as the understanding of the possibilities of decolonised innovation under resource constraints, as detailed in Chapter 6.

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Framing New Knowledge

Chapter 2
Why Decolonise Innovation?

2.1 MODERNITY, INNOVATION, AND COLONIALISM

Modernity's relation to colonialism and its matrix of power connected to innovation through the process of modernisation (adoption of new technologies, methods, and values) were discussed in Chapter 1. Several researchers have developed concepts and analyses of the relation between modernity, innovation, and colonialism, including Walter Mignolo and Catherine Walsh (2018), Ahmed Ansari (2019), and Adam Nocek and Tony Fry (2021), who have been researched in more detail here to show how they define these relationships. Mignolo and Walsh describe the relationship as:

> *"Coloniality is constitutive, not derivative, of modernity. Modernity/coloniality are intimately, intricately, explicitly, and complicitly entwined. The end of modernity would imply the end of coloniality." (p. 4)*

They go on to make the point that *modernity* (foreign modes of socio-cultural and political orders and forms of knowledge) legitimises *coloniality* (the structure of knowledge and understanding imposed by the West) through oppression, exploitation, and dispossession while being manifested as a structural, systemic, and systematic mode of thinking and doing. They suggest that *innovation emerges only from inquiry* that goes from action to reflection and

from reflection upon action to a new action. However, modernity dismantles the possibility for an individual to transcend the linear precepts and outcome-oriented views of Western knowledge, research, and thought. Therefore, modernity restricts an individual's ability to be truly human.

Building on this view, Lisa Lowe (2015), who writes on ethnicity, race, and migration, argues that modernity's links to liberal promises of emancipation, free labour, trade, and government bring with them the heterogeneous pasts of conquest, capture, and colonialism (p. 137). Moreover, Ahmed Ansari (2019), one of the founding members of the Decolonising Design platform, describes current theory, practice, and pedagogy in the field of design as *"not being adequate to addressing longstanding systemic issues of colonial power"*, which according to him are products of modernity and its ideologies in both developed and developing economies (p. 130).

Ansari asserts an urgent need for critical and pragmatic imagination that dares to identify the possibilities and conditions that will give us alternatives to western modernity. Similarly, Adam Nocek and Tony Fry (2021) call for envisioning the possibility of designing new conditions for being human by learning without obeying the one-dimensional understanding of modernity and by opposing the conditions of containment.

Their conclusions suggest that these problems cannot be solved in the same frame of mind that created them. Therefore, we must delink from the narratives and promises of modernity and from Western assumptions by not resisting but re-existing and redoing through the perspectives of others.

As discussed, discourse on modernity consists of different and often conflicting theories, experiences, and ideological commitments that depend on the perspective and angle of interrogation. This research disagrees with the notion that modernity, as a consequence of globalisation, is similar everywhere and claims that modernisation is a process that occurs within

culturally and geographically specific contexts. Thus, this research explores how resource constraints and context-specific approaches enable *alternative modernity* (other possibilities, as well as distinct modes of socio-cultural and political order and forms of knowledge) and modernisation processes across different cultural contexts.

Michael Foucault, a historian of ideas and relationships between power and knowledge, defines modernity as *'an attitude'* and *'a mode of relating to contemporary reality'* (Foucault, 1984). This suggests that modernity is inescapable (Gaonkar, 2001) and that for non-Western nations, modernity must be grounded in the complexities of their own culture. Thus, requiring the development of '*alternative modernities*' (Eisenstadt, 2000) that persistently appreciate the *present* through reflection upon the immediate context with care—considering what is optional, avoidable, and ethical while considering what is necessary, unavoidable, and sustainable, as shown in Figure 2.1.

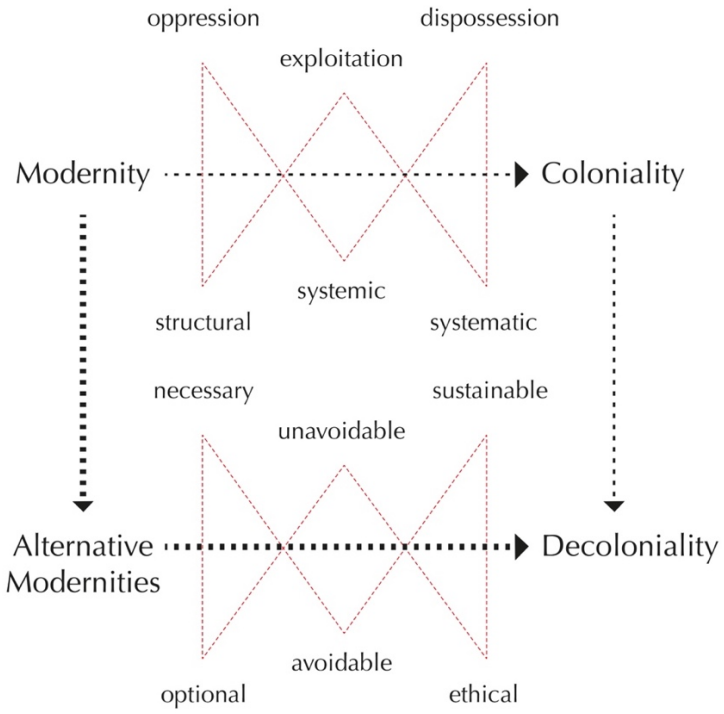

Figure 2.1: *Towards Alternative Modernities and Decoloniality* (based on Mignolo and Walsh, 2018, Eisenstadt, 2000, and Kwame, 1997)

Alternative modernities imply *the need to choose one and reject another possibility*, and thus call for the appropriation of Western assumptions through selection, reinterpretation, and reformulation of the imported colonial ideas (Eisenstadt, 2000, p. 15) to decolonise praxis by self-creating technologies in accordance with the local people's intellect and standards, as well as their cultural and social values (Kwame, 1997). These points will be further developed in the following sections.

2.1.1 INNOVATION AND THE TWO WORLDS: HORIZONTALITY vs. VERTICALITY

Culture, according to Appadurai, *"is a process that mobilises and articulates a nation's distinct qualities and traits"* (Appadurai, 2003, p. 15), and therefore, its people's innovativeness and creativity is determined by the conduciveness of its culture towards the existence of a system of activities and possible changes (Signorini, et al., 2009, p. 258) as well as the equitable interaction of diverse people and entities (Pamela and Raihan, 2017, pp. 85-101).

A key cultural difference between the East and the West is how the definition of innovation fluctuates across these locations. In *developed economies* (countries with sustained economic growth, high literacy and employment rates, and advanced technological infrastructure), innovation is defined as *an experimental approach* with the purpose of diversifying the range and quality of existing or new offerings (Hall, 2011, p. 17 and Barnett, 1967, p. 6). It is dependent on *a step-by-step process* conducted *horizontally* to conceive and deliver each stage with inputs managed and channelled in a coordinated manner **(see Appendix D, D2)**.

In *least developed economies* (countries with fragile industrial and economic ecosystems, low literacy and employment, and severe structural impediments to sustainable development) and developing economies (countries working

towards improved industrialisation, economic and social stability, and enhanced living standards for its populace); however, innovation is defined as *a flexible approach* with the purpose of increasing the social and commercial impact of an existing or new offer (Joseph Schumpeter, 2017, pp. 223-229). It is dependent on *a pragmatic process* conducted *vertically* in which reflection upon capability and available resources plays a key role, with inputs managed and channelled independently **(see Appendix D, D3)**.

The vertical approach provides a wide range of viewpoints and perspectives, resulting in more focused ideas and a greater ability to innovate with fewer resources at hand. The horizontal path, on the other hand, triggers a dynamic learning process through the diffusion of knowledge, resulting in innovation with more resources at hand through the work of several subjects who share common practice and interests (Bettiol and Micelli, 2014, p.11).

While these findings provide crucial information about how innovation is perceived in different geographies, they do, however, suggest the need for understanding how cultural formations might work in practice and how innovation is practiced under resource constraints across different cultural contexts.

2.1.2 A DECOLONISED VIEW OF INNOVATION

Design is the first tradition among many traditions of human inquiry and action, which, as its own culture, enables us to innovate. Through design, we create not just new artefacts, but also new conditions and systems based on chance and necessity (Nelson and Stolterman, 2012, p. 2). In the context of this thesis, the relationship between design and innovation is defined as:

> *"When we create new things—technologies, organisations, processes, environments, ways of thinking, or systems—we engage in design." (p. 1)*

In this way, *designing under resource constraints* is seen as a form of inquiry and action taken in a specific location that combines available materials and tools, intention, and imagination to *innovate*—creating something that does not yet exist and that is unique for a particular time and condition, people, and place.

However, one of the main issues facing least developed and developing economies, especially those with a colonial past and influence, is that design-led innovation methods in these contexts have received little or no attention, which indicates a gap in understanding the *relationship of design to development* (design for industry) or the *role of design in achieving sustainable development goals* (design for good).

Whilst design for industry, which refers to the practice of developing new ideas to meet the needs of the market over other considerations, such as environmental sustainability, social responsibility, and user experience (Boehnert, 2014), has led to significant industrialisation and technological progress, it has also had negative consequences for the environment, public health, and social justice through the design of products that are difficult to repair, recycle, or reuse and that often have short lifespans and lack cultural significance.

On the other hand, design for good refers to the practice of developing new ideas to meet the needs of end-users, communities, and the environment over the needs of the market (Carry, 2017). However, we have recently started to understand that the local environment, availability of materials and tools, and people's needs, dreams, and aspirations in least developed and developing economies are distinctly different from those in developed economies (Section 1.3). Therefore, it is important to *explore decolonised and alternative methods of innovation* that prioritise these findings.

A *decolonised view of innovation*, therefore, is not only about displacing

Western rationality as the only framework and possibility of thinking, understanding, and doing, but also a posture of both protest and proposition that looks, thinks, and acts with the constant and always fluctuating present whilst carrying the burden of the past and the hopes of the future (Mignolo and Walsh, 2018, pp. 109-115). Moreover, it is not a static condition nor a lineal point of arrival, but instead, it is a walking, asking, reflecting, analysing, theorising, and actioning process that is a continuous movement of contention, relation, and formation seeking to make visible, open up, and advance distinct perspectives and positionalities (Mignolo and Walsh, 2018, pp. 17,19).

These findings lead us towards the *need for building new context-specific theories* (Zeschky, Winterhalter, and Gassmann, 2014, p. 2) *and methods* accordingly (Tavoletti and Cerruti, 2015, pp. 2-3). One such approach is through *designing under resource constraints* (see Chapter 3), which refers to the development of new ideas that can transmit liberatory joy to the body and community (Tunstall, and Agi, 2023, p. 106) through *reprioritising existing resources* (available tools, materials, and equipment), and in turn designing objects that are more efficient in their use, ethical in their practice, and more effective in their purpose (Pansera and Owen, 2018).

2.2 INNOVATION vs. CARBON CULTURE

A key issue with the current traditions of inquiry and action, according to Matthew Huber (2013), a researcher specialising in geography, energy, and environment, is that *"energy consumption makes us less aware of the real-world"* and in turn breeds arrogance through its visions of freedom, independence, and entrepreneurialism (p. 1). The carbon form, known as fuel or electricity used for power, is therefore accepted as an ordinary part of everyday life that is embedded in ongoing processes of mobilising, energising, making, and doing (Sheller, 2019, p. 57), and subsequently in the practice of innovation.

The carbon culture, as established above, has resulted in the formation of an innovation mindset that centres on the notions of increased consumption and production and a way of life specific to Western societies. This is further argued by anthropologist David Hughes (2017), that production and consumption of energy is like slavery, an unconscious act that increases the ability to imagine whilst decreasing the possibilities for invention (pp. 3,22). This particular livelihood has been transported globally through *cross-cultural exchanges* (trading of ideas, feelings, stories, and customs between two or more different cultures) and mass media, which have created a collective sense of the imagination and creativity (Appadurai, 1986, p. 31) that justifies access to resources and an individuated sense of power over the geographies of everyday practices (Huber, 2013, p. 9). Over the years, this mindset has influenced cultures elsewhere and contributed to cultural disjuncture, an increase in carbon emissions, and an impact on climate change.

In contrast, *designing under resource constraints* can be an important climate change mitigation strategy for reducing greenhouse gas emissions and also preserving limited energy and materials. It can promote sustainable development by enabling the development of new ideas through a more conscious approach to manufacturing, economic growth, and social well-being, which is further explored in the following sections.

2.2.1 CROSS-CULTURAL EXCHANGES AND SUFFIXSCAPES

Cross-cultural exchanges, Cowen (2004) argues, are the result of migration and travel, which in turn have created hybrid cultures that introduce, through human imagination, synthetic products of multiple global influences (pp. 7,15,62,111) that are disconnected from the realities of local life. In this case, imagination, according to Appadurai (1986), *"is a staging ground for action"* (p. 8), which can be considered the driving force behind the movement of people, their actions, and the transnationalisation of cultures.

In response to the global cultural disjunctures, Appadurai (1990) proposes *'five landscapes of globalisation'* (known as Suffixscapes), which reveal the changing social, territorial, and cultural reproduction of culture and group identity through the flows of migration, technology, finance, media, and ideology, whilst tackling the problem of how to describe culture on a global scale. These five landscapes or dimensions are summarised here:

Ideoscapes:	flows of modernity, ideas, freedom, and rights.
Financescapes:	flows of money through technology and capitalism.
Ethnoscapes:	flows of people through tourism, migration, war.
Technoscapes:	flows of mechanical and information through multinational and national corporations.
Mediascapes:	flows of images and information through film, magazines, newspaper, and television.

The Suffixscapes can be understood as localised interactions and interconnections for building imagined worlds and values by constructing deep perspectives into historical, linguistic, contextual positioning, political situatedness, and cultural experiences (Appadurai, 1990, p. 267). However, according to Ashley Hall (2013), a designer and professor of design innovation, *"the suffixscapes are conceived as a framework and a way of*

understanding and describing the shift from the real to the imagined, but not as a method, nor a way of acting" (p. 42).

Building upon Hall's argument, Figure 2.2 is an attempt to address the above limitations by constructing a framework for action that explores Appadurai's *landscapes of globalisation* (1990) through the contextualisation of culture as a dynamic process between global influences, local values and practices, and different levels and depths of motivation. It visualises how the sum of our practices shapes our values and influences our selection from available modes, means, and ends of action, and how our immediate context influences our global values and positioning through localised interactions and practices, which in turn shapes our ideas and designed objects.

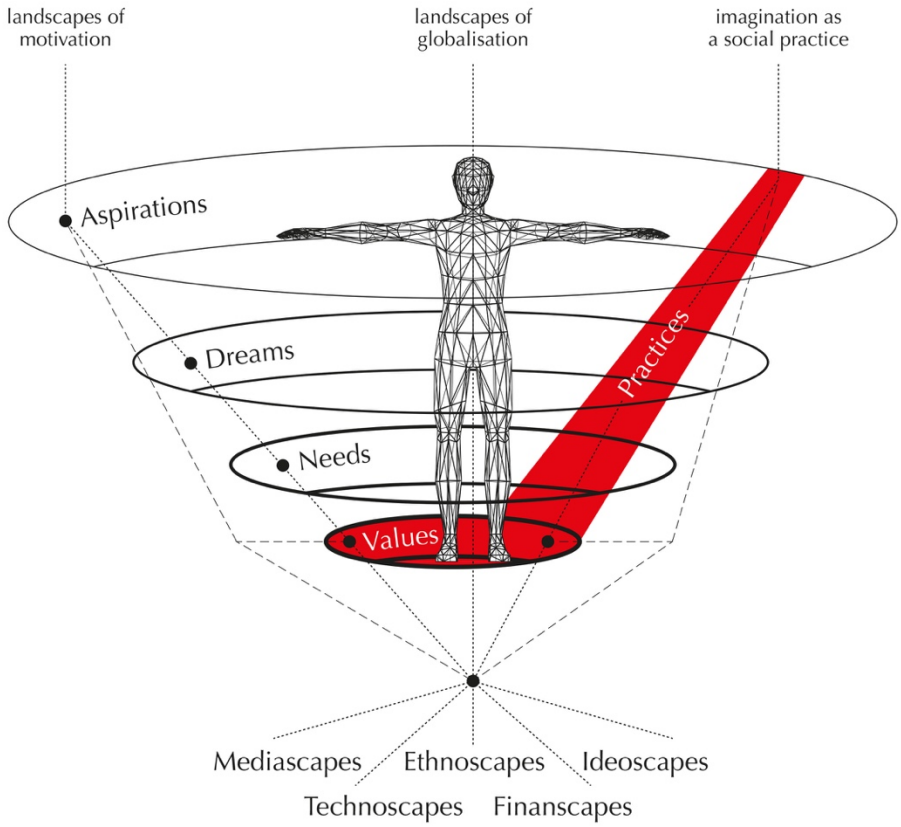

Figure 2.2: *New Cultural Processes*

2.3 PILOT PROJECTS

In this section, I am aiming to contextualise my pre-PhD practice within the expanded field of innovation **(see Appendix A)**. I will demonstrate my initial approach to the issues discussed so far and narrow my focus towards decolonised innovation.

Central to my interest and focus as a designer has been designing for *'the other 90%'* (Polak, 2007) and for *'the real world'* (Papanek, 1985). Before this PhD thesis and the findings from this research, which I will discuss in detail in the following chapters, my work could be best described as Human-Centred Design concerned with the values and ethics of Co-design and Social Design. While this approach was different from traditional industrial design in the way ideas were conceived, developed, processed, and delivered, it was highly influenced by the methods and aims of Western academic institutions and commercial agencies.

Two pilot projects demonstrate my initial approach to *designing under resource constraints* (described in Section 1.3), where *Project 1* was initiated *with* resource constraints and *Project 2* was initiated *for* resource constraints. Both projects are designed for a least developed economy context, more precisely Afghanistan, and were part of my postgraduate studies at the Royal College of Art and Imperial College London.

Research, writes Glanville, is carried out in two main arenas. The first is experiment; the second is theory (Glanville, 1999, p. 82). Seen in this light, my approach to experimentation, through these pilot projects, tries to escape from the theory first and instead research the unknown to build relations that I seem to sense before I can clearly recognise and demonstrate them (Rheinberger, 1997, p. 13) by perceiving opportunities arising from the applications of existing and new knowledge to form a new idea.

2.3.1 PROJECT 1: MANGAI WATER PURIFIER: DESIGNING UNDER AND *WITH* RESOURCE CONSTRAINTS

Mangai is a vertical twin-sack water transporting device designed to make accessing water easier for the inhabitants of Kabul, Afghanistan (Figure 2.3) and purify water on-the-go using low-tech water purification technology. The project was carried out during the first year of my postgraduate studies in Innovation Design Engineering between May and June 2012.

My approach to innovation followed the five stages of *'design-thinking'* process (Kelley, 2001) to design and develop a device that builds upon the existing behaviours, processes, and activities of local people. In addition, my focus was to lessen the physical strain of water transportation on the end-users, provide a technology based on the existing infrastructure and production methods, and create a household product that is economically and socially viable as well as locally sourced **(see Appendix A, A1)**.

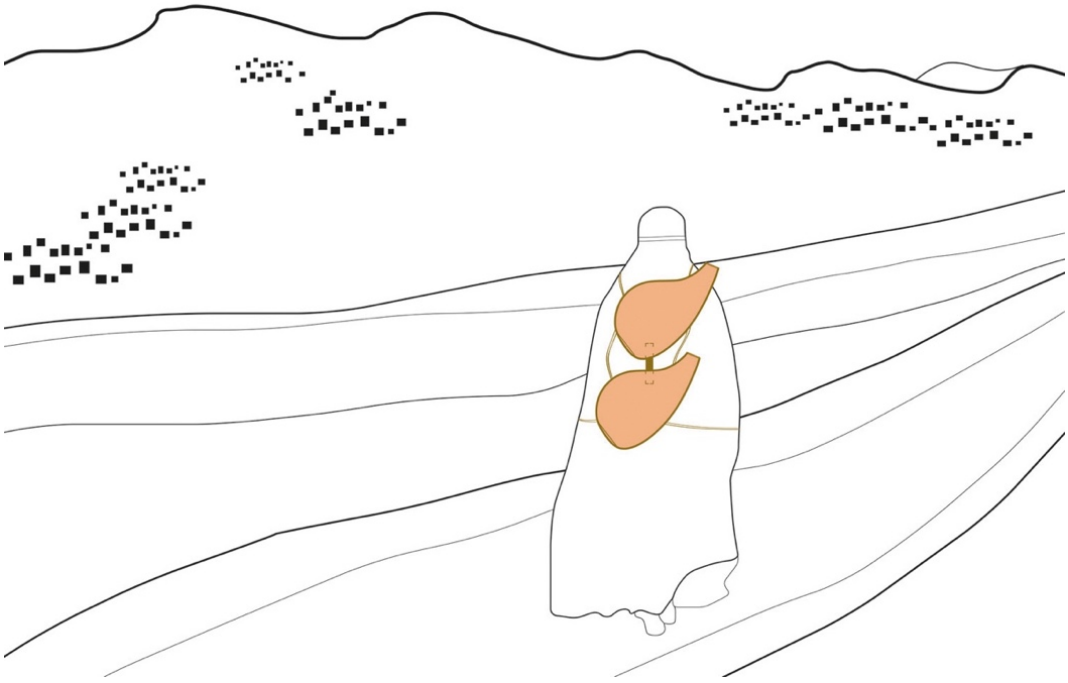

Figure 2.3: *Mangai Water Purifier*

2.3.1.1 FINDINGS

Through the practice of designing *under* and *with* resource constraints, I witnessed that my approach to innovation evolved from an industry-oriented linear way of thinking to ad hoc. I was learning by doing and taking action to improve imposed circumstances while reflecting on my surroundings to formulate decisions through making and testing. Similarly, my thinking was being formed by making in the context and immediately putting it to use (Vaughan, 2017, p. 35), known as *'site-specific knowledge production'* (Kaya, and Yagiz, 2011, p. 65).

2.3.1.2 EVALUATING MYSELF

During Project 1, I was strongly influenced by the geography and the immediate clusters of skills and knowledge embedded in the local culture. I was absorbing and exploiting tacit knowledge by *'being there'* in Kabul, Afghanistan, and through physical experience while working closely with the local suppliers and makers, which meant that I had to adapt my design to meet the local level of creativity and sensitivity to quality and aesthetics (Bettiol, and Micelli, 2014, p7-17).

An important finding from this evaluation has been the way in which the immediate context and on-the-ground activities forced my thinking and changed my innovation process from thinking and practicing individually to seeking and applying methods that required a collective understanding and approach to problem-solving. Thus, I was no longer in control of the outcome and was artificially shaping and formulating myself to think and practice like the end-users and local makers, as illustrated in Figure 2.4.

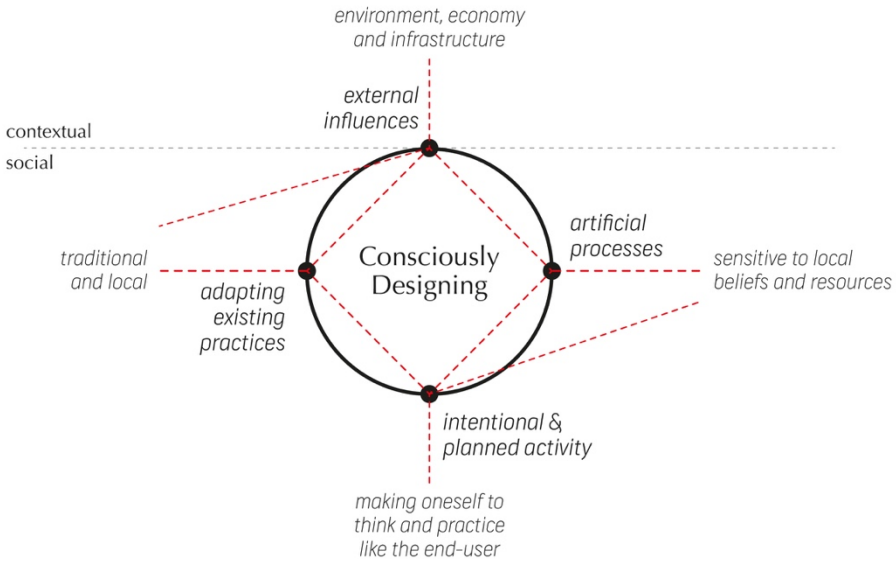

Figure 2.4: *Dimensions of Consciously Designing*

2.3.2 PROJECT 2: QAF SUSTAINTABLE WASHING SYSTEM: DESIGNING UNDER AND *FOR* RESOURCE CONSTRAINTS

Qaf is a washing machine that uses kinetic force to wash clothes on-the-go or stationary at home, while making the process of washing three times quicker through the reduction of labour and an increase in efficiency (Figure 2.5). The project was carried out during the second year of my postgraduate studies in Innovation Design Engineering between March and June 2013.

In this project, I designed and developed a device that evolves existing ways of washing clothes in locations with no electricity and lack of clean water while adapting to the local context, environment, and belief systems. In addition, my focus was to make clothes washing a sustainable, delightful, and empowering activity for those living far away from the sources of water. My aim was to provide a new technology based on the readily available infrastructure and production methods that would cost less, function well, and be suited to the daily needs of the end-users **(see Appendix A, A2)**.

Figure 2.5: *Qaf Sustainable Washing System*

2.3.2.1 FINDINGS

Selectivity between shared and lived knowledge and experience allowed me to be open to local rules, responsive to the performance of others, and adjustable to local culture or way of work to experiment and develop a household object based on embodied and intuitive know-how rather than explicit or appropriated findings for mass consumption. Through the practice of designing *under* and *for* resource constraints, I witnessed that my approach to innovation evolved from strategic to having to put emphasis on utilising social relations and practical local knowledge in the design process. I was learning by reflecting on received information and testing it through small experiments to introduce new ideas in ways that imitate the existing beliefs whilst creating continuity of interactions between the available tools and materials, the immediate environment, and the participants and me (Gunn et al., 2013, p. 18), known as *'reflection-in-action'* (Schön, 1991, p. 50).

2.3.2.2 EVALUATING MYSELF

During Project 2, I was continuously *'composing and connecting'* a variety of elements, such as the process of accessing water, the practice of washing clothes, the unavailability of electricity, and environmental challenges, into relationships with one another. I was trying to use simple and ready-made objects to make design decisions without investing time and energy in in-depth examinations (Nelson, and Stolterman, 2012, p. 108).

An important finding from this evaluation has been the way in which I intentionally rejected existing assumptions to develop open-ended and deliberate outcomes by forcing my imagination and ways of thinking upon the locals, where I was making those around me adapt their practice and confine their understanding and approach to problem-solving like I did, as illustrated in Figure 2.6.

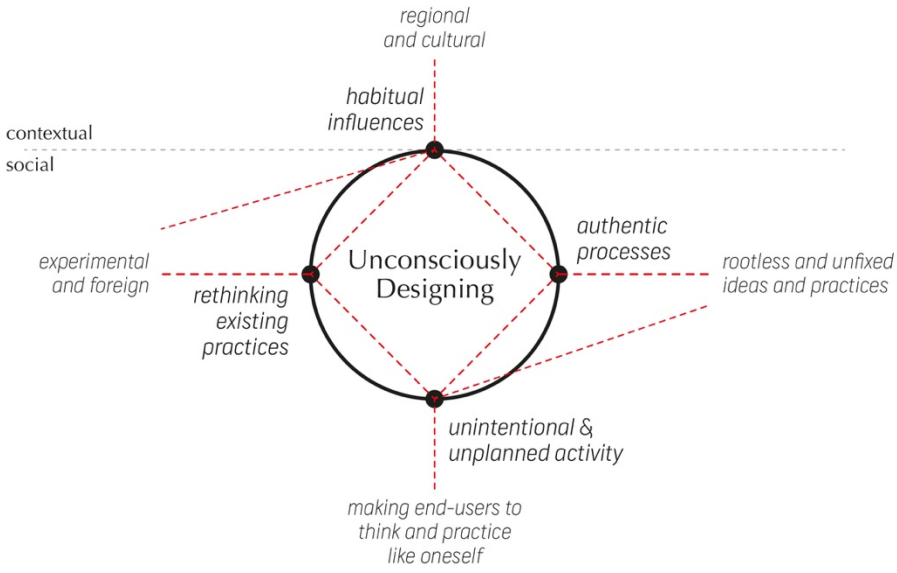

Figure 2.6: *Dimensions of Unconsciously Designing*

2.3.3 REFLECTIONS ON DESIGNING UNDER RESOURCE CONSTRAINTS

An important area of exploration and finding through these projects was the enabling of conditions, systems, and actions that facilitated the unfolding of human potential through design in a context where design was not valued and understood and where design was surprisingly invisible and unrecognised (Nelson, and Stolterman, 2012, p. 2). My ideas and making techniques were judged by two qualities: that they should support or complement what the context already has, and that they are able to be incorporated and synthesised into the local way of life (Cowen, 2004, p. 139).

During the pilot projects, while unlearning the core rules and methods of my educational and practical training, I felt that I was freeing my ideas, methods, and processes from the biases and forces of globalisation (Tunstall, 2013, p. 238). However, through a period of reflection, I realised that my approach was pushing the universality of Western thought instead of questioning, delinking, or undoing it by *capitalising on the difference and domination of relations* between me and the end user through Project 1, and by *forming a new structure of control, labour, and local resources* through Project 2 (Mignolo and Walsh, 2018, pp. 21-23).

Establishing this finding further elevated the need to *seek radically distinct perspectives and positionalities* that displace Western thinking and doing as the only framework and possibility for innovation under resource constraints, and to *investigate better design methods that push other questions, other reflections, other considerations, and other understandings* that do not repeat colonial thinking and doing and are in harmony with other cultures, situations, and settings.

2.4 RESOURCE CONSTRAINTS AS A RATIONALE FOR DECOLONISED INNOVATION

Resource constraints, as described in Sections 1.3 and 2.3, *enable the development of local knowledge and expertise that liberates* the designer/researcher from continuous erasure of difference and universalised material practice (the modes of design that are performed across different cultures and societies and which have become similar in nature, such as the use of tools, type of material, making technique, and purpose of consumption). By positioning the designer/researcher within an endless process of *unmaking and remaking, composing,* and *connecting,* resource constraints can create a space for design in other ways and prefigurations (Fry, and Nocek, 2021, p. 17-21).

As a project of resistance to accepted methods, *resource constraints can physically and psychologically build capability for independence and the conditions for autonomous dignity from colonial missions and visions* by providing the possibilities to rethink the system of thought, mentality, and power structure that constructs the hegemonic and Western-centric matrix of design knowledge and practice (Bhatia, and Priya, 2018, pp. 647-648). Seen in this light, *resource constraints can create the conditions for creative diversity* by enabling designers/researchers to change norms from within through self-reflection and determination to achieve culturally suitable local solutions and, in the words of Escobar (2021), help them defend some of their practices, transform others, and invent new practices (p. 37).

Thus, resource constraints can be understood as a rationale for Decolonised Innovation because they are always *local, specific, and multivalent* and offer a way to decolonise oneself and others through the development of their own language, logic, ontological, epistemological, and cosmological constellations that structure a specific social and material world (Ansari, 2021, p. 139).

2.5 FRAMING DECOLONISED INNOVATION

This chapter began by reviewing literature on transnational cultural transfer and the impact of unbalanced design methods and reflecting upon the issues related to current thinking processes and approaches to innovation. This chapter further highlighted, through the findings from literature (Section 2.1, 2.2, and 2.4) and the reflections on the pilot projects (Section 2.3), the shortcomings in both design academia (e.g., theories and pedagogy that lack contextual and cultural understandings) and practice (e.g., methods that ignore socio-cultural and contextual needs). Moreover, the theories presented by Cowen, Friedman, Fry, Appadurai, and Escobar et al. lack understanding of non-Western innovation practices and call for the need to develop methods that can help designers and researchers with ways of knowing and acting that differ from colonial power relations and logics of *coloniality*—the ways in which colonial legacies impact cultural and social systems as well as knowledge and its production (Mignolo, and Walsh, 2018)—as well as to apply them in practical ways in the form of artefacts under resource constraints.

Cowen's *cross-cultural exchange theory* provides a way to understand patterns of human behaviour at different scales. Similarly, Friedman's *cross-border theory* provides models in the form of mindsets that help with identity construction and cultural production in transition. However, they do not consider what can happen when influences from the immediate context, limitations of resources, and human positioning in the form of a local, migrant, or foreigner come into play with thinking and making processes.

Fry's *defuturing* and *sustainment theory* helps to identify the dependency of existing design methods on linear and instrumentalist thinking, which has resulted in unsustainable consumption and calls for a non-scientific way of thinking, designing, and making without modernity. However, it does not provide alternative methods of designing that could change human

psychology and action towards responses that are based on necessity rather than choice.

Appadurai's *suffixscapes*, on the other hand, are an elementary framework for understanding global cultural flows and providing political arguments around cultural alterations. This view connects with Signorini, et al.'s *social theory* that cultural difference and identity are crucial bases for innovation, which further suggests the potential of design research to carry out explorations that can address global disjunctures and differences.

Decolonised Innovation is the author's description for *alternative process of inquiry and action for introducing and implementing a new idea in a unique setting with the goal of producing culturally acceptable outcomes* through connecting to locality as well as reading, interpreting, and ordering local reality under resource constraints. It makes a claim for *another innovation* that is different from mainstream methods of innovation by utilising personal limitations and geographic restrictions to create new ways of being and becoming that are socially relevant, aesthetically preferable, and ethically acceptable.

The commonality running through the theories of Cowen's cross-cultural and Friedman's cross-border exchange, Fry's defuturing and sustainment, and Appadurai's suffixscapes is to bring in and implement *other* ways of understanding and approaching the practice of innovation that *liberate* the designer/researcher—to set him/her loose from the restraints and constraints of existing concepts (Chilisa, 2012, p. 14). Thus, *Decolonised Innovation* is an effort to pause, reconsider, change, and reform our thinking as well as to fundamentally alter how we perceive and use innovation in various cultural and geographic contexts.

Accepting what already exists and exploring how others practice innovation is evidently the first step towards liberating humans and decolonising innovation from worldly constraints. However, findings from Chapters 1 and

2 revealed that understanding *other* methods of innovation and how they can be practiced ethically and appropriately is a major gap that needs filling, including the gap in knowing what the differences and similarities between other innovation and conventional innovation are and how resource constraints enable unlearning and relearning processes.

Methods capture key procedural and practice knowledge about design; thus, *methods form an important part of design research* and are one of the major means through which design research impacts academia, practice, and society. However, innovation theories that have emerged during the last decade of design research lack a focus on methods of innovation (Cash, 2020). For this reason, the following chapter will now explore the gaps and challenges raised and answer ***Research Question 1:*** **What are the current methods of designing innovation under resource constraints?** through a comprehensive literature review, case study analysis, and practice-based design projects conducted by the author.

Generating New Knowledge

Chapter 3
Innovation Under Resource Constraints

3.1 INTRODUCTION

The suggestion that resource constraints spur different types of innovation was first proposed by Zeschky et al., (2014, p. 16), who based their findings on business models and economic theories but failed to explain how these innovations can be achieved exactly.

In this chapter, I evaluate in depth the methods of innovation that originate under resource constraints. To do this, I combine systematic literature review and design research methods to explore existing assumptions and perspectives *to liberate my own mind and give space to other frames of reference* (Chilisa, 2012, p. 14), and *gather reference materials* (Frayling, 1993, p. 5). Furthermore, I draw on perspectives and epistemology from cultural studies, expanding through a literature review and then defining them through cross-case study analysis and prototyping.

Afterwards, I structure the findings into *five method groups* (three projects under Ideoscapes, three projects under Financescapes, two under Ethnoscapes, three under Technoscapes, and two under Mediascapes), pinpoint the differences between them, and consider an alternative epistemology arising from social theory with a focus on the role of culture, economy, and the environment in influencing these methods of innovation and their practice.

3.1.1 SYSTEMATIC LITERATURE REVIEW

A systematic literature review was conducted to identify the trends emerging in the field of my research, mainly to find knowledge gaps, gain a new perspective, and understand what has gone before to be able to critique and expand the subject area (Smallbone and Quinton, 2010, p. 1). Using a search engine (Google Scholar), the initial search focused on finding articles from the science, design, engineering, and economics societies that directly investigated resource constraints as an approach to innovation. Limiting parameters were used to prioritise scholarly journals and articles submitted between 2012 and 2018. In addition, five subject-specific and cross-cultural books by celebrated authors formed the backbone **(see Appendix D, D7)**.

Business and innovation thinkers Navi Radjou and Jaideep Prabhu, in *Frugal Innovation: How To Do More With Less (2015)*, lay out the key principles, perspectives, and techniques behind the art of doing more with less. Whereas Charles Leadbeater, a leading authority on innovation and creativity gives an understanding of the personal traits and qualities of those who practice under resource constraints in *The Frugal Innovator (2014)*. Moreover, specialists in aerospace innovation and experts on space science, Brian Sauser, in *NASA Strategic Project Leadership in an Era of Better, Faster, Cheaper: Striving for Systems Innovation (2008)*, and Howard McCurdy, in *Faster, Better, Cheaper: Low-Cost Innovation in the U.S. Space Program (2003)*, both give an overview of the cultural and political aspirations that provided the experimental base from which innovation under resource constraints was successful. In addition, they give recommendations, remind us of important rules, and share lessons learned from their experiments.

While these publications acknowledge the subject area to be new and significant, they fall short in explaining how innovation can be practiced under resource constraints.

Following this, a total of 2,874 journals and articles were found out of which 109 were deemed relevant **(see Appendix D, D8)**, resulting in the identifying of thirteen methods of innovation under resource constraints: *'Frugal Innovation'* (Bound and Thornton, 2012*), 'Cost Innovation'* (Tiwari and Herstatt, 2014), *'Reverse Innovation'* (Govindarajan and Trimble, 2012), *'Jugaad Innovation'* (Radjou et al., 2012), *'Bottom of Pyramid Innovation'* (Prahalad, 2012), *'Gandhian Innovation'* (Prahalad and Mashelkar, 2010), *'Empathetic Innovation'* (Gupta, 2012), *'Long tail Innovation'* (Anderson and Markides, 2007), *'Below-the-Radar Innovation'* (Kaplinsky, 2011*), 'Inclusive Innovation'* (George et al., 2012), *'Good Enough Innovation'* (Hossain, 2014), *'Grassroots Innovation'* (Prabhu and Jain, 2015), and *'Faster, Better, Cheaper Innovation'* (McCurdy, 2005 and NASA's Skunkworks, 1992).

These thirteen methods can be considered under the general umbrella term *innovation under resource constraints*, and a further study followed to explore and define them through a *'three-stage approach'* (Tranfield et al., 2003) that included planning, conducting, and reviewing (see Figure 3.1) literature on four different search databases—Google Scholar, EBSCO, ProQuest, and SSRN, which are considered the most comprehensive databases in the field of design and engineering. The aim here was to identify and collect literature through a more rigorous and systematised approach involving the deconstruction and reconstruction of existing knowledge and transform them into a body of new findings.

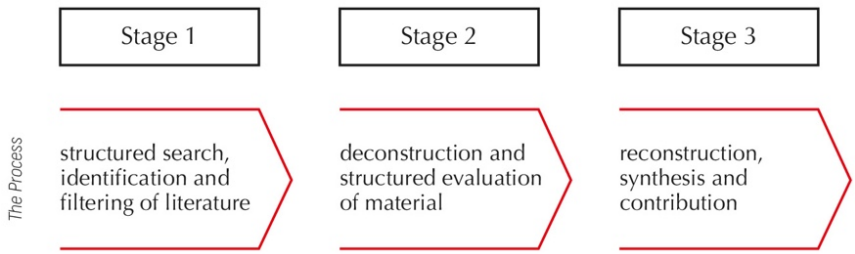

Figure 3.1: *Three-stage Approach to Literature Review* (adopted from Tranfield et al. 2003)

The findings from the literature were analysed and explored through a *matrix method* to gather specific findings, which involved multi-layer categorisation of each method of innovation to identify the influences of cultural, political, environmental, and social factors on their process and outcome. Furthermore, the findings from the matrix were analysed and synthesised through *six systematic qualitative frames* (parameters, criteria, visual reference, narrative, context, and motivation), which derived from supervision discussions, to extract the social and cultural contexts and experiences linked to the case studies and distil the most directed information (Miles et al., 2013, p. 108).

3.1.2 CASE STUDY ANALYSIS

A multiple-case study procedure was used (see Figure 3.2), where a selection of two or more cases that are literal replications with exemplary outcomes demonstrate the practice of a particular theory behind each method of innovation but are differentiated in terms of industry or sector to maximise analysis (Yin, 2018, p. 59). The case studies are chosen based on their functionality, architecture, environmental interactions, user interactions, and cost characteristics (Saunders, 2009, p. 4).

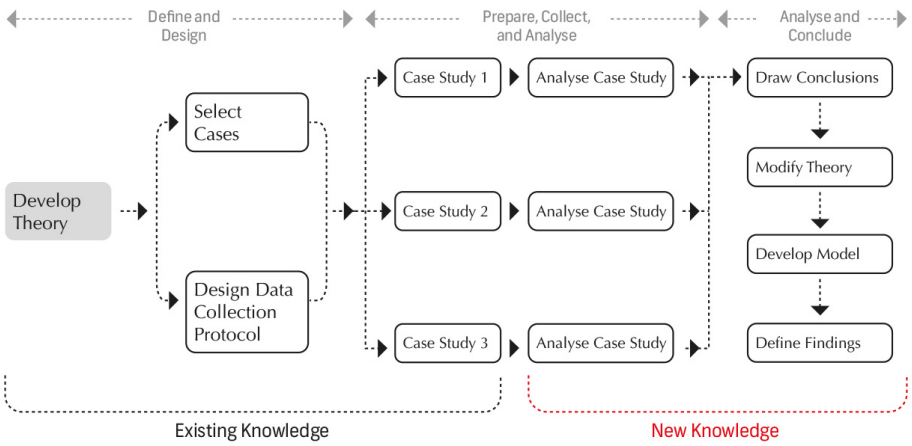

Figure 3.2: *Multi-case Study Procedure* (adopted from Yin, 2018)

3.1.3 COLLECTING FINDINGS AND ANALYSIS

To collect and analyse the findings, I applied a four-layer approach. First, I decoded (unravel and interpret) the findings from the literature review to allow for defining the process of each method of innovation. This required using *the selection method* to weigh the findings of the literature review against the case studies (Benden et al., 2012, p. 12), which were then reformulated into a **conceptual framework** (Figure 3.3) using Anderson and Billou's (2007) *4As framework* (Availability, Awareness, Acceptability, and Affordability) with a focus on actions at structural, relational, and transformative levels.

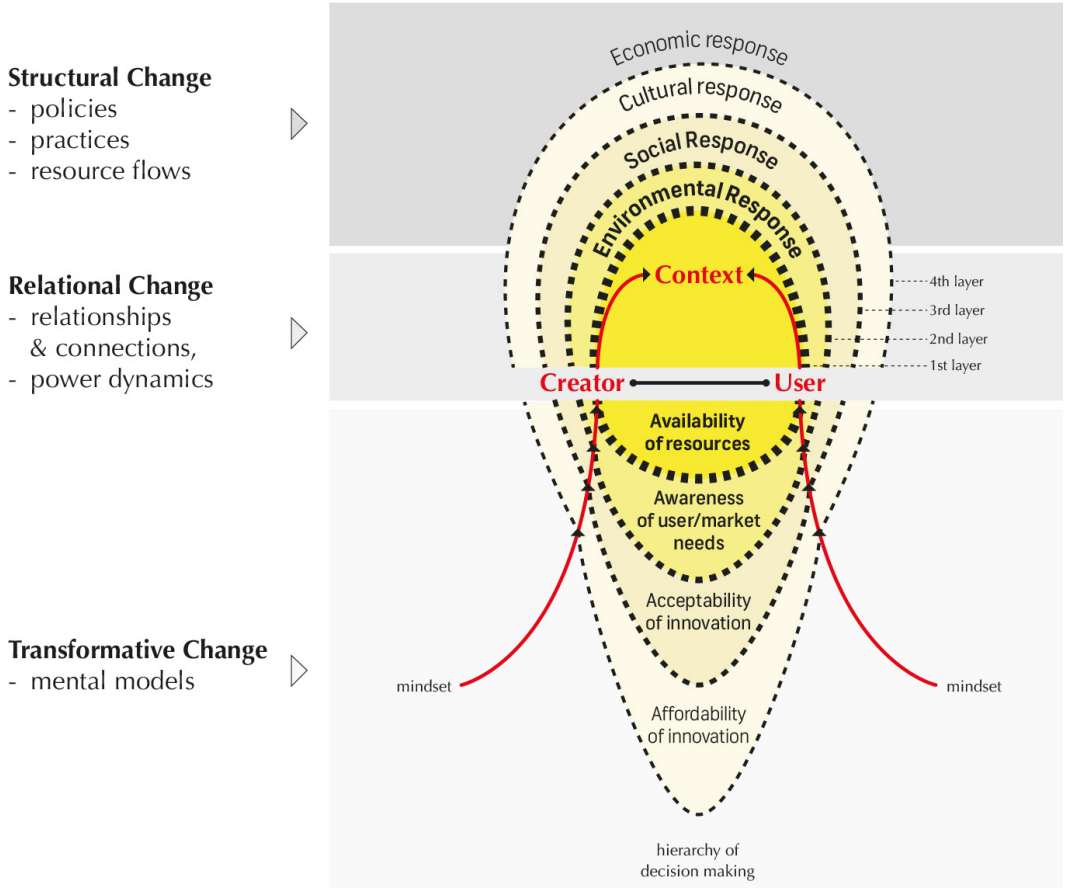

Figure 3.3: *Conceptual Framework for Defining Individual Methods of Innovation Under Resource Constraints*

The frameworks in Figures 3.4 (p. 74); 3.9 (p. 82); 3.13 (p. 90); 3.17 (p. 98); and 3.22 (p. 107) serve as *a guide for practicing the thirteen methods of innovation* in a reflective manner. As shown in Figure 3.3, there are four layers of decision-making, and at its core is the emphasis on the relationship between *the creator* (designer/researcher as producer and manufacturer of innovation), *the end-user* (client/employer as consumer and beneficiary of innovation), and *the context* (location/environment as market and place of use). Each method begins with a reflection on the immediate context and the available resources to develop a new idea in accordance with the local environment. The second step in the framework concerns the needs of the user and the market, with a focus on addressing a social issue. Following this, the third step helps with further contextualising the idea through an understanding of local cultural dynamics by involving the local population in the design process. The final step is concerned with the affordability of the innovation for the end-user and the most suitable business model.

After reformulation, each method of innovation is **translated through practice** (Sections 3.2.3, 3.3.3, 3.4.3, 3.5.3, and 3.6.3) by designing an everyday object (a measuring tool) using the *'thinking-through-making'* (Sennett, 2009) method, where my thought processes and the materials that I use are in a continuous process of correspondence within an ongoing, improvisational process between myself, the materials, and other non-human things, such as tools and the physical environment (Ingold, 2013). Following this, the findings from practice were analysed through a **categorisation** process and further through a **measuring decolonisation** process (Section 3.2.4, 3.3.4, 3.4.4, 3.5.4, 3.6.4) with a focus on each method's point of reference (Brem and Wolfram, 2014) to understand their level of complexity and relevance.

Finally, the reformulated methods of innovation were **clustered under suffixscapes** (Appadurai, 2003), which helped reveal five new and alternative method groups of innovation that are influenced by the current world situation **(see Appendix D9)**.

3.2 PROJECT 1: IDEOSCAPES

Out of the thirteen methods of innovation under resource constraints, *Frugal Innovation, Below the Radar Innovation,* and *Jugaad Innovation* are concerned with the ideas and narratives of *doing more with less, reuse,* and *design for social change*. As shown in the decoding process **(see Appendix E, E1, E2, and E3)**, this cluster of methods represents a set of *situation-based responses* that centre around *self-democratising* to design for the other 90% and make the future more accessible for more people. They begin with the investigation of people's needs by integrating them as co-developers and are strongly influenced by local concepts of culture transmitted through spontaneous interactions with the everyday (Casanova et al., 2012, p. 2) in a mutually improvised context (Larsen and Bogers, 2014, p. 386).

3.2.1 FRUGAL, BELOW THE RADAR, AND JUGAAD INNOVATION

Frugal Innovation focuses on higher-quality outcomes that aim to reduce cost and functionality. Its starting point is Jugaad (Brem and Wolfram, 2014, p. 5) and adapts tried-and-tested technologies that require basic engineering skills (Hossain, 2015, p. 4) to develop just-in-time design to respond to the immediate environment and the identified purpose of use (Radjou and Prabhu, 2015, p. 33). *Below the Radar Innovation* is characterised by simplicity and low costs, with a focus on developing new ideas that can be recreated and appropriated by the end-user using available tools and local skills (Papaioannou, 2014, pp. 9-10).

Jugaad Innovation, on the other hand, is a quick and improvised solution to temporary problems (Agnihotri, 2015, p. 401). It is triggered by the need to convert waste into something functional, useful, and beautiful while compromising on quality (Prabhu and Jain, 2015, p. 6).

3.2.2 CASE STUDY ANALYSIS

Findings from the case study analysis **(see Appendix E, E4)** show that the market for these innovations is the *'arrival cities'*—the third space between rural and urban, populated by aspirational end-users who want to make a better living (Leadbeater, 2014, p. 17).

The key similarity between *Frugal*, *Below the Radar*, and *Jugaad* is in their ability to enable decision-making in an enclosed, self-sufficient environment where beliefs and lived experiences are turned into action using locally available tools and skills. Other similarities among these methods of innovation include:

1. Focusing on a particular need that's derived from first-hand experience and utilising available materials and tested technologies to design a functional solution.
2. Achieving a simplified design solution that is 50-90% cheaper than the one currently available on the market using mostly recycled material.

Figure 3.4 further defines the relationship between the designer, the user, and the context and provides the frameworks for designing the Ideoscapes cluster of innovations **(see Appendix E, E5)**, which are explored through practice in the following section.

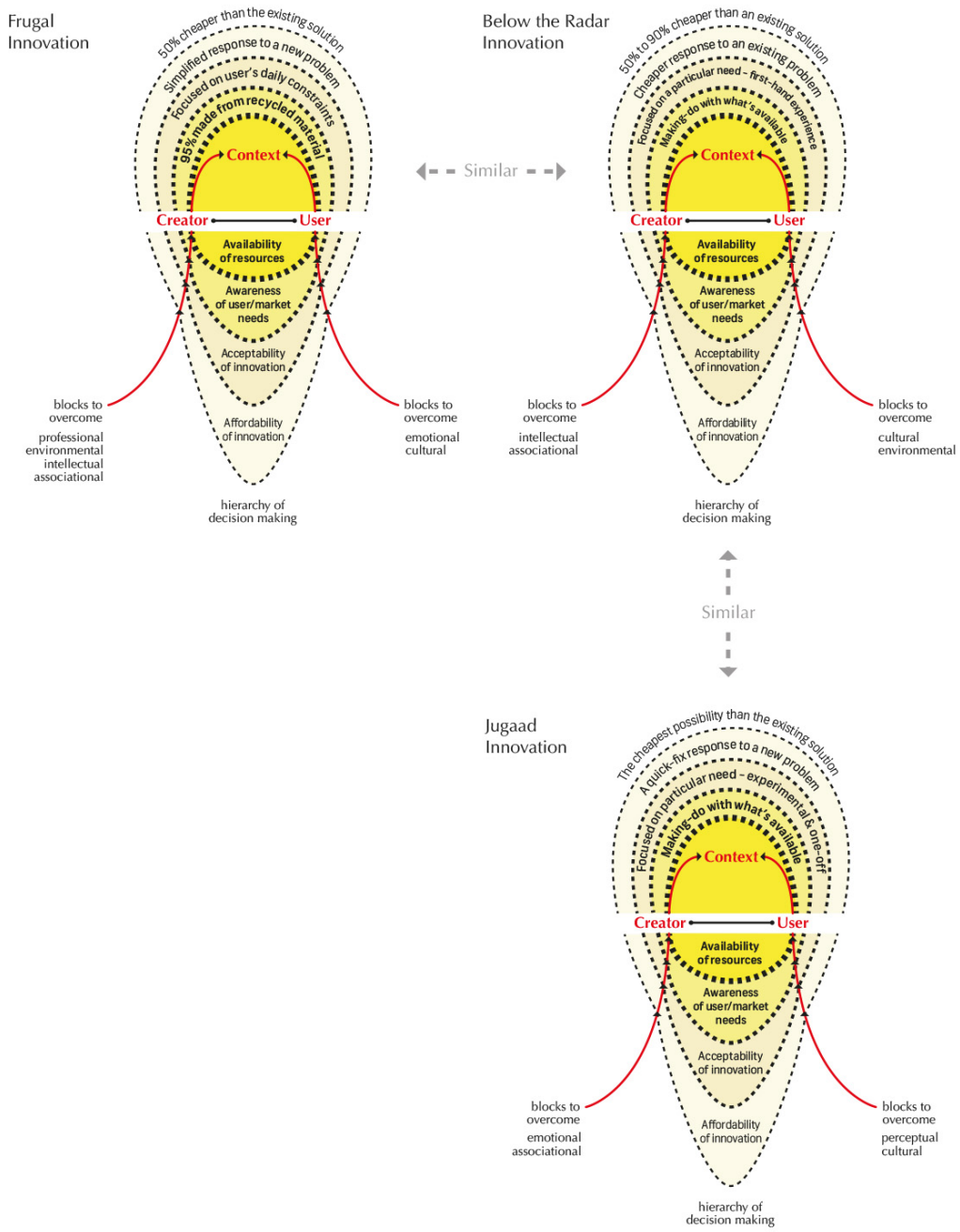

Figure 3.4: *The Ideoscapes Cluster: Conceptual Frameworks for Designing 'Innovation for the Other 90% and Making the Future More Accessible for More People' Under Resource Constraints*

3.2.3 RESEARCH DESIGN AND CONDUCTING RESEARCH

To translate the frameworks (see Figure 3.4) into practice, I explored each method of innovation using Sennett's (2009) *'thinking-through-making'* method. The first of these was *Frugal Innovation* (Figure 3.5), which required the *use of recycled material* to address a specific need of the end-user. I began by sourcing recycled timber to make a functional measuring tool, limiting myself to using half of the material. Following this, I applied the available hand tools, such as a hand drill, knife, and ruler, with the aim of addressing two key end-user needs: a measuring tool that is simple to use and enables the end-user to measure physically and visually.

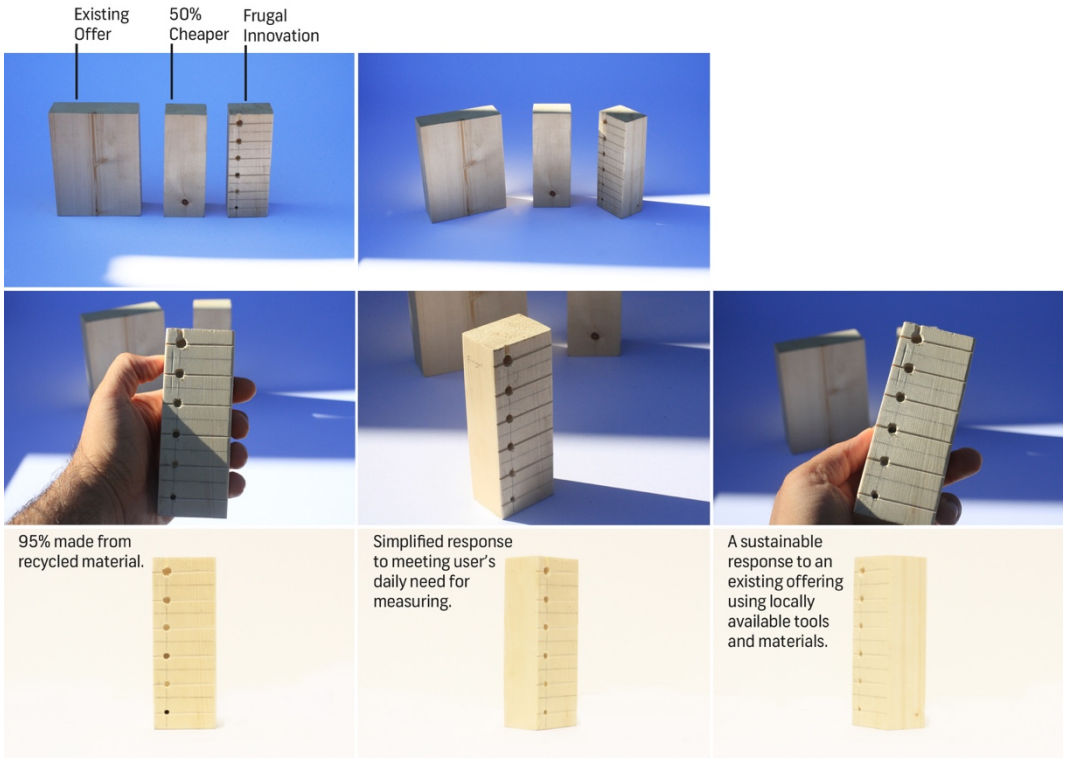

Figure 3.5: *Designing Frugal Innovation*

Below the Radar Innovation (Figure 3.6), on the other hand, required a *personalised response* that began with repurposing a piece of material that

belonged to the location of my practice. Following this, I applied the available hand tools to make a one-off and functional measuring device with the aim of conserving the identity of the original material.

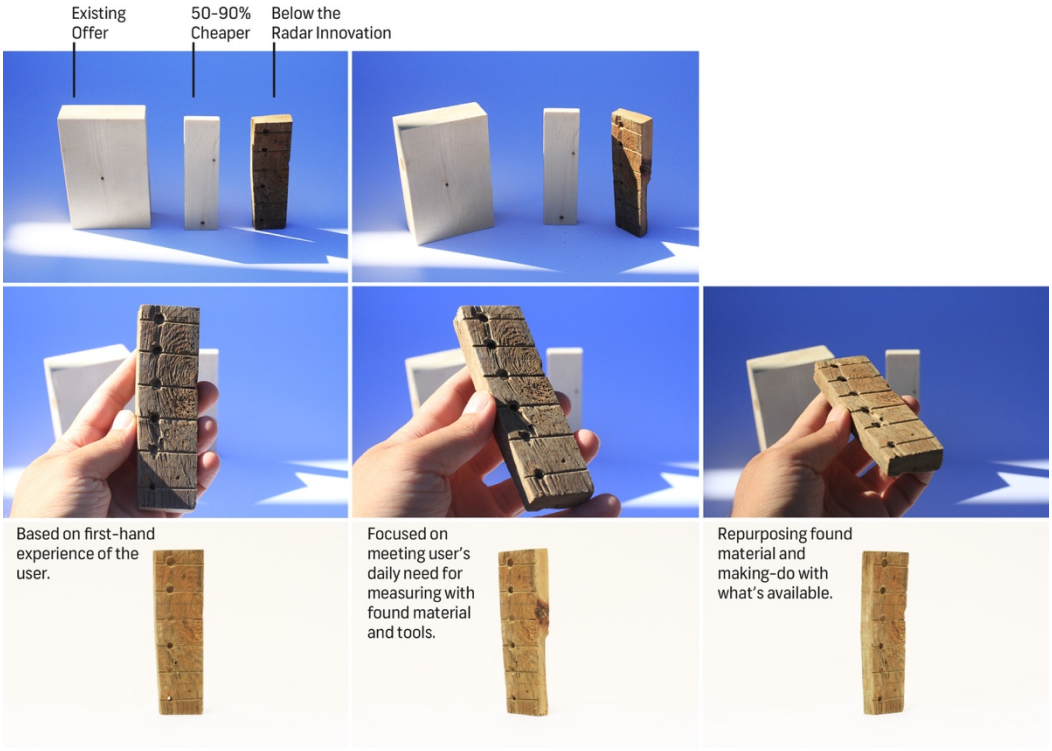

Figure 3.6: *Designing Below the Radar Innovation*

Jugaad Innovation (Figure 3.7), however, required *converting waste material* and began with finding an unused object—a bike's broken chainstay in this case—to experiment with and develop a quick fix solution using available tools.

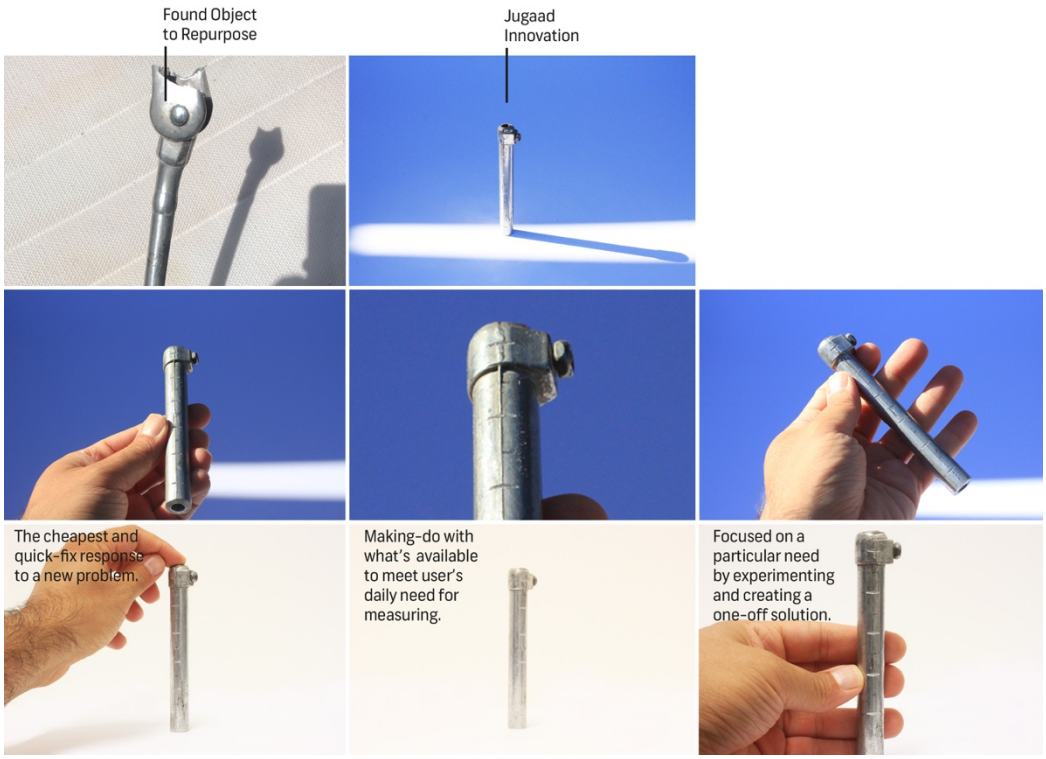

Figure 3.7: *Designing Jugaad Innovation*

3.2.4 FINDINGS

Table 3.1 is an attempt to map my understanding of the level of complexity needed to practice these methods. Through these initial probe projects, I realised that *Frugal Innovation* is a method for developing new ideas that are understandable, honest, and easy to use for a particular culture. Its focus on recycled material makes it environmentally friendly and locally sourced, and in some cases, it aims for the repairability of the product within a cultural ecosystem and helps develop society and the wider world.

Moreover, *Below the Radar Innovation* also focuses on functional outcomes, with an emphasis on being less evident and obtrusive in the environment by using objects and materials that are already integrated within the context. It is a method for developing new ideas that improve life by allowing self-sufficiency and an individual response to a situation.

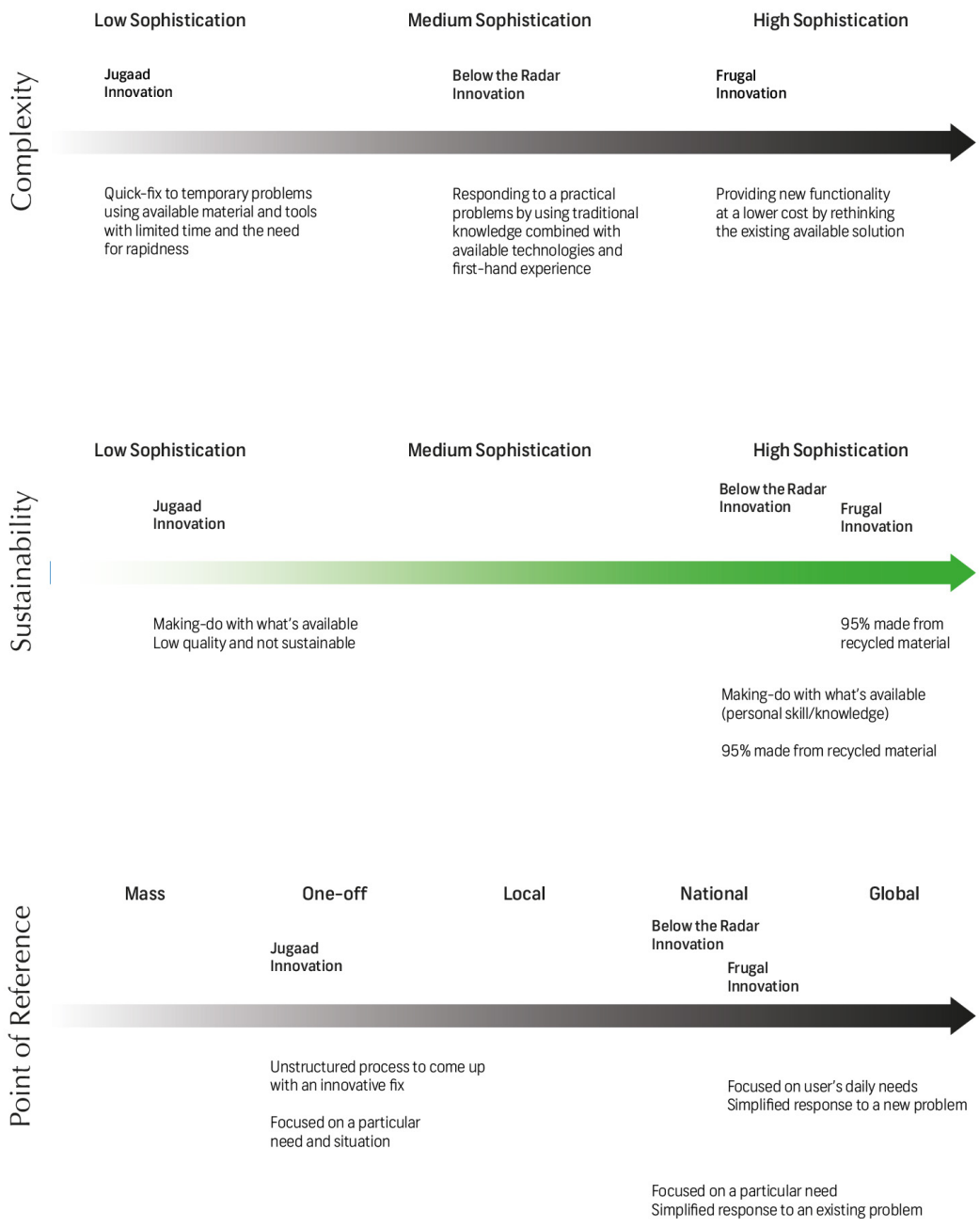

Table 3.1: *Categorising Frugal Innovation, Below the Radar Innovation, and Jugaad Innovation*

In contrast, *Jugaad Innovation* is a method for developing a one-off and low-quality solution for the hyperlocal; however, it promotes unethical production and consumption behaviours that impact society and the environment in negative and undesirable ways (Simula et al., 2015, p. 11). It

aims to develop new ideas that are problem-oriented and build on the notion of self-reliance and independent practice that reject mass production.

A key finding from the literature review is that *Frugal Innovation* requires the integration of end-users (mainly those living in urban locations with small budgets that lack adequate access to technology for their daily use) through a design-led process that delivers better human insights to find a *new market* opportunity at a lower cost.

Further analysing the findings through Papanek's seven inhibitors, I realised that when designing *Frugal Innovation*, I was tackling the majority of the vertical and horizontal blocks and achieving higher levels of decolonisation through this method **(see Appendix E6)**. *Frugal Innovation* required me to reach a solution beyond my field or specialism by integrating the needs of those living in urban locations to find a *new market* opportunity at a lower cost. On the other hand, *Below the Radar* and *Jugaad Innovation* required me to reject accepted knowledge by integrating the needs of those living in rural locations to find an opportunity in an *existing market* at a lower cost.

3.3 PROJECT 2: FINANCESCAPES

Faster Better Cheaper Innovation, Cost Innovation, and *Reverse Innovation* are concerned with the ideas of *low-cost* and *limited budget*. As shown in the decoding process **(see Appendix F, F1, F2, and F3)**, this cluster of methods represents a set of *process-based responses* that centre around *self-accomplishment and design for recognition and acceptance*. They begin with the investigation of people's aspirations by exploring functionalities that are found in products within developed economy societies and are strongly influenced by locally available technologies that can be simplified, delineated, and remodelled (Williamson, 2010, p. 344) to deliver fewer complex solutions quickly to the market (Stanko, 2012, p. 753).

3.3.1 FASTER BETTER CHEAPER, COST, AND REVERSE INNOVATION

Faster Better Cheaper Innovation focuses on miniaturising and modularising new technology through reengineering, downsizing, and outsourcing (McCurdy, 2001, pp 50-51). This approach requires risk-taking and experimentation to meet shorter development cycles and continuous user feedback (Stanko, 2012, p. 753) and develop a re-packaged solution that was originally intended for a different context and use (Zedtwitz et al., 2014, p. 13). *Cost Innovation* focuses on limiting and simplifying features to develop new ideas that are low on quality but high in technology, as well as lightweight or smaller than the existing offer (Agnihotri, 2015, p. 403).

Reverse Innovation, on the other hand, focuses on high technology that portrays limited functionality, materiality, and complexity in its design and manufacturing and that which is developed and adopted first in least developed or developing economy contexts before being transferred as a new solution to a developed economy context (Govindarajan and Trimble, 2012).

3.3.2 CASE STUDY ANALYSIS

Findings from the case study analysis **(see Appendix F, F4)** show that the market for these innovations is the *'growing cities'*—where people lack financial capabilities but maintain high aspirations for developed economy products and technology (Williamson, 2010, p. 344).

The key similarity between *Faster Better Cheaper*, *Cost*, and *Reverse* is in their ability to shift historical cost-based relationships to value-based engagements by stripping out complexity without sacrificing user experience while creating high-performance, low-cost, and adaptive new ideas that address the most compelling challenges. Other similarities among these methods of innovation include:

1. Focusing on a particular need that's not specific to any context to make it transferrable and adaptive by using miniaturised and modular components.

2. Achieving a set of major cost-based objectives using as little design as possible and minimising modification and complications to suit different cultural contexts and infrastructure.

Figure 3.8 further defines the relationship between the designer, the user, and the context and provides the concepts for designing the Financescapes cluster of innovations **(see Appendix F, F5)**, which are explored through practice in the following section.

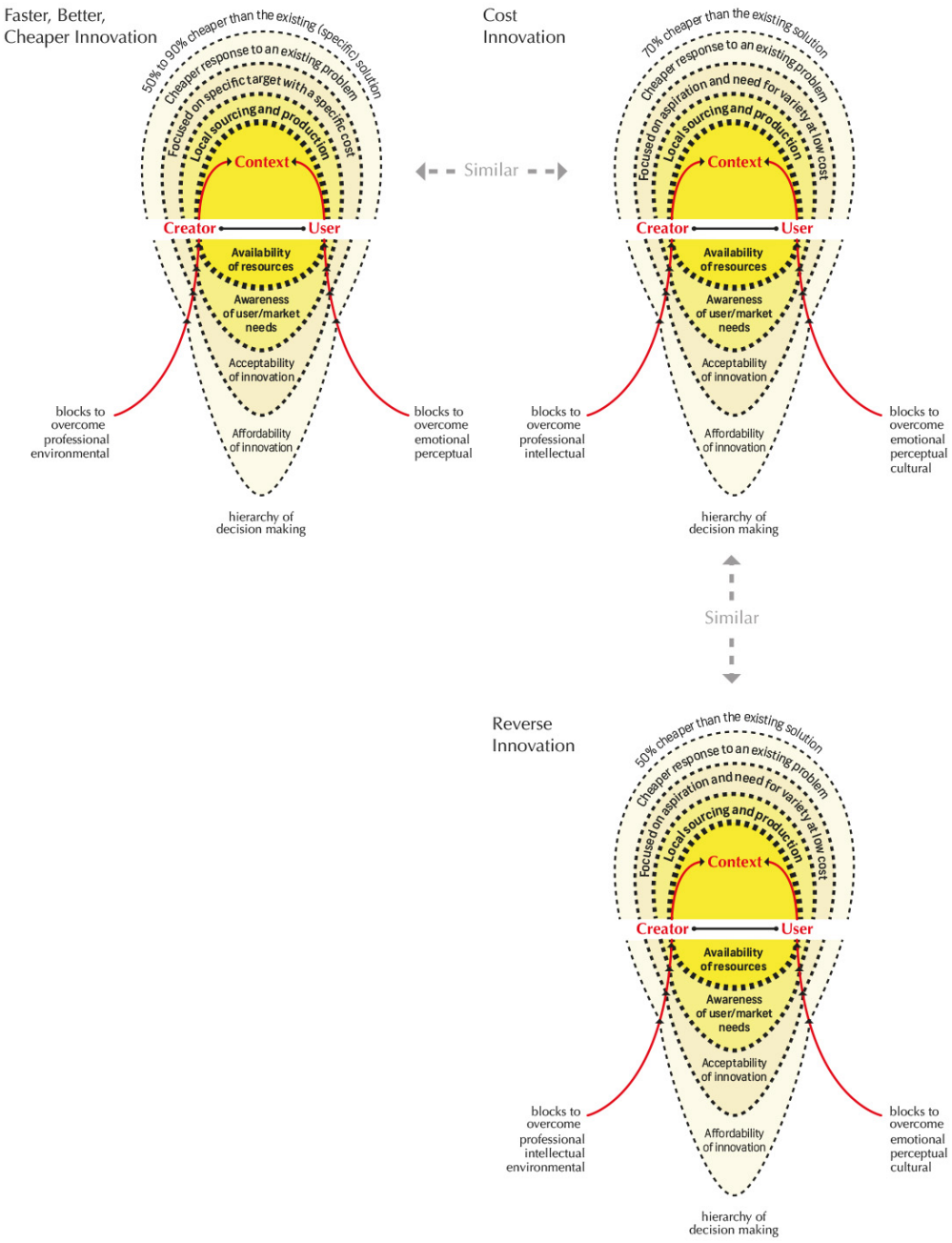

Figure 3.8: *The Financescapes Cluster: Conceptual Frameworks for Designing 'Innovation for Recognition and Acceptance' Under Resource Constraints*

3.3.3 RESEARCH DESIGN AND CONDUCTING RESEARCH

Designing *Faster Better Cheaper Innovation* (Figure 3.9) required a *systems-based response* to address several needs of the end-user. I began with a fixed amount of available material to experiment with and develop a measuring tool that is compact and allows for choice and adaptability. A key aspect of this method involved the miniaturisation of the design solution through the integration of a mechanism to make it modular, sharable, and personalised by the end-user.

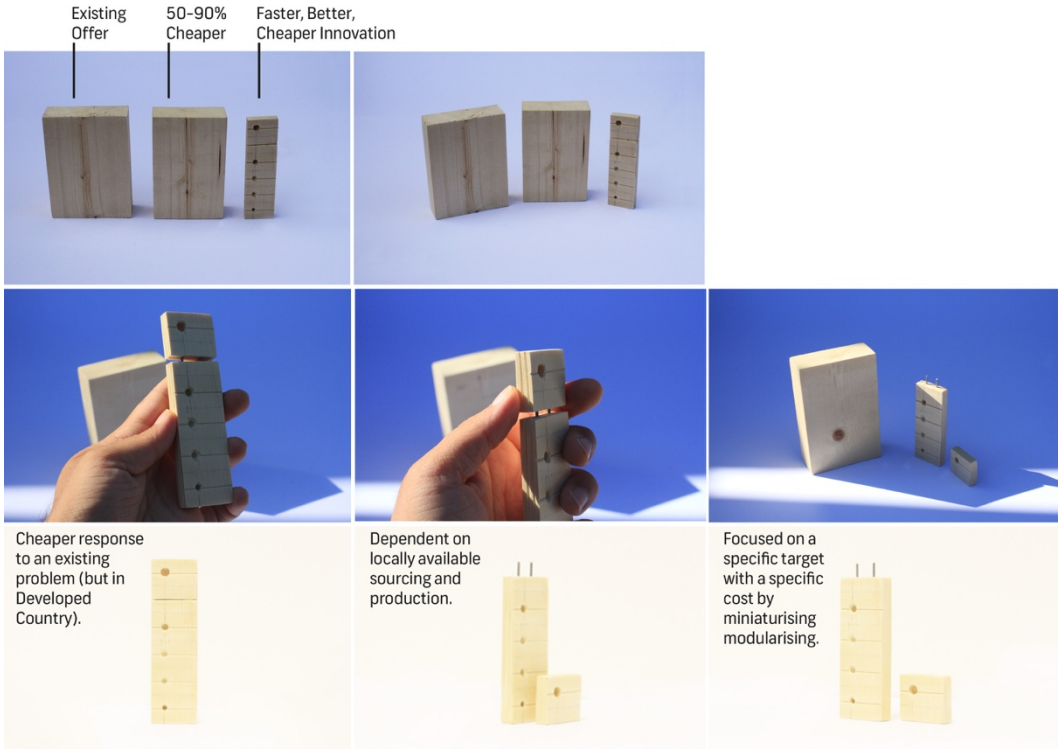

Figure 3.9: *Designing Faster Better Cheaper Innovation*

Designing *Cost Innovation* (Figure 3.10) required a *localised response* to address the multiple needs of the end-user. I began by sourcing low-quality materials to develop the main function of the measuring tool. Following this, I went about identifying an additional need to help differentiate from an existing offering, a grating surface in this case, to provide the end-user with variety in

the application of the measuring tool.

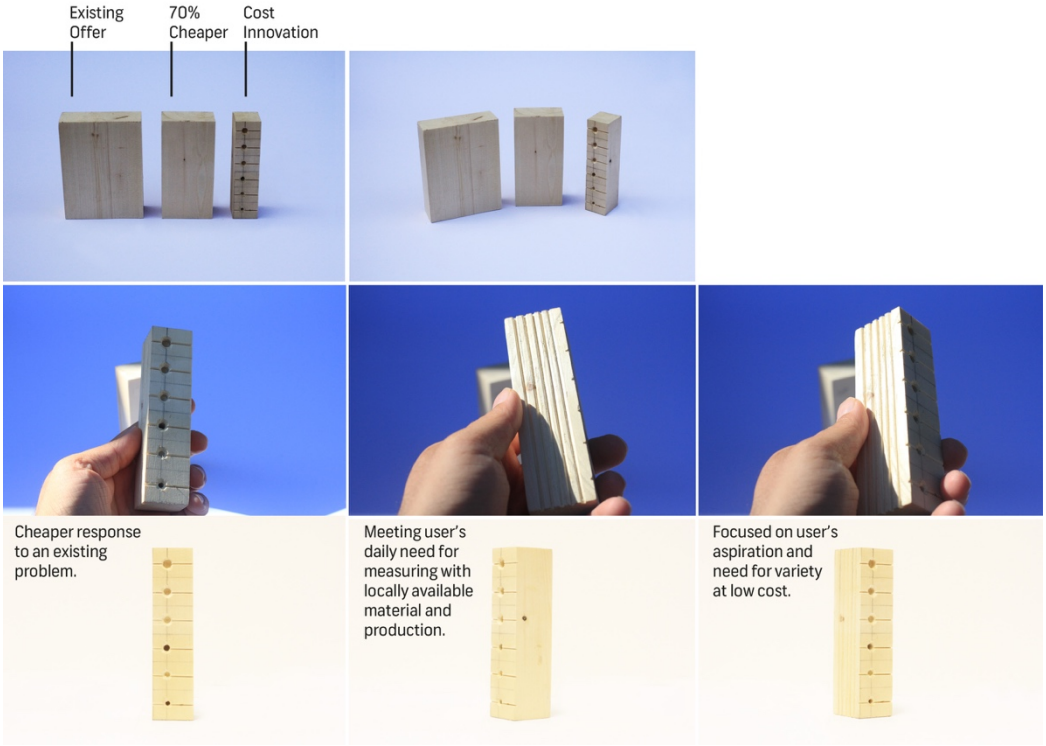

Figure 3.10: *Designing Cost Innovation*

Reverse Innovation (Figure 3.11) required a similar approach to Cost Innovation, however, with a focus on high-quality material aimed at end-users living in a developed economy context.

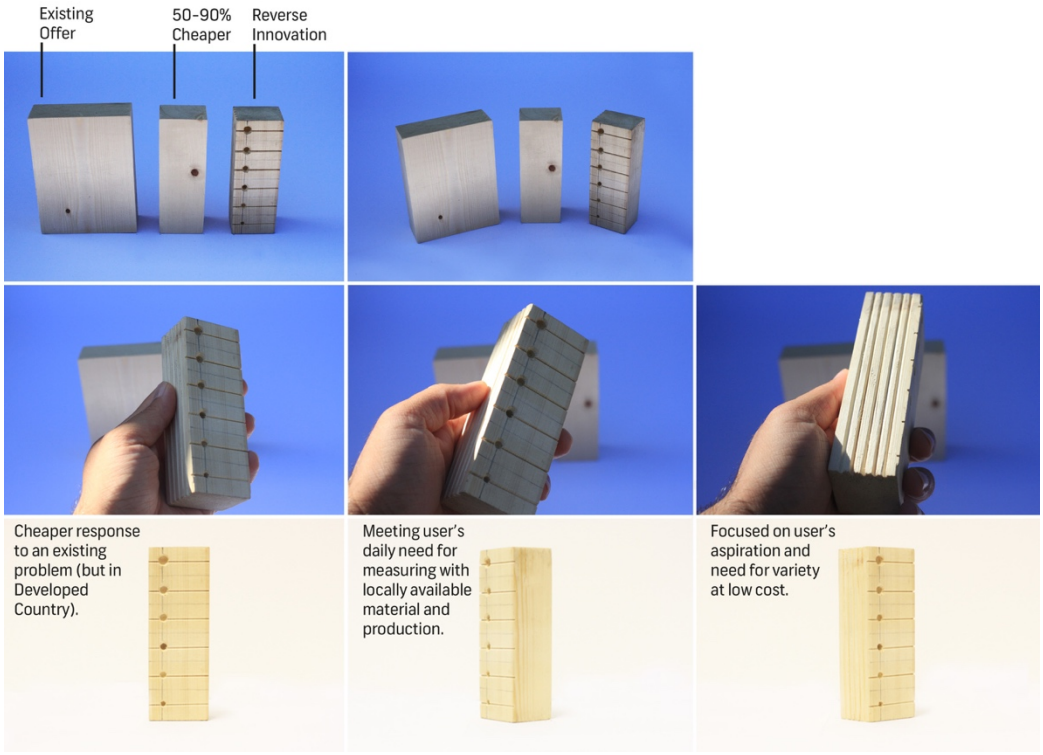

Figure 3.11: *Designing Reverse Innovation*

3.3.4 FINDINGS

Table 3.2 is an attempt to map my understanding of the level of complexity needed to practice these methods. Through these initial probe projects, I realised that *Faster Better Cheaper Innovation* is a method for developing new ideas that are mission-led and not context-based. Its focus on schedule, reliability, and cost makes it fall within the *'pick two'* philosophy, which means that only two of the three terms in the equation are given priority at any given time, and therefore, faster and cheaper cannot simultaneously be better (McCurdy, 2001, p. 9).

Moreover, *Cost Innovation* also focuses on cost-cutting processes; however, it is a method for creating variety and imitating high-quality foreign ideas with an emphasis on scalability and locally available off-the-shelf components and materials aimed at a specific culture and context.

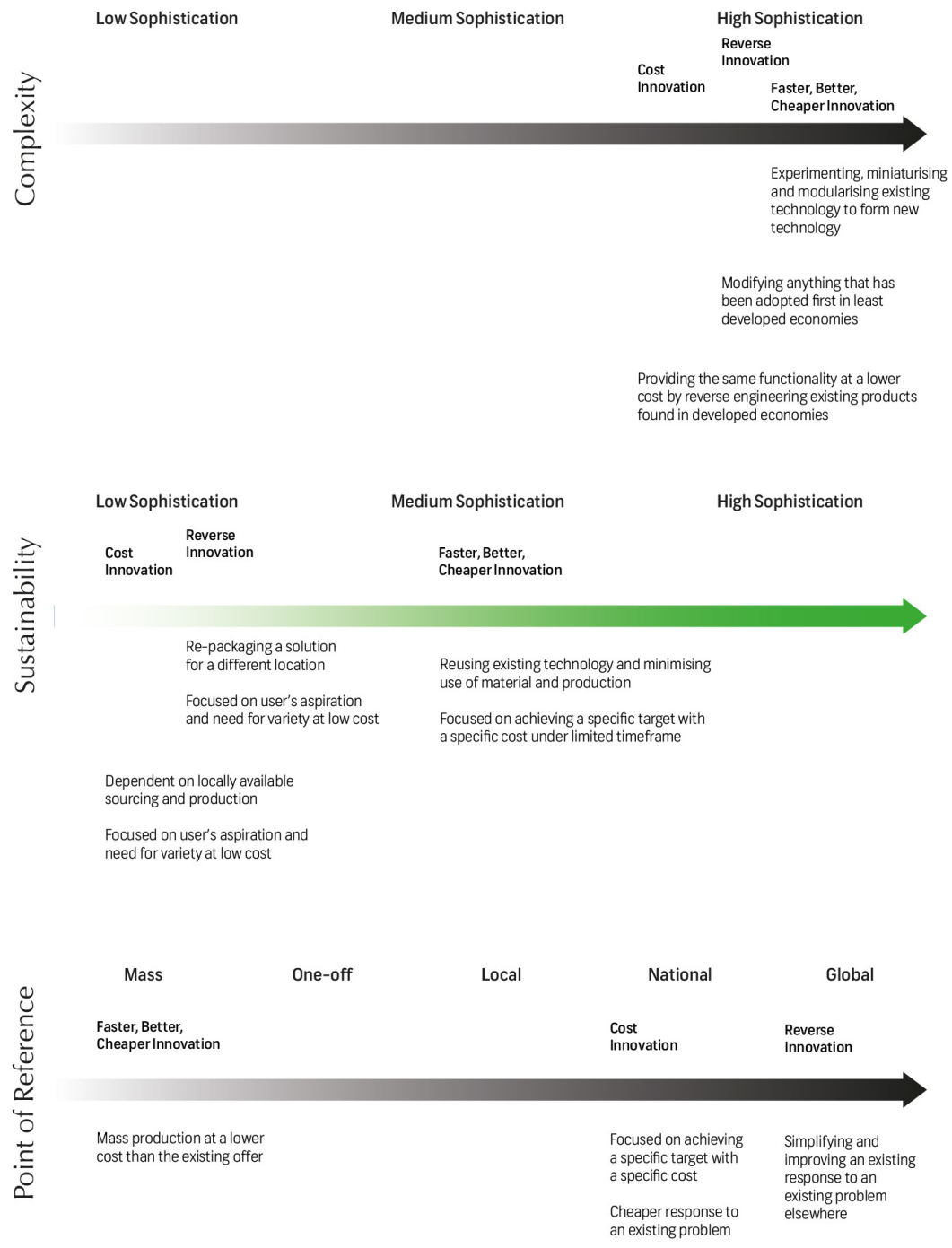

Table 3.2: *Categorising Faster Better Cheaper Innovation, Cost Innovation, and Reverse Innovation*

In contrast, *Reverse Innovation* is a method for providing a simplified and better version of Cost Innovation by shifting cost-based relationships to value-based engagements to expand the quality of design and manufacturing in least

developed and developing economies (Zedtwitz et al., 2014, p. 14). However, it ignores all forms of identification with the local culture and way of life, promotes consumption, and further deteriorates the identity of the designer and society while destroying the environment.

A key finding from the literature review is that the starting point for all three methods of innovation in this cluster is defining the cost of the outcome within a set timeframe, an identified technology that needs reengineering, and an identified market rather than a specific cultural context. They all require experimentation and the integration of non-luxury and inexpensive social and infrastructural needs.

Further analysing the findings through Papanek's seven inhibitors, I realised that when designing *Reverse Innovation,* I was tackling the majority of vertical and horizontal blocks **(see Appendix F6)** and therefore achieved higher levels of decolonisation through this method. All three methods in this cluster required me to reject accepted knowledge by integrating the needs of those living in rural locations who perceive that there is a need for a product system that sits beyond their cultural or habitual practices through an iterative process and delivers considered outcomes for an existing market at a lower cost.

3.4 PROJECT 3: ETHNOSCAPES

Grassroots Innovation, and *Gandhian Innovation* are concerned with the ideas of *possibility, surprise,* and *individualism*. As shown in the decoding process **(see Appendix G, G1, and G2)**, this cluster of methods represents a set of *experiment-based responses* that centre around *knowledge transfer and design for problem solving and social mutual collaboration*. They begin intuitively without a structured process by considering problems in the direct environment to develop high-performance local solutions that are rugged, affordable, niche, and user-friendly (Brem and Wolfram, 2014, p. 13).

3.4.1 GRASSROOTS, AND GANDHIAN INNOVATION

Grassroots Innovation focuses on developing green technologies to create scalable new ideas for environmental problems (Sarkar and Pansera, 2016, p. 3) through empathy and interaction with the local community. It aims to bring economic and social benefits to the end-user by challenging social and political structures of marginalisation and exclusion (Papaioannou, 2014, p. 10).

Gandhian Innovation, which correlates with India's founder and anti-colonial activist, Mahatma Gandhi, and subsequently the culture, is an approach carried out by curious individuals with a focus on experimentation and a social agenda to develop new ideas that benefit society by experimenting with and modifying off-the-shelf components to create ultra-low-cost and extremely affordable green technologies. It aims to combine foreign knowledge with local capability to formulate advanced product systems with low production costs and limited expertise (Brem and Wolfram, 2014, p. 13).

3.4.2 CASE STUDY ANALYSIS

Findings from the case study analysis **(see Appendix G, G3)** show that the market for these innovations is the *'bottom-up cities'*—where people oppose the idea of blueprints and an ideal state (Breuer et al., 2014) and depend on pre-existing networks and local knowledge to develop new ideas for the poor (Iizuka and SadreGhazi, 2012, p. 7).

The key similarity between *Grassroots*, and *Gandhian* is in their ability to hack into existing technology that is familiar to the end-user using available tools to reconfigure and develop new forms of use and new sources of consumption. These methods are identified through personal experience in the local area and by shifting everyday activities towards sustainable, safe, and cost-effective practices (Sarkar and Pansera, 2016, p. 1). Other similarities among these methods of innovation include:

1. Focusing on developing new ideas that improve life for a highly specific community of people and their context by modifying technologies that are familiar to the end-user and are repairable by locally available tools and skills.

2. Achieving new knowledge in response to a problem at hand using experimental approaches.

Figure 3.12 further defines the relationship between the designer, the user, and the context and provides the concepts for designing the Ethnoscapes cluster of innovations **(see Appendix G, G4)**, which are explored through practice in the following section.

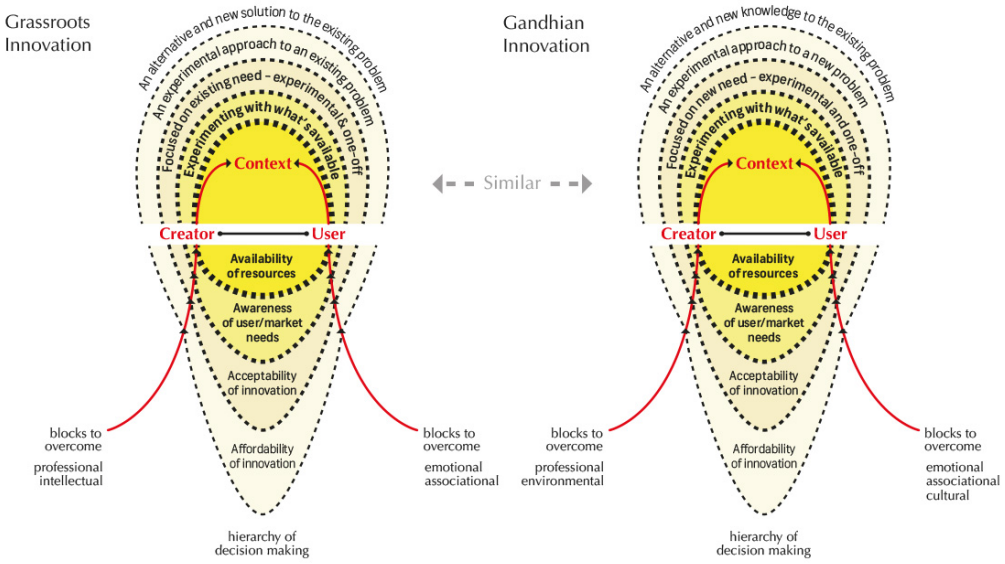

Figure 3.12: *The Ethnoscapes Cluster: Conceptual Frameworks for Designing 'Innovation for Social and Mutual Collaboration' Under Resource Constraints*

3.4.3 RESEARCH DESIGN AND CONDUCTING RESEARCH

Designing *Grassroots Innovation* (Figure 3.13) required an *experimental approach* to address an immediate need in an extraordinary way. I began by experimenting with an existing object while considering elements of surprise and playfulness that would change my perception of household objects and shift my view on sustainability by developing a measuring tool that is versatile, futuristic, and niche.

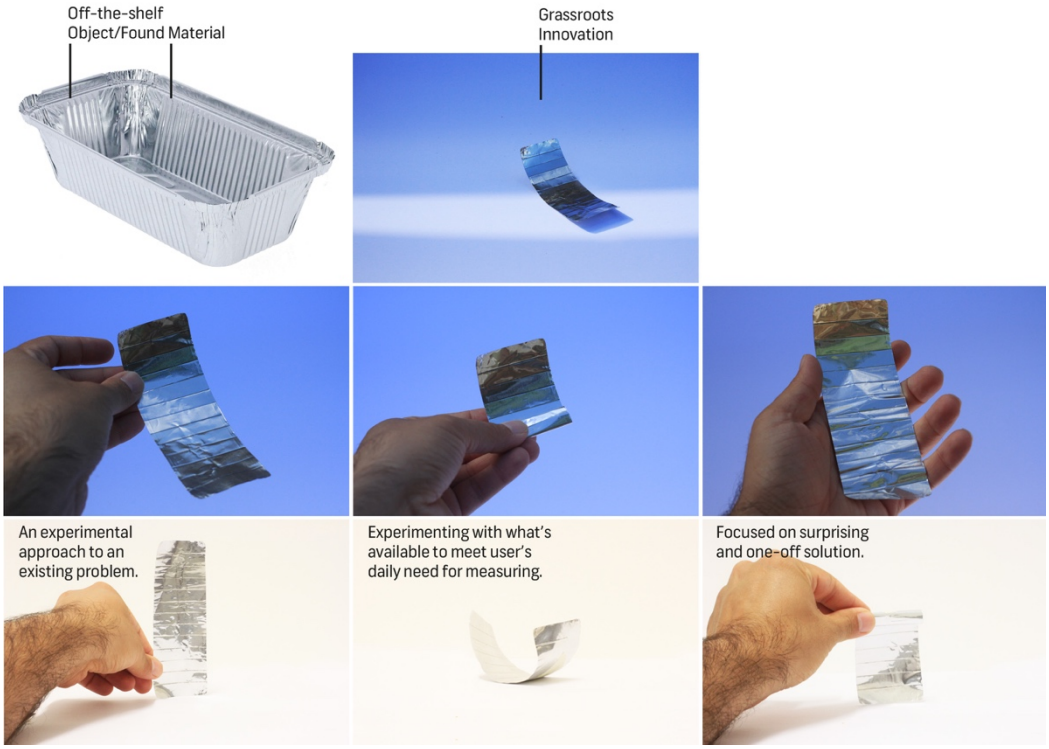

Figure 3.13: *Designing Grassroots Innovation*

Gandhian Innovation (see Figure 3.14), on the other hand, required an *experimental approach* to address the multiple needs of the end-user. I began by modifying and reconfiguring off-the-shelf objects to develop a measuring tool that considers different uses within the household. The aim was to combine digital technology with a low-tech solution to deliver high performance at a low cost and with a local twist that provided an alternative option in contrast to the existing offer.

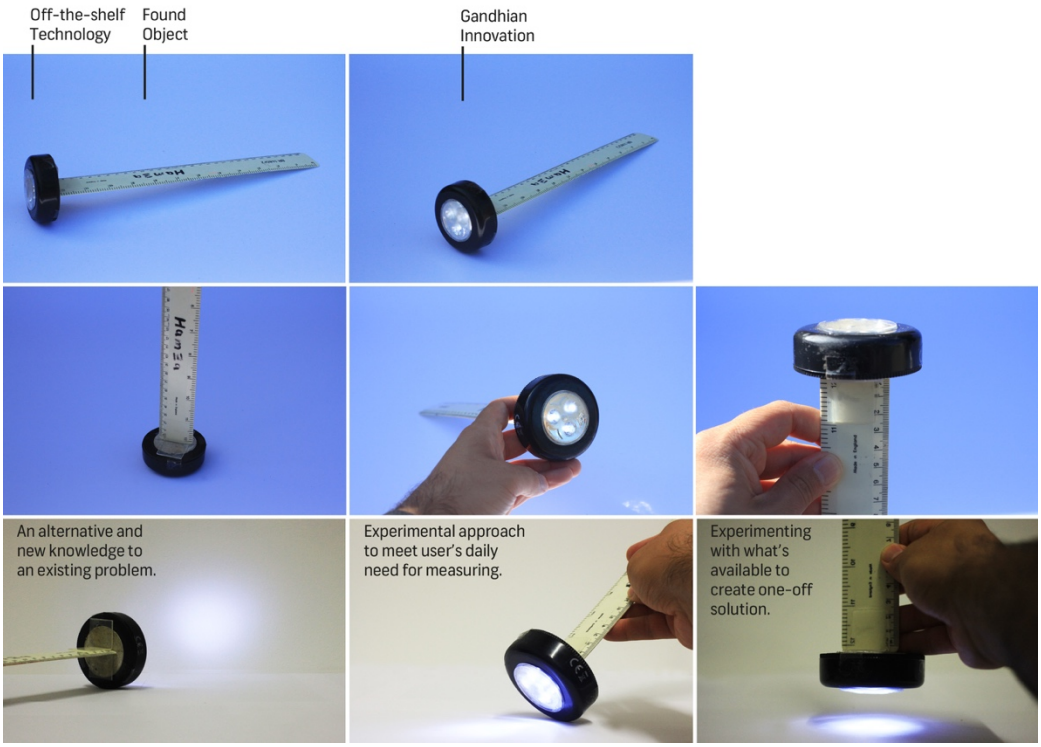

Figure 3.14: *Designing Gandhian Innovation*

3.4.4 FINDINGS

Table 3.3 is an attempt to map my understanding of the level of complexity needed to practice these methods. Through these initial probe projects, I realised that both *Grassroots Innovation* and *Gandhian Innovation* are methods for developing useful and functional new ideas and making the outcome easy to understand. They are alternative ways of achieving self-sufficiency and responding to a situation by rejecting mass production and resource consumption. The technology involved needs to be in use within the context and familiar to the end-users to make a positive impact, while the outcome is less evident or obtrusive in the environment by having minimal design features.

However, it's worth noting that *Gandhian Innovation's* experimental nature limits its production and impact, but the knowledge that it produces can be transferred and shared across different locations and industries, whereas

Grassroots Innovation is developed with a market strategy and allows for commercialisation and mass consumption at a local scale.

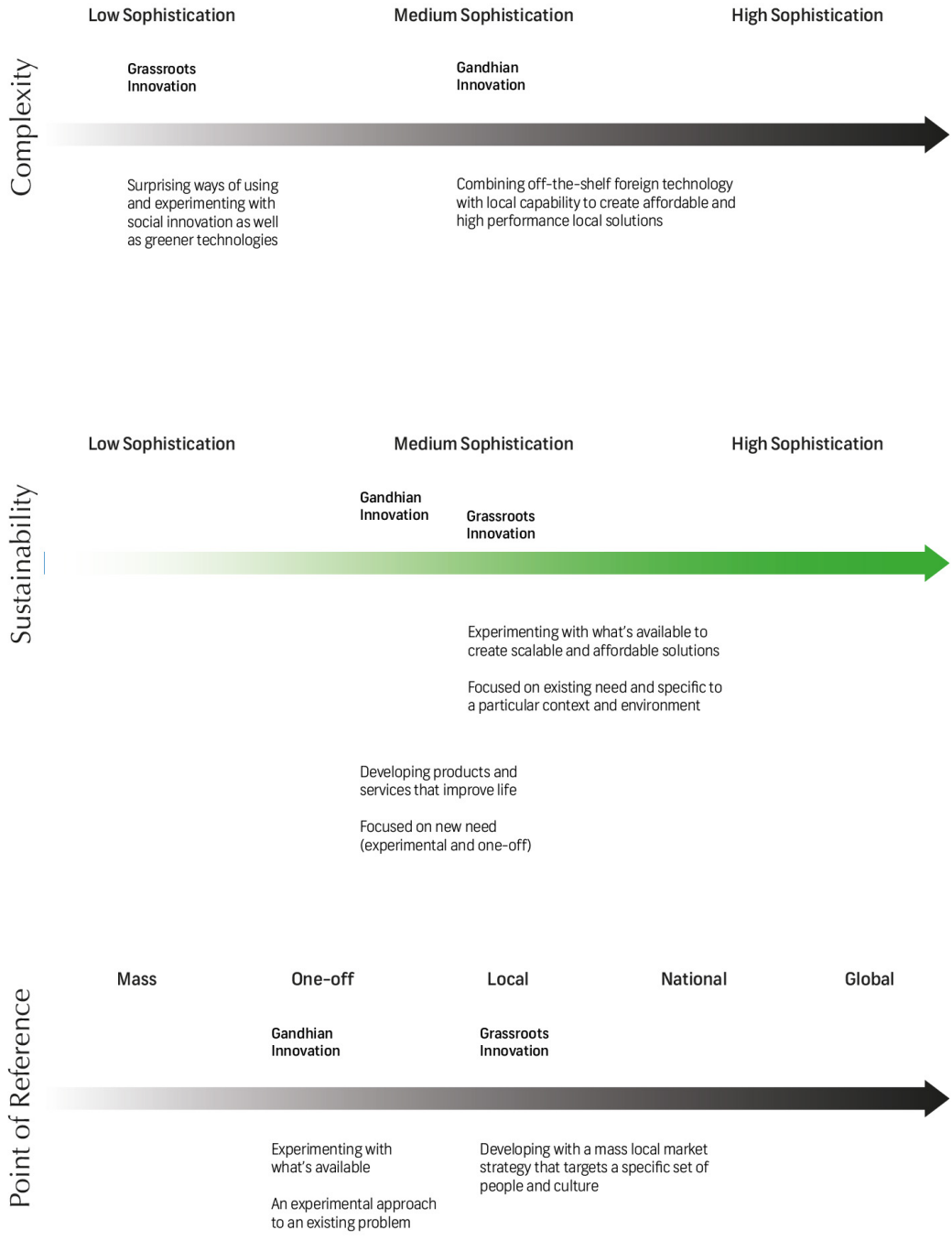

Table 3.3: *Categorising Grassroots Innovation, and Gandhian Innovation*

Grassroots Innovation is less sophisticated as it combines available material with local knowledge to respond to an existing problem; however, it is more sustainable than Gandhian Innovation as it generates context-based, scalable new ideas suited to a specific market and infrastructure (Hossain, 2016, p. 975). *Gandhian Innovation*, on the other hand, is considered more sophisticated as it intends to experiment with foreign technology to modify and create new localised uses and knowledge.

A key finding from the literature review is that for both *Grassroots*, and *Gandhian Innovation* the starting point is the personal experience of an individual who has identified a particular technical or social problem in their community. They aim to transform prerequisite conditions into a useful product system by experimenting and testing locally available technologies to create a niche local solution using the tools at hand.

Further analysing the findings through Papanek's seven inhibitors, I realised that when designing *Gandhian Innovation*, I was tackling the majority of vertical and horizontal blocks **(see Appendix G5)**, and therefore achieved higher levels of decolonisation through this method. It required me to reach a solution beyond my field or specialism by allowing the immediate environment to influence my behaviour and approach to design. While this method helped me produce a new idea that is not fully developed, it did, however, require me to fully understand the needs of the end-user as well as the cultural setting before creating or modifying existing technology (Brem and Wolfram, 2014, p. 6).

In contrast, *Grassroots Innovation* required me to question accepted knowledge and methods of production while integrating the needs of those living in rural locations to deliver a simpler, functional, and user-friendly outcome for an existing market at a lower cost. The end-user of these innovations lacks adequate access to product systems that would suit their way of life and living conditions.

3.5 PROJECT 4: TECHNOSCAPES

Bottom of the Pyramid Innovation, Good-Enough Innovation, and *Long Tail Innovation* are concerned with the ideas of a *boundary-less flow of technology* and *technology as an enabler of independence*. As shown in the decoding process **(see Appendix H, H1, H2, and H3)**, this cluster of innovations under resource constraints represents a set of *user-driven responses* that centre around elevating poverty and *designing for unmet or under-served needs and for social and human development*. They are highly user-driven and are accomplished through reverse-engineering and adjusting products and technologies from developed economies towards the specific needs of people and their contextual conditions in least developed and developing economies—developing cheaper, robust, affordable, and technically simple product systems in a way that allows do-it-yourself repair (Ernst et al., 2015, p. 66).

3.5.1 BOTTOM OF THE PYRAMID, GOOD-ENOUGH, AND LONG TAIL INNOVATION

Bottom of the Pyramid Innovation focuses on addressing basic needs by allowing us to immerse ourselves in the lives of the end-users (Iizuka and SadreGhazi, 2012, p. 10) and view them as producers and suppliers (Radojevic, 2013, pp. 17-18) to develop an appropriate ecosystem that enables the innovation to function within the context of use (Prahalad, 2012, pp. 10-11). It requires a strong commitment to establishing alliances with the end-users and the local suppliers and participatory ventures with local institutions and stakeholders (Pansera and Owen, 2014, p. 303).

Good-Enough Innovation, on the other hand, focuses on radical incrementalism, where features are eliminated while robustness and ease of use for the end-user take priority in the design process to increase usability and decrease complexity and over-engineered ideas (Radjou et al., 2012).

Long Tail Innovation further builds on these qualities and focuses on creating multiple options and variety for the end-user by using evolution as a method for reducing the problem of excessive production and waste and addressing the needs and interests of a specific user group (Anderson, 2009, pp. 53-55).

3.5.2 CASE STUDY ANALYSIS

Findings from the case study analysis **(see Appendix H, H4)** show that the market for these innovations is *'circular cities'*—where people pursue objectives other than consumption or profitability (Pansera and Owen, 2014, p. 304), and eliminate waste by relying on local and available materials and capabilities (Pansera and Owen, 2013, p. 4).

The key similarity between *Bottom of the Pyramid*, *Good-Enough*, and *Long Tail* is in their ability to establish alliances with the end-user and form participatory ventures with the local institutions and stakeholders to address a specific need. In addition, they include the end-user in the production process so that their skills are enhanced, and they have an alternative source of income. Other similarities among these methods of innovation include:

3. Focusing on developing new ideas that are reverse-engineered and adjusted from developed economies towards the specific needs of people in least developed and developing economies and their contextual conditions.

4. Achieving core functionality by limiting features and integrating local sourcing and production methods with standard components.

Figure 3.15 further defines the relationship between the designer, the user, and the context and provides the concepts for designing the Technoscapes cluster of innovations **(see Appendix H, H5)**, which are explored through practice in the following section.

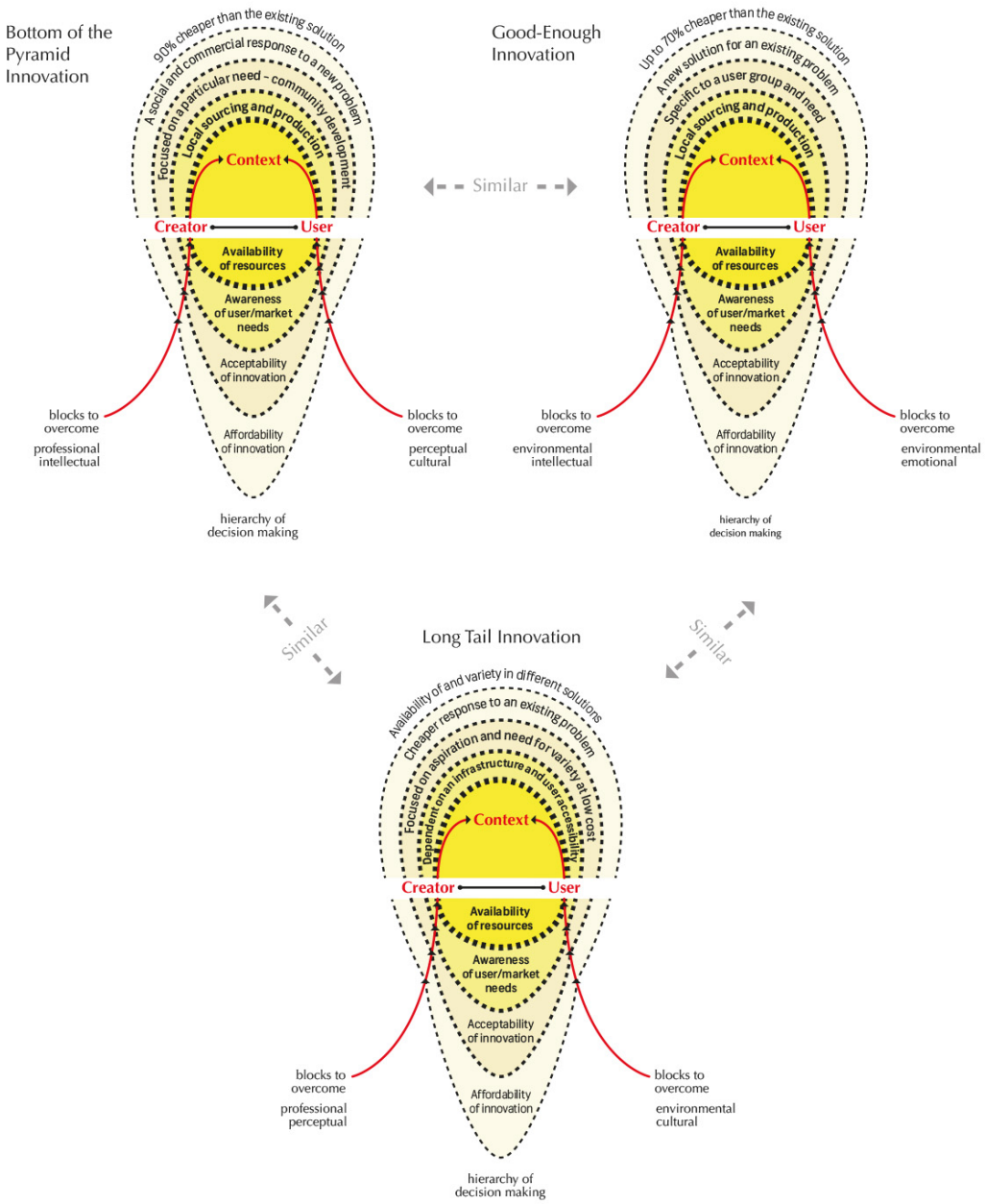

Figure 3.15: *The Technoscapes Cluster: Conceptual Frameworks for Designing 'Innovation for Social and Human Development' Under Resource Constraints*

3.5.3 RESEARCH DESIGN AND CONDUCTING RESEARCH

Designing *Bottom of the Pyramid Innovation* (Figure 3.16) required a *social response* to address the needs of the end-user. I began by reusing an existing material to develop a measuring tool that integrated an opportunity for collaboration with a local designer. Following this, I developed a measuring tool that provided an opportunity for collaborating with a local designer through consideration of their making techniques and skill set as well as objectives, capability, and vision throughout the process.

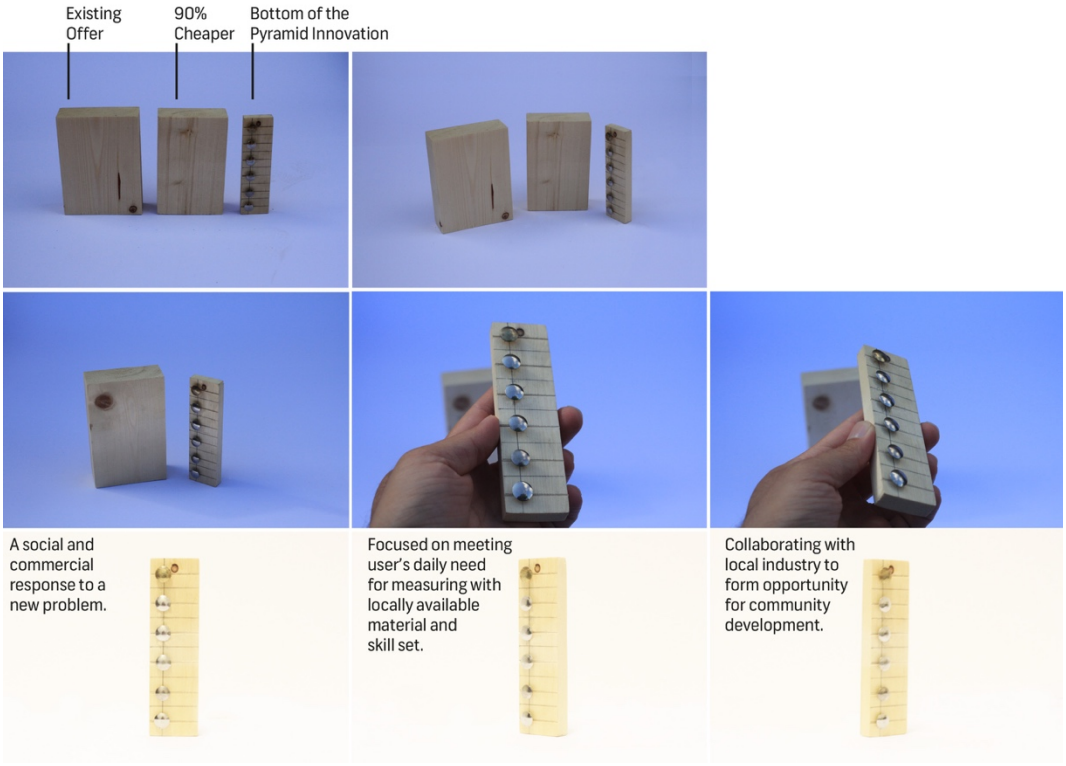

Figure 3.16: *Designing Bottom of the Pyramid Innovation*

Good-Enough Innovation (see Figure 3.17) required a *user-centred approach* to address the needs of a specific group of people with low purchasing power. I began by identifying the need—a lack of user-friendly design in this case—

to develop a solution that yearns for a better standard of living for the end-user and help them with their rational purchase decision by providing a tailored-made solution at a low cost. To do this, I tailored the functional aspects of the measuring tool while increasing its robustness and ease of use for the end-user.

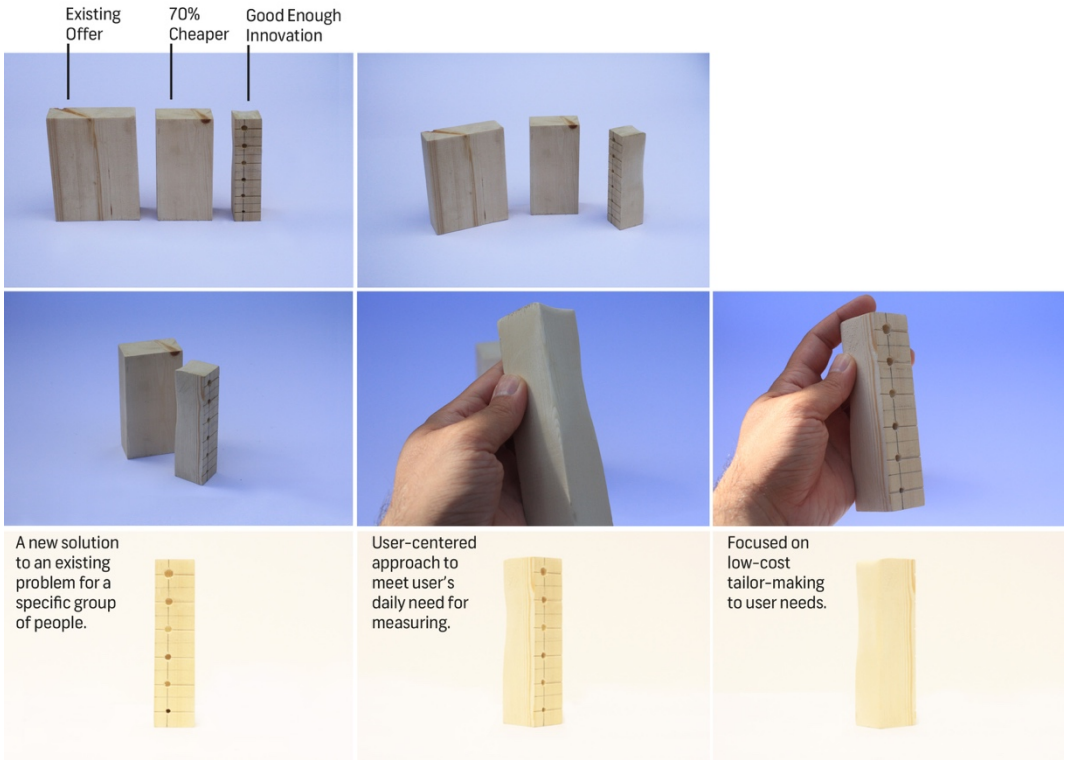

Figure 3.17: *Designing Good-Enough Innovation*

Long Tail Innovation (see Figure 3.18), on the other hand, required a similar approach to Good-Enough Innovation but with a *flexible approach* to provide a variety of uses. I began by combining different shapes and variations to develop a measuring tool that would help reduce the problem of excessive production and waste. To do this, I made the functional aspects of the measuring tool flexible while creating the opportunity for the end-user to have multiple options and a variety of uses.

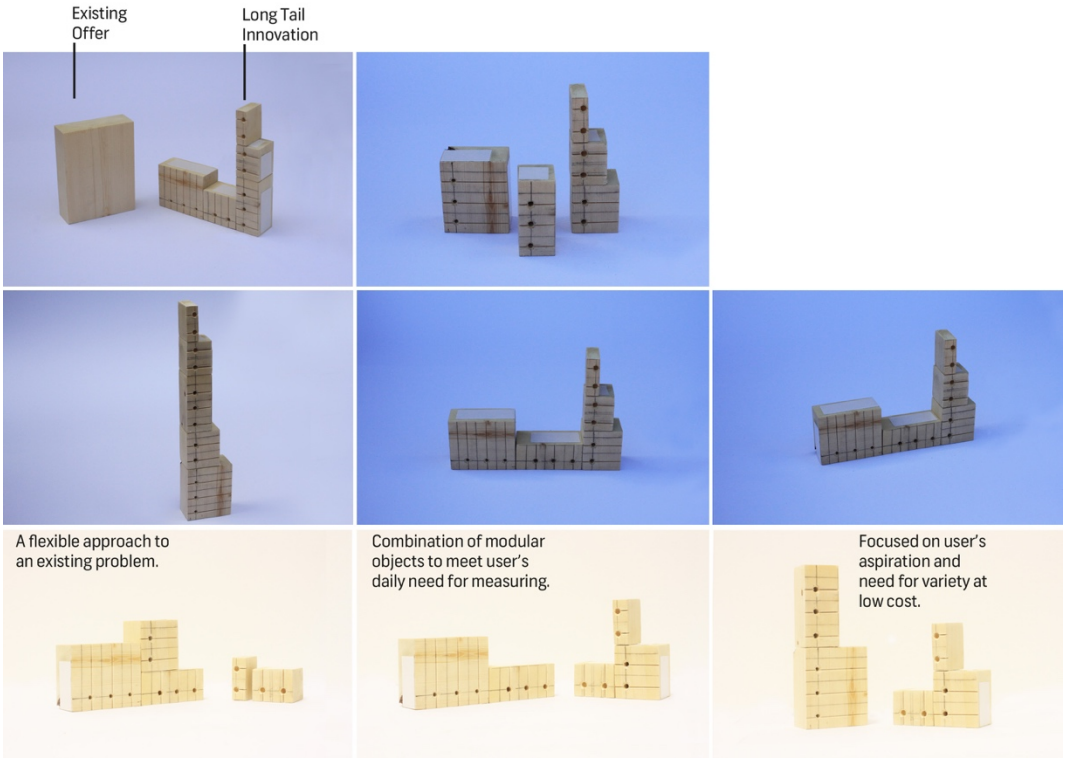

Figure 3.18: *Designing Long Tail Innovation*

3.5.4 FINDINGS

Table 3.4 is an attempt to map my understanding of the level of complexity needed to practice these methods. Through these initial probe projects, I realised that the methods of innovation in this cluster intend to create a variety of solutions for an existing problem. The technology involved needs to be in use within the context and familiar to the end-users to make a positive impact, while the outcome is less evident or obtrusive in the environment using minimal design.

Out of the three methods of innovation, *Bottom of the Pyramid* and *Good-Enough Innovation* are methods for increasing the chances of public good by addressing specific human needs within a social and cultural context while encouraging reframing of existing and new problems through rapid prototyping, testing, and user feedback. In addition, they intend to increase

income for the world's poor by addressing their basic needs while providing an opportunity for empowerment and sustainable development.

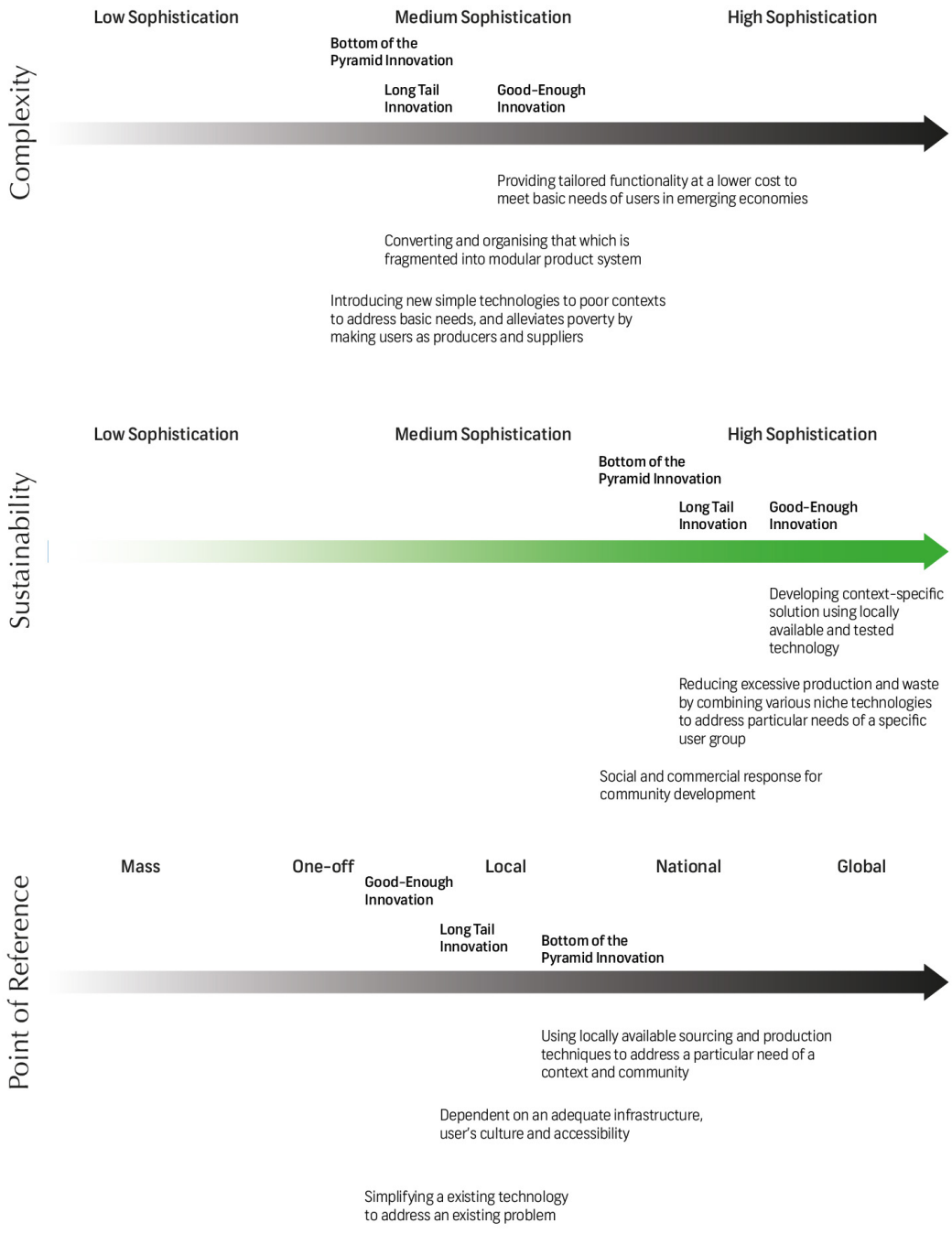

Table 3.4: *Categorising Bottom of the Pyramid Innovation, Good-Enough Innovation, and Long Tail Innovation*

All three methods of innovation in this cluster are suitable for a local market due to their high dependence on locally available sourcing and production as well as on adequate infrastructure and access to end-user input. They are sophisticated in terms of complexity as they provide tailor-made functionality and introduce simplified technologies to targeted end-users in poor contexts. They are highly sophisticated in terms of sustainability due to their focus on community development and delivering a niche idea that is designed for a specific market and particular need while reducing excessive production and waste.

A key finding from the literature review is that the starting point for *Bottom of the Pyramid*, *Good-Enough*, and *Long Tail* is integration of the end-user and their communities in the design process to develop collective resilience towards failure and ensure continuous improvement on the quality of the innovation (Basu, 2013, p. 134).

Further analysing the findings through Papanek's seven inhibitors, I realised that all three methods of innovation helped me tackle an equal amount of vertical and horizontal blocks **(see Appendix H6)**, and therefore achieving a similar amount of decolonisation. When designing *Bottom of the Pyramid Innovation* I was questioning accepted knowledge and methods of production and became highly dependent on the skills and capabilities of the local industry as well as locally available and off-the-shelf components and materials. The end-user of this method of innovation has very little purchasing power and must be able to accept solutions that are practical yet basic, while accepting that there is a need for a product system that sits beyond their cultural and habitual practices.

Good-Enough Innovation, on the other hand, required me to allow the immediate environment to influence my behaviour and approach to design. In addition, I had to integrate the end-user to achieve a simpler, more functional, and more user-friendly outcome. The end-user of this method of

innovation must be able to get involved and participate in the creation or modification of existing technology to develop a solution that suits his/her immediate environment and be able to adopt it without additional infrastructure.

In contrast to the other two methods of innovation, *Long Tail Innovation* required me to question accepted knowledge and behaviour to explore areas beyond my field or specialism. In addition, I had to develop a solution that was relevant to the end-user's cultural and environmental needs. The end-user of such innovation is highly influenced by his/her immediate environment and available infrastructure, while accepting that there is a need for a product system that sits beyond their cultural and habitual practices.

3.6 PROJECT 5: MEDIASCAPES

Empathetic Innovation, and *Inclusive Innovation* are concerned with the ideas of *inclusivity, openness, empowerment,* and *free knowledge through the availability of media channels*. As shown in the decoding process **(see Appendix J, J1, and J2)**, this cluster of innovations under resource constraints represents a set of *customer-oriented responses* that centre around *co-creation* and *co-designing* with the stakeholders through participatory and equity-based collective decision-making to enhance the social and economic wellbeing of the end-user. They are accomplished through the understanding and experiencing of people's pains and problems as well as their behaviour—developing personalised solutions that consider business model, efficiency, and delivery alongside technological innovation (Da Silva, 2016, p. 11).

3.6.1 EMPATHETIC, AND INCLUSIVE INNOVATION

Empathetic Innovation focuses on increased empathy towards the end-user to gain a better understanding of their problems and needs by realising them as one's own in order to create possibilities that would help generate more value for the end-user (Montonen et al., 2014, p. 368). This is achieved by experiencing and identifying the struggles of a specific group of people with a particular need (Gupta, 2012, p. 33) and putting oneself in their shoes. It requires reconfiguring existing practices and experimenting with existing technology to find better ways that are beneficial to the end-user.

Inclusive Innovation, on the other hand, focuses on addressing the relevant needs of the end-user by involving them in the development of the solution through a human-centred process to have a positive effect on their livelihoods and enable them to absorb and adopt a new idea (Foster and Heeks, 2013, p. 335). It aims to allow individuals on lowest incomes, for example, less than

$2 per day, to imagine, share, and participate in co-creation processes in which the outcome is created together with their needs and abilities in mind, subsequently enabling them to have a more effective market exchange (Kimmitt and Munoz, 2015, p. 2). It requires context-specific intervention using locally available and tested technology to create a social enterprise opportunity for the end-user.

3.6.2 CASE STUDY ANALYSIS

Findings from the case study analysis **(see Appendix J, J3)** show that the market for these innovations is *'human-centred cities'*—where people prioritise health and wellbeing over material gain and aspire to create opportunities for socio-economic wellbeing (Prabhu and Jain, 2015, p. 45).

The key similarity between *Empathetic*, and *Inclusive* is in their ability to target a specific group of people and to involve them in addressing their needs. In addition, they are developed by understanding existing practices as well as by experimenting with and reconfiguring existing technology to find new and better ways that benefit the end-user. Other similarities among these methods of innovation include:

1. Focusing on developing new ideas that are experimental yet purpose-led and that take into consideration the physical, environmental, social, and financial capabilities of the end-user.
2. Achieving core functionality by adding various features to an existing technology to alleviate the pain of someone else, with a focus on improving conditions for the end-user.

Figure 3.19 further defines the relationship between the designer, the user, and the context and provides the concepts for designing the Mediascapes cluster of innovations **(see Appendix J, J4)**, which are explored through practice in the following section.

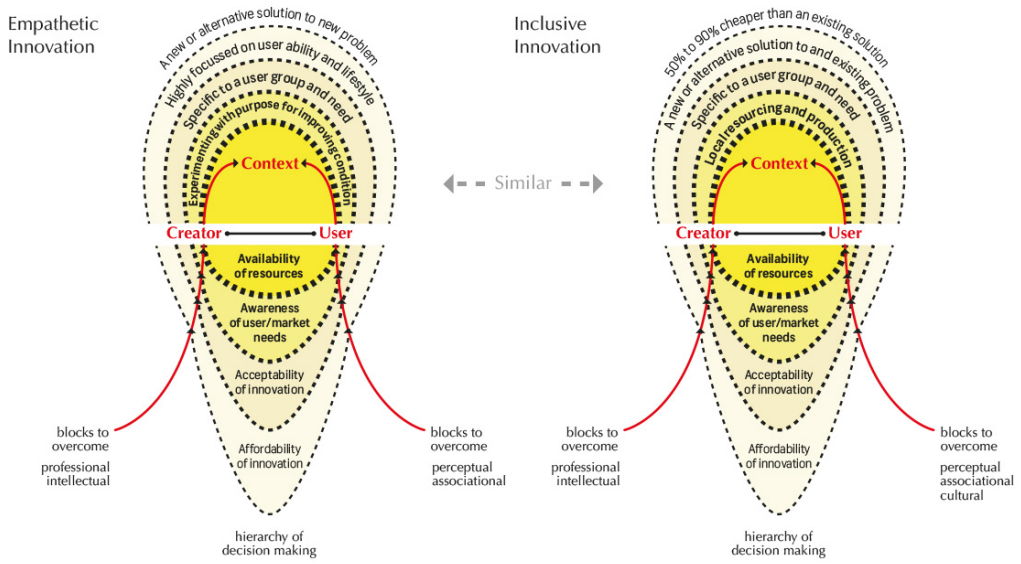

Figure 3.19: *The Mediascapes Cluster: Conceptual Frameworks for Designing 'Innovation for Equity-based Collective Decision-making' Under Resource Constraints*

3.6.3 RESEARCH DESIGN AND CONDUCTING RESEARCH

Designing *Empathetic Innovation* (Figure 3.20) required *experimenting with purpose* to address an existing and/or new need of a specific group of people. I began without material or cost restrictions to develop a new measuring tool while considering the needs of end-users with arthritis and drawing upon insights gathered during the making process. Following this, I experimented with the purpose of improving the usability factors of the device to suit the end-user's physical as well as visual abilities and living conditions.

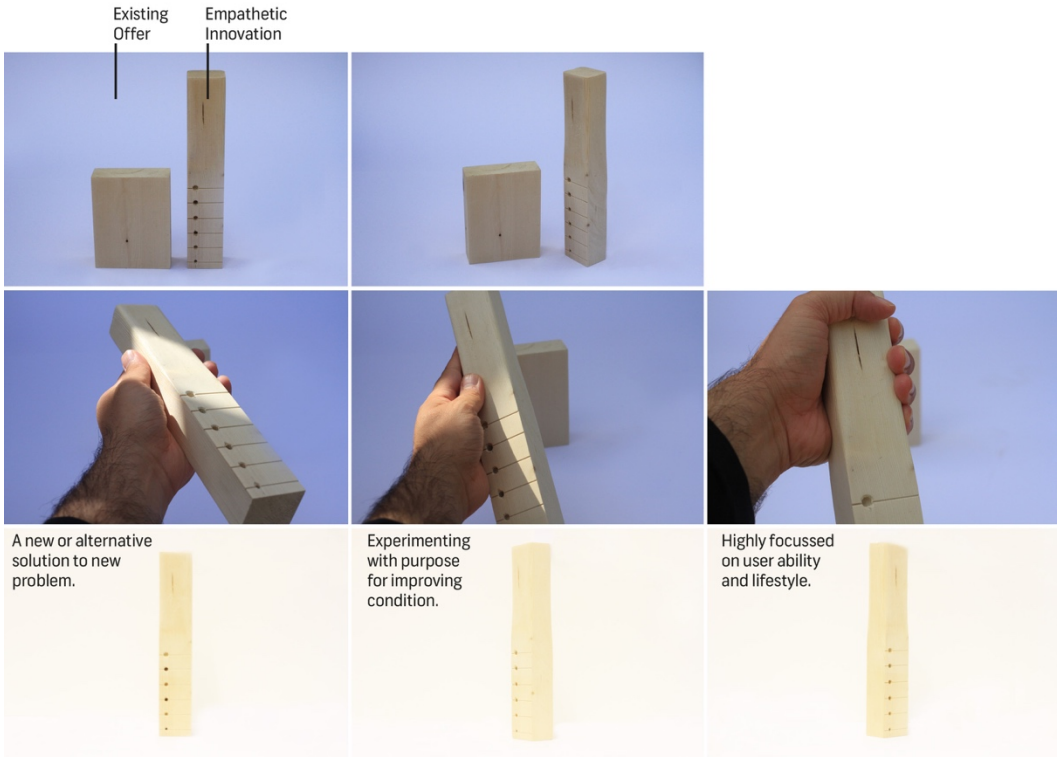

Figure 3.20: *Designing Empathetic Innovation*

Inclusive Innovation (Figure 3.21), on the other hand, required a *user-centred approach* to address an existing need for a specific group of people. I began by identifying an extreme need—a lack of consideration for those with physical and visual impairment in this case—to develop a solution that not only met the needs of the end-user but also provided an opportunity for improving their socio-economic conditions. To do this, I tailored the functional aspects of the measuring tool with the possibility of personalisation and ease of use for the end-user.

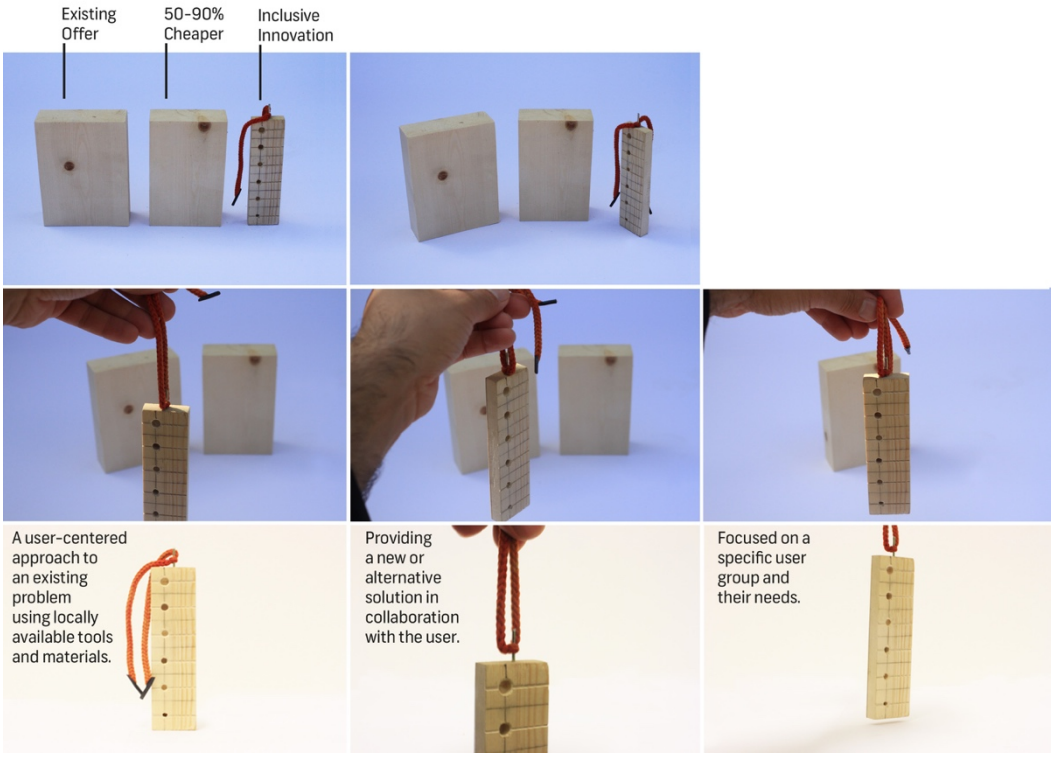

Figure 3.21: *Designing Inclusive Innovation*

3.6.4 FINDINGS

Table 3.5 is an attempt to map my understanding of the level of complexity needed to practice these methods. Through these initial probe projects, I realised that the methods of innovation in this cluster intend to create solutions in collaboration with the end-user; therefore, innovation is co-created and based on mutual understanding. However, *Empathetic Innovation* is a method for providing a radical solution to an existing need, whereas *Inclusive Innovation* is a method for providing a tailored solution to an existing need. Both methods of innovation develop designs that are tailored to the end-user's daily needs and their context and focuses on making the end-users producers and suppliers. The technology involved needs to be in use within the context and familiar to the end-users to make a positive impact, while the outcome is less evident or obtrusive in the environment using minimal design.

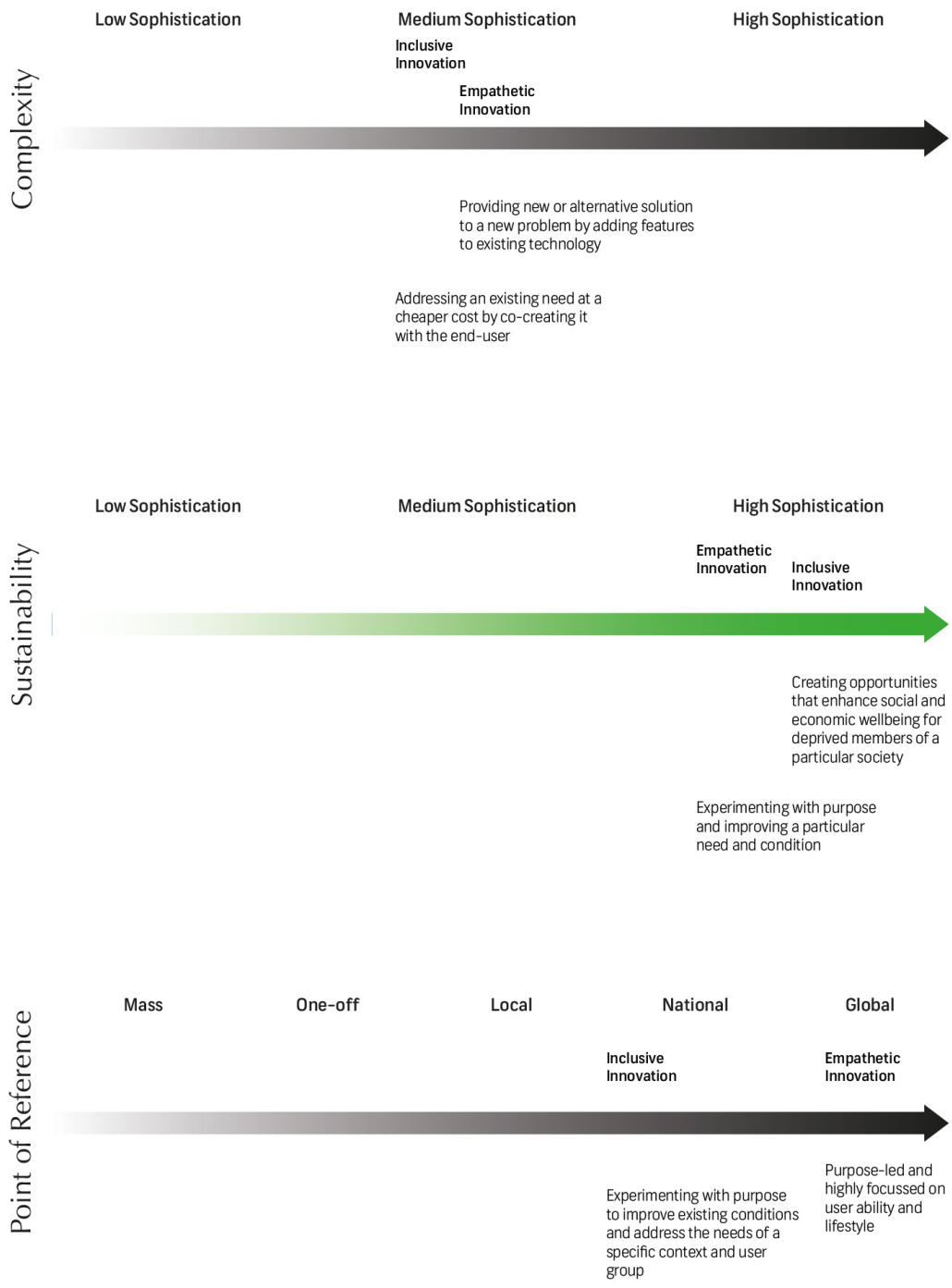

Table 3.5: *Categorising Empathetic Innovation, and Inclusive Innovation*

Empathetic Innovation aims to increase the chances of public good by addressing specific human needs within social and cultural practices while encouraging reframing of existing and new problems through rapid prototyping, testing, and user feedback. However, *Inclusive innovation*,

because of its aim to enhance social and economic wellbeing for deprived members of a particular society, allows the designer to develop a new idea that is meaningful to the end user and creates a better world for all.

Furthermore, *Empathetic Innovation* is less sophisticated in terms of complexity as it uses existing technology to add new features but requires another person's perspective and participation, which therefore requires an increased amount of time and money as well as appropriate spaces for creative collaborative work (Montonen et al., 2014, p. 370). Similarly, *Inclusive Innovation* combines local knowledge acquired through co-creation with the end-users with available technologies and a locally available workforce to respond to an existing problem.

Both methods of innovation in this cluster are highly sustainable, while one focusing on delivering a purposeful outcome that meets the needs of a specific user group, whereas the other creates opportunities that enhance social and economic wellbeing for deprived members of a particular society through training, job creation, and social wellbeing. However, *Empathetic Innovation* can appeal to the mass global market as it responds to human conditions and lifestyles that are similar in other regions, which enables its outcome to be transferred and used globally, whereas *Inclusive Innovation* can be limited to only local markets (Boer et al., 2013, p. 1) due to being a context-specific intervention that is suited to a specific market and infrastructure.

A key finding from the literature review is that both methods of innovation in this cluster highly rely on the input and participation of the end-user to develop a solution based on mutual understanding and through continuous on-site testing and reflection.

Further analysing the findings through Papanek's seven inhibitors, I realised that when designing *Inclusive Innovation*, I was tackling the majority of vertical

and horizontal blocks **(see Appendix J5)**, and therefore achieving higher levels of decolonisation through this method. It required me to reach a solution beyond my field or specialism, while questioning the accepted knowledge and my behaviour and approach to design. Furthermore, it required me to fully understand the end-user's needs through qualitative research and find the root causes of their problem, preferably in the comfort of their own homes and environments.

Empathetic Innovation also required me to reach a solution beyond my field or specialism but through purpose-led experimentation to alleviate the pain of someone else and improve their existing conditions, while questioning the accepted knowledge and my behaviour and approach to design. It required me to fully understand the end-user's needs through qualitative research as well as through open-ended conversation and small-scale interventions to allow me to go deep into the world and lives of the end-user.

The end-user of these innovations must be able to consider their situation and accept solutions that are not luxury objects. They must also understand that their involvement and participation in the creation or modification of existing technology is an important part of the process and be able to consider solutions that are low-cost and that will sit beyond their cultural or habitual practices.

3.7 REFLECTIONS AND SUMAMRY

The research journey taken through the systematic literature review explored *other* methods of innovation under resource constraints from a design perspective by identifying and transforming existing knowledge into a new theoretical framework, which resulted in the development of **thirteen methods of innovation under resource constraints** through a comprehensive case study analysis and practice-based design projects to answer Research Question 1.

In addition, the outcomes and experiences from Projects 1, 2, 3, 4, and 5 demonstrate how ideas, information, and cultural differences flow across borders to influence our approach and provide the basis for understanding how to practice innovation under resource constraints ethically and appropriately.

Furthermore, the findings from these *initial probe projects* were synthesised theoretically and empirically to understand which method of innovation enables high decolonisation under resource constraints. By far the most surprising finding was the success in translating all thirteen frameworks into practice and identifying and clustering them under the suffixscapes.

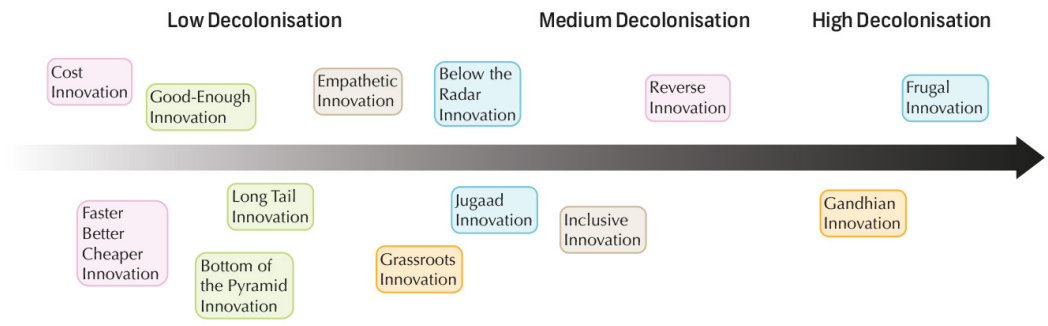

Table 3.6: *Theoretical Measuring of Decolonisation in the Thirteen Methods of Innovation Under Resource Constraints*

Figure 3.22: *Empirical Measuring of Decolonisation in the Thirteen Methods of Innovation Under Resource Constraints*

Reflecting upon the findings from **Appendix E6, F6, G5, H6, and J6**, which describe how I have measured high and low levels of decolonisation, Table 3.6 shows that, despite theoretical similarities between the thirteen methods

of innovation, there exists a distinction between those with low and high decolonisation. Figure 3.22 further visualises these distinctions and shows that *those with high decolonisation are aesthetically and functionally different*, but *similar in their purpose* to enable the designer/researcher and the end-user to achieve higher levels of adaptability, experimentation, and collaboration. The thirteen methods' distinction is detailed in Chapter 6 (Section 6.2) and briefly described below:

1. **Frugal Innovation:** *a method for developing new ideas that are understandable, honest, and easy to use.*
2. **Below the Radar Innovation:** *a method for developing new ideas that improve life and self-sufficiency.*
3. **Jugaad Innovation:** *a method for developing new ideas that use locally found objects.*
4. **Faster Better Cheaper Innovation:** *a method for developing new ideas that are mission-led and not context-based.*
5. **Cost Innovation:** *a method for developing new ideas that imitate high-quality foreign objects as low-cost alternative.*
6. **Reverse Innovation:** *a method for developing new ideas that shift cost-based relationships to value-based engagements.*
7. **Grassroots Innovation:** *a method for developing new ideas that have elements of surprise and playfulness.*
8. **Gandhian Innovation:** *a method for developing new ideas that are sustainable using foreign technologies.*
9. **Bottom of the Pyramid Innovation:** *a method for developing new ideas that make end-users producers and suppliers.*
10. **Good-Enough Innovation:** *a method for developing new ideas that represent specific social activities and cultural contexts.*
11. **Long Tail Innovation:** *a method for developing new ideas that enable flexibility in purchasing and consumption practices.*

12. **Empathetic Innovation:** *a method for developing new ideas that provide a radical solution to an existing need.*

13. **Inclusive Innovation:** *a method for developing new ideas that provide a tailored solution to an existing need.*

In answering RQ1, I realised that when practicing the thirteen methods of innovation under resource constraints, I was constantly looking for *ways to free up my mind from external knowledge or thoughts* in order to reflect inside, find answers, and focus on the problem at hand. Therefore, I was *elevating the need to seek personal perspective and positionality* through questioning, reflecting, and considering other ways of thinking and possibilities. Whereas, prior to this, I would have heavily relied upon the ideas and creations of other people to trigger my own design activities.

Thus, this chapter highlighted the knowledge gap in the literature as well as the capability gap in innovation methods by applying and testing alternative and new knowledge through practice and *understanding how resource constraints can influence the process and the outcome of innovation*. However, two major gaps in the literature have been identified that need filling.

The first is the lack of a *holistic view* of approaches that can lead to functional, desirable, or delightful outcomes in a specific cultural context and through different characters and positionalities, including the gap in knowing *how to think and make decisions in the moment of now* as a local, migrant, or foreigner. For this reason, Chapter 5 will test and compare the findings thus far against the frames described in Chapter 1, Section 1.4, to answer ***Research Question 2:* How to design functional, delightful, and desirable innovation under resource constraints?** through practice, and will further review action research and participatory design methods to understand and define what alternative methods of innovation exist under resource constraints.

Despite this, there would still remain a gap in *clarifying and understanding*

which method of innovation is ethically, culturally, and environmentally suitable for which cultural context and why. To fill the second major gap in the literature, Chapter 6 will identify the methods that can lead to liberating the human and decolonising innovation from worldly constraints by answering ***Research Question 3:*** **Which method is contextually appropriate for designing decolonised innovation under resource constraints?** by expanding on the agency of the researcher in demonstrating decolonised approaches to innovation in the real world, reciprocated by the participants under resource constraints in different cultural contexts.

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Chapter 4
Methodology: Decolonised Innovation Proposition

4.1 INTRODUCTION

This thesis discusses a different and more integrated approach to innovation with a focus on non-Western methods. Therefore, research is conducted and claimed with a *decolonial approach* by working in reciprocity with people to bring in multiple perspectives (local, migrant, and foreigner designer/researcher) using mixed methods study, rather than conducting research on people (Gullion, and Tilton, 2020, p. 2). According to Bagele Chilisa, in Indigenous Research Methodologies 2012, researching through a decolonial approach is *"a process of understanding the participant through their own assumptions and perspectives, cultural practices, thinking patterns, beliefs, and values in real life"* (pp. 8-14).

The research methods used in this research have limitations in their application and purpose within a non-Western context, as methods can be context-dependent due to the needs and expectations of a community (Biggs, and Buchler, 2007, p. 68). However, limitations have been addressed where possible through ethical standards and participatory and decolonising

research processes that required constant reflective attention and action.

The knowledge production process in this research remains espoused by mainstream methodologies respectful of Western methods, mainly due to my academic and professional training being from a Western perspective, which may differ from the position and perspective of the participants, and in the words of Smith (2012):

> *"…comes with a cultural orientation, a set of values, a different conceptualisation of such things in time, space, subjectivity, different and competing theories of knowledge, highly specialised forms of language and structures of power." p.44*

This chapter outlines a methodology that I developed to suit the aims and motivations behind my research, which I call the *Decolonised Innovation Proposition* (see Section 1.4), that builds upon Dieter Rams' principles of '*good design'* (Jong, 2021) by not only focusing on people but also their contextual and cultural affordability, available tools and materials, and deliberately favouring the approaches that are more respectful, ethical, sympathetic, and useful.

4.2 COMPOSITION OF DECOLONISED INNOVATION PROPOSITION

There are four main components (Table 4.1) that explain the methodology undertaken in this research.

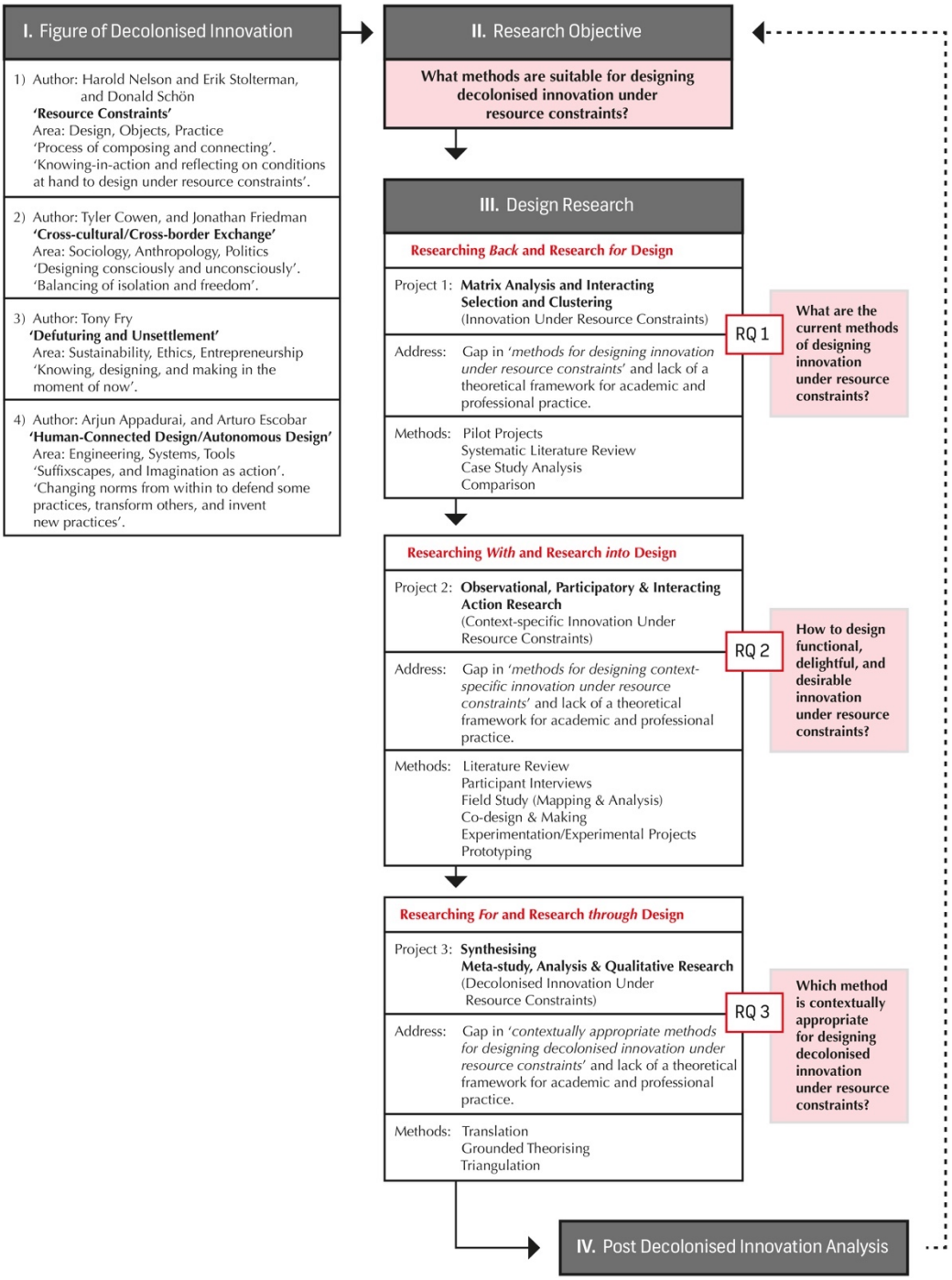

Table 4.1: *Composition of Decolonised Innovation Proposition*

4.2.1 FIGURE OF DECOLONISED INNOVATION

First of these is the **Figure of Decolonised Innovation**, which emerged from resource constraints as a *'process of composing and connecting'* Nelson, and Stolterman (2012) in (Section 1.3), and as *'knowing-in-action and reflecting on conditions at hand to design under resource constraints'* Schön (1991) in (Section 1.4.3). At this point, the thought grew to question the role of cross-cultural and cross-border exchange as *'designing consciously and unconsciously'* Cowen (2004) in (Section 1.3), and as *'balancing of isolation and freedom'* Friedman (1994) in (Section 2.5).

Furthermore, defuturing and sustainment is explored as a new form of practice for *'knowing, designing, and making in the moment of now'* Fry (2011, 2014) in (Sections 1.1, and 2.4), which further questions the role of human-connected design and autonomous design through *'suffixscapes',* and '*imagination as action'* Appadurai (1990) in (Sections 1.2, and 2.2.1), and through *'changing norms from within to defend some practices, transform others, and invent new practices'* Escobar (2021) in (Section 2.5).

4.2.2 RESEARCH OBJECTIVE

These findings required a broader view of design research, one that would acknowledge a more collaborative approach that is carried out in the field to test the methods under realistic conditions and in the realm of human actions that lead to new knowledge and results for design practice (Seago, and Dunne, 1999, p. 22). Thus, the second component of the Decolonised Innovation Proposition is the **Research Objective**, which calls for a *'designerly mode of inquiry'* into the above theories in the form of *'learning by doing'*, also known as *'action research'* (Archer, 2004, p. 27).

4.2.3 DESIGN RESEARCH

To fulfil the research objective, the third component of the Decolonised Innovation Proposition focuses on **Design Research**, with particular attention to the research process, approach, and methodology (Smith, 2012, p. 120). My role, as an investigator, is as an *'active participant'* within the situation under study, where I intervene and take planned action with my subjects through conversing and taking part in their daily lives, including their activities, customs, rituals, and routines, to make some desired or anticipated events happen or to improve circumstances (Stringer, 1996) within a geographically bounded community to investigate an issue, develop interventions, and assess outcomes (Gullion, and Tilton, 2020, p. 11).

Furthermore, the research design follows a *'systematic inquiry'* to explore the research objective and help answer the research questions in three separate but interlinked steps—**Researching *Back* and Research *for* Design** (see Chapter 3); **Researching *With* and Research *into* Design** (see Chapter 5); and **Researching *For* and Research *through* Design** (see Chapter 6)—that brings together decolonial approaches to research through the world views of non-Western individuals (Thambinathan, and Kinsella, 2021, p. 1) alongside Frayling's (1993) *categories of design research* with the goal to communicate new knowledge that is appropriate, transparent, and replicable (Archer, 2004, p.28).

4.2.4 POST DECOLONISED INNOVATION ANALYSIS

The fourth and final component is the **Post Decolonised Innovation Analysis**, where I analyse the findings from the projects by reflecting and evaluating the understandings and bringing to surface the new knowledge—the methods of design and ways of knowing and making that enable decolonised innovation (see Chapter 7).

4.3 APPROACHES TO METHODOLOGY

The approach taken in this research is *'mixed methods'*, as it involves collecting, analysing, and integrating qualitative as well as quantitative data to provide a more complete understanding of the research objective (Leavy, 2017, p. 9). In addition, a *'multi-strategy design'* paradigm is used to help explain and interpret the findings through sequential, convergent, and nested (Robson, 2011, pp. 161, 164) data collection and analysis.

To bridge the gap between theory and practice, this research uses Kurt Lewin's (1946) *'Action Research'* as a tool for improving and understanding the practice and the situation in which the practice takes place, and for the involvement of those who are the focus of the research as well as their participation in the process (Robson, 2011, p. 188) through a cycle of self-reflective cycles of planning, acting, observing, and reflecting (see Figure 4.1).

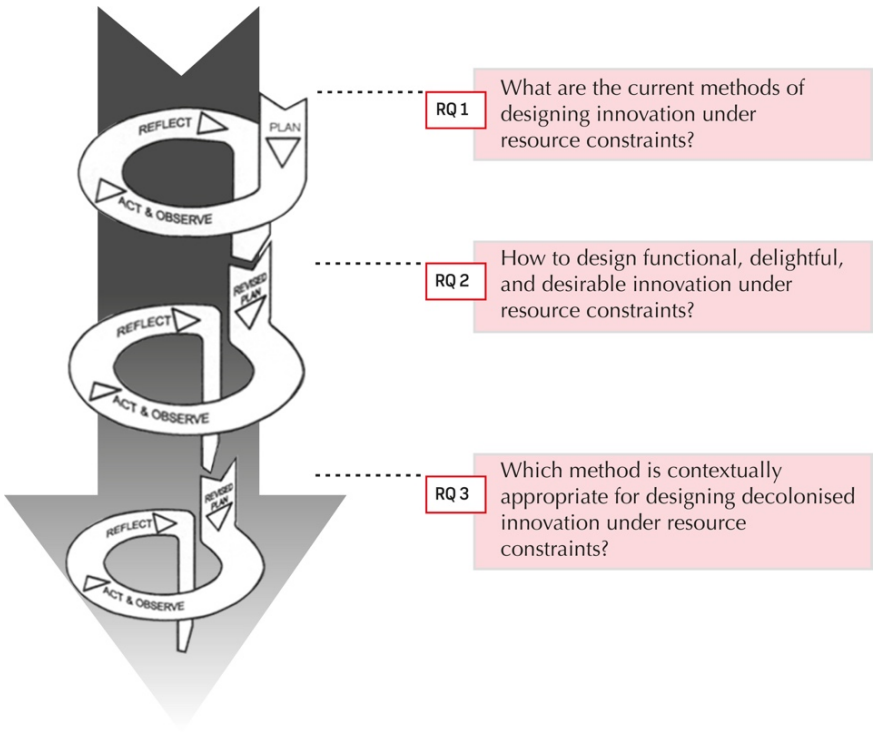

Figure 4.1: *The Self-Reflecting Spiral of Action Research*
(adopted from Kemmis, and Wilkinson, 2002)

Action research actively engages in a circular process of continuous learning (Glanville, 1999, p. 89) through *reflective practice* undertaken collaboratively as a form of *participatory design inquiry* by the researcher and the participant. The aim here is to study, reframe, and reconstruct the practices of particular people in particular places (Kemmis, and Wilkinson, 2002, pp. 24-25) through a continuous *"spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action"* (Lewin, 1997, p. 144).

Unlike traditional research approaches where action is not the focus, but the creation of knowledge is, the aim of this research is to both act and create knowledge or theory about that action *"for collaborative learning and the design, enactment, and evaluation of liberating actions in an ongoing cycle of co-generative knowledge"* (Greenwood, p. 131) that is both useful and practical in everyday life (Coghlan, 2016).

4.3.1 DECOLONISED INNOVATION METHODOLOGY FLOW

Research is undertaken systematically and sequentially, and the sequence of research is divided into four elements, where each element of the research sequence centres around a particular research question that is then explored through a selection of methods based on the kind of information and research problem that is sought (Table 4.2). Therefore, a broad range of methods are selected for each research question to allow flexibility in the process and help formulate possible and potential research problems (Robson, 2011, p. 232).

Once suitable methods were selected to address the research question, a research project was developed alongside a project network map **(see Appendix D, D5)** and a project setup structure **(see Appendix D, D6)** as a strategy for gathering data that led to new findings and research outcomes.

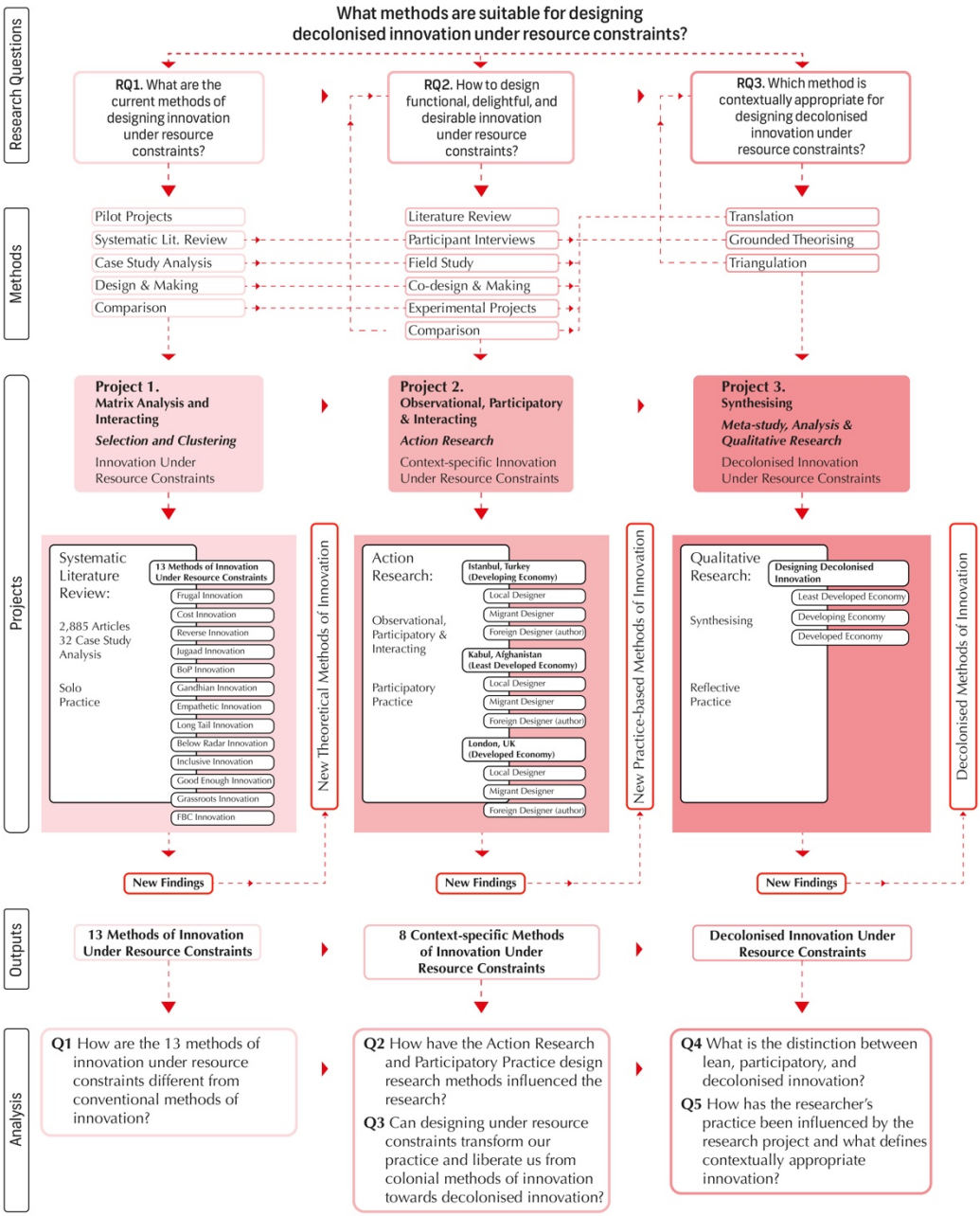

Table 4.2: *Decolonised Innovation Methodology Flow Describing the Research Questions, Activities, Outputs, and Analysis Methods*

It should be noted that research did not flow smoothly and naturally from questions to answers and that the real world as well as the geopolitical constraints, such as government control over personal freedoms of the local population, resource protectionism, and resource nationalism, played havoc with any carefully planned activities. This included the failed 15 July, 2016

coup d'état attempt in Istanbul at the start of my research journey; the global outbreak of the COVID-19 pandemic in January 2020 during my research; and the fall of Kabul to the Taliban on 15 August, 2021 towards the end of my research. Thus, having flexibility built into the research allowed for opportunities to appraise the evidence in a structured way.

The methodology flow shown in Table 4.2 defines how research questions are compared to projects and research methods, which are then analysed through a series of further questions drawn from the research questions and project findings.

The methods of analysis will be qualitative, as the data collection follows Spradley's (1980) '*nine dimensions of descriptive data collection'*, which are:

1. *Space* (layout of the physical setting and the immediate context).
2. *Actors* (details of the people involved).
3. *Activities* (various activities of the actors).
4. *Objects* (physical elements; tools, materials, equipment).
5. *Acts* (specific individual actions).
6. *Events* (occasions; discussions, meetings).
7. *Time* (sequence of events).
8. *Goals* (what actors are attempting to accomplish).
9. *Feelings* (emotions in particular contexts).

Thus, this research adopts an *'emancipatory'* view of the point and purpose of action research, in which participants attempt to liberate themselves by remaking and improving their own practice and overcoming distortions, incoherence, contradictions, and injustices (Kemmis, and Wilkinson, 2002, p. 32). Therefore, designing is used to help understand situations by allowing for the making of things that can be immediately put into those situations (Vaughan, 2017, p. 35).

4.4 RESEARCH DESIGN

The Decolonised Innovation methodology described above is applied and tested through a series of projects to answer the research questions and is designed to address the main research objective that emerged from the findings described in Chapters 1 and 2 and detailed in the Figure of Decolonised Innovation (Section 4.2.1), as well as from the findings of the pilot projects described in Chapter 2 and from the projects described in Chapters 3 and 5.

4.4.1 METHODS

It needs to be stated that there is no standard model of practice or framework for selecting methods that examine decolonial perspectives and applications of research. However, the choice of methods is based on making informed and explicit connections dynamically and relationally across different cultural contexts to help disrupt assumptions and perspectives and produce knowledge elsewhere (Thambinathan, and Kinsella, 2021, p. 3).

Based on this view, this research has a starting point in unsettling the point of reference by qualitatively exploring methods of innovation that exist elsewhere as a process of '*unlearning*' through Projects 1, 2, 3, 4, and 5, followed by qualitatively conducting ethical cross-cultural research through collaboration and partnership with members of the communities who are being studied as a process of '*re-learning*' through Projects 6, 7, and 8 (Tapp et al., 1974, p. 233).

4.4.2 POSITIONING THE RESEARCHER

Returning to the questions asked in Sections 2.5 and 3.7, Projects 1, 2, 3, 4,

and 5 use a *systematic literature review* approach where the researcher identified, selected, assessed, and summarised the findings from recent and most relevant articles and publications, and then further distilled the results using qualitative synthesis using case study analysis, practice-based inquiry, and reflections on the initial probe projects (Chapter 3). Projects 6, 7, and 8 will use *action research,* where the researcher will conduct research with collaborative partners and will be situated both internally and externally while acting as an active designer-facilitator in terms of design practice—someone who, in the words of Mignolo and Walsh (2018):

> *"…endeavours to provoke, encourage, construct, generate, and advance with others other ways of thinking and of doing." p. 83*

Consideration is given to both the researcher's and the participants' cultural perspectives, ensuring that the way the research is conducted, and its findings are contextually appropriate and meaningful by adapting and applying the research methods in a culturally meaningful way. This included having knowledge and understanding of the sociocultural and political dynamics of the research setting to minimise the risks of inadvertently imposing the researcher's beliefs, values, and behaviour upon the research setting and the participants (Pelzang, and Hutchinson, 2018, p. 1).

To find the right participant and information, the researcher's self-representation is adaptive (not essentialist) to the local culture and applies a more fluid (rather than matching) cultural and racial identity to enable him to collect valid, meaningful, diverse, and detailed data. The researcher's positionality as an *'insider and outsider'* follows the observations made by Mullings (1999), where his status is situated as a *'seeker of information'* that questions who can be a *'knower'* (Pang, 2016) and investigates the associations between *'self and other'* and *'self as other'* (Fletcher, 2014; Pang, 2016).

4.4.3 ETHICS

Three interwoven strands of ethical inquiry are applied throughout this research as conceptual tools to enable ethical and decolonial decision-making and practice across different cultures and contexts. Based on Fry's *'Design Futuring'* (2014) and Heidegger's *'Being and Time'* (1927), these strands help minimise the consequences of actions before and during the research.

The *first* of these is the experience of the researcher in dealing with cultural sensitivity and working on design projects across several countries, which has provided some understanding of appropriate behaviours and experience of engaging with a wide range of participants, situations, and policies through design activity. Thus, *'self-reflection'* (Fry, 2014) is used as a form of ethical inquiry to help the researcher reflect upon previous understandings and experiences and acknowledge the *'being-of-the-world'* (Heidegger, 1927) and others when making decisions.

The *second* of these is the moral obligation of the researcher as a critical frame of reference to overcome the will and desire to identify and elevate key findings. Thus, *'self-overcoming'* (Fry, 2014) is used as a form of ethical inquiry that helps the researcher acknowledge his and the participants' position as *'being-in-the-world'* (Heidegger, 1927) amongst other things, and fuse self-reflection and the discovery of new knowledge to recognise that new findings can expose and ascribes responsibility for them.

The *third* strand is the remaking of shared futures by taking what is already ethically good and building with and on it, while finding ways to eliminate what is not in collaboration with the participants. Thus, *'becoming otherwise'* (Fry, 2014) is used as a form of ethical inquiry that helps the researcher understand alternative perspectives and assign the process of *'world-making'* (Heidegger, 1927) by bonding his research activities with lived experiences.

Strands two and three are particularly relevant to this research and are

considered when selecting participants as well as the location of the research. Academics and local guides **(see Appendix D5)** are identified and will be consulted before and during the research to inform the inquiry along with the responses from participants.

Costs of labour (standard local rate per day) and materials (use of available materials and tools) will be covered for all the participants, and where possible, a more cultural approach will be applied to help with the relationship and trust building processes (see Chapter 5). As a collaborative project, the intellectual property rights will reside with the researcher and the participants, and the outputs will be available for free use by all parties for personal development. The names of all participants and guides will be mentioned (with their consent) and credited against the skills and knowledge that they have shared in this research collaboration.

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Chapter 5
Decolonised Innovation Under Resource Constraints

5.1 INTRODUCING THE CONTEXT FOR RESEARCH

The geographic location of research for the following three research projects, which are structured in three groups (three projects in Istanbul, three projects in Kabul, and two projects in London), is described in detail in Chapter 1, Section 1.4.4.

In this chapter, I evaluate in depth *the methods of innovation that originate under resource constraints through multiple perspectives and motivations as alternative knowledge* and explore how they differ from lean or participatory innovation methods. To do this, I combine action research and participatory design methods to acknowledge and honour the culture of participants and their social structure and consider how their cultural practices and norms form part of the research by bringing them to the surface, being conscious of them, and challenging and understanding them so that they don't subconsciously control me (Gullion, and Tilton, 2020, pp. 44, 54).

As an *'active participant'* (Stringer, 1996), I facilitate and produce while being embedded as part of the process to investigate in the real world through a variety of perspectives (Frayling, 1993, p. 5) so that evidence from

observational and personal experience can be compared with design and participants as its subjects.

The key aspect of this research is to situate design, practice, and research as learning and doing under resource constraints across different locations **(for details, see Appendix K)**, which, according to Vaughan (2017, p. 12) *"provides the context, means, and parameters of the study"*. The research is recorded by following a format of describing the location of research, available resources, and related constraints, adapting and relating the research activities and evidence gathering alongside, describing the final output, and analysing the results against the findings from Chapter 4 as well as from the researcher's and collaborator's perspectives. Research outputs are supported through pre- and post-project interviews, illustrations, and photographs, with a record in **Appendices M, N, and P**.

5.2 INTRODUCING THE RESEARCH IN CONTEXT

The research methods selected for this phase and the structure of the projects have been described in detail in Chapter 4, and the relationship between the methods, the approach undertaken in each location, and the challenges of working across different cultural contexts is an important element that will be introduced here **(detailed in Appendix L)**.

While the literature and previous personal experience provided a background understanding, these findings were not treated as an essential starting point for research, and to avoid issues of power relationships with the participants, I did not set the agenda in isolation but in partnership with a network of individuals in each location.

Planning the projects in advance and in different locations was certainly complex and challenging; therefore, consideration of real-world constraints, such as limited time and familiarity with the locality, getting into a sensitive situation, and understanding the practicalities of carrying out the study, was in the background alongside the research focus. The projects required detailed pre-planning and alternative options **(see Appendix C3)** in case the plans changed due to volatile and unpredictable circumstances.

Through semi-structured interviews **(see Appendix C1 and C2)**, participants were required to share and apply their psychological, social, and cultural experiences. Because this research investigated new modes and approaches of thinking and doing, the research output raised questions about the current methods and approaches, with the possibility of redirecting practice and output towards confronting politics, social, and economic inequalities. Thus, participants were informed in advance, their approval was recorded via consent, and in return, financial compensation was offered to cover time spent on the research, not research output.

5.3 PROJECT 6: PRACTICING IN DEVELOPING ECONOMY

Design provides a unique opportunity for developing economies to transition from informal crafts-based practices to structured and context-oriented ones through the formation of a mutually creative process where local resources and capabilities are conjoined with the acts of exchange, borrowing and lending, and instantaneous cooperation. The *workshop*, which is unique to the urban culture of these countries, provides the space for discussion and improvisation, mutual exploration of an idea and its delivery, and focuses on techniques and skills through dialogue and hands-on experimentation in a situated location using materials at hand.

Site-specific knowledge production undertaken in the *workshop* allows the designer/researcher to interact and adapt with the surrounding environment and experiences in the workshop, for example, by reflecting upon previous work and prototypes, testing different materials, and changing their mind by asking questions in the process of making. Thus, the three projects undertaken in Istanbul further build upon the notion and role of the *workshop* as a place of collaboration and experimentation as well as creativity and innovation historically and culturally, and are an important element in conducting participatory design research in a developing economy context.

5.3.1 THE FIELD: KADIKOY, KARAKOY, AND FATIH —ISTANBUL, TURKEY

Prior to design research, field studies were undertaken to get familiarised with the geography of the city and develop an understanding of the local culture, available skill set, and potential influences on people's behaviour and approach to innovation. As described in **Appendix K2**, three areas were analysed based on their identity as a cluster of spaces where designers have been creating and innovating for years and therefore accumulate enough data

from their experiences to be able to take part in this research and help identify key patterns in Istanbul.

5.3.2 AVAILABLE RESOURCES AND KEY CONSTRAINTS

Based on field research and participant interviews, three types of resources were identified within the immediate surroundings of Istanbul. The first contends that there is a strong concentration of skilled craftsmen who are experienced in using traditional making tools and specialise in metal and glass works predominantly. The second explains that Istanbul's urban configuration provides easy access to various types of expertise and knowledge and enables collaboration across different fields and cultural beliefs. Finally, the availability of hardware and off-the-shelf components enables a culture of localised production and consumption processes.

On the contrary, the constraints identified contend that the specialised traditional skills and tools limit the possibility for experimentation and, thus, there is a lack of production methods and limitations in developing and making complex artefacts. In addition, while there is a strong appetite for collaboration amongst the designers, differences between belief systems and thinking processes do exist. For example, findings from participant interviews and on-the-ground observations suggested that locals remain conservative in their approach to changing and advancing their methods, whereas migrants constantly feel they need to invent and differentiate. This limits experimentation and impacts the development and quality of execution. Furthermore, reliance on off-the-shelf components and specialised local production systems has resulted in low-quality outputs and a culture of copyists that is less favoured and not suited to the emerging needs and ambitions of people.

5.3.3 RESEARCH DESIGN

A three-step design research method was developed to bridge the gap between theory and practice, which has been discussed in detail in Chapter 4, Section 4.3, along with a project structure **(see Appendix D6)** that acted as a flexible and adaptable process for finding things out. In Istanbul, two individuals (Semiha Kan, and Artin Aharon) were identified from a pool of potential participants based on the recommendations from the researcher's network as well as their skills and relevance to this research. They were introduced to the project through the Participant Project Information and Consent Form **(see Appendix B1)**, which helped with getting familiarised with the participant's area of practice, motivation for taking part in this research, and an understanding of their approach and thinking processes. A small fee in the form of a cultural gesture, for example, dinner for Semiha and a bottle of beverage for Artin, was agreed upon in return for their time and participation.

Semiha Kan is a *local designer* and President of the Turkish Industrial Designers Society. She trained at the Istanbul Technical University and has over fifteen years of design and making experience. Based in the Kadikoy area, Semiha specialises in the design of tableware, flatware, glassware, furniture, accessories, and packaging. Her practice centres around functional, simple, and faithful products that are locally manufactured using readily available materials, and her work has been exhibited in Turkey, Germany, Finland, the USA, and China and featured in Elle Décor and Azure. Her area of material expertise lies in metal, ceramics, and moulded polymers, as evidenced in her work for various local brands and private clients (Figure 5.1).

Figure 5.1: *Semiha Kan and A Selection of Semiha's Design Work for Various Clients*

Artin Aharon, on the other hand, is a *migrant designer* without formal education but with many years of design and making experience. Based in the Galata area of Karakoy, Artin specialises in the design of bespoke furniture, installations, and objects. His practice centres around surprise, craftmanship, and the relationship between tools and processes available in the immediate context. Artin's work has been exhibited across different national and

international locations for both educational and professional purposes and featured in digital and physical publications. His area of material expertise mainly lies in metal and scrap objects, as evidenced in his work for various private clients (Figure 5.2).

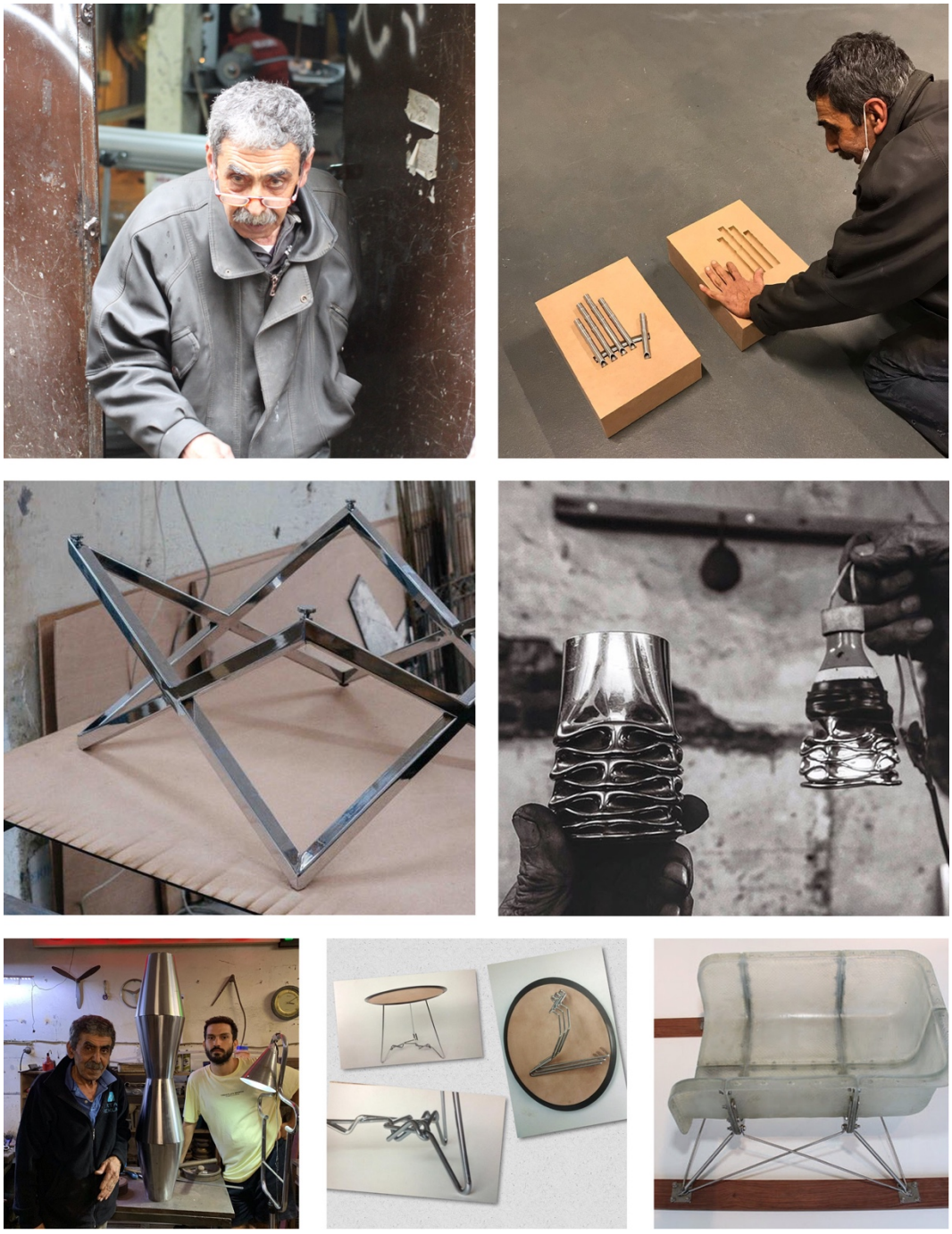

Figure 5.2: *Artin Aharon and A Selection of Artin's Design Work for Various Clients*

5.3.4 CONDUCTING DESIGN RESEARCH

After a ferry trip to Kadikoy across the Bosporus Strait and a short walk from the ferry terminal, one morning a visit was arranged to meet with *Semiha Kan*, a *local designer*, at her studio on the second floor of a 1970s office building with views towards the sea and tool shops on the ground floor. Semiha's studio neighbours other local design studios, forming a cluster of creative workshops on multiple floors that share findings, tools, and equipment. Examples of her work, a combination of tableware prototypes and wireframes, can be seen on timbre-framed shelves placed on each side of the room, while two work desks sit in the middle with a laptop and some material samples that were delivered from a local workshop are placed on one and magazines and books on the other. The studio is also used for teaching industrial design students from the Technical University of Istanbul as part of a summer internship programme, with the aim of connecting academia with professional practice and the local industry.

During the visit, Semiha, who spoke and understood English professionally and did not hesitate to speak her mind, described and showcased her approach to innovation under resource constraints as *'smart production: designing of what I am able to with what is available to use'* (detailed in Table 5.1), which consisted of *reconfiguring* by cutting and joining different moulds acquired through a network of friends and existing products found in the local shops. This is followed by taking pictures and further editing her initial idea by drawing over it or finding elements from the internet or publications to add, then taking her idea to the local manufacturing workshop to see if they have a similar mould that could be used as well as to see if it could be made using the available tools and skills set within a fixed budget. Finally, contextualising the design and developing a narrative around the outcome to fit the local culture, a particular need, and people's tastes.

She elaborated that the configuration of multiple design studios placed within

the same building as her studio has allowed her to experiment with different types of existing moulds belonging to her neighbours, while the availability of off-the-shelf components and manufacturing workshops on the ground floor has allowed her to develop a *local way of thinking*. This has informed her design process and enabled her to build new ideas specific to the production techniques and materials available in the city.

Semiha believes that innovation in Turkish household products and tableware is dependent on *'finding common things in the immediate context in order to make something new, but not necessarily a new design or innovation'* based on the notions of *found and made* and *mix and match,* because both clients and manufacturers avoid taking risks. She went on to say that:

> *"Generally, I say, why do we need to do new things? In Turkey, the design process is not important because every client wants similar-looking things, and nobody says, hey there's a new technology, so let's think about a new way of making, or let's experiment."*

As a *local*, Semiha's key constraint is the limitations in production methods, and therefore, she is reliant on traditional making techniques and tools, resulting in the need for similar-looking things and tremendous pressure on materials that suit these methods, such as bronze and ceramics. Thus, forcing her to develop new ideas that fall within the manufacturer's ability, available materials, and skill set.

However, through the interview discussions and reflecting on work samples **(see Appendix M1)**, Semiha was able to identify separate approaches that are unique to her practice and could allow her to liberate herself from conventional design processes, which are detailed here.

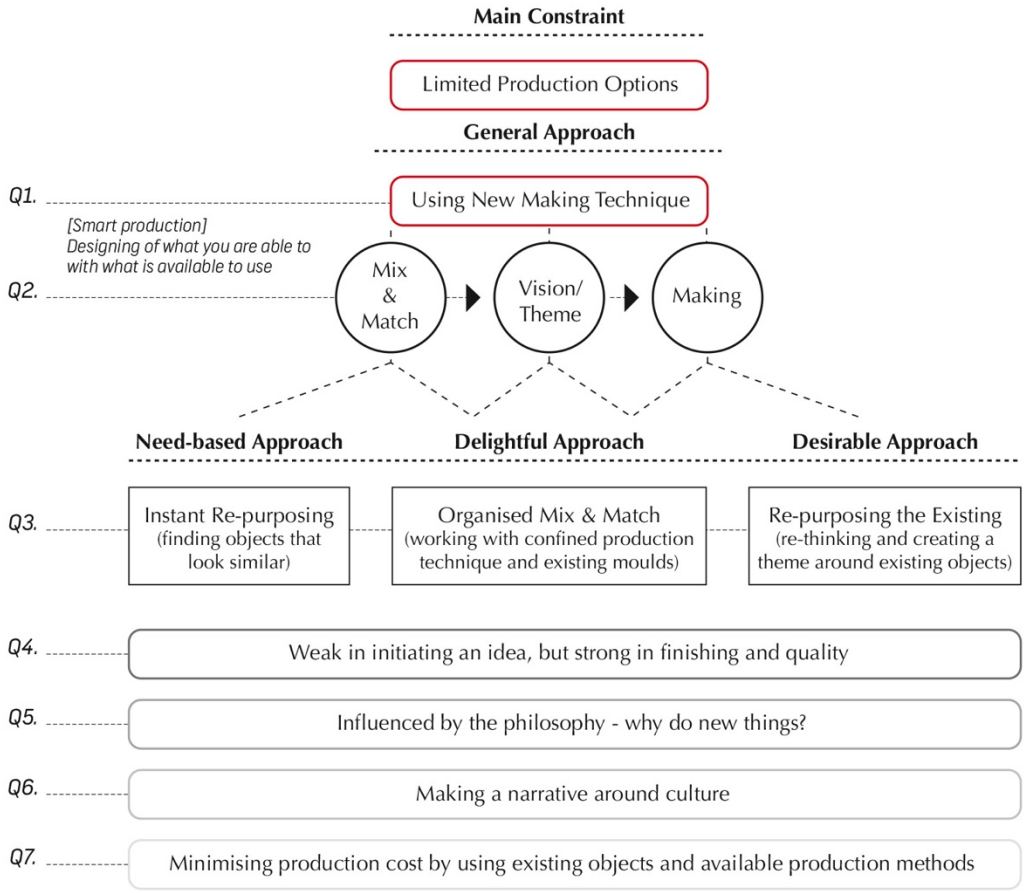

Table 5.1: *Mapping Semiha Kan's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Local in Istanbul*

To solve a functional problem, Semiha's approach follows the process of *instant mix and match*, through which she repurposes found and off-the-shelf objects to develop a conventional yet unique idea. For example, when considering a new sugar container for a high-end market (top row in Figure 5.3), three separate objects that imitated her idea were collected from different local suppliers and neighbouring design studios, and through minor changes, such as recolouring or resizing, she was able to create a locally sourced product that is easy to assemble and repair with cultural references.

When designing delightful ideas, her approach follows the process of an *organised mix and match*, where she speculates by working within a confined

method of production using existing moulds that she could configure. For example, when considering new tableware (middle row in Figure 5.3), she started by visiting different manufacturers and friends to explore available moulds for re-use and re-purpose by either adding or subtracting from its existing shape, size, context, and use.

Designing desirable ideas, however, transcends her approach towards the process of *re-purposing the existing*, where she intentionally re-thinks and creates a new theme around existing products and objects. For example, when considering a new candleholder for the local market (bottom row in Figure 5.3), Semiha started with a predetermined purpose and a new narrative that included an understanding of the context, key functionality, and type of end-user, which then allowed her to search locally and find a base of a lightbulb alongside an unused coffee cup that formed the basis of her vision. Following this, a local manufacturer of bronze and clay-based objects was approached to get an understanding of the costs and give feedback on her choice of material.

Additional findings suggested that, *as a local designer*, Semiha feels less confident initiating new ideas due to limitations in production techniques, while cultural influences make it difficult to be experimental and create new things. However, her strength lies in re-creating new narratives and uses for existing objects and materials, which allows her to minimise production costs and achieve high-quality outcomes, and Semiha goes on to say that:

> *"In order to liberate myself from these constraints, I balance myself (my idea, vision, and ambition) with what is there to use (materials, tools, and skill set). I call it smart production. I don't consider this as a negative influence, but rather it makes my imagination and design more focused."*

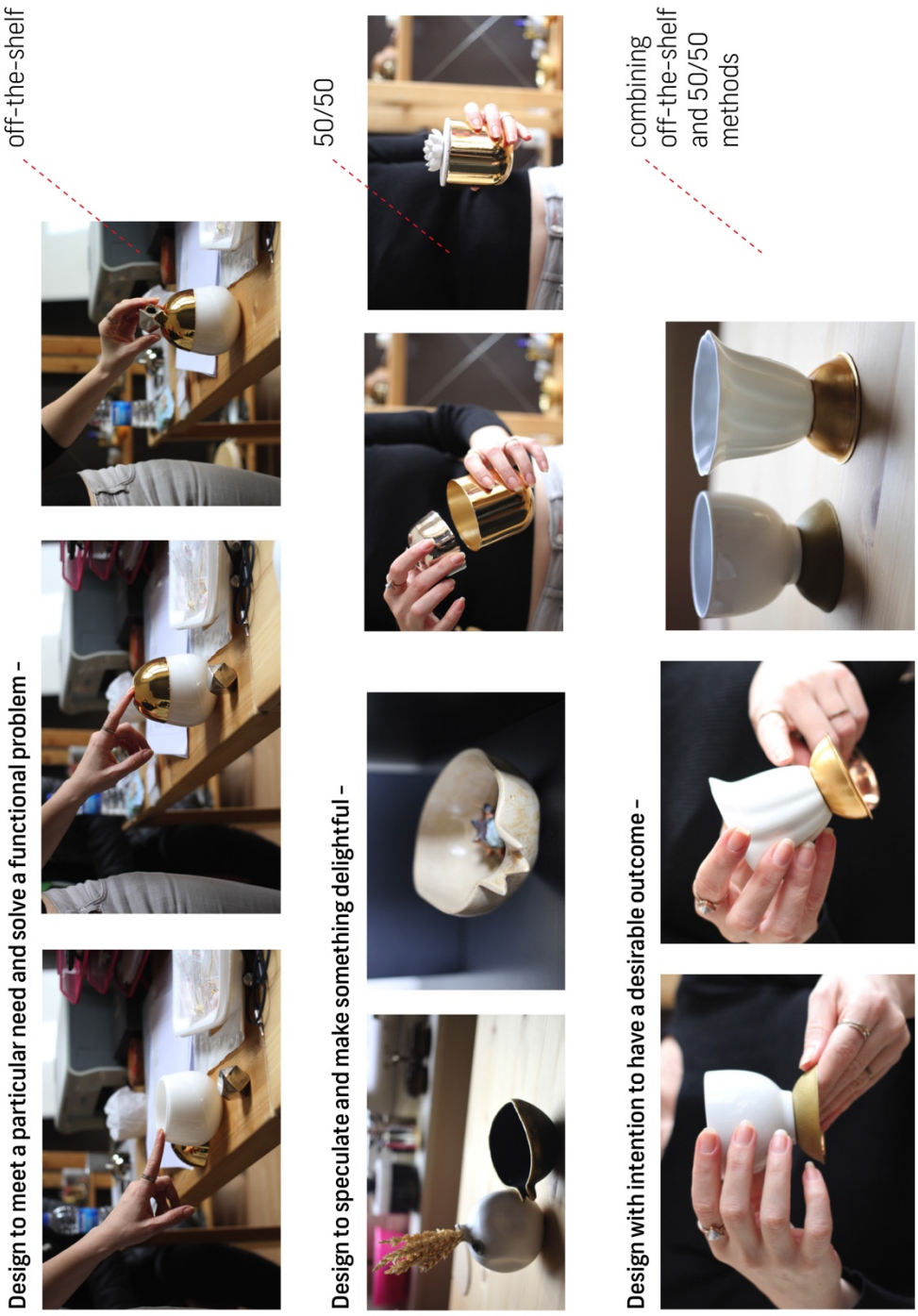

Figure 5.3: *Visualising Semiha Kan's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Local in Istanbul*

The following day, and through another ferry trip in the morning, a visit was arranged to meet with *Artin Aharon*, a *migrant designer*, at his studio in Karakoy. Based in one of the streets on the hill near the iconic Galata Tower, known

for creative workshops, Artin's studio is a three-storey building with each floor having its own purpose and functionality. For example, the ground floor is a showroom displaying some of his previous works in steel and mixed material and also used as a meeting space for clients and visitors. The other two floors, which he shares with his younger brother, accommodate the making and production tools and equipment, as well as a room with magazines and a large worktable in the middle where material samples and personal experiments are placed. The studio is also used by industrial design students from the Technical University of Istanbul to meet and discuss their design projects with Artin and develop working prototypes using his expertise, tools, and equipment.

During the visit, both Artin and the researcher relied heavily on translation, which was provided by the researcher's guide and paid translator, Semih Arsalan. The limitations of language and his status as a migrant made Artin reluctant to speak freely at times, but through sharing the purpose of the project and its benefits to his own practice, he felt more confident. Artin described and showcased his approach to designing innovation under resource constraints as '*thinking through experimenting: designing along the way and improving quality gradually'* (detailed in Table 5.2), which consisted of *transmitting* existing ideas through magazines and media and looking through product manuals, followed by manipulations and experiments using the tools and materials available in the studio to create something new and purposeful for mass production.

He elaborated that his work is strongly influenced by the acts of negotiation, translation, and collaboration, and this way of working is dominated by the setup of his studio and the movement across different parts of the building. For example, the ground floor is often used as a place for discussion and negotiation, the first floor for making and translating, and the top floor for exploring and collaborating with others. This movement across different setups within his studio, according to Artin, allows him to develop a *migrant*

way of thinking where he searches for other modes of being and appropriates his thinking based on the context of his practice. Through a nonlinear movement, he is able to liberate his mind from political and cultural influences and find meaning behind his ideas.

Artin believes that people in Turkey do not have sensitivity towards innovation *'because there is a constant fear of being judged, and therefore, they do not do everything that is on their mind, which makes us selective and conservative when it comes to creating new ideas'*. He went on to say that:

> *"In Turkey, design is strongly influenced by consumption. We create new things for two reasons: to showcase a particular type of lifestyle and to edit or conceal reality. There is very little understanding of purpose-led or context-specific innovation because there is a constant feeling of not belonging to the local culture among the migrant population."*

Artin's key constraint as a *migrant* is the limitations of artistic freedom, which according to the United Nations Educational, Scientific and Cultural Organisation refers to *"the freedom to imagine, create, and distribute diverse cultural expressions free of external pressures"* (UNESCO, 2019, p. 2). This has resulted in the concealment of context-specific and cross-cultural perspectives, processes, prospectives, actions, and thoughts, which in turn has given rise to repeated and stagnant practices that put tremendous pressure on available materials, skill sets, and equipment. Thus, forcing him to develop designs that project universality by mirroring the outside world through gradual experiments, referencing, and mimicking ideas from magazines and the internet.

However, through the interview discussions and reflecting on work samples **(see Appendix M2)**, Artin was able to identify separate approaches that are unique to his practice and could allow him to liberate himself from conventional design processes, which are detailed here.

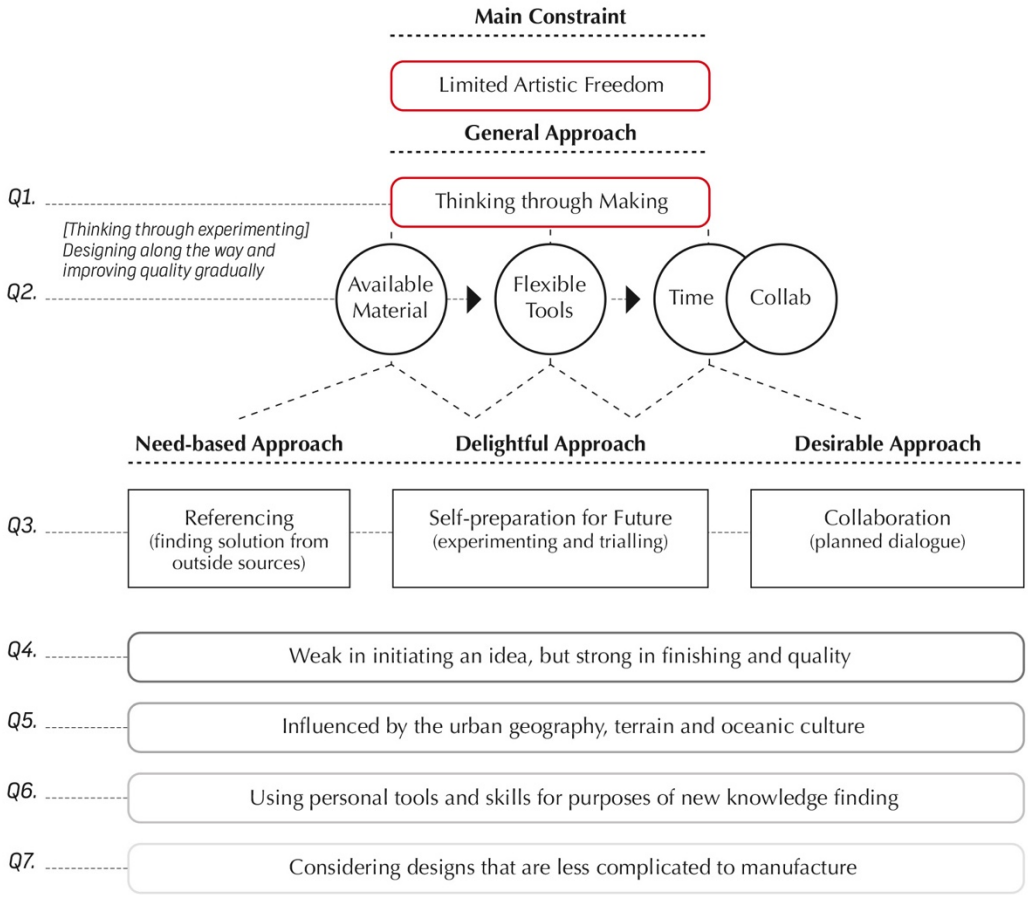

Table 5.2: *Mapping Artin Aharon's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Migrant in Istanbul*

Artin's approach when designing for a particular need or functional problem follows the process of *referencing and matching ideas from outside sources*, which enables him to use available materials and tools to experiment and reach a similar-looking outcome. For example, he uses his experience or memory alongside the images from found sources to develop an edited version of the original (top row in Figure 5.4), which is, however, less sophisticated.

When designing delightful ideas, Artin follows the process of *self-preparation by purposefully experimenting*, where he uses his tools in a flexible way to explore new methods of thinking and making with the aim of culturally

transforming himself and the end-user. For example, he makes materials visible by reducing conventional making steps or radically advancing the aesthetic qualities of the outcome, thus renewing the process of making (middle row in Figure 5.4).

To design desirable ideas, however, requires Artin to take a collaborative approach where he uses the expertise and tools of others to develop a *planned and structured* process with a focus on elements of surprise and beauty through the integration of clever detailing. For example, he begins with drawing and composing to find a direction and then gradually makes, tests, and changes his creation by negotiating and validating with the end-user, client, or collaborator (bottom row in Figure 5.4).

Additional findings suggested that, *as a migrant designer*, Artin feels that he continuously needs to change and adapt his ideas to suit the cultural and political landscape to be able to win projects and get commissions, thus making it harder for him to initiate a new idea. However, his strength lies in being receptive to change and able to let go and relearn, which allows him to use and apply his skills and knowledge as well as his tools for different purposes, and Artin goes on to say that:

> *"Cultural exchange and events affect my preference for materials, shapes, and reference points. I am constantly trying to find my own identity through my work; however, I end up creating a culture that I do not belong to by depending on the ideas, dreams, and imagination of others"*.

Figure 5.4: *Visualising Artin Aharon's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Migrant in Istanbul*

Considering the above-mentioned findings, two significant internal reflections can be made in relation to my own practice and those demonstrated by Semiha and Artin. Firstly, my understanding of the workshop

as a place for initiating and designing innovation has been widened from purely seeing it as a location for experimentation and creativity to a place of purpose-led self-preparation and gradual self-improvement in a developing economy context. It demonstrated a strong element of community building among individuals with a common need and interest and indicated an openness to sharing and learning, as well as being less competitive, and secretive which is less common in developed economy contexts.

In addition, my understanding of innovation across different cultural contexts has evolved from entirely being focused on transferring ideas and technologies from one location to another to finding common and related things in the immediate context in order to create something new.

To have a better understanding of the differences between my own practice and that of the participants, a further investigation was carried out to examine the activity of innovation and to measure my behaviour and that of a participant in a cultural context where I take the role of a *foreigner* and work with the participant to construct a more comprehensive understanding of decolonised ways of knowing, designing, and making under resource constraints in a developing economy context.

5.3.5 CONDUCTING RESEARCH THROUGH DESIGN

Based on Artin's reflective creative practice and experimental approach to design, as detailed above, he was identified as a suitable participant to conduct research through design. Additionally, his studio setup with the availability of tools and materials (Figure 5.5) along with his attitude, experiences, and knowledge as a migrant designer meant that he was more appropriate than Semiha to further test the findings thus far.

Figure 5.5: *Artin Aharon in his Studio in Istanbul's Karakoy Neighbourhood*

Artin was introduced to the project the following day through an informal discussion on the previous day's findings, where he reflected that:

> *"The interview process made me realise that ideas can also be given through conversation and not just through visuals or physical mock-ups, which usually takes a lot of time."*

And that he wishes to utilise this way of working where he can *look deep inside himself for answers* and conduct research through design by having an *experience-led dialogue* with the available tools and materials, the studio environment, and me to focus on the outcome desired for end-users in the present moment rather than the past or the future. Taking this into consideration, a task was set to co-design a new artefact specific to the immediate environment and available resources that would accommodate all three motivations—needs, dreams, and aspirations—resulting in a six-cycle innovation process (see Figure 5.6) realised through a post-project interview.

5.3.6 ISTANBUL RESEARCH OUTPUT

Figure 5.6 shows the process undertaken in Artin's studio to innovate a new artefact through the characters of a *migrant* (participant) and a *foreigner* (researcher). Our combined acts and responses were highly influenced by the layout of Artin's studio, and the process map below highlights the integral relation and interdependence amongst our past needs, present dreams, and future aspirations in a format of decision-making and a cycle of action.

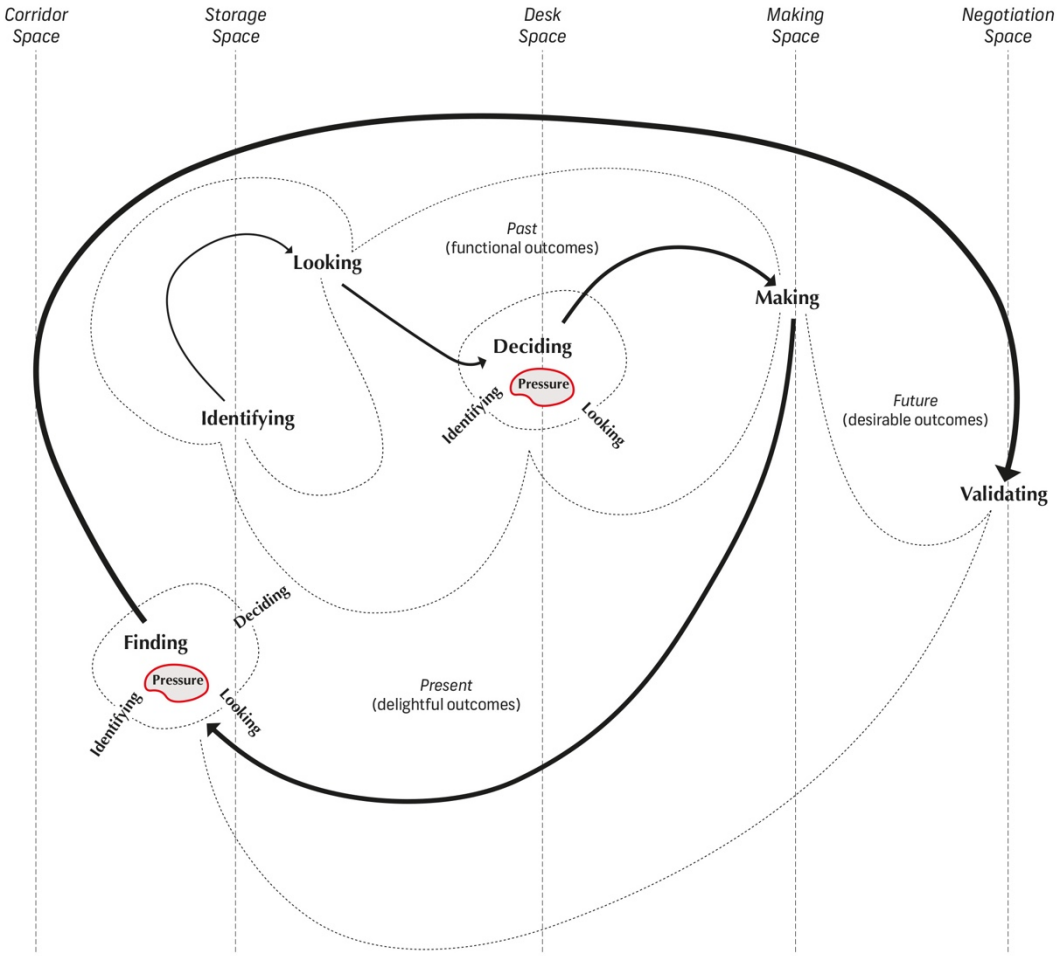

Figure 5.6: Mapping the *Six-cycle Innovation Process for Practicing Decolonised Innovation Under Resource Constraints in Developing Economy*

As a reflective practice **(see Appendix M3 for practice and facilitation**

details), responses at each cycle were in continuous search of balance and harmony with the moment of now and helped with constructing paths and praxis towards *other* ways of thinking, sensing, believing, doing, and living (Mignolo and Walsh, 2018, pp. 100, 120).

5.3.7 ISTANBUL FINDINGS

The research undertaken in Istanbul was transformative in the sense that both me and the participant *examined design through material forms, places, spaces, and experiences* (Koh, 2015, p. 432) in a developing economy setting and offered an understanding of context-specific approaches that challenge the colonialism of knowledge and practice through multiple perspectives. This was made possible by involving *'a reflexive and dialogical movement'* that went from action to reflection and from reflection upon action to a new action (Freire, 1985, p. 50), as visualised in Figure 5.6.

Systematically understanding Semiha and Artin's approach to innovation and incorporating their geographical knowledge to engage in a creative, non-linear, and active process of learning with the participant, their context, and culture helped in generating context-specific practice where existing knowledge and concepts are not taken for granted (Koh, 2015, p. 438).

The research through design project in Istanbul revealed innovation in the process where both me and the participant were *reaching backwards* to design for the present and subsequently for the future by tracing the origins of our new idea, evolving our knowledge and skills in a new direction, and in turn confronting the ongoing conditions and making decolonising acts and actions (Mignolo and Walsh, 2018, p. 49).

Throughout the co-designing process, Artin was critical and theoretical and was trying fluid and distinct cultural and traditional trends and sequences that

were deeply rooted in his pragmatic action and the agency that came from his personal and intentional connection with the constraints and his identity and experience as a migrant. This forced him to transform his practice and become more aware of his own thinking and making processes and aims (Freire, 1985, p. 44). The collaboration, according to Artin, made him more aware of his own praxis, and he went on to say that:

> *"Having to start my thinking process by reflecting upon my surroundings and resources at hand. This allowed me to humanise my own inquiry and approach to innovation by choosing existence and reality within my immediate surroundings instead of the dictations of our capitalist, culturally hybrid, and outcome-oriented society. And those moments of pressure, created by differences in our way of thinking and making, challenged me to change my linear views on design form depending on external sources of knowledge, research, and thought to context-specific and action-oriented precepts, suppositions, and outcomes in the moment of now."*

The chain of cultural transfer exchanges began with Artin's struggle when *deciding on the purpose* (function and aesthetic quality) of the artefact, where previously he would rely upon his personal preference and experience, which would lead to an outcome without much understanding of the end-user's needs or the context of use. This meant that I had to challenge and provoke myself and the participant to tackle related vertical and horizontal blocks (see Figure 5.7) to move away from the research solely relying on previous modes of practice towards thinking and doing in praxis and embed the live context through active modes of action.

Artin's challenge was in attempting to divert from ways of doing things and systems of belief that would distance him from reflecting within and between contexts and stop him from seeing opportunities beyond his vision and capability. Although both I and the participant were able to transcend our

practice by relying solely on the materials and tools in hand, the major challenge for Artin was to transition from a designer who followed his own intention to one who thinks and continuously reflects as an equal participant in the research.

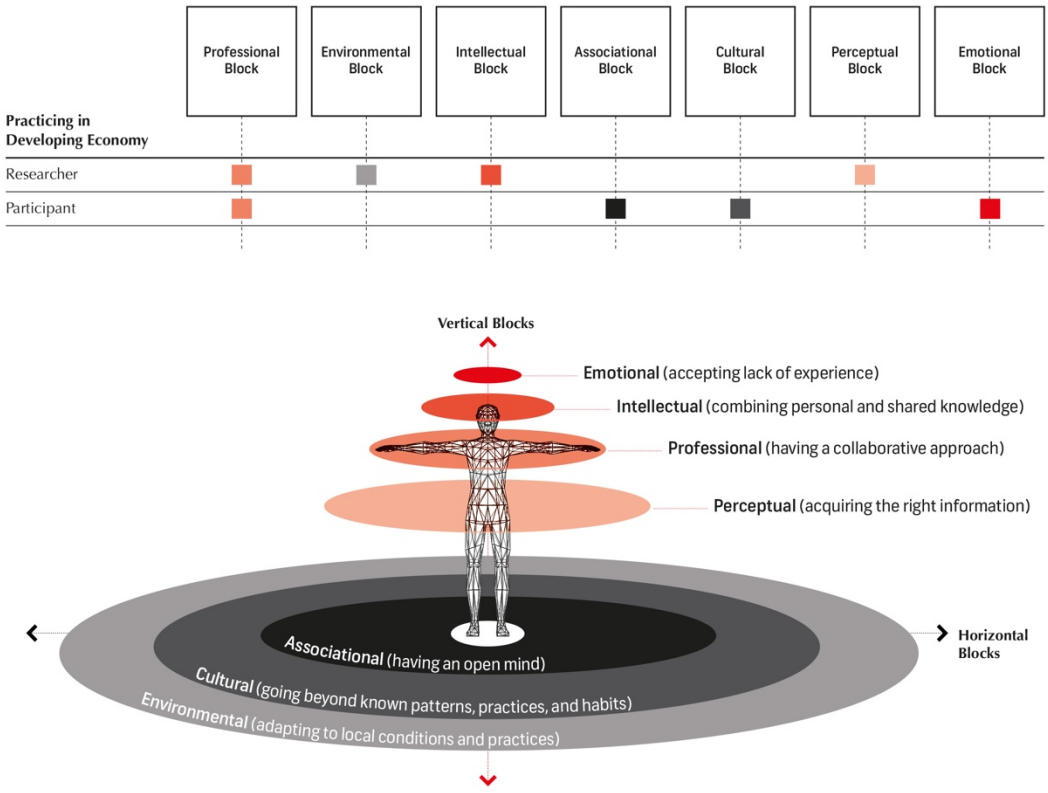

Figure 5.7: *Measuring Decolonisation in Practicing as a Migrant (Participant) and Foreigner (Researcher) in Developing Economy Context*

The challenge for me was to adjust to the location of practice in such a way that would allow me to observe and understand the key differences between the participant's conventional way of thinking and doing and the approach taken as part of this research. The other challenge was to intervene as a facilitator to encourage Artin to make decisions based on the aims and objectives of the project as well as his own motivation and position as a participant.

Following the findings from Istanbul, I travelled to Kabul, Afghanistan, where similar research was undertaken to help answer the research question in a different cultural context and under different resource constraints, which is detailed in the following section.

5.4 PROJECT 7: PRACTICING IN LEAST DEVELOPED ECONOMY

In the words of Papanek (1985), *design* is *"the most powerful tool with which we can shape our tools and environments as well as our society and behaviour"* (p. 14). However, due to their turbulent history and volatile social and economic conditions, design in least developed economies, as discussed in Chapter 2, has been absent from this perspective, where 20% of the world's population lives under extreme resource constraints (World Bank, 2016). Furthermore, there is a lack of awareness and understanding of design's role and responsibility within the local population, resulting in a limited contribution to design at both the philosophical and practical levels.

Design, therefore, provides a unique opportunity for least developed countries to connect and interweave their political, cultural, economic, and environmental dimensions and develop innovation theories and methods directed by their local resources and capabilities. The *shop,* which is unique to the urban culture of these countries, provides the space for creating, accessing, and repairing artefacts that have economic and social value and where end-user needs are identified, discussed, and effectively served in a way that produces cultural impact.

Site-specific knowledge production undertaken in the *shop* allows the designer/researcher to interact with and adapt to the surrounding environment. For example, having access to key consumer insights, rapidly user-testing prototypes, and having access to key suppliers as well as awareness of local conditions are experiences connected with the shop. Thus, the three projects undertaken in Kabul further build upon the notion and role of the *shop* as a place of consideration and acceptance, as well as creativity and innovation historically and culturally, and are an important element in conducting participatory design research in a least developed economy context.

5.4.1 THE FIELD: DEH AFGHANAN, AND SARAK-E-NOW —KABUL, AFGHANISTAN

Like the approach taken in Istanbul, field studies were also undertaken in Kabul to get familiarised with the geography of the city, however, with a view to further building upon my previous experiences (see Section 2.3) and understanding of the local culture, available skill set, and potential influences on people's behaviour and approach to innovation. As described in **Appendix K4**, two areas were analysed based on their identity as a cluster of spaces where designers have been creating and innovating for years and therefore accumulate enough data from their experiences to be able to take part in this research and help identify key patterns in Kabul.

5.4.2 AVAILABLE RESOURCES AND KEY CONSTRAINTS

Based on the field research and participant interviews, three types of resources were identified within the immediate surroundings of Kabul. Like Istanbul, there is a strong concentration of skilled craftsmen in Kabul who are experienced in using traditional making tools and specialise in metal and wood works predominantly. The second contends that Kabul's geographic location makes it easy to access different types of materials imported from neighbouring Iran and Pakistan, as well as various types of traditional expertise and knowledge. Finally, the availability of recycled materials and off-the-shelf components enables a culture of localised production and consumption processes.

On the contrary, the constraints identified contend that the country's inadequate infrastructure and unavailability of electricity further limit production methods and the possibility of making complex artefacts, thus forcing the locals as well as the migrant designer communities to specialise

in traditional skills and tools. In addition, four decades of war, including the Soviet invasion (1979-1989), civil war (1989-2001), and international war on terror (2001-2021) have resulted in the destruction of local industries and very little appetite for collaboration amongst the designers. Those who had migrated to neighbouring countries during the war and have since returned are less integrated within the community and are considered less experienced.

Like Istanbul, reliance on off-the-shelf components and specialised local production systems in Kabul has resulted in low-quality outputs and a culture of copyists that is less favoured and not suited to the emerging needs and ambitions of the local population.

5.4.3 RESEARCH DESIGN

The three-step design research method undertaken in Istanbul was also applied in Kabul, where two individuals (Zilmai Mirzayi, and Nizrab Hajizada) were identified from a pool of potential participants. Selecting participants was based on visiting several shops to analyse the location of practice for safety purposes, the work quality of the individual, and their availability and motivations for collaboration. Participants were also introduced to the project through the Participant Project Information and Consent Form **(see Appendix B1)**, which helped with getting familiarised with the participant's area of practice, motivation for taking part in this research, and an understanding of their approach and thinking processes. A small fee was paid after the completion of the research, for example, 1,500 Afghanis per day, which was agreed upon in return for their time and participation.

Zilmai Mirzayi is a *local designer* without formal education or training who started as a trainee under his father and has been designing, making, and selling household products for over forty years (Figure 5.8).

Figure 5.8: *Zilmai Mirzayi and A Selection of Zilmai's Design Work for Various Clients*

Based in the Deh Afghanan area, Zilmai specialises in the design of homeware, from storage units to stoves, ventilation systems, and cladding systems. His practice centres around functional and decorative products that

are locally manufactured using thin sheets of metal, and his work is evident within the local community in different households and on newly built commercial buildings. His area of material expertise mainly lies in metal and aluminium objects, as evidenced in his work for various public and private clients.

Nizrab Hajizada, on the other hand, is a *migrant designer* who trained as an apprentice in neighbouring Pakistan as a refugee and has been practicing in Kabul for the past ten years. Based in the Takhnikom area, Nizrab specialises in the design, manufacture, and repair of bespoke home equipment, furniture, and objects. His practice centres around functional and purposeful design that embeds cross-cultural techniques and craftsmanship, which is influenced by his experiences as a refugee working across different countries in the region. His area of material expertise mainly lies in metal and off-the-shelf technology, as evidenced in his work for various private clients (Figure 5.9).

Figure 5.9: *Nizrab Hajizada and A Selection of Nizrab's Design Work for Various Clients*

5.4.4 CONDUCTING DESIGN RESEARCH

After a short journey across the Kabul River to Deh Afghanan by taxi, which is considered a safer mode of travel, one morning a visit was arranged to meet with *Zilmai Mirzayi*, a *local designer*, at his shop located a short distance away from the main road. Zilmai's shop sits among government buildings and is

placed within a row of cargo containers that were transformed into shops by the municipality. Zilmai's shop forms part of a cluster of enclosed spaces facing a shared courtyard, which is used for displaying work and for placing raw materials and large equipment, as well as for cutting and open-air making. Examples of his work, a combination of homeware prototypes and cultural objects, can be seen hanging and placed in front of the shop, while his work desk and specialised tools were placed inside for safety and security reasons. The shop is also used for meeting potential clients to discuss and share ideas and to train new apprentices from the local area, mainly youngsters who study in the morning and then come to learn skills in the afternoon.

During the visit, Zilmai, who spoke Dari with me, one of the national languages of Afghanistan, described and showcased his approach to designing innovation under resource constraints as *'recontextualising through making: reusing what is known and the existing know-how'* (detailed in Table 5.3). This consisted of *adding with purpose* by folding and shaping thin metal sheets into everyday products used by the local population. This is followed by identifying the usability steps of the product and finding the tools to add shapes and patterns to reinforce key points for durability and beauty. Afterwards, the creation is left in front of the shop to attract customers and receive feedback to improve the next cycle of production. Due to a lack of progress in the design and application as well as the making technique of these household products, Zilmai does not feel the need to contextualise his output or develop a narrative around it to fit the local culture, as he says:

> *"We don't have the luxury to misuse material and our time; therefore, experimenting and testing new things (shapes, functions, applications) are difficult to pursue."*

He elaborated that the limitation of electricity and dependence on imported material from neighbouring countries with whom the country has volatile

relations limits his ambitions and, in turn, his willingness to innovate—to change his process and output—and goes on to say that:

> *"The type of tools, which are mostly hand tools, dictate that what is to be made and how, therefore allowing very little time and opportunity to explore new frontiers and negotiate their purpose with the end-user."*

However, the cluster of shops and working alongside other locals with similar skills and knowledge have enabled him to reflect on the quality of his production. In addition, it has allowed him to develop a *local way of thinking* that informs his design process towards building ideas specific to the local conditions and infrastructure that help the citizens continue their cultural activities at home. He believes that:

> *"In the midst of so much international influence through imports and media, in Afghanistan, the everyday needs a culture where we are continuously pulling that which belongs to us and pushing that which is foreign."*

Zilmai believes that innovation in Afghan household products and homeware is dependent on *'finding the right balance between the current living conditions of people and their situation today and the deteriorating infrastructure of the country'* based on the notion of *known and existing* because both end-users and makers avoid taking risks. He went on to say that:

> *"Bala fikri (referring to innovation in Dari, which means high thinking) happens out of full a stomach when you can afford to waste time and when you have some free time to imagine and think about new ways of life and living. But we produce to meet the market's needs, and there's no market for new things because we don't know what will happen tomorrow or the day after."*

As a *local,* Zilmai's key constraint is the unavailability of electricity, and,

therefore, he is reliant on traditional making techniques and hand tools as well as materials that suit these methods. This has resulted in him being limited to only that which is known and familiar to him and his clients, thus forcing him to replicate and follow centuries-old processes and techniques to make designs that carry the past with them rather than innovate and help forge new and liberated futures.

However, through the interview discussions and reflecting on work samples **(see Appendix N1)**, Zilmai was able to identify separate approaches that are unique to his practice and could allow him to liberate himself from conventional design processes, which are detailed here.

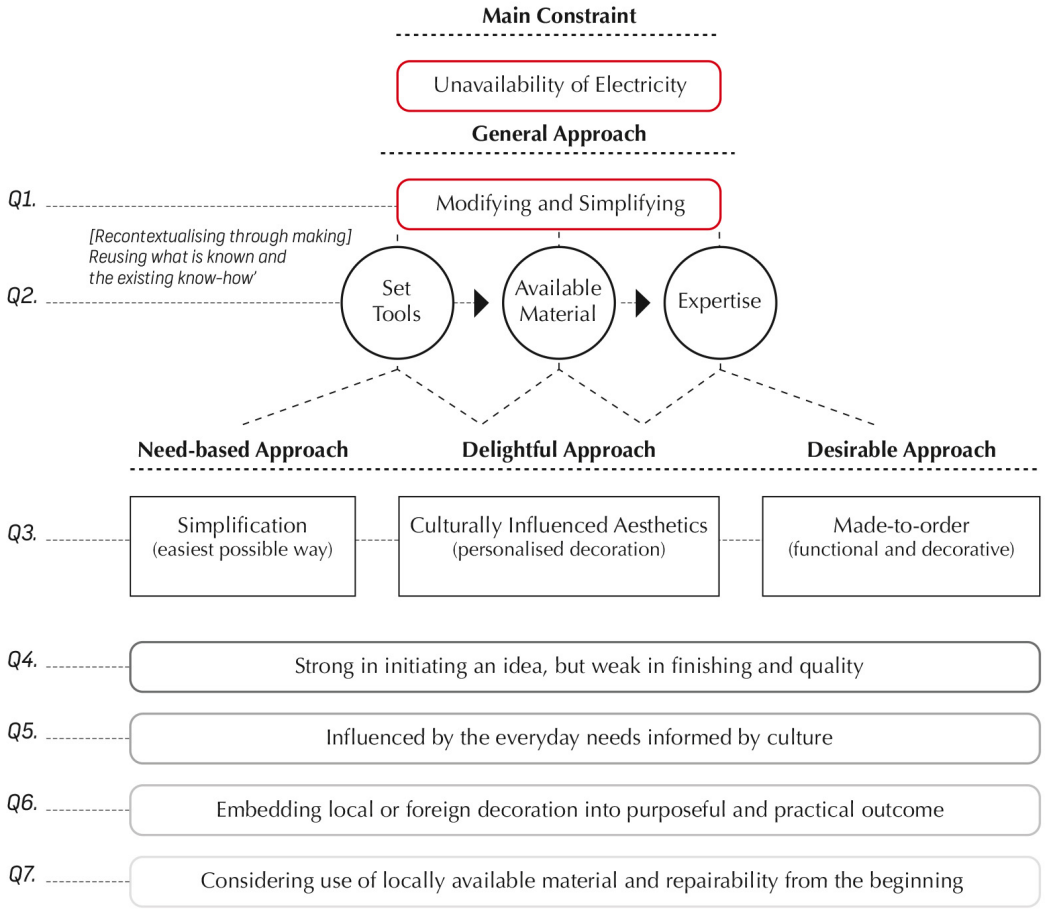

Table 5.3: *Mapping Zilmai Mirzayi's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Local in Kabul*

To solve a functional problem, Zilmai's approach follows the process of *simplification*, through which he relies on locally available tools to find the easiest way to make his idea come to realisation by purely focusing on the functionality and purpose of the outcome. For example, when considering a new type of chimney for a local client (top row in Figure 5.10), he chose a less desirable but durable material, followed by making it easy for the end-user to place and remove it as well as to assemble and repair it with cultural references.

When designing delightful ideas, his approach follows the process of *purposeful decoration*, where he relies on the aesthetics of available materials to shape and personalise them using a range of hand and mechanical tools. For example, when considering a new storage system (middle row in Figure 5.10), he needed to strengthen its structure without adding additional material or using complex tools while aiming to make it culturally relevant. By using hand tools and adding locally known patterns, Zilmai manipulated and extruded the surface of the storage system to make it stronger where it felt weak.

However, when designing desirable ideas, Zilmai combines his expertise in designing and making functional and purposeful decorative household items into a process of *make to order*. He relies upon the end-user's insights and cultural habits to inform the functional as well as the decorative elements of his design. For example, when considering a new samawar, a container traditionally used to heat and boil water (bottom row in Figure 5.10), Zilmai started with an understanding of the end-user's practical needs that included the context of use, key functionalities, and aesthetics to suit the environment of use. This allowed him to search for the tools within his immediate context and use them to form shapes and patterns that work as structural as well as decorative elements.

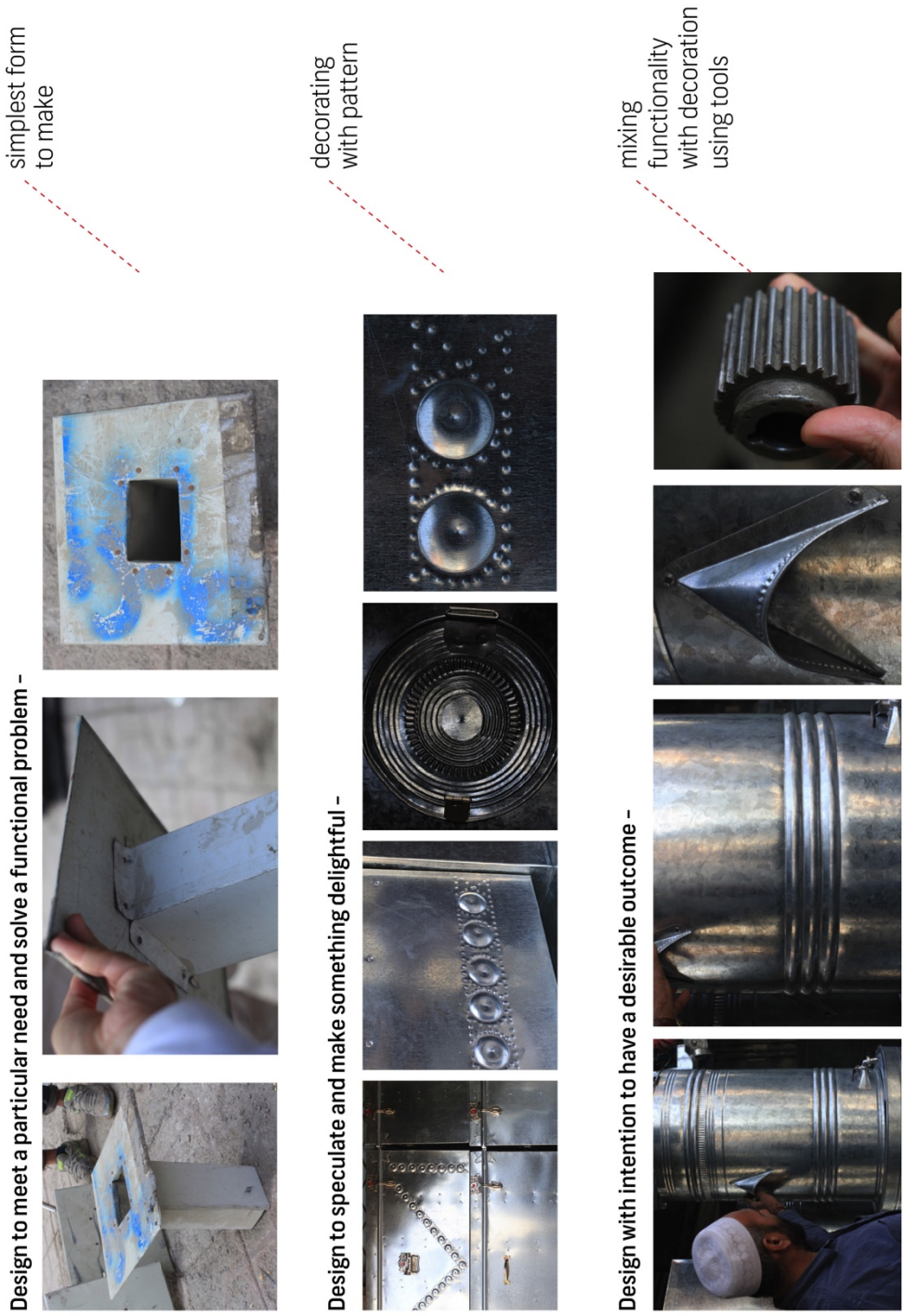

Figure 5.10: *Visualising Zilmai Mirzayi's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Local in Kabul*

Additional findings suggested that *as a local designer*, Zilmai feels that his tools dictate his thinking process and allow him to initiate new ideas without

restrictions; however, he struggles with delivering complex designs, which tend to be weak in finishing and quality. Furthermore, his strength lies in rethinking the everyday needs of local people that are informed by their cultural and social activities.

Following a couple of days of security alert in the city caused by a roadside explosion, one Thursday morning a visit was arranged to mee *Nizrab Hajizada*, a *migrant designer*, at his shop in Sarak-e-Now Chelsetoon. Based on the right side of the main street near the Soviet-era technical institute, known as Takhnikom, Nizrab's shop is a small museum-like space where examples of his previous work, off-the-shelf components, and metal cut-outs sit in harmony alongside the busy road. The shop is divided from the main road by a frontage that is used for experimental making and placing equipment, including a loaned electric saw, a generator, and a welding machine, while the inside of the shop is used for conceptual thinking and technical planning. The shop is also used for meeting clients and for leasing and selling various types of repaired and reverse-engineered household items.

During the visit, Nizrab, who also spoke Dari with me, described and showcased his approach to designing innovation under resource constraints as *'alternative reuse: shifting original ideas to a new reality'* (detailed Table 5.4), which consisted of *mixing with purpose* by using available objects and materials to develop new forms of application and cross-cultural making techniques. This is followed by identifying the usability steps of the product and finding the tools to adapt his design to integrate off-the-shelf components. Afterwards, the creation is placed in the shop or installed at the premises of the customer and used as a reference point for making other artefacts and customer consultation. Due to a lack of development in the design of local household items and their making techniques, Nizrab feels that people fear failure, and goes on to say that:

> *"Resource constraints is the situation of having multiple options in the face of political, economic, and social challenges. It allows me*

> *to find alternative ways of doing things and be ready to find new ideas in the process."*

He elaborated that limited electricity and dependence on more sophisticated tools have formed a culture of researching and exploring new ways of thinking and making that are considered less important, affecting people's choice of material, functionality, and purpose of use, and says that:

> *"Maybe one of the issues with resource constraints is that you can't fixate on or decide the time of your making, which therefore forces you to put your focus and detail in the wrong place."*

While unpredictability of time and electricity has meant that Nizrab's design process is not under his own control, his dependency on his existing and previous knowledge and know-how has enabled him to think of new ways of doing things. He has developed a *migrant way of thinking* where he mentally and physically goes back and forth in search of ideas, using his immediate context to manipulate his design process by negotiating with the local conditions and available tools and materials, and believes that:

> *"The culture of research, which is to open up our minds and find new ways of doing things, is in conflict with people's fear of failure and affects how we plan and understand our practice."*

Nizrab believes that innovation in Afghan household products and objects is dependent on *'making techniques that consider less loss of material and enable the end-user to repair and adjust its purpose according to their cultural needs'*, based on the notion of *systemic standardisation*, where both the end-user and the maker plan and develop a design collaboratively. He went on to say that:

> *"Lack of collaborative and cross-disciplinary work due to decades of war and social unrest has created a stagnant mindset amongst the experienced designers and makers in Kabul, which has meant*

that very little advancement is made in both learning and teaching new methods of thinking and making."

As a *migrant,* Nizrab's key constraint is also the unavailability of electricity, which makes him rely on ready-made or off-the-shelf components as well as on finding and mixing different objects and materials as a method for his new creations. This has forced him to devise a plan before attempting to make it, thus restricting his imagination to only that which is in his memory and around him rather than to innovate or help forge new and liberated futures.

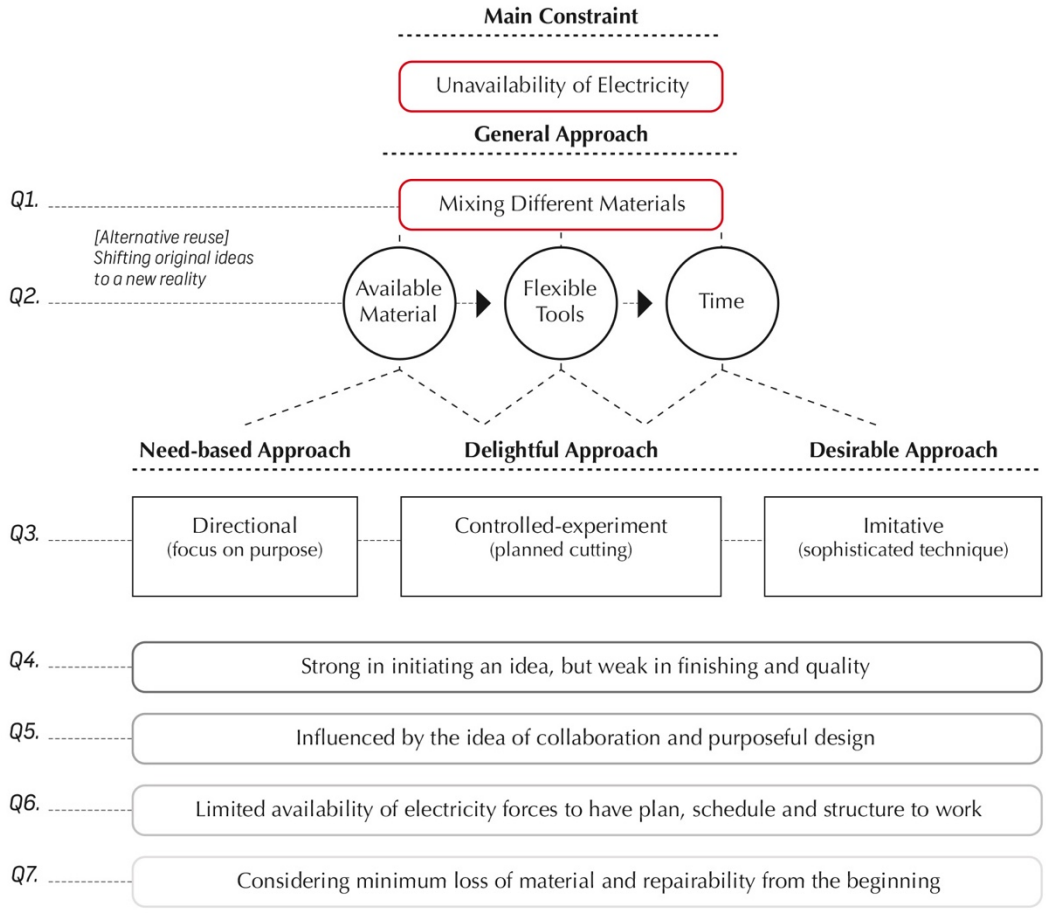

Table 5.4: *Mapping Nizrab Hajizada's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Migrant in Kabul*

However, through the interview discussions and reflecting on work samples **(see Appendix M2)**, Nizrab was able to identify separate approaches that are unique to his practice and could allow him to liberate himself from conventional design processes, which are detailed here.

To solve a functional problem, Nizrab's approach follows the process of *purpose-finding*, where he focuses on functionality and ease of use by giving it directional aesthetics that are simple to understand and follow. For example, when considering a new type of opening and closing mechanism for a new project (top row in Figure 5.11), he would take inspiration from everyday objects and available materials known to local people and mimic or integrate them with his overall design to help emphasise key functionalities and directions of use.

When designing delightful ideas, Nizrab follows the process of *careful planning*, where he uses his tools in a flexible way to experiment with purpose and use minimal time and material. For example, while cutting material for a new project, he aims to plan his cutting process in a way to allow the cut pieces to be used for another project. This is followed by finding off-the-shelf components that would suit the cut pieces and form the basis for a new idea (middle row in Figure 5.11).

Designing desirable ideas, however, transcends his approach towards the process of *imitation*, where he intentionally adapts sophisticated techniques found in foreign appliances and objects and integrates them into his own design. For example, when considering a new ventilation system for a local client (bottom row in Figure 5.11), Nizrab started by exploring airflow techniques found in household items, vehicles, and packaging. This allowed him to build his idea by imitating locally known functionalities and transferring them from their accepted use to everyday settings.

Figure 5.11: *Visualising Nizrab Hajizada's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Migrant in Kabul*

Additional findings suggested that *as a migrant designer*, Nizrab feels that his experience as a refugee in neighbouring countries allowed him to develop collaboration and partnership skills for seeking new frontiers and developing

new possible outcomes. However, he struggles with delivering complex designs, which tend to be weak in finishing and quality. Furthermore, as a migrant, his strength lies in being able to plan, use less material, and transform complex functionalities into thoughtful techniques that are informed by cultural and social activities.

Considering the above-mentioned findings, further internal reflections can be made in relation to my own practice and those demonstrated by Zilmai and Nizrab. Firstly, to consider the process of making as a way to recycle existing know-how and to recontextualise and repurpose ideas from elsewhere has helped me see and do things differently in a least developed economy context. In addition, my understanding of innovation across different cultural contexts has evolved from entirely being focused on introducing new living conditions and cultural practices to balancing between the existing living conditions of people and their situation as well as their everyday social and physical infrastructure.

To have a better understanding of the differences between my own practice and that of the participants, a further investigation (similar to the one in Istanbul) was carried out to examine the activity of innovation and to measure my behaviour and that of a participant in a cultural context where I take the role of a *foreigner* and work with the participant to construct a more comprehensive understanding of decolonised ways of knowing, designing, and making under resource constraints in a least developed economy context.

5.4.5 CONDUCTING RESEARCH THROUGH DESIGN

Based on Nizrab's reflective creative practice and experimental approach to design, as detailed above, he was identified as a suitable participant to

conduct research through design. Additionally, his shop setup with the availability of tools and materials (Figure 5.12), along with his attitude, experiences, and knowledge as a migrant designer, as well as better safety measures, meant that he was more appropriate than Zilmai to further test the findings thus far.

Figure 5.12: *Nizrab Hajizada in his Shop in Kabul's Sarak-e-Now Chelsetoon Neighbourhood*

Nizrab was introduced to the project the following day through an informal discussion on the previous day's findings, where he reflected that:

> *"The interview process made me realise that having a purpose is, on its own, a form of innovation that helps shape our approach towards new ethical and contextual practice."*

And that he wishes to utilise this way of working where he can *'find new meanings for existing objects and make things that teach him new methods of thinking and doing'* and conduct research through design by having an *inquiry-led dialogue* with the available tools and materials, the shop environment, and the researcher' to focus on the challenge that needs overcoming for end-users in the present moment rather than the past or the future. Taking this into

consideration, a task was set to co-design a new artefact specific to the immediate conditions and the resources at hand through conversation with one another and dialogue with the immediate environment that would accommodate all three motivations—needs, dreams, and aspirations—resulting in a ten-cycle innovation process (see Figure 5.13).

5.4.6 KABUL RESEARCH OUTPUT

Figure 5.13 shows the process undertaken in Nizrab's shop to innovate a new artefact through the characters of a migrant (participant) and a foreigner (researcher). Our combined acts and responses in Kabul were highly influenced by the layout and proximity of Nizrab's shop to the public space and the main road, and the process map below highlights the integral relation and interdependence amongst our past needs, present dreams, and future aspirations in a format of decision-making and a cycle of action.

As a reflective practice **(see Appendix M3 for practice and facilitation details)**, responses at each cycle were in continuous search of accidents, demonstrations, and curious juxtapositions of findings, events, and unpredictable consequences in the moment of now, which helped with decision-making and driving circumstances towards *alternative* ideas, experiences, views, and knowledge (Feyerabend, 2010, p. 14).

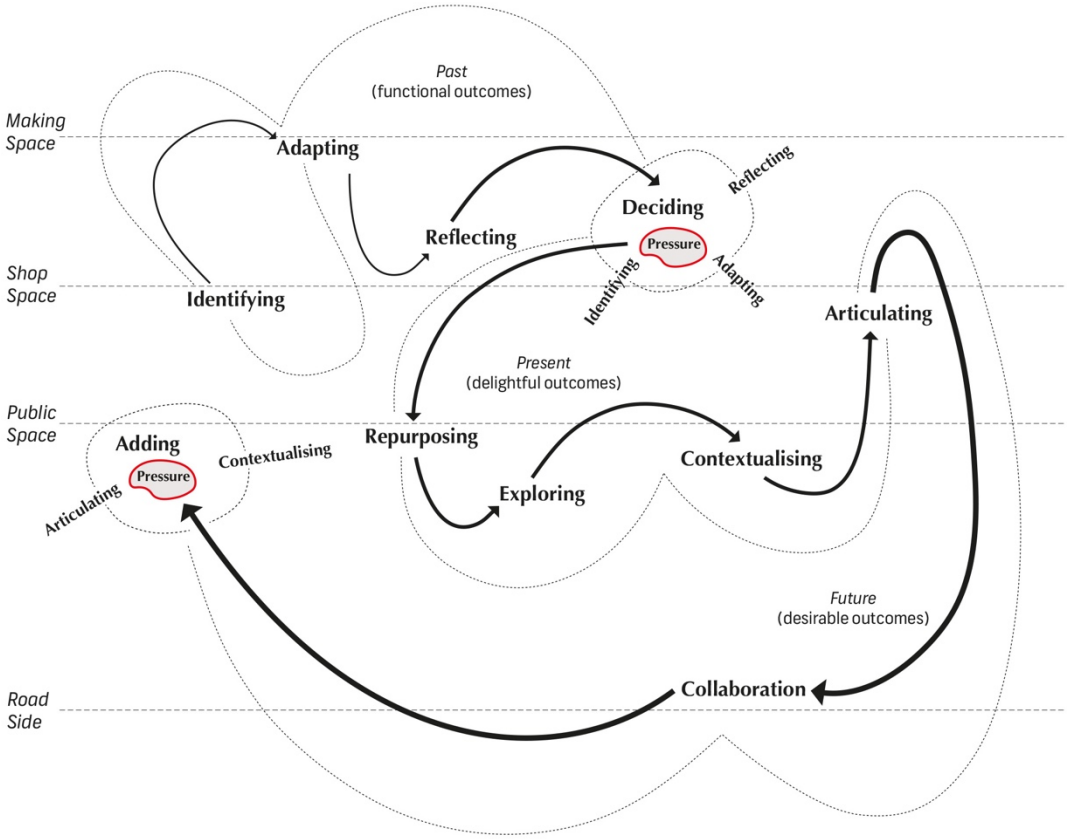

Figure 5.13: Mapping the *Ten-cycle Innovation Process for Practicing Decolonised Innovation Under Resource Constraints in Least Developed Economy*

5.4.7 KABUL FINDINGS

The research undertaken in Kabul was transformative in the sense that both me and the participant *examined design through discovery and experimental manipulation rather than a theory-first approach*, which according to Rheinberger (1997) *"is a form of active investigation"* carried out in a least developed economy setting where the arrangement of the immediate environment produces knowledge that is not yet defined (p. 27) and offered an understanding of context-specific approaches that challenge the colonialism of knowledge and practice through multiple perspectives.

Systematically understanding Zilmai and Nizrab's approach to innovation and incorporating their geographical knowledge to engage in a creative, non-

linear, and active process of learning with the participant, their context, and culture helped in generating context-specific practice where a judicious blend of activity and receptivity informed the complexities of a specific situation, which according to Kwa (2011) *"is the act of doing the right thing whilst having the right emotion"* (p. 23).

The research through design project in Kabul revealed innovation in the process where both me and the participant were *shifting and constantly rearranging* our production techniques in order to design for the present and subsequently for the future by unlearning and relearning the origins of our new idea, evolving individual and collective knowledge and skills in a new direction, and in turn using the knowledge established in the Western world instead of being used by it and relinking to a set of liberating processes, narratives, and ways of doing and living (Mignolo and Walsh, 2018, p. 146).

Throughout the co-designing process, Nizrab was productively unstable and was trying rigid and distinct cultural and traditional trends and sequences that were deeply rooted in his experimental action and the agency that came from his personal and intentional connection with the constraints and his identity and experience as a migrant. This forced him to transform his practice and externalise his ideas and visual imagery, resulting in him gradually becoming strategic and disciplined (Lewis, 2006, p. 11). The collaboration, according to Nizrab, made him more aware of his own praxis, and he went on to say that:

> *"Carrying out controlled experiments by reflecting upon my surroundings and resources at hand allowed me to systematise my own inquiry and approach to innovation by deconstructing Western knowledge and incorporating localised learning. The pressure points in the process informed my understanding of how existing knowledge and belief systems enable us to reach backwards into our past and help with forming new evolutionary outcomes in the moment of now."*

The chain of cultural transfer exchanges began with Nizrab's struggle when *deciding on the scope* (range and convenience) of the artefact, where previously he would rely upon his personal preference and experience, which would lead to an experimental outcome without much understanding of the end-user's needs or the context of use. This meant that I had to challenge and provoke myself and the participant to tackle related vertical and horizontal blocks (see Figure 5.14) to move away from the research solely relying on previous modes of practice towards thinking and doing in praxis and embed the live context through active modes of action.

Nizrab's challenge, like Artin's, was also in attempting to divert from ways of doing things and systems of belief that would distance him from reflecting within and between contexts and stop him from seeing opportunities beyond his vision and capability. Similarly, both me and the participant were able to transcend our practice by relying solely on the materials and tools in hand; however, the major challenge for Nizrab was to transition from a designer who followed his own intention to one that contextualises his practice and continuously articulates his action as an equal participant in the research.

Like Istanbul, the challenge for me was to adjust to the location of practice in such a way that would allow me to observe and understand the key differences between the participant's conventional way of thinking and doing and the approach taken as part of this research. The other challenge was to balance the relationship between subconscious feelings of fear and local barriers that kept me from thinking creatively and intervening as a facilitator to encourage Nizrab to make decisions based on the aims and objectives of the project as well as his own motivation and position as a participant.

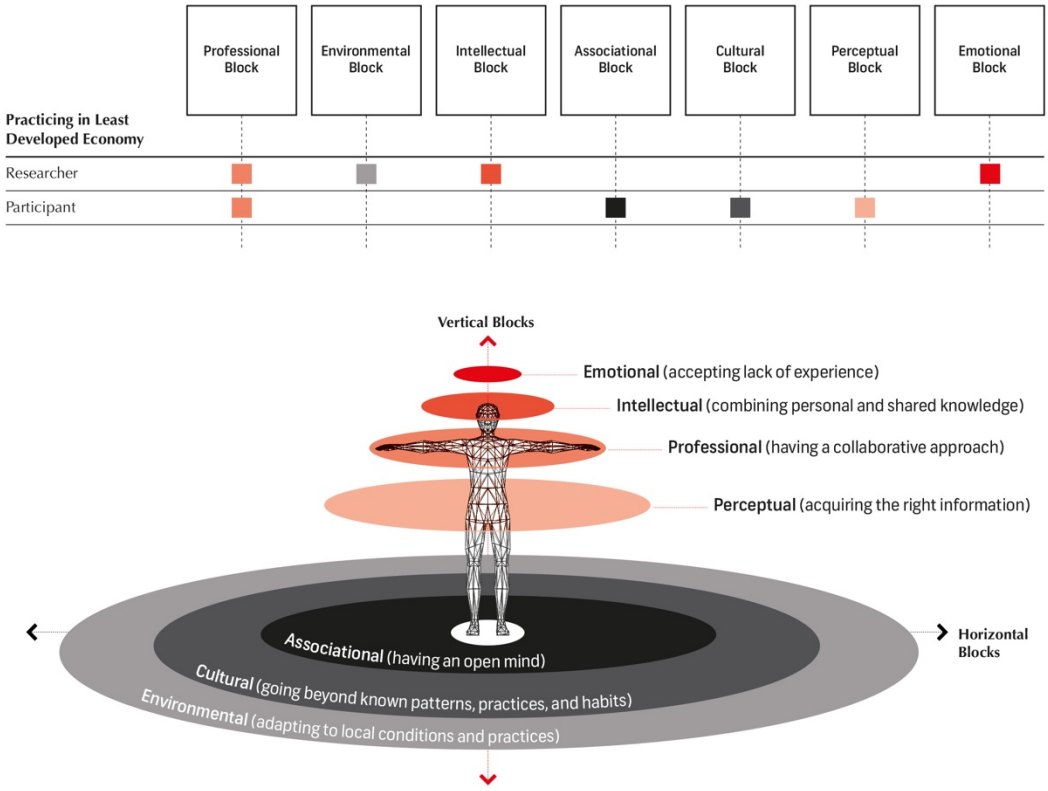

Figure 5.14: *Measuring Decolonisation in Practicing as a Migrant (Participant) and Foreigner (Researcher) in Least Developed Economy*

Following the findings from Istanbul and Kabul, I travelled back to London, United Kingdom, where further research was undertaken to help answer the research question is a different cultural context and under different resource constraints, which is detailed in the following section.

5.5 PROJECT 8: PRACTICING IN DEVELOPED ECONOMY

Design has been a major contributor in enabling developed economy countries to turn ideas into action, bring high productivity, and maximise social awareness and cultural knowledge through world-leading centres of design research, education, and industry, albeit through a globalised system of power where Western-centric ways of seeing, knowing, and acting in the world flattened and eradicated alternative and non-Western-centric ways of thinking as well as resources and capabilities (Ansari et al. 2019, p. 130).

Subsequently, the subject for this research came from my postgraduate studies in Innovation Design Engineering at the Royal College of Art (RCA) and Imperial College London. I had joined the RCA after years of intensive design practice across the UK, Europe, the Middle East, and Asia based on the skills and methods learned in the *studio* during my undergraduate design studies with the hope of moving beyond Western-centric worldviews and biased belief systems that favoured Western design methods, principles, and rules over non-Western values and needs. However, my MA and MSc projects (detailed in Section 2.3.1) as well as my own reflections on the last fifteen years as a designer highlighted the lack of understanding and awareness that exists, in both design academia and practice, on how one should design for different contexts and cultures and what methods of innovation to apply that suit diverse socio-economic conditions and locations with limited resources.

The research undertaken in London, a developed economy and coloniser context, further builds upon the role of the *studio*, which is unique to the academic and practice-based design cultures of these countries. The *studio* provides the space for discussions, learning, and professional practice that focuses on the expression of cultural and regional identity, techniques, and skills through the appropriateness of a design solution and autonomous

independent practice (Spruce, 2007). Thus, due to the COVID-19 pandemic and limitations for *participatory research* (systematic inquiry in direct collaboration with the participants for the purpose of action or change) that followed, the following two projects focus on understanding how resource constraints and site-specific knowledge production undertaken in the *studio*—a place of structured and reflective creativity—enable the development of alternative methods of innovation. It is also an attempt to test my practice and understand the effects of my findings from Istanbul and Kabul when conducting research by observing and mapping the interpretation and approach of a local and a migrant towards designing needs, dreams, and aspirations under resource constraints in a developed economy context.

5.5.1 THE FIELD: SOUTHWARK, AND KENSINGTON —LONDON, UK

Following the approach taken in the previous two locations, in London too, field studies were undertaken to pinpoint the geography of the city and build upon my knowledge and understanding of the local culture, available skill set, and potential influences on people's behaviour and approach to innovation. As described in **Appendix K6**, two areas were analysed based on their identity as a cluster of spaces where designers have been creating and innovating for years and therefore accumulate enough data from their experiences to be able to take part in this research and help identify key patterns in London.

5.5.2 AVAILABLE RESOURCES AND KEY CONSTRAINTS

Based on the field research and participant interviews, three types of resources were identified within the immediate vicinity of London. The city is home to some of the world's best design talent, who are experienced in

using digital tools and methods and specialise in collaborative creative works predominantly. The second contends that London's position as a leading knowledge hub and its growing start-up companies provide countless opportunities for knowledge exchange and collaboration. Finally, the city's strategic location and its connected transport networks make it easy to access technical expertise and materials from across many regions and enable a culture of globalised production and consumption processes.

On the contrary, the constraints identified contend that the high costs of labour, materials, and tools further limit production methods and the possibility of making complex artefacts, thus forcing the locals as well as the migrant designer communities to adopt a leaner plan of work and follow a guided and organised process. In addition, increasing regulations and standards compliance frameworks are harmonising linear approaches across different sectors; for example, compliance requirements such as risk management, cost reductions, and business revenue are driving the way innovation happens. Furthermore, reliance on sophisticated software and specialised tools has resulted in complicated planning and a culture of value engineering dependent on various teams and their resources.

5.5.3 RESEARCH DESIGN

The three-step design research method undertaken in Istanbul and Kabul was also applied in London, where two individuals (Chris Natt, and Era Savvides) were identified from a pool of potential participants based on the relevance of experience and practice, the work quality, and their availability and motivations for collaboration. Participants were introduced to the project through the Participant Project Information and Consent Form **(see Appendix B1)**, which helped with getting familiarised with the participant's area of practice, motivation for taking part in this research, and an understanding of their approach and thinking processes. No fee was paid for the completion

of the research or in return for their time and participation.

Chris Natt is a *local designer* trained at the Royal College of Art and Imperial College London. He has over fifteen years of design and making experience and was recognised as one of the Massachusetts Institute of Technology's Innovators Under 35 Europe in 2017. Based in the South Kensington area, Chris specialises in the design of objects to help prevent injury and provide rehabilitation to the end-user. His practice centres around the development of educational tools that address the humanitarian field. His area of material expertise lies in 3D printing, vacuum forming, and moulded polymers, as evidenced in his work for various research and development clients (Figure 5.15).

Figure 5.15: *Chris Natt and A Selection of Chris' Design Work for Various Clients*

Era Savvides, on the other hand, is a *migrant designer* from Cyprus who trained as an architect at the Bartlett School of Architecture and has been practicing in London for the past ten years. Based in the Bermondsey area, Era

specialises in complex architectural artefacts, furniture, and objects. Her practice centres around a material-based, crafted approach to digital design and the creative use of robotic fabrication. Her area of material expertise lies in marble, stone, and concrete, as well as in reusing natural composites, as evidenced in her work for various private clients (Figure 5.16).

Figure 5.16: *Era Savvides and A Selection of Era's Design Work for Various Clients*

5.5.4 CONDUCTING DESIGN RESEARCH

Due to the COVID-19 restrictions, in London, the design research was conducted virtually through online exchanges and conversations; however, face-to-face meetings and discussions had taken place prior to the pandemic. Chris Natt, a *local designer*, is based between cultural and educational institutions, and his studio is placed within a row of Victorian townhouses amongst embassies and research centres. As a shared workspace, his studio comprises a laptop computer and a working desk, while examples of his work, a combination of technical prototypes, post-it notes, and sketches, could be seen placed on the walls and the desk. The studio space is also used for conducting user research and involving end-users to test prototypes.

During in-person and virtual discussions, Chris described and showcased his approach to designing innovation under resource constraints as *'adjusting: altering thinking to achieve desired fit within current practices'* (detailed in Table 5.5). This consisted of a *systems-centred approach*, where he begins by breaking down existing processes with the local users and manufacturers in order to understand what the real need is and what could be produced locally. This is followed by assessing his idea against the existing quality control measures with a view to raising local quality standards, then turning his findings into a concept through drawings and prototypes in line with cultural norms and belief systems while considering cost and affordability aspects of the outcome.

He elaborated that the lived experience of others acts as a form of available knowledge that helps him with define and frame the design challenge in a cultural context. This allows him to switch and modify his methods accordingly, while role playing and playfulness have allowed him to develop a *local way of thinking* that informs his design process and enables him to build new ideas specific to locally available production techniques and materials.

Chris believes that innovation in the humanitarian field is dependent on *'working and moving near the people and places where problems exist in order to help us change perspective'*, based on the notion of *shifting* our biases in the moment of now. He went on to say that:

> *"Discussion around cultural values and needs often comes up while in transit with local people, which reinforces the role of the local context and knowledge in understanding the core problem as well as the viability of a potential response."*

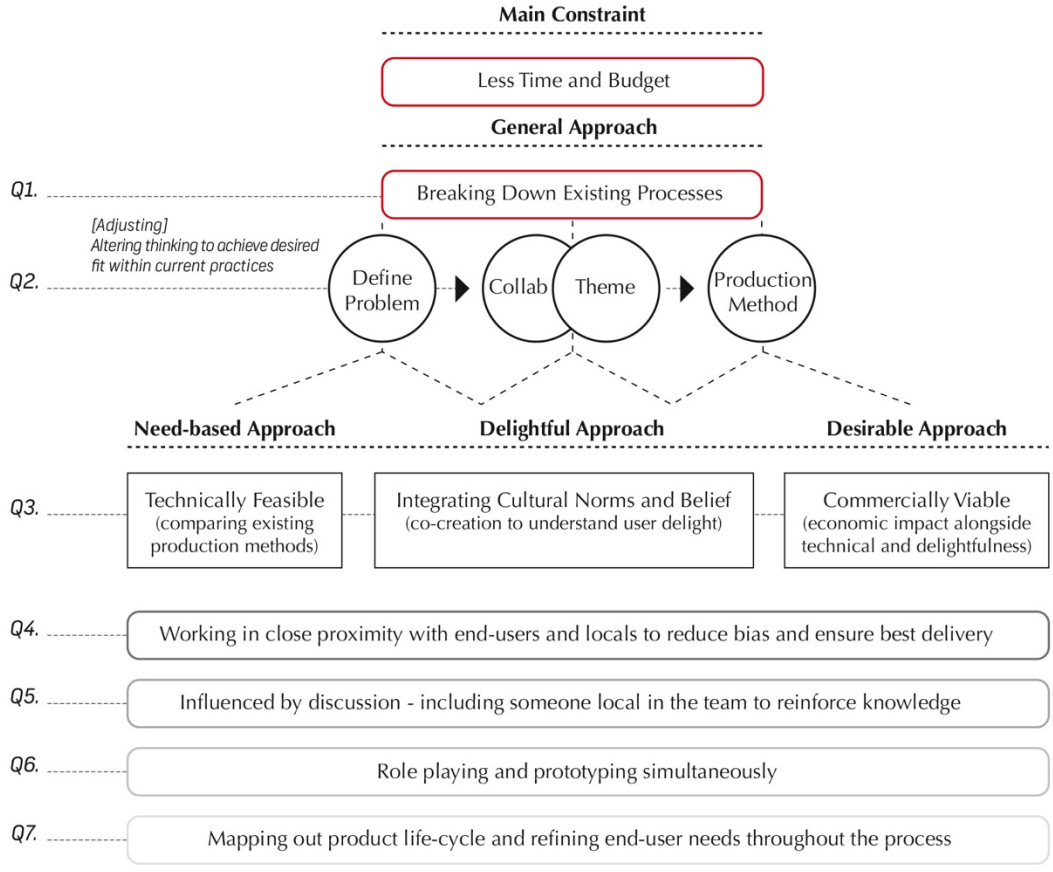

Table 5.5: *Mapping Chris Natt's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Local in London*

As a *local*, Chris' key constraint is the limitation of time and budget, and,

therefore, he is reliant on a structured and linear approach. This has resulted in the need to break down existing processes while adjusting and working within the remits of current practice. Thus, forcing him to develop designs that fall within the manufacturer's ability, the available materials, and the imposed quality control measures.

However, through the interview discussions and reflecting on work samples **(see Appendix P1)**, Chris was able to identify separate approaches that could allow him to liberate himself from conventional design processes, which are detailed below.

To solve a functional problem, Chris' approach follows the process of *technical feasibility*, through which he explores current making methods and compares them against each other to find what could be made locally with the highest quality possible. For example, when considering a new type of prosthetic limb for amputees in low-income settings (top row of Figure 5.17), he spent time with the technicians and fabricators to understand and break down existing making methods and processes, followed by identifying steps and techniques to embed end-user input for a better user experience.

When designing delightful ideas, Chris' approach follows the process of *co-creation*, where he brings in the end-user as part of the design journey to explore and integrate their cultural needs and belief systems as a form of delight and surprise. For example, when considering the future of prosthetics in the context of low-income societies (middle row in Figure 5.17), Chris combined participatory activities with decision-making techniques to bring about key cultural qualities, such as usability factor, colour, shape, and size that would suit diverse group of people and enable him to map out the product lifecycle in conjunction with the end-user needs.

Designing desirable ideas, however, transcends his approach to the process of *assessing and decision-taking*, where he considers the economic impact and

benefits of his innovation to the end-user alongside their practical and delightful needs. For example, when considering a new device for eliminating mines (bottom row in Figure 5.17), Chris aimed for ideas that are multi-faceted and easy to implement within existing business models. For this, he used high-tech fabrication and manufacturing technologies such as 3D printing to ensure both affordability and quality of his innovation.

Additional findings suggested that, *as a local designer*, Chris depends highly on the knowledge of others at the beginning of a project and therefore requires more time to initiate new ideas due to complex end-user needs and technical requirements. However, his strength lies in the integration of cultural norms and the understanding of existing production methods and emerging new technologies, which allows him to minimise social and economic disruption and achieve high-quality outcomes. Chris goes on to say that:

> *"To liberate myself from constraints and existing knowledge, I engage the local population in the design process, and this is critical in reducing my own biases and constraints. It's critical for me to work in close proximity to the people and places where problems exist; I call it adjusting, where I balance myself by including nationals who are familiar with the local culture."*

Figure 5.17: *Visualising Chris Natt's Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Local in London*

Following on from this, Era Savvides' approach *as a migrant designer* was captured virtually; however, face-to-face meetings and discussions had taken place prior to the pandemic. Era's studio sits between commercial and

technology sector businesses and is positioned within a thriving part of the city. As a shared workspace, her studio comprises desktop and laptop computers and a collaborative working desk where she carries out drawing, mapping, and concept generation activities. The studio space is also used for generating ideas for national and international design competitions through digital prints and physical prototypes of various scales.

During in-person and virtual discussions, Era described and showcased her approach to designing innovation under resource constraints as *'relating: matching design intentions with limitations of making'* (detailed in Table 5.6). This consisted of *exchanging and adjusting* by interacting and sharing knowledge with the fabricator and manufacturer to gain expertise and understand what is possible to design collaboratively and make locally. This is followed by combining the findings and exchanges into an idea that is informed by multiple identities, hybrid making methods, and local capabilities.

She elaborated that the process of knowledge exchange at the start of the project stimulates a sense of commitment and appetite for adjusting and reprogramming oneself in a cultural context and allows her to do things differently. This act of appropriating herself on-the-go has allowed her to develop a *migrant way of thinking* that informs her thinking and enables her to develop new techniques based on the type of tools and equipment as well as locally available materials.

Era believes that innovation in the built environment is dependent on *'developing a close relationship with the fabricator and manufacturer to make sure informed decisions are made in response to contextual and economic limitations'*, based on the notion of *adapting* her process and idea in the moment of now. She went on to say that:

> *"Working together with the fabricator and manufacturer allows for the testing of various ideas and strengthens the design process through the exchange of valuable insights and the adaptation of*

unconventional materials and making techniques, which result in new findings and ways of doing things."

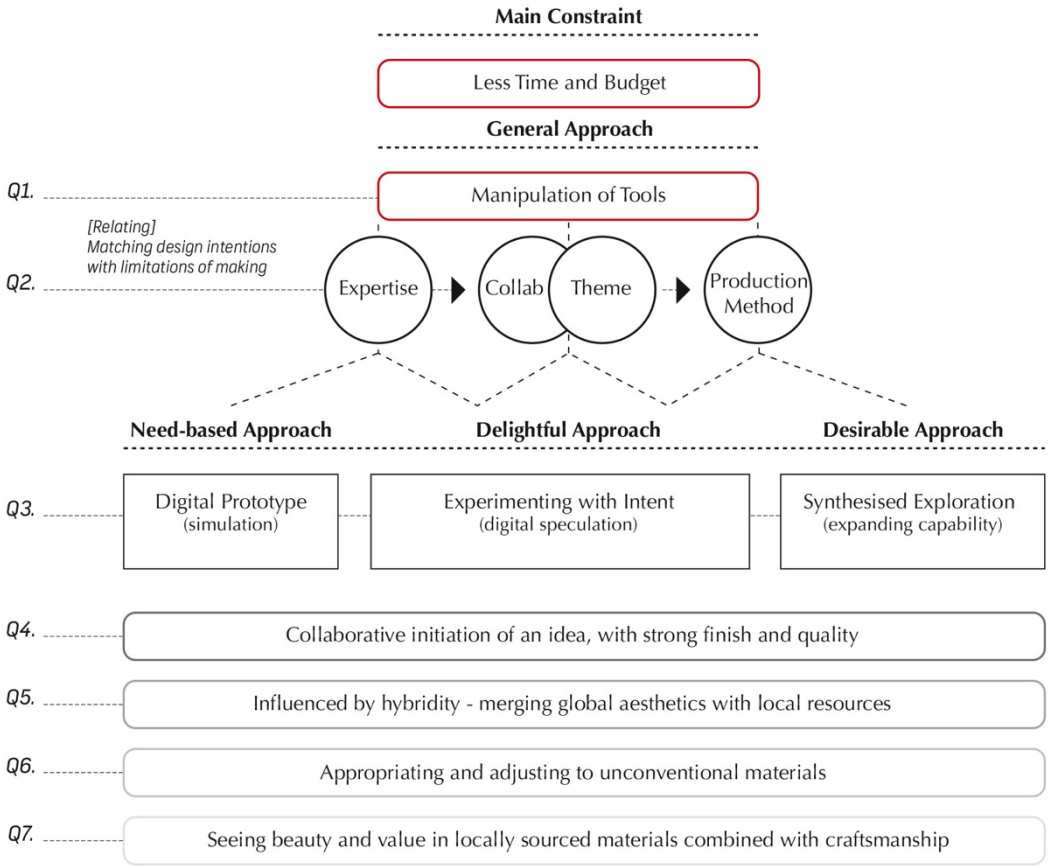

Table 5.6: *Mapping Era Savvides' Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Migrant in London*

Era's key constraint as a *migrant* is also the limitation of time and budget, which makes her reliant on the manipulation of tools and adaptation of her design to match the source of output. This has resulted in the need to constantly seek alternative means of realisation for her ideas while revisiting previous projects to develop an appropriated response based on past experiences. Thus, forcing her to compromise her Mediterranean identity with rigid and structured ways of thinking and making.

However, through the interview discussions and reflecting on work samples **(see Appendix P2)**, Era was able to identify separate approaches that are unique to her practice and could allow her to liberate herself from conventional design processes, which are detailed below.

To solve a functional problem, Era's approach follows the process of *digital prototyping*, through which she develops multiple ideas to resolve key functions of her design. For example, when considering a new type of building façade or a balustrade for an urban location (top row of Figure 5.18), Era turns to simulation software to translate her idea into a visual form to understand the true shape, size, and formation of the innovation. This is followed by adjusting the design to the available budget and capability of the fabricator.

When designing delightful ideas, Era's approach follows the process of *experimenting with intent*, where she combines her intuition and new knowledge gained through collaboration by manipulating available materials and tools and developing a new theme or offering. For example, when considering a new type of sensorial surface for a public building (middle row in Figure 5.18), she combined manual and mechanical tools in the design process to bring about the true qualities of the stone and the effects of handmaking. This enabled her to have better control over the outcome and purpose of her innovation.

Designing desirable ideas, however, transcends her approach towards the process of *synthesised exploration*, where she triangulates input from herself, the fabricator, and the digital manufacturing tool to push towards hybrid capabilities and new territories by adjusting and combining different ideas. For example, when considering a new façade cladding system for a private client (bottom row in Figure 5.18), Era relied upon relationship building and nurturing available skills to form a synthesis between limitations and possibilities using digital and physical making techniques and expertise.

Additional findings suggested that, *as a migrant designer*, Era also depends highly on the knowledge of others at the beginning of a project and therefore requires longer time to initiate new ideas due to complex end-user needs and technical requirements. However, her strength lies in the integration of collaborative working methods and the importance of hybridised and synthesised thinking and making, which allows her to maximise the inherent values of collective knowledge and exploration to achieve high-quality outcomes. Era goes on to say that:

> *"My approach to building relationships with fabricators and their machines has arisen from my cultural background and having lived in the UK for 14 years, and as a migrant designer, I consider this a big plus—a way of synthesising constraints."*

Figure 5.18: *Visualising Era Savvides' Interpretation and Approach to Designing Needs, Dreams, and Aspirations as a Migrant in London*

5.5.5 LONDON FINDINGS

The research undertaken in London revealed that the process of innovation under resource constraints in a developed economy setting relies heavily on building dialogue and conversation with knowledge produced elsewhere and by others, which therefore counters and interrupts the individuality and competition characteristic of academia. In addition, it helped in understanding how the participants' act of correlation encourages them towards commitments, collaborations, and interculturalisation that cross disciplinary formations and geographical borders (Mignolo and Walsh, 2018, p. 84). However, collaborative initiation of a new idea and reliance on others knowledge by both Chris and Era has meant having limited control over the environmental and economic impact of their innovation when designing under resource constraints, and upon reflection, Era went on to say that:

> *"As a migrant designer, my experience is that few designers can respond to this with honesty, and that is because we are constantly compromising our design and feel reluctant to challenge or question the opposing field, their techniques, and their culture."*

The chain of cultural similarities between both participants' approaches to innovation is connected to the limitations of time and budget, which are contextually situated and force them to adjust and relate their ideas to the available materials and tools, therefore making them dependent on a set of local sequences and traditions. By challenging and provoking them to tackle related vertical and horizontal blocks (see Figure 5.19), I was able to help them immerse themselves in the real world and acknowledge their limited knowledge and information in responding to end-user needs.

However, the chain of cultural differences is connected to their personal position and identity as local or migrant. In the case of Chris, his approach heavily relies on finding an existing set of patterns, habits, and practices based

on functional, aesthetic, or experiential needs that could be addressed through a known design process or innovation. Whereas for Era, her approach is a combination of intensive learning and experimentation processes to help her achieve outcomes that are new to her, to the people she collaborates with, and to the end-users.

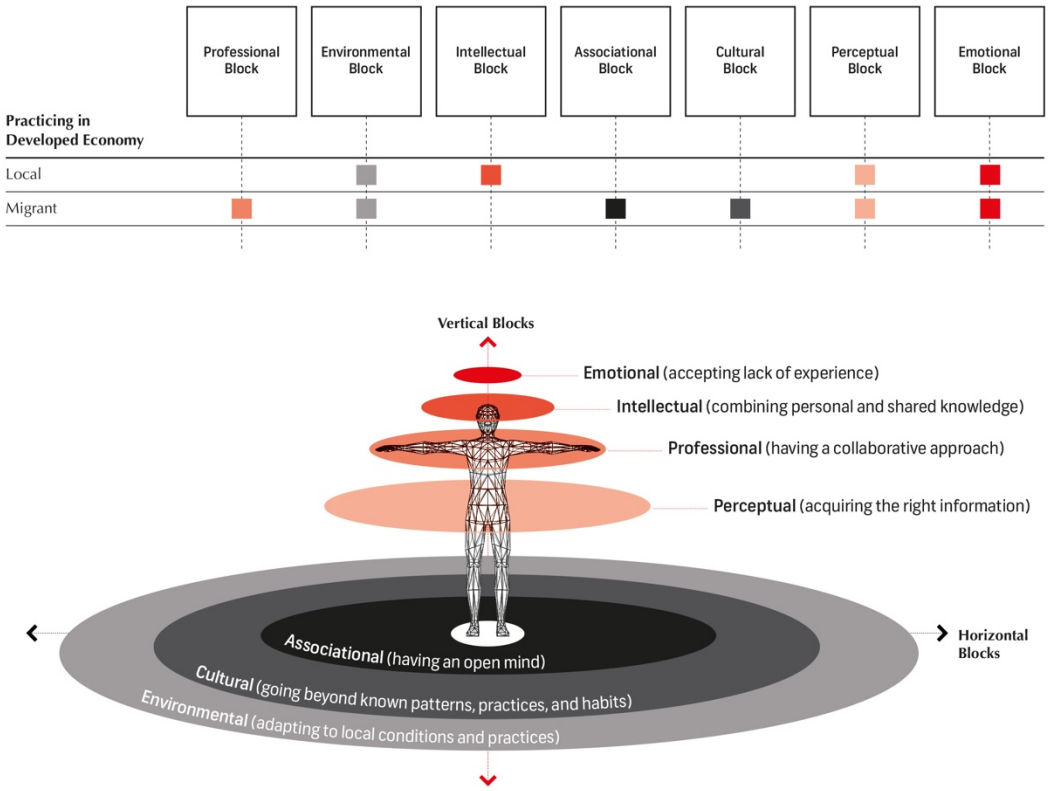

Figure 5.19: *Measuring Decolonisation in Practicing as a Local and Migrant (Participants) in Developed Economy*

5.6 COLLECTING FINDINGS AND REFLECTIONS

Practice-led inquiry and participatory research and making undertaken across Istanbul, Kabul, and London explored *other* methods of innovation under resource constraints from multiple perspectives, which have resulted in the development of **context-specific methods of innovation under resource constraints** to answer Research Question 2.

In addition, the outcomes and experiences from Projects 6, 7, and 8 demonstrate how the immediate context triggers design responses that are only accessible via context-specific knowing, thinking, and making and offer new opportunities for physical, cultural, and multi-sensory engagement with tools, materials, and the environment.

In answering RQ2, a key realisation has been that my practice and identity as a designer have evolved considerably while moving across different cultural contexts. I noticed that in Istanbul I was continuously trying to keep an equal balance between my identity as a foreign designer and someone who understood and valued the local culture. In Kabul, however, I was more inclined towards demonstrating my cultural awareness than my design knowledge. Whereas in London, I would bring my design expertise to the forefront and give my cultural awareness less priority. The findings from this research have informed my practice, from being and acting as a designer of new ideas to a *designer of new ideas for distinct cultural contexts* influenced by localised methods and plural worldviews.

Furthermore, designing under resource constraints across three cultural contexts and through three different characters offered by far the most transformative understanding of decolonised approaches to innovation via participatory design projects, which have brought forward approaches to design and methods of innovation specific and relevant to each character and

context. The richness of these is relayed in the research outputs and the findings are described in Table 5.7. The more significant finding was the success in completing the projects across the three locations within a year and attaining recorded outputs from various project collaborators.

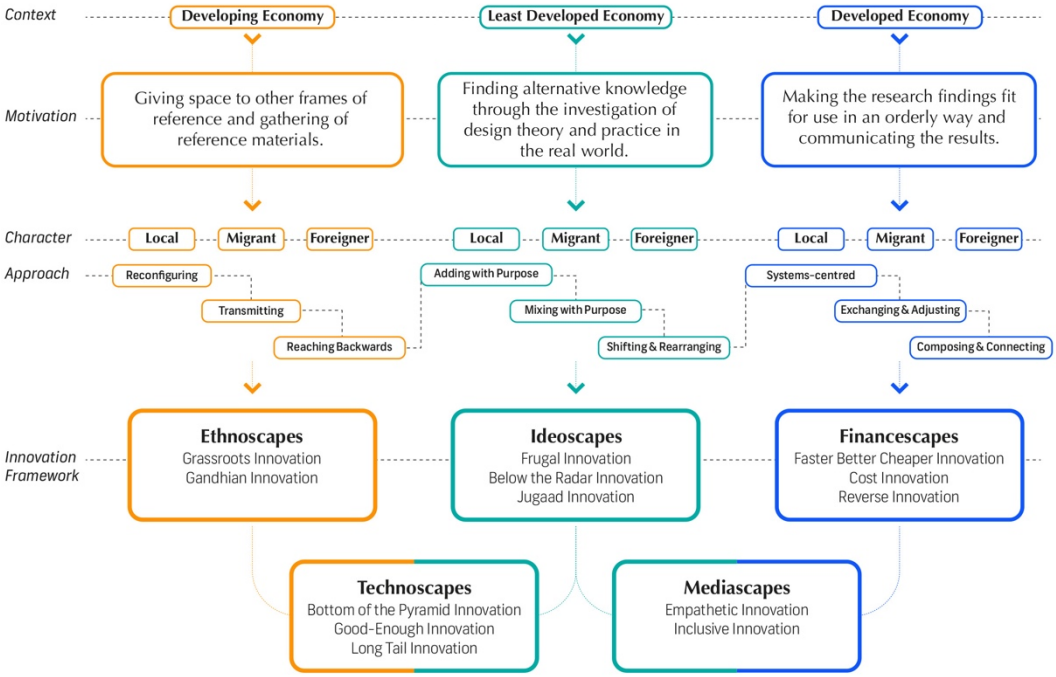

Table 5.7: *Key Findings from Research Outputs*

Findings from researching and practicing in the *developing economy context* (Istanbul, Turkey), suggest that *decolonisation is achieved by adjusting to existing assumptions and perspectives*, where the designer/researcher gives space to frames of reference and methods that already exist by finding and analysing past knowledge and experiences and relearning from his/her previous output (detailed in Section 5.3). Thus, the act of tracing the origins of our new idea and evolving our knowledge and skills in a new direction drive the development of a new offering through *reconfiguring and repurposing oneself as well as the available materials and tools*. This suggests that the methods of innovation within *Ethnoscapes* (detailed in Section 4.4) and, to some extent,

Technoscapes (detailed in Section 4.5) are more inclined towards designing decolonised innovation under resource constraints in a developing economy context.

On the other hand, in the context of the *least developed economy* (Kabul, Afghanistan), *decolonisation is achieved by transforming local practices and cultural norms into an attitude for doing more with less* where the designer/researcher co-creates alternative knowledge by being conscious of a variety of perspectives and procedures specific to the context and human needs (detailed in Section 5.4). Thus, the act of discovering and manipulating found materials and tools drives the development of a new offering by *simplifying and carefully planning the knowledge established in the Western world instead of being used by it*. This suggests that the methods of innovation within *Ideoscapes* (detailed in Section 4.2) and, to some extent, *Technoscapes* (detailed in Section 4.5) and *Mediascapes* (detailed in Section 4.6) are more inclined towards designing decolonised innovation under resource constraints in a least developed economy context.

However, in the context of the *developed economy* (London, UK), *decolonisation is achieved by systematising existing processes and knowledge to make informed decisions based on the study of existing patterns, habits, and practices* where the designer/researcher fits his/her findings for responsible actions to narrow the gap between theory and practice (detailed in Section 5.5). Thus, the act of comparing and assessing available materials and tools drives the development of a new offering through *shifting and exchanging locally available technologies that can be simplified, delineated, and remodelled*. This suggests that the methods of innovation within *Financescapes* (detailed in Section 4.3) and, to some extent, *Mediascapes* (detailed in Section 4.6) are more inclined towards designing decolonised innovation under resource constraints in a developed economy context.

In Chapter 6, I will bring together the research findings and make them fit for

responsible action. To do this, I narrow the gap between theory and practice to give responsibility to others to achieve decolonised innovation (Noxolo, Raghuram, and Madge, 2011, p. 423) and demonstrate which methods are more appropriate across different cultural contexts, with the aim of developing and contextualising outcomes that are identifiable, practical, and real (Frayling, 1993, p. 5).

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Synthesis and Conclusion

Chapter 6
On Decolonised Innovation

6.1 COMPARING DECOLONIAL FRAMES

Chapter 3 introduced and analysed various methods of innovation under resource constraints and reviewed them through several frames, including Anderson and Billou's *'4As framework'* with a focus on actions at structural, relational, and transformative levels; Appadurai's *'suffixscapes'* to understand and contextualise the findings from case studies and practice; Brem and Wolfram's *'categorisation'* to understand their level of complexity and relevance; and Papanek's *'seven inhibitors'* to understand their level of decolonisation.

Furthermore, these findings were explored in Chapter 5 in terms of their appropriateness and relevance across three different cultural contexts as well as their relationship to three sets of motivations and characters. Following the completion of the projects in Chapters 3 and 5, the collected findings and research outputs will be analysed and discussed here to explore the relationship between the five clusters of innovation and the research projects in Turkey, Afghanistan, and the United Kingdom.

The tables and frameworks generated in Chapter 3 helped in understanding the process and purpose of each method of innovation in enabling decolonial thinking and making under resource constraints. The tables and diagrams generated in Chapter 5 helped in understanding the gaps between the

innovation theories and real-world practice and research outcomes. In addition, several tables were generated to compare the outputs with the aim of describing the relationship between the methods of innovation and the cultural, environmental, and social differences, and they build on comparisons made in Table 3.6 of Chapter 3 and Table 5.7 of Chapter 5.

Findings through observations and discussions across the locations and physical outputs from multiple perspectives and characters indicate that some of the research outcomes here could be understood in terms of a suitable approach to innovation that enables decolonisation from externally imposed conventional methods and perspectives.

The following sections will use the five analysis questions from the Decolonised Innovation Methodology Flow in Table 4.2 to focus the key findings and aid discussion.

Q1 How are the 13 methods of innovation under resource constraints different from conventional methods of innovation?

6.2 ON ANOTHER INNOVATION

The systematic search in Chapter 3 helped with the identification and filtering of literature to understand how resource constraints, global cultures, and transnational flows help trigger *other* methods of innovation. It helped with addressing the gap in the literature by identifying the *thirteen methods of innovation* and carrying out a structured evaluation of these methods through case study analysis and design practice. In doing so, it is answering ***Research Question 1:*** **What are the current methods of designing innovation under resource constraints?** However, there still remained a gap in understanding the differences and similarities between these methods, which will be explored in this section.

Analysing and clustering the thirteen methods of innovation under Appadurai's *suffixscapes* (Ideoscape, Financescape, Ethnoscape, Technoscape, and Mediascape) provides the conceptual framework for understanding the post-colonial and transnational characteristics of cross-cultural and cross-border exchanges that influence the way innovation is perceived and practiced across different cultural contexts. The key findings made during the five successful projects detailed in Chapter 3 are collected here to discuss the significant conceptual and methodological distinctions of each method of innovation that make them different from conventional innovation, using examples from the project outputs. The criteria for analysis involve considering the findings from the case studies, the output from practice, and the reflections from categorisation, while also considering the definitions of each suffixscapes from Chapter 2.

Ideoscapes are the way that we understand our current worldly circumstances

and the concepts of local culture transmitted via our active interactions with the immediate surroundings and resources at hand. A situation-based dialogue with the available tools and materials allows for the *development of appropriate and thoughtful ideas that are accessible and affordable for those on the move who aspire for better living standards in a new location*, examples of which are shown in Table 6.1. In comparing the interpretations, a key difference between *Frugal Innovation, Below the Radar Innovation,* and *Jugaad Innovation* and the conventional methods of innovation can be drawn around the need for the designer/researcher to have a focused design objective that considers outcomes based on *doing more with less, designing for social good*, and *reusing found objects*.

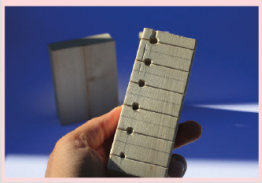
Suffixscape	Ideoscapes	
Cultural Context	**Arrival Cities** ... the third space between rural and urban, populated by the aspirational end-users who want to make a better living.	***Situation-based*** ... responses that centre around self-democratising to design for the other 90% and make the future more accessible for more people.
Design Distinction	**Frugal Innovation** Doing More With Less 	**Below the Radar Innovation** Design for Social Good 	**Jugaad Innovation** Reusing Found Objects 

Table 6.1: *Evidence of Appadurai's Ideoscapes in Project 1 and the Conceptual and Methodological Distinctions of Frugal, Below the Radar, and Jugaad Innovations*

Financescapes enable us to mediate and equalise our core design objective within our current circumstances by simplifying, delineating, and remodelling the immediate surroundings and resources at hand through cost-

cutting and adjusting, which in turn shapes our ideas and modifies our practice. A process-based dialogue with the available tools and materials allows for the *development of thorough and rigorous ideas that are accessible to those lacking buying power who aspire for higher living standards in a congested location*, examples of which are shown in Table 6.2. In comparing the interpretations, a key difference between *Faster Better Cheaper Innovation, Cost Innovation,* and *Reverse Innovation* and the conventional methods of innovation can be drawn around the need for the designer/researcher to have a focused design objective that considers outcomes based on *miniaturisation and modularisation, low quality but high technology,* and *high quality and high technology*.

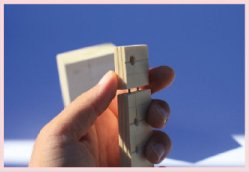
Suffixscape	**Financescapes**		
Cultural Context	**Growing Cities** ... where people lack financial capabilities, however, maintain high aspirations for developed economy products and technology.	***Process-based*** ... responses that centre around self-accomplishment and design for recognition and acceptance.	
Design Distinction	**Faster Better Cheaper Innovation** Miniaturising & Modularising 	**Cost Innovation** Low Quality but High-tech 	**Reverse Innovation** High Quality & High-tech 

Table 6.2: *Evidence of Appadurai's Financescapes in Project 2 and the Conceptual and Methodological Distinctions of Faster Better Cheaper, Cost, and Reverse Innovations*

Ethnoscapes can be viewed as the way we allow our core design objective to be influenced through mutual and cross-cultural collaborations and knowledge transfer in the form of physical, analogue, and digital

transmission. An experiment-based dialogue with the available tools and materials allows for the *development of affordable and niche ideas that are accessible by those living in an independent manner who rely upon a network of small and locally available resources*, examples of which are shown in Table 6.3. In comparing the interpretations, a key difference between *Grassroots Innovation,* and *Gandhian Innovation* and the conventional methods of innovation can be drawn around the need for the designer/researcher to have a focused design objective that considers outcomes based on *scalable* and *affordable green technology*.

Suffixscape	Ethnoscapes	
Cultural Context	**Bottom-up Cities** ... where people oppose the idea of blueprints and ideal state and depend on pre-existing networks and local knowledge to develop new ideas for the poor.	***Experiment-based*** ... responses that centre around knowledge transfer and design for problem solving and social mutual collaboration.
Design Distinction	**Grassroots Innovation** Scalable Green Tech 	**Gandhian Innovation** Affordable Green Tech 

Table 6.3: *Evidence of Appadurai's Ethnoscapes in Project 3 and the Conceptual and Methodological Distinctions of Grassroots, and Gandhian Innovations*

Technoscapes enables our core design objective to be changed and directed through unmet and under-served needs in the form of extended physical, analogue, and digital technologies. A user-driven dialogue with the available tools and materials allows for the *development of affordable and technically simple ideas that are accessible and repairable by those living in a sustainable environment who rely on circular materials and capabilities*, examples of which

are shown in Table 6.4. In comparing the interpretations, a key difference between *Bottom of the Pyramid Innovation, Good-Enough Innovation,* and *Long Tail Innovation* and the conventional methods of innovation can be drawn around the need for the designer/researcher to have a focused design objective that considers outcomes based on *co-creating for basic needs, simplifying user needs,* and *variety and universality*.

Suffixscape	Technoscapes	
Cultural Context	**Circular Cities** ... where people pursue objectives other than consumptions or profitability, and eliminate waste by relying on local and available materials and capabilities.	***User-driven*** ... responses that centre around elevating poverty and design for unmet or under-served needs and for social and human development.
Design Distinction	**Bottom of the Pyramid Innovation** Co-creating for Basic Needs 	**Good-Enough Innovation** Simplified User Needs 	**Long Tail Innovation** Variety and Universality 

Table 6.4: *Evidence of Appadurai's Technoscapes in Project 4 and the Conceptual and Methodological Distinctions of Bottom of the Pyramid, Good-Enough, and Long Tail Innovations*

Mediascapes enables our core design objective to be inclusive and empowering through co-creation and co-designing with the stakeholders in the form of participatory and equity-based collective decision-making. A customer-oriented dialogue with the available tools and materials allows for the *development of personalised and holistic ideas that are accessible by those living in a healthy environment who aspire for enhanced social and economic wellbeing*, examples of which are shown in Table 6.5. In comparing the interpretations, a key difference between *Empathetic Innovation,* and *Inclusive Innovation* and

the conventional methods of innovation can be drawn around the need for the designer/researcher to have a focused design objective that considers outcomes based on *better value with high technology* and *better value with low technology*.

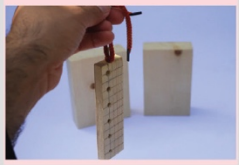
Suffixscape	Mediascapes	
Cultural Context	**Human-centred Cities** ... where people prioritise health and well-being over material gain and aspire to create opportunities that enhance social and economic wellbeing for society.	***Customer-oriented*** ... responses that centre around participatory and equity-based collective decision-making to enhance social and economic wellbeing of the end-user.
Design Distinction	**Empathetic Innovation** Better Value with High-tech 	**Inclusive Innovation** Better Value with Low-tech 

Table 6.5: *Evidence of Appadurai's Mediascapes in Project 5 and the Conceptual and Methodological Distinctions of Empathetic, and Inclusive Innovations*

In analysing the above figures alongside the findings from Chapter 3, it could be argued that the thirteen methods of innovation under resource constraints have been interpreted in a way that organises the flow of cultural material through various social and real-world interactions and enables new ways of contextualising the methods through design thinking and human-to-human, human-to-resources, and human-to-context motivations.

Q2 How have the Action Research and Participatory Practice design research methods influenced the research?

6.3 ON DESIGNING IN THE MOMENT OF NOW AND IN UNSETTLED CONTEXT

As a systematic inquiry, a combination of tools was selected for carrying out separate but interlinked practice-based research based around designing research and researching through a design approach that required the combining of both Action Research and Participatory Research methods to bring together decolonial world views and new knowledge that is appropriate, transparent, and replicable. In conducting the design projects, various research tools were used, including field studies and photographs of research contexts and output, including location and environment of practice, thinking and making techniques, drawings, workshops, objects, and models **(Appendices K, and L)**. Interviews and observations were recorded through objects and writings **(Appendices M, N, and P)** and research instruments, mapping, and diagrams **(Appendices C, and D)** were used to plan and conduct participant interviews and research projects.

Researching in the field relied heavily on action research through the process of improvisation—not only to break away from the established body of convention but in a generative and relational way that reflected the immediate context, available materials, and tools to help find a new and personal direction towards innovation. During research with the participants, it became clear that *resource constraints can enable new methods of innovation through a distinct cultural approach to inquiry for action that combines what we know and what we want to get done in parallel to the weight of the past in the moment of now* (Hallam, and Ingold, 2007, pp. 2-6).

Q3 Can designing under resource constraints transform our practice and liberate us from colonial methods of innovation towards decolonised innovation?

6.4 ON DESIGNING NEEDS, DREAMS, AND ASPIRATIONS UNDER RESOURCE CONSTRAINTS

The action research and the field research undertaken across three different cultural contexts and tested through different characters and motivations in Chapter 5 further demonstrate the ways in which resource constraints liberate us from accepted methods of innovation. The findings show that *'resource constraints provide us with psychological and physical capabilities'* (Bhatia, and Priya, 2018) to overcome personal limitations and geographic restrictions *'through a process of unmaking and remaking, composing, and connecting* (Fry, and Nocek, 2021), *and the means to defend and transform our existing practices as well as to invent new ones'* (Escobar, 2021). In doing so, it is answering ***Research Question 2:*** **How to design functional, delightful, and desirable innovation under resource constraints?**

The relationship between resource constraints and designing needs, dreams, and aspirations was revealed during participant interviews, which highlighted a variety of context-specific approaches without much consideration to their use or understanding of their purpose. The key finding was that the participants perceived their resource-constrained ways of knowing, thinking, and doing as *'not appropriate'* to the modern world and, therefore, would focus solely on ideas that are repetitive and organised around the imitation of developed economies that are considered culturally superior. However, the research projects displaced this view and helped with transforming the participants' practice *from imitating knowledge without understanding its relation or consequence towards their life, culture, and society* (Manzini, 2015), as shown in Figure 6.1.

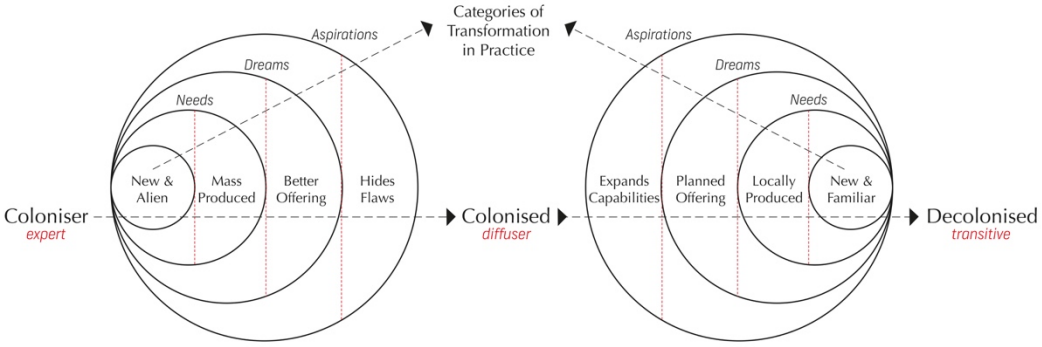


Figure 6.1: *Evidence of Transformation in Designing Under Resource Constraints*

Table 6.6 further describes how context-specific modes of practice undertaken by the participants prepared them for *transforming their knowledge and skills as well as imagination and creativity* (Mignolo and Walsh, 2018) to maintain a position of being-in-the-world (Fry, 2009) through non-Western-centric ways of thinking, designing, and making and to identify what needs to be eliminated, destroyed, unmade, and remade under limit and control simultaneously.

Projects	Main Constraint	Designing Needs	Designing Dreams	Designing Aspirations
Project 6 Practicing in Developing Economy	**Limited Production Options and Artistic Freedom**	**Instant Re-purposing** (finding objects that look similar) **Referencing** (finding solution from outside sources)	**Strategic Mix & Match** (working with confined production technique/moulds) **Self-preparation** (testing/trialling)	**Re-purposing the Existing** (re-thinking or creating a theme around existing objects) **Collaboration** (planned dialogue)
Project 7 Practicing in Least Developing Economy	**Unavailability of Electricity**	**Simplification** (easiest possible way) **Directional** (purpose-led)	**Culturally Influenced Aesthetics** (personalisation) **Controlled Making** (planned cutting)	**Made-to-Order** (functional personalisation) **Imitative** (sophisticated making)
Project 8 Practicing in Developed Economy	**Less Time and Budget**	**Technically Feasible** (comparing existing production methods) **Digital Prototype** (simulation)	**Integrating Cultural Norms and Belief** (co-creation with the end-user) **Intentional Making** (digital speculation)	**Commercially Viable** (economic impact with technical superiority) **Synthesised Exploration** (expanding capability)

Table 6.6: *Evidence of Decolonised Methods of Innovation Under Resource Constraints*

Q4 What is the distinction between lean, participatory, and decolonised innovation?

Q5 How has the researcher's practice been influenced by the research project and what defines contextually appropriate innovation?

6.5 ON DECOLONISED WAYS OF KNOWING, THINKING, AND DOING

Reflecting on the findings from Chapter 5, one might then ask, how is decolonised innovation different from lean or participatory innovation? *Lean Innovation*, which originated in the 1980s from Japan's lean manufacturing revolution, best known as the Toyota Production System, follows the scientific method that begins with predictions rather than trying to understand the end purpose and, as such, aims to discover and eliminate the sources of waste through a step-by-step and structured process that focuses on what is essential (Ries, 2011). *Participatory Innovation*, on the other hand, originated in the 1970s with Norway's co-creation revolution towards developing technological alternatives with and for future users. It follows the scientific method that addresses the use of technology for a specific group of people rather than trying to address the needs of different settings and means of production, and as such, it tends to be a structured process for innovation that requires more resources and is suited for large-scale systems (Bodker, and Pekkola, 2010)

The findings from Project 6 illustrated in Figure 5.6 **(Appendix M3)** and Project 7 illustrated in Figure 5.13 **(Appendix N3)**, demonstrate Decolonised Innovation as a *'socially responsible and contextually aware method for envisioning new conditions for being human and renewing hope that another world and another way of achieving needs, dreams, and aspirations is possible'* (Fry, and Nocek, 2021). Decolonised Innovation, therefore, is an approach that helps us move

ourselves, our practice, and our thinking towards *'possibilities of other'* modes of being, doing, and living. It follows the act of balancing and reasoning with constrained conditions at hand, which can be defined as:

> *"…contextual, relational, practice-based, and lived—as walking, asking, reflecting, analysing, theorising, and actioning—in continuous movement, contention, relation, and formation." (Mignolo and Walsh, 2018, p. 19)*

Building upon this view, Figure 6.2 illustrates the methods of innovation that are contextually appropriate based on the above analysis and findings, along with an understanding of my position in the larger global system and my aim for ontological rather than additive change (Ansari et al., 2017). In doing so, it is answering ***Research Question 3:*** **Which method is contextually appropriate for designing decolonised innovation under resource constraints?**

Decolonised Innovation originates from the point when Western methods of innovation are displaced as the only possibility and when learning in place and making in place merge with kinetics, spiritual presence, and emotion (Mignolo and Walsh, 2018). This description is further supported by Friedman's (1994) argument that we have entered the *'age of tribalism'* due to the increasingly strong collective pressures from macro-economic, political, geographical, and cultural processes that are intertwined and require localised practices. This, according to Manzini (2015), calls for a *"rethinking of the mainstream way of thinking and doing that are small, local, and connected actions"* in which available resources are catalysed and used in the best way possible, which Cowen (2002) refers to as *'geographic clustering',* indicating that successful innovations are spatially concentrated and are developed through better local understanding.

My design practice evolved through field studies and participatory research projects, allowing me to develop a culture and posture for innovation that absorbs numerous outside influences without losing my identity (Cowen,

2004), and granting a balance of isolation and freedom while still encompassing my existence in a system of geographic rules under resource constraints (Friedman, 1994).

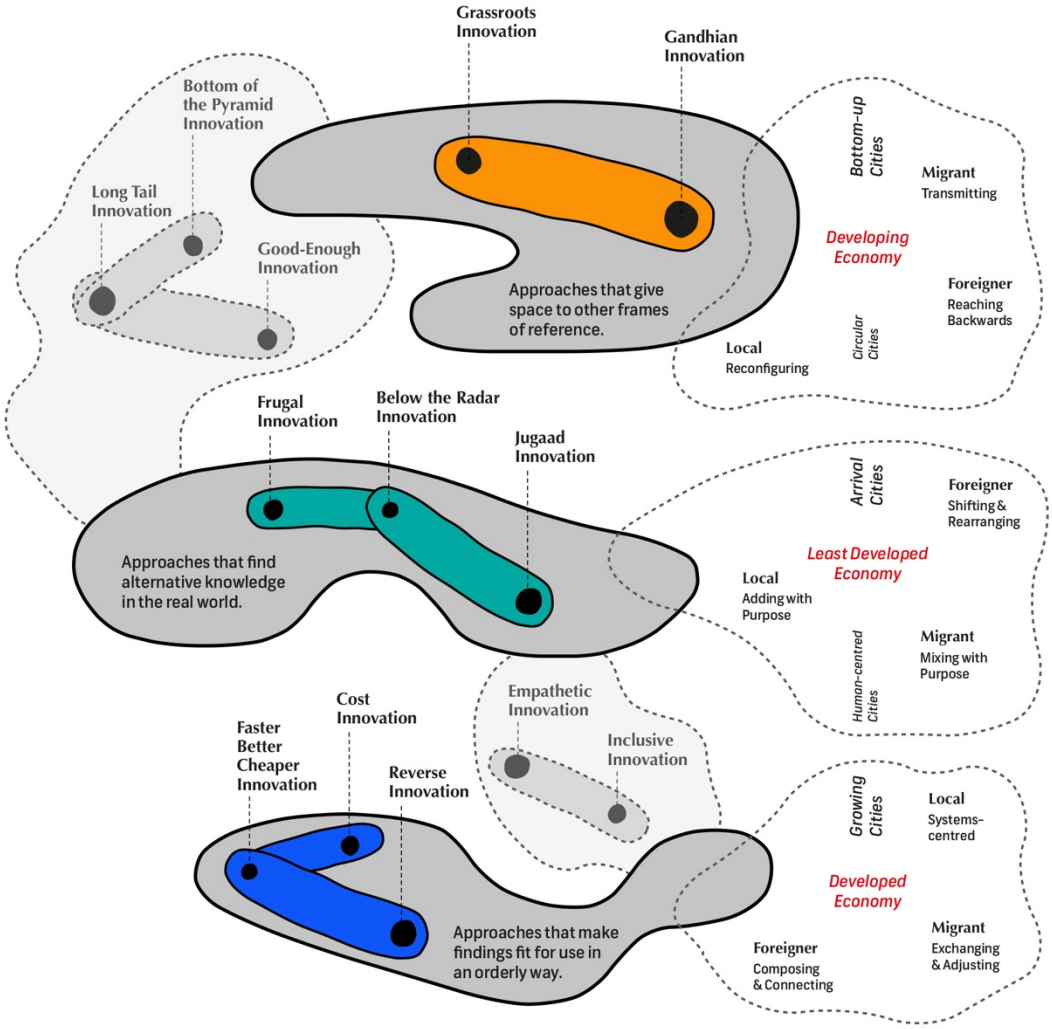


Figure 6.2: *Evidence of Contextually Appropriate Innovation*

Furthermore, an ontological change would require me to give attention to the constraints at hand in a way where I do not regard them as problems to be solved but rather distribute the tensions, pressures, and strains that could give rise to a wide array of responses (Fry, and Nocek, 2021).

A structured process was followed (as shown in Table 6.7) to understand and identify which method of innovation is contextually appropriate. This involved the development of several key principles in the sequence of knowledge-finding undertaken in this research to support and extend the participants' behaviour, attitude, goal, and intent.

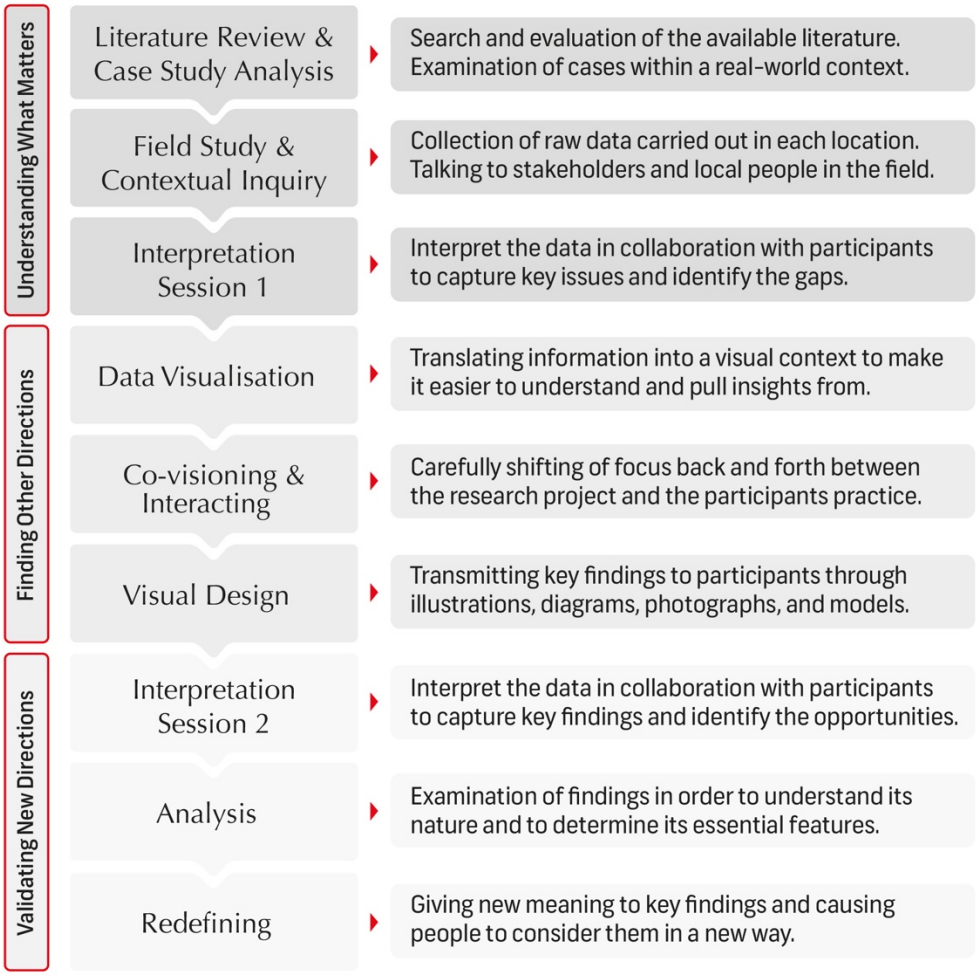


Table 6.7: *Evidence of the Process Undertaken for Understanding and Identifying Contextually Appropriate Innovation*

Understanding what matters to people was the key objective when identifying cultural and contextual appropriateness. This required taking them out of the context of their everyday practice and immersing them in different thinking

modes to make them aware of their own priorities and motivations through the sharing of findings from the literature review, case studies, and contextual inquiry in their natural environment. This was followed by finding other directions through carefully translating new forms of knowing, thinking, and making as well as shifting perspectives to allow for the formation of new directions through interpreting and validating in collaboration.

Pursuing this design research has enabled me to develop a clear understanding of *how innovation is understood and practiced* across geographic, cultural, and political borders. It has impacted me through reflecting upon *my transformation from a foreign designer to a collaborative and multi-character designer* with an approach that involves the perspectives of locals and migrants through the understanding of the variation in the type of action and skill set of participants in different cultural contexts. It has given me the *methods to pursue innovation under resource constraints* and the *opportunity to reflect on what I do* and position my practice closer to *Transformative Design* (an interdisciplinary process that seeks to create sustainable and systemic changes in the behaviour and form of individuals, systems, and organisations) that cross geographic, cultural, and political borders with an ethical and non-Western-centric mindset. As a design practitioner, it encouraged me to explore, think, and research on a systems level to find new knowledge, which is discussed in the following chapter.

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Chapter 7
Conclusion

7.1 SUMMARY OF FINDINGS

This research set about to explore a different and more integrated approach to innovation with a focus on methods of innovation through a *decolonial approach* by working in reciprocity with local and migrant designers across Istanbul, Kabul, and London. In addition, it set about to bring in multiple perspectives using a mixed methods study, investigate the *practice of innovation as a design action* for introducing and implementing a new idea in distinct cultural contexts, and examine *the influence of resource constraints* (uncertainty and unavailability of materials as well as tools, socio-political instability, uniqueness of the environment, and fluctuating economic situation) *in achieving decolonised methods of innovation*. The findings from this research claim new knowledge and limitations in the following categories:

7.1.1 THEORY

a. Designing under resource constraints can reveal other methods of innovation.

Regardless of the challenges presented by resource constraints across different cultural contexts, the findings from this research have shown that they *can create the space to empower and help us transform conventional methods of innovation* towards more inclusive, equitable, and socially just methods. Through the development of local knowledge and expertise, prioritisation,

and focus, designing under resource constraints *can foster resilience and resourcefulness, reflexive thinking, and context-specific outcomes*. In addition, this approach *can significantly contribute to the growing emphasis on sustainability and environmental considerations in design* with its emphasis on eco-friendly practices, the use of renewable materials, and outcomes that are energy-efficient and environmentally responsible.

Further findings from action research have shown that designing under resource constraints is *a project of resistance to accepted methods* of innovation. Designing under resource constraints as a creative approach *can enable us to form alternative modernities within our particular sociocultural context* and find diverse ways of knowing and being in the context from which our ideas emerge (Ingold, 2013) through a process of unmaking and remaking, composing, and connecting.

As shown, limited research on resource constraints and their relationship to intentional innovation and context-specific practice provided a design opportunity for revealing and understanding *the thirteen methods of innovation under resource constraints* as *'other'* methods of innovation, but instead the focus remains on transferring methods of innovation from one place to another without being aware of the social, cultural, and environmental impact of methods derived from elsewhere (Barcham, 2023). This often leads to junk design in the form of imported, displaced, and mass-produced wants through unethical and inappropriate design practices.

However, this study has shown that designing under resource constraints *can move us away from the dominant Western-centric approach to innovation physically and psychologically* through the incorporation of diverse perspectives, local knowledge, and production systems, as well as cultural, geopolitical, and environmental contexts in the innovation process.

b. Decolonised Innovation is aesthetically and functionally different from conventional innovation.

Moreover, the need to explore *context-specific methods of innovation that challenge and seek to dismantle the traditional Western-centric perspectives and practices* that have historically and contemporaneously dominated innovation methods provided the opportunity to address the legacies of colonialism and its effects on conventional innovation practices. Specifically, *to decolonise the methods of innovation* by including diverse voices and knowledge systems as well as integrating the local context in shaping the future.

The findings from this research have shown that Decolonised Innovation *is purpose-led*, and in doing so, *its methods are flexible and responsive* to the immediate context and the available tools and materials, ensuring that design outcomes are culturally and contextually relevant and sustainable. To address and recognise the complexity and diversity of cultural contexts, Decolonised Innovation *is intentional*, and in doing so, *its methods encourage a culture of experimentation and learning from failures* to reflect a paradigm shift in how innovation is approached aesthetically and functionally by challenging the linear and profit-driven nature of conventional innovation while prioritising social impact, sustainability, and equitable distribution of benefits.

Further findings from participatory research have shown that, aesthetically, Decolonised Innovation *incorporates diverse cultural values, symbols, and design expressions* by recognising the importance of local knowledge, traditional practices, and personal experiences in shaping the design and presentation of new outcomes. This aesthetic diversity *celebrates and respects cultural heritage* and *challenges the homogeneity* often associated with conventional methods of innovation (Culture 2030 Global Campaign, 2021). Whereas functionally, Decolonised Innovation *strives to address the needs, dreams, and aspirations of marginalised communities*, considering their unique contexts, challenges, and experiences. It emphasises community engagement,

participatory approaches, and co-creation processes to ensure that innovation is not imposed from external sources but emerges from within the community itself (Mignolo and Walsh, 2018). This functional aspect *involves local knowledge systems and practices and a deep understanding of the social, economic, and environmental dynamics* of a specific cultural context and geographical region. Decolonised Innovation is, then, *aesthetically and functionally different* from conventional innovation.

7.1.2 METHODOLOGY AND METHODS

c. Decolonised Innovation Methodology.

Conducting collaborative research across different cultural contexts to test the thirteen methods of innovation and co-investigate context-specific ones from different perspectives could not follow an existing approach but rather a systematic and sequential process of cultural and social interaction. As a result, different methods were employed to help answer the research questions, allow me and the participants to situate ourselves in this emerging field of design research, and reflect on how our interventions and findings influenced the area of observation.

First, through Chapter 3, I *researched back* by respecting practices that already exist and articulating research practices that arise out of the specificities of epistemology and methodology rooted in survival struggles (Smith, 2012, p. 6). This step, in Frayling's (1993) words, was the *"gathering of reference materials"* (p. 5) for design and focused on knowledge-finding and analysis based on evidence. Following this, through Chapter 5, I *researched with* the participants within their social structure by considering their cultural practices and norms as part of my research. This step, in Frayling's (1993) words, was the investigation of design theory and practice in the real world through *"a variety of perspectives, models, rules and procedures"* (p. 5), with

design and participants as its subjects. Finally, through Chapter 6, I *developed and contextualised the outcomes* that are identifiable, practical, and real. This step, in Frayling's (1993) words, was to *"communicate the results"* (p. 5).

Despite the richness of this approach, the shifting of perspective posed particular challenges, such as the lack of a standard approach to selecting methods to examine innovation methods in different cultural contexts and from a non-Western perspective. As a result, I also employed diagramming as a method for ordering information and distilling key findings from these interactions for wider use.

d. Diagramming as a visual method.

In line with the aims of this research, I have used a *visual method of diagramming to translate theoretical findings into knowledge for practice* by using diagrams to *analyse and communicate the methods of innovation* more effectively and *develop a deeper understanding of my own practice* in response to the cultural and contextual components associated with each approach. As a result, the visual method breaks down the sequential and parallel steps involved in innovation methods and allows for identifying potential knowledge and skill gaps as well as opportunities for collaboration and decision-making.

Furthermore, to *facilitate a more comprehensive understanding* of the dynamics of the methods of innovation and enable cross-cultural collaboration, diagrams are used to *provide a common visual language* that simplifies the purpose and relationships between them and to support an iterative approach towards exploring different possibilities.

7.1.3 PRACTICE

e. The multi-character designer.

Finally, this research contributed to the overall richness and diversity of the design profession by exploring *context-specific methods of innovation through the distinct backgrounds and perspectives of multiple characters* to add depth to the understanding and practice of innovation in different cultural contexts.

One of the key findings from this research has been *understanding participants' cultural perspectives as contextually appropriate and meaningful practice* to help me unlock my potential in identifying, adapting, and applying research methods in a culturally meaningful way through knowledge and understanding of the sociocultural and political dynamics of the research setting (Pelzang, and Hutchinson, 2018). While a clear method of capturing and relating as a foreigner designer/researcher in between the participants has not emerged, my self-representation as an adaptive designer to the local culture enabled me to collect valid, meaningful, diverse, and detailed data, which helped me to *emerge as a situated seeker of information across different cultural contexts* (Pang, 2016) through the perspectives of local as well as migrant characters.

f. Displacing Western methods of innovation may lead to recolonisation.

Despite the fact that displacing Western methods of innovation is a complex and ongoing process, the outcomes of this research have highlighted that *different regions have their own unique resources, perspectives, needs, and challenges*, which can drive alternative methods of innovation. This research has shown that by considering local factors and adapting to specific contexts, we can develop new ideas that may be better suited to particular

circumstances. Therefore, it is not a universal truth that decolonisation always leads to recolonisation.

Furthermore, this research recognises that *the displacement of Western methods of innovation does not necessarily imply a decline in Western innovation*, but rather highlights the importance of diversity and dynamism within the global innovation landscape, where different regions and countries can contribute their own unique perspectives and approaches to driving progress. In addition, the outcomes from this research recognise that *coloniality will not go away with design*; however, it is determined by it, as *design can change the conditions for the future* through possible action and alternative critical knowledge and practices. It also recognises that decolonisation of innovation can simply mean, from the perspective of Frantz Fanon (1961), *the replacing of existing methods of innovation by another method of innovation based on a process of re-ordering, re-stablishing, and re-producing the conditions of coloniality* that will result in a power imbalance (pp. 27-35). Because of this, having a clear understanding of appropriate methods of innovation, as identified by this research, is an important consideration to overcome systems of oppression through design (Barcham, 2023).

Thus, to create *affirmative transformations towards decolonised futures, it requires place-based design strategies identified by this research* that enable local modes of making and existing as well as territorial and ethnic struggles (Escobar, 2021). Ultimately, the success of decolonised innovation depends on a range of factors, including the political will of both Western and non-Western nations to form global collaborations and cross-cultural initiatives for fostering dialogues, mutual understanding, and shared responsibility to address the biases of the past and work towards more equitable design practices, as well as the strength and resilience of local institutions and the degree of support and solidarity from the global community. While there is no guarantee that decolonisation of innovation will lead to lasting independence and self-determination, it remains an important and necessary

step towards achieving greater social and environmental justice and equality.

7.1.4 LIMITATIONS

g. Weaknesses in methods and argument.

The Decolonised Innovation Proposition represents the approach that I have taken in this research and is not the only strategy to develop and evaluate contextually and culturally appropriate methods of innovation. It is possible that *different researchers may find approaches that are more respectful, ethical, sympathetic, and useful* than the approach that I propose. The limitations of the Decolonised Innovation Proposition can be considered *a methodological approach that follows a linear process of learning*, which could lead to overgeneralised understanding, inaccurate observations, a selective perception of things, and closing off of inquiry as soon as an idea is developed (Leavy, 2017, p. 4).

My approach in this research had a very specific focus on people, processes, and products and was dependent on particular geographic and cultural contexts. Additionally, *the tools that I employ in this research were developed by me and are reflective of my own design background*, which in turn influenced my choice of methods for collecting, analysing, and interpreting findings, as well as narrowing the scope of the study and limiting the arguments raised in this research.

Such delimitations involved conscious exclusionary and inclusionary decisions made by me during the development of this research. For example, having a semi-structured approach to participant interviews across Istanbul, Kabul, and London may have allowed me to influence how participants responded to my questions and potentially received biased verbal and physical input from participants through their belief that certain responses

would be favourable to me rather than their authentic response. Similarly, participants may have influenced how I understood and collected research data based on their behaviour, or I may have been biased by their input by collecting data based on a single impression and a short timeframe.

In response to these limitations, measures adopted include the use of a *multi-strategy design* that is sequential, convergent, and nested; using *mixed methods study*, rather than conducting research on people; having *project peers* with similar interests, knowledge, understanding, and expertise of the subject area; using *diagramming* as a visual representation of information, reflections, and learnings; and using *action research* to explore findings from the field research undertaken across three different cultural contexts and tested through three different characters and motivations.

7.2 FUTURE SIGNIFICANCE

The future value of this research lies in understanding its significance in relation to several developments within *responsible and transformative design research and innovation*, including climate change, purpose-led consumption, cross-cultural collaboration, and the co-design of innovation for context-specific approaches aimed at delivering and leading on the global sustainable development goals that reflect cultural values and expectations. The view presented by this research is that the *agenda and agency of innovation will have to become more contextual, intentional, directional, and ethical* to address the unpredictable and fluctuating world conditions and suit different cultural, environmental, and contextual needs.

In the years since I began this research project, interest in decolonising design for ethical and cross-cultural research and innovation has grown considerably across academic institutions, the public and private sectors, as well as third-sector organisations. Their findings, thus far, have been based on assumptions and hypotheses that lack a clear understanding of cultural and contextual differences across locations and geographies, and with them, the methods that could lead to deconstructing the Western-centric thinking behind innovation practice. I am hoping that my experiences across different cultural contexts and this practice-led research *adds to the methodological, theoretical, and practical approaches* available to researchers and practitioners and *opens up further possibilities for conducting decolonised research and practice* through the methods of innovation under resource constraints proposed in this research.

This research lays the *foundation for understanding and designing context-specific innovation* that emerges as a common project-process of creative possibilities through connecting to locality as well as reading, interpreting, and ordering local reality under resource constraints. In an age of Artificial Intelligence (AI) where computers can transform and accelerate the design process by bringing

together billions of visual forms and texts to make better outputs, this research *strengthens the role of humans as responsible designers in using design methodologies* to address and solve complex cultural, social, and environmental problems through systemic ethical understanding, purpose-led creativity, ingenuity, and empathy to impact people's lives and livelihoods.

Furthermore, it provides the *methods for developing and testing non-Western innovation practices* that can assist designers and researchers with decolonial ways of knowing and acting, as well as applying them in practical ways through multiple perspectives in the form of artefacts across least developed, developing, and developed economies.

7.3 RECOMMENDATIONS

As this exploration ultimately implies, the outcomes and findings of this project can be interpreted as a first step in *systematic research on methods of innovation under resource constraints* and *in practice-based research on decolonised innovation* through design. While the findings have successfully answered the research questions, there are still many aspects that require further research.

One potential direction moving forward would be to bridge the knowledge gap between this research and the hidden determinants of design and the context-specific circumstances, in particular through *ways of understanding more accurately the impact of decolonised innovation on the end-users*, the way they use its outputs, and the new socio-cultural and geo-political relationships that it will generate with consumption and waste.

Further building on this area, *a multi-disciplinary approach to testing the thirteen methods of innovation under resource constraints* would allow for understanding the ways that other fields may use and apply these methods of innovation. Extending knowledge of local and migrant designers through testing their *suitability and impact in different collaboration models and cultural contexts* would further fill the gap between theory and practice, give responsibility to others to achieve decolonised innovation, and demonstrate which methods are more suitable in their respected fields and cultural contexts.

Additionally, a detailed exploration of the proposed methods of innovation under resource constraints through different mediums and future urban scenarios would be valuable to enable a *better understanding of the discussions and voices from other disciplines* and help draw different methods of capturing and dismantling knowledge from them.

GLOSSARY

Action Research: self-reflective cycles of planning, acting, observing, and reflecting for improving and understanding the practice and the situation in which the practice takes place, and for the involvement of those who are the focus of the research as well as their participation in the process.

Alternative Modernity: other possibilities, as well as distinct modes of socio-cultural and political order and forms of knowledge.

Colonial: the structure of knowledge and understanding imposed by a foreign power, government, or institution.

Colonialism: the psychological and physical dominance and control by foreigners over local people and their behaviour.

Colonised: the situation of being under the psychological and physical domination and control of foreigners.

Conventional Innovation: the traditional process of inquiry and action for introducing and implementing a new idea.

Context-specific: a study conducted in a unique setting with the goal of producing culturally acceptable outcomes and conclusions with limited applicability to other settings.

Cross-border flow: the movement or transfer of information, ideas, feelings, stories, and customs across country borders.

Cross-cultural exchange: when people of two or more different backgrounds trade information, ideas, feelings, stories, and customs.

Decolonial: the process of delinking from the structure of socio-cultural and political orders and forms of knowledge imposed by the West, and then creating other and context-specific ways of thinking, doing, and living.

Decolonisation: the process of having a more critical understanding of the underlying assumptions, motivations, and values.

Decolonised: the alternative knowledge and understanding as a counter-discourse to Western knowledge and understanding.

Decolonising innovation: the process of rethinking, reframing, and reconstructing the ways of inquiry and action for introducing and implementing a new idea that preserve the Western-centric, colonial lens.

Decolonised Innovation: the alternative process of inquiry and action for introducing and implementing a new idea in a unique setting with the goal of producing culturally acceptable outcomes.

Decolonial Research: a process of understanding the participant through their own assumptions and perspectives, cultural practices, thinking patterns, beliefs, and values in real life.

Designer: who engages in creative problem-solving and innovation across various disciplines

Designing under resource constraints: a form of inquiry and action taken in a specific location that combines available materials and tools, intention, and imagination.

Developed Economy: countries with sustained economic growth, high literacy and employment rates, and advanced technological infrastructure.

Developing Economy: countries working towards improved industrialisation, economic and social stability, and enhanced living standards for their populace.

Improvisation: a distinct approach to action-led inquiry that is conscious and based on intentional action.

Innovate: the act of creating something that does not yet exist and that is unique for a particular time and condition, people, and place.

Innovation: the process of inquiry and action for introducing and implementing a new idea.

Least Developed Economy: countries with fragile industrial and economic ecosystem, low literacy and employment, and severe structural impediments to sustainable development.

Liberate: to set loose from the restraints and constraints of existing concepts.

Methods of Innovation: systemic procedures of inquiry and action for introducing and implementing a new idea.

Modernity: the foreign modes of socio-cultural and political orders and forms of knowledge

Resource constraints: the personal limitations (encompassing our cultural, social, and environmental circumstances, such as lack of access to knowledge and skill, limited budget, and availability of funds) as well as geographic restrictions (encompassing our technological, economic, and political circumstances, such as shortage of tools and equipment, limited infrastructure, and access to electricity) that are essential for accomplishing a particular need, dream, or aspiration.

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