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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Royal College of Art
Postgraduate Art & Design

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

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Appendix A
Pilot Projects

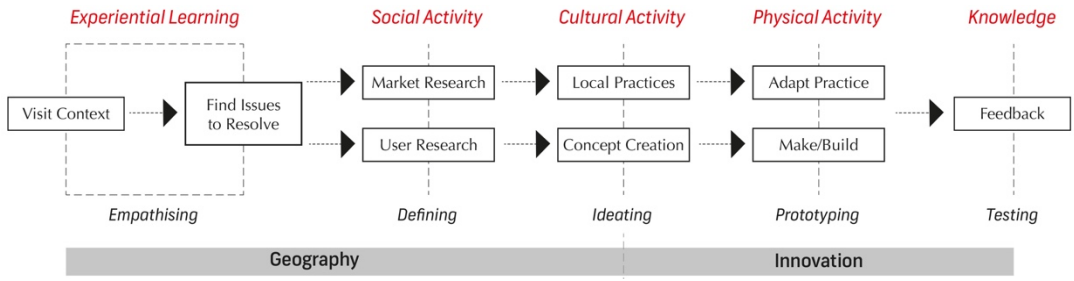
A1 Pilot Project 1

The *Mangai Water Purifier* project explored *designing consciously* within a resource-constrained context by adapting my idea to locally available materials, manufacturing techniques, and the end use of my intervention. This meant referencing historical and traditional ways of accessing water, transportation, and storage methods unique to the Central Asian region and culture, which formed the beginnings of the innovation process.

In this project, I practice as a *local designer*, and my practice was rooted in the local culture and fixed in the traditions of the context, while my approach to innovation followed the five stages of the *design-thinking* process (empathise, define, ideate, prototype, and test). This approach to design is not only concerned with the creation of products and their aesthetic values but also with how it can help develop a sense of identity and belonging for people by considering their local way of life and ecosystem.

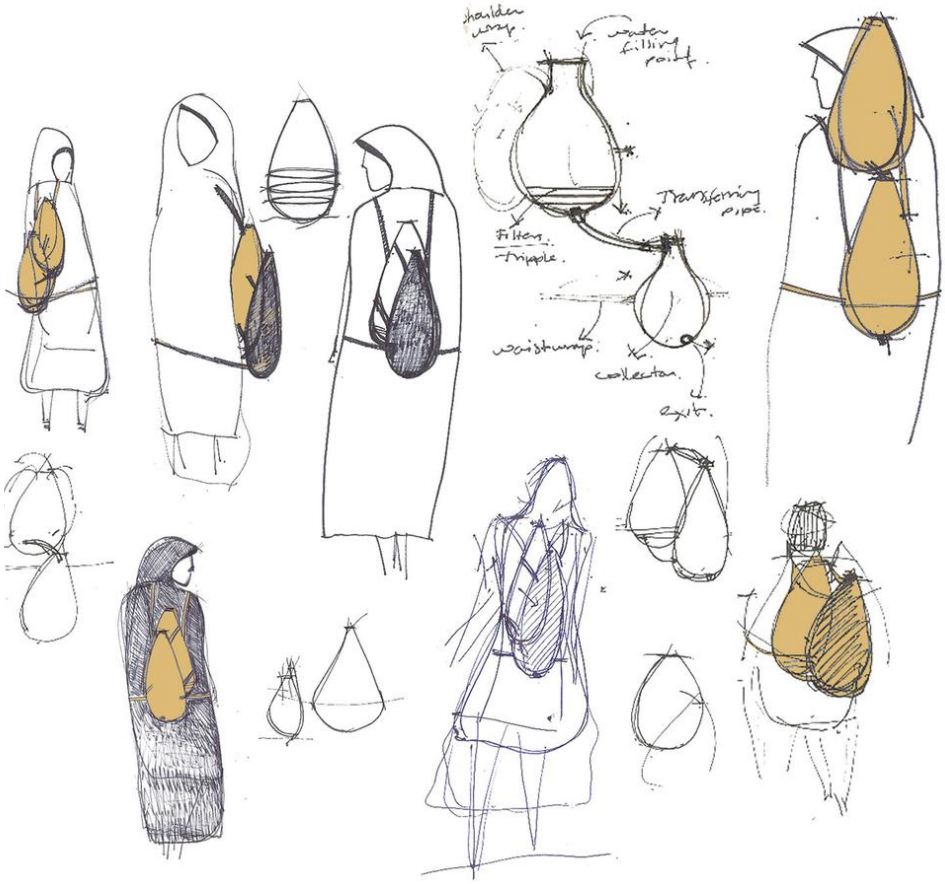
Throughout the project, I developed a sense of dialogue with the local context that gradually shaped the outcome (Kaya, and Yagiz, 2011, p. 64) and allowed me to form a re-directive process while interpreting my work through available resources. To acquire the right set of information, I had to act upon the problem without any preoccupied perception followed by working with the emotional and psychological significance of the problem at hand rather than approaching it with my personal knowledge. This required me to *consciously* modify and unify my design to suit the immediate context and the available materials and tools—making, testing, and, where necessary, changing and simplifying the idea (Glanville, 1999, p. 87).

This project was focused on *moving away from a problematic situation*—difficulty accessing and transporting water—which originated from experiencing the geography and being socially and culturally influenced by the end-user's way of thinking and practice.

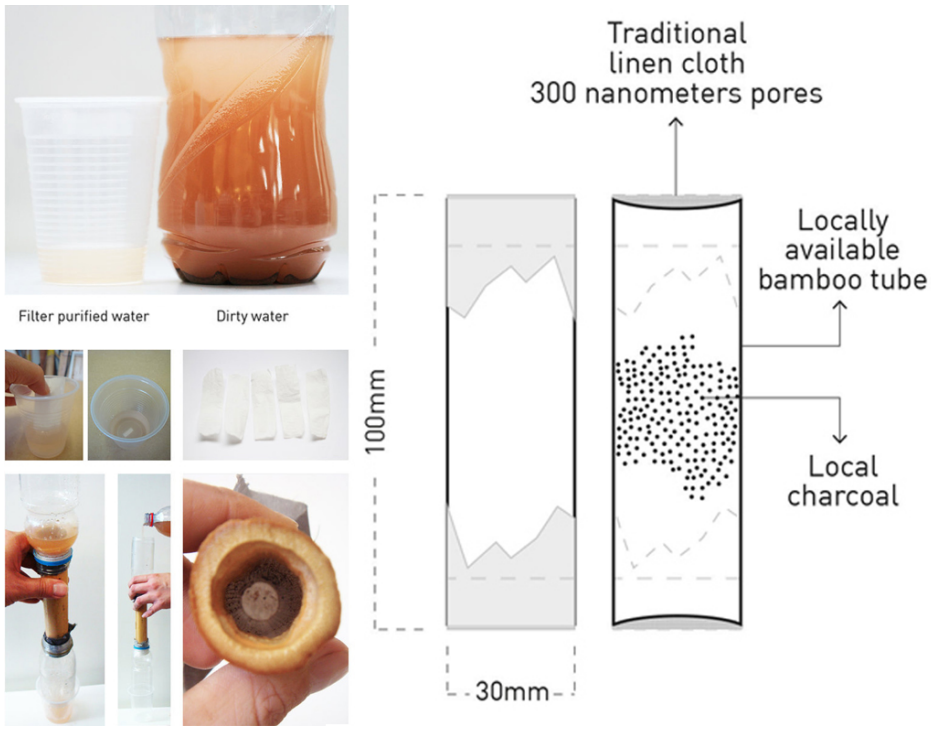


A1.1: *Mangai's Innovation Process*

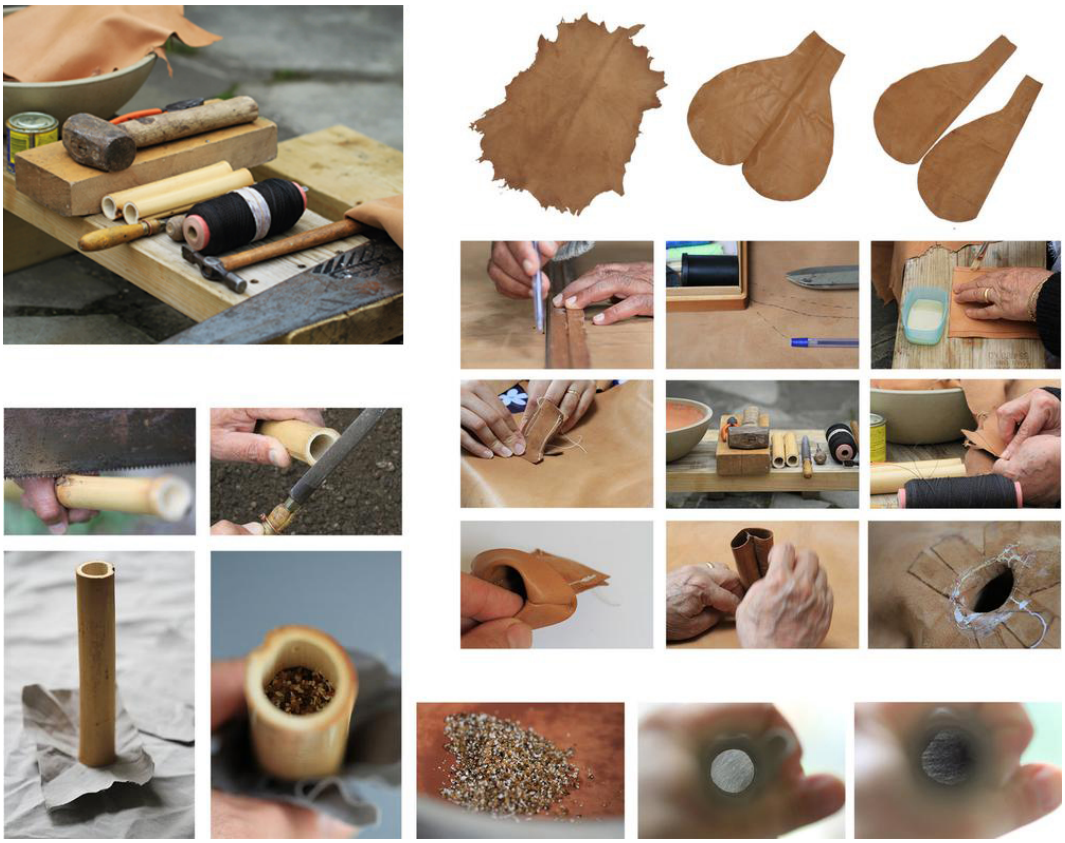
A1.2: *Finding Issues to Resolve*



A1.3: *Concept Creation*



A1.4: *Embedding Local Technology Practices*



A1.5: *Embedding Local Making and Practices*

A1.6: *Mangai Water Purifier*

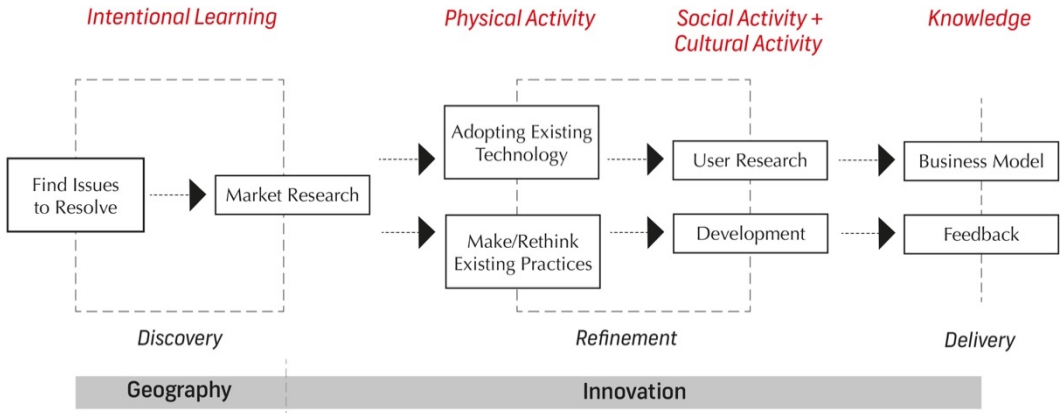
A2 Pilot Project 2

The *Qaf Sustainable Washing System* project explored *designing unconsciously* for a resource-constrained context by being instantaneous and experimental with what is available and responding through rethinking local practices. This meant identifying objects and technologies that are readily available and known to the region and culture. This approach formed the beginnings of the innovation process.

In this project, I practice as a combination of *migrant* and *foreign designer*, and my practice is rootless and unfixed. While my approach to innovation followed the three stages of *disruptive innovation* process (ideation, incubation, and execution), I was not only concerned with the creation of a new device, but also with how it can introduce new ideas and practices to people.

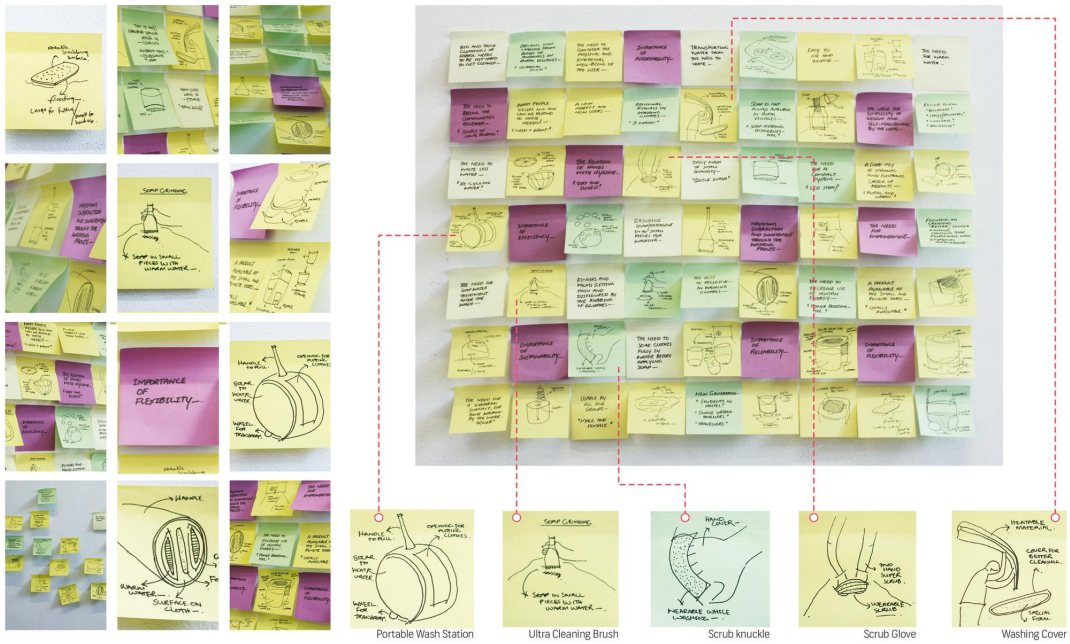
Throughout the project, I was being selective with the knowledge I was receiving from my observations and interactions with the local people while continuously making fine adjustments to my idea to keep on course with the emergent thinking through negotiation and improvisation in the moment of now (Hallam, and Ingold, 2007, p. 80-81). This required me to think *unconsciously* and evolve from predetermined and fixated thinking to look beyond the set of patterns, habits, and practices that I was exposed to, such as the method of washing and local manufacturing techniques.

This project focused on *moving towards a desirable situation*—being able to wash clothes with less water, time, and strain—which originated from purpose-led experimentation and by influencing the end-user by my way of thinking and practice.



A2.1: *Qaf's Innovation Process*

A2.2: *Adapting Existing Practices*



A2.3: *Concept Development*

A2.4: *Design Development*

A2.5: *Adapting Existing Making Techniques*

A2.6: *Qaf Sustainable Washing System*

Appendix B
Ethics and Permissions Forms

B1 Indicative Research Information and Consent Form

Participant Project Information & Consent Form

(One signed copy of this form should be retained by the Participant and one copy by the Project Researcher)

Decolonised Innovation: Designing needs, dreams and aspirations under constraints

For further information
Supervisor: Professor Ashley Hall
ashley.hall@rca.ac.uk
+447870648882

Idrees Rasouli
+447985414318
idrees.rasouli@netowork.rca.acu.uk

insert date

Dear Potential Participant,

I am Idrees Rasouli, *a student* in the (Innovation Design Engineering, School of Design) at the Royal College of Art. As part of my studies, *I am* conducting a research project entitled (Decolonised Innovation: Designing needs, dreams and aspirations under constraints). You are invited to take part in this research project which *examines the activity of design and innovation for and in resource-constrained contexts with a focus on ways of knowing, designing and making. It explores design for a new culture, whilst questioning the role of borders and transnationalism.*

If you consent to participate, this will involve:
Interview –
Drawing, making, thinking –
Photographing and Filming

Participation is entirely voluntary. You can withdraw at any time up to the point of publication and there will be no disadvantage if you decide not to complete the study. All information collected will be confidential. All information gathered will be stored securely and once the information has been analysed all individual information will be destroyed.

Images or quotes, which may allow you to be identified will only be used with your express permission.

If you have any concerns or would like to know the outcome of this project, please contact my supervisor, *Professor Ashley Hall,* at the above address.

Thank you for your interest.

I *(please print)* …… have read the information above and all queries have been answered to my satisfaction. I agree to voluntarily participate in this research and give my consent freely. I understand that I can withdraw my participation from the project up to the point of publication, without penalty, and do not have to give any reason for withdrawing.

I understand that all information gathered will be stored securely, and my opinions will be accurately represented. Any data in which I can be clearly identified will be used in the public domain only with my consent.

Participant Signature…….

Researcher Signature……

Date: ……

Complaints Procedure:

This project follows the guidelines laid out by the Royal College of Art Research Ethics Policy.

If you have any questions, please speak with the researcher. If you have any concerns or a complaint about the manner in which this research is conducted, please contact the RCA Research Ethics Committee by emailing ethics@rca.ac.uk or by sending a letter addressed to:

The Research Ethics Committee
Royal College of Art
Kensington Gore
London
SW7 2EU

Appendix C
Research Instruments

C1 Indicative Participant Questionnaire

PARTICIPANT NAME: **ACTIVITY:** **DATE:**

DURATION: *(circle as appropriate)* hours — 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
days — 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
other — .....

LOCATION: *(describe the location of your work being carried out)*

1. **Have you ever designed under constraints, if so what were the constraints and how do you react to available material, know what to design and how to make in the moment of 'now' with limited resources?**

2. **How do you approach a project with limited resources in unsettled context – can you talk me through an example of a recent project that you have designed and draw or describe your process?**

3. **Do you have different approaches to designing under constraints, if so how do you:**

   a) Design to meet a particular need and solve a functional problem?
   b) Design to speculate and make something delightful?
   c) Design with intention to have a desirable outcome?

4. **Do you think your work is influenced by an approach or motivation that is related to your culture, if so how do you reduce cultural influence in the discovery, creation and delivery of your design?**

5. **Are you influenced by cross-cultural and cross-border exchanges, such as religion, conflict, knowledge and lifestyle, if so has it changed the way you think and design?**

6. **Have you ever redirected or transformed your approach to design in orderto suit what is available within the context, if so can you show me an example to see how did it change the way you design? Can you describe the reasons behind the changes in materials, tools, shape and form of your object?**

7. **When designing under constraints, what measures do you take to make sure your design is suitable for the end-user and sus tainable for the environment?**

C2 Indicative Post Participatory Practice Questionnaire

PARTICIPANT NAME:

ACTIVITY:

DATE:

DESIGNING: *(circle as appropriate)*
a) to meet a particular need -
b) to speculate and make something delightful -
c) with intention to have a desirable outcome -

DURATION: *(circle as appropriate)*
hours — 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
days — 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
other — .....

LOCATION: *(describe the location of your work being carried out)*

LIST OF AVAILABLE MATERIALS:

LIST OF AVAILABLE TOOLS:

LIST OF CONSTRAINTS:

DETAILED DESCRIPTION OF ACTIVITY:

PROCESS MAP:

WHAT DID YOU DO FIRST AND WHY?

ENVIRONMENT: *(describe the surroundings and project set-up)*

INFLUENCES: *(describe what influences did you have and what inspired the process or outcome)*

REFLECTION: *(describe your thoughts and comments)*

WHAT WAS CHANGED: *(describe what did you change to work with the constraints — describe the reasons behind the changes in materials, tools, shape and form of your object.)*

C3 Indicative Pre-Research Planning

Day 0 – Saturday 10th August
— Arrival + settling -
— Aimal Estanakzai (meeting to discuss plan)

Day 1 and 2 – Sunday 11th and Monday 12th August
— Eid + Family

Day 3 – Tuesday 13th August
— Orientation

Day 4 – Wednesday 14th August
— Finding tools to make 13 Type of Innovation in Context
— Setting up own studio with tools to mimic context

Day 5 – Thursday 15th August
— Subject of Making – representing 13 Types of Innovation
— Material of Making – reuse, repurpose and recycle
— Locating Collaborators – local and migrant (consent)

Day 6 – Friday 16th August
— Family

Day 7, 8 and 9 – Saturday 17th, Sunday 18th and Monday 19th August
— Making – 13 Types of Innovation (5x clusters)
— Locating Collaborators – local and migrant (visit previous contacts)

Day 10 – Tuesday 20th August
— Pre-workshop interviews with participants (local)
— Plan for Making (local)

Day 11 – Wednesday 21st August
— Pre-workshop interviews with participants (migrant)
— Plan for Making (migrant)

Day 12 – Thursday 22nd August
— Making with participants (local)
— Post-workshop interviews (local)

Day 13 – Friday 23rd August
— Family

Day 14 – Saturday 24th August
— Making with participants (migrant)
— Post-workshop interviews (migrant)

Day 15 and 16 – Sunday 25th and Monday 26th August
— Forum – local, migrant and foreigner discussions
— Reflection with Collaborators/Participants

Day 17 – Tuesday 27th August
— Context Research – mapping exercise on resources
— Kabul University Workshop – with students

Day 18 – Wednesday 28th August
— Context Research – mapping exercise on resources
— Kabul Polytechnic University Workshop – with students

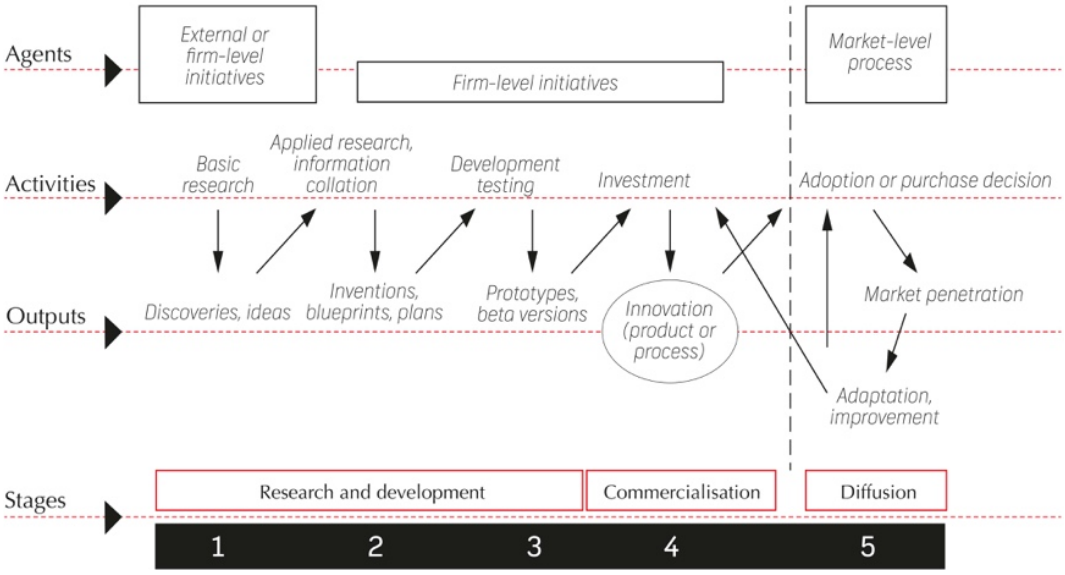
Day 19 and 20 – Thursday 29th and Friday 30th August
— Family

Day 21 – Saturday 31st August
— Return to London

Appendix D
Mapping and Diagrams

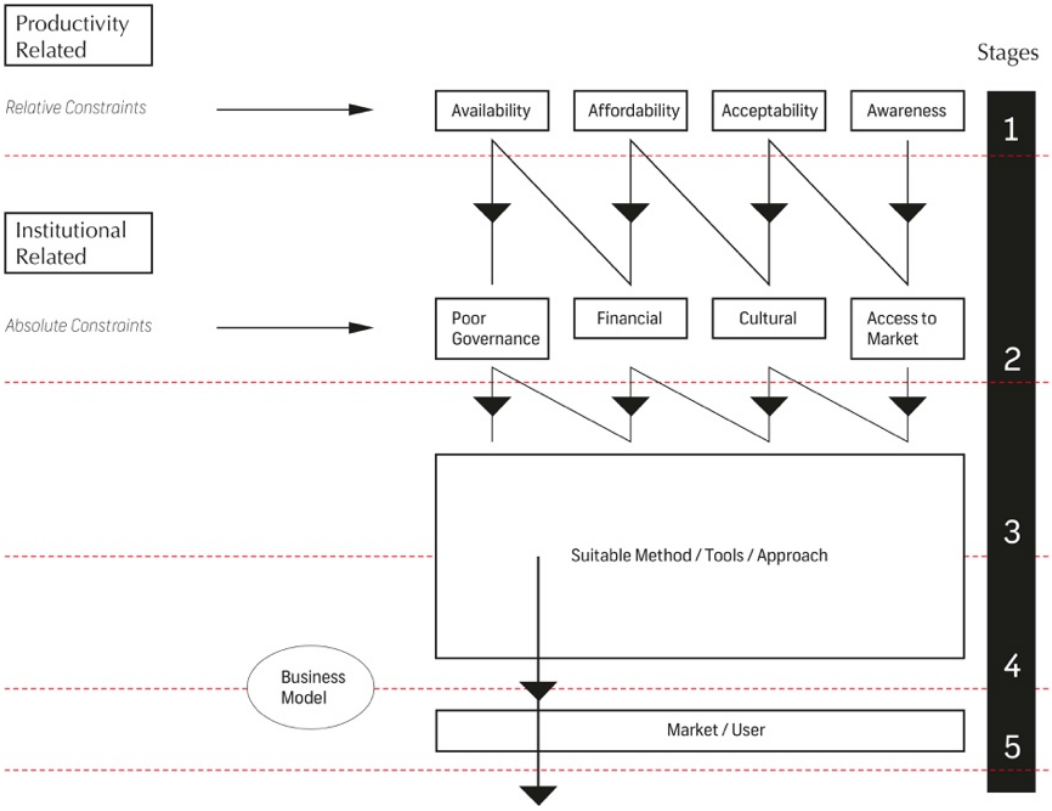
D1 Researcher's Transitions

D2 Stages of Horizontal Innovation



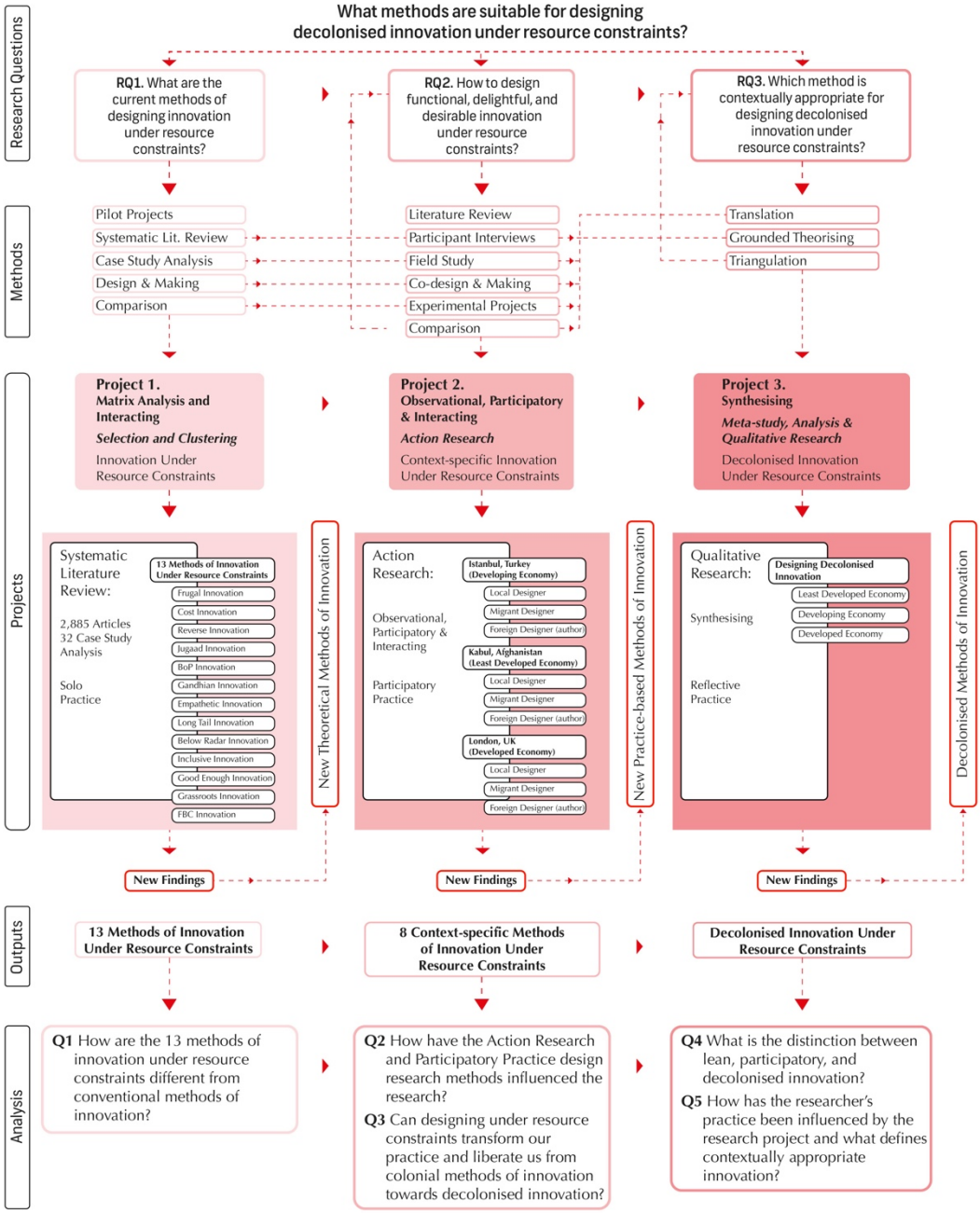
Based on Rosegger 1986, and Greenhalgh and Rogers 2010-Stages of General Innovation

D3 Stages of Vertical Innovation



Based on Anderson and Billou, 2007–4As Framework

D4 Decolonised Innovation Methodology Flow

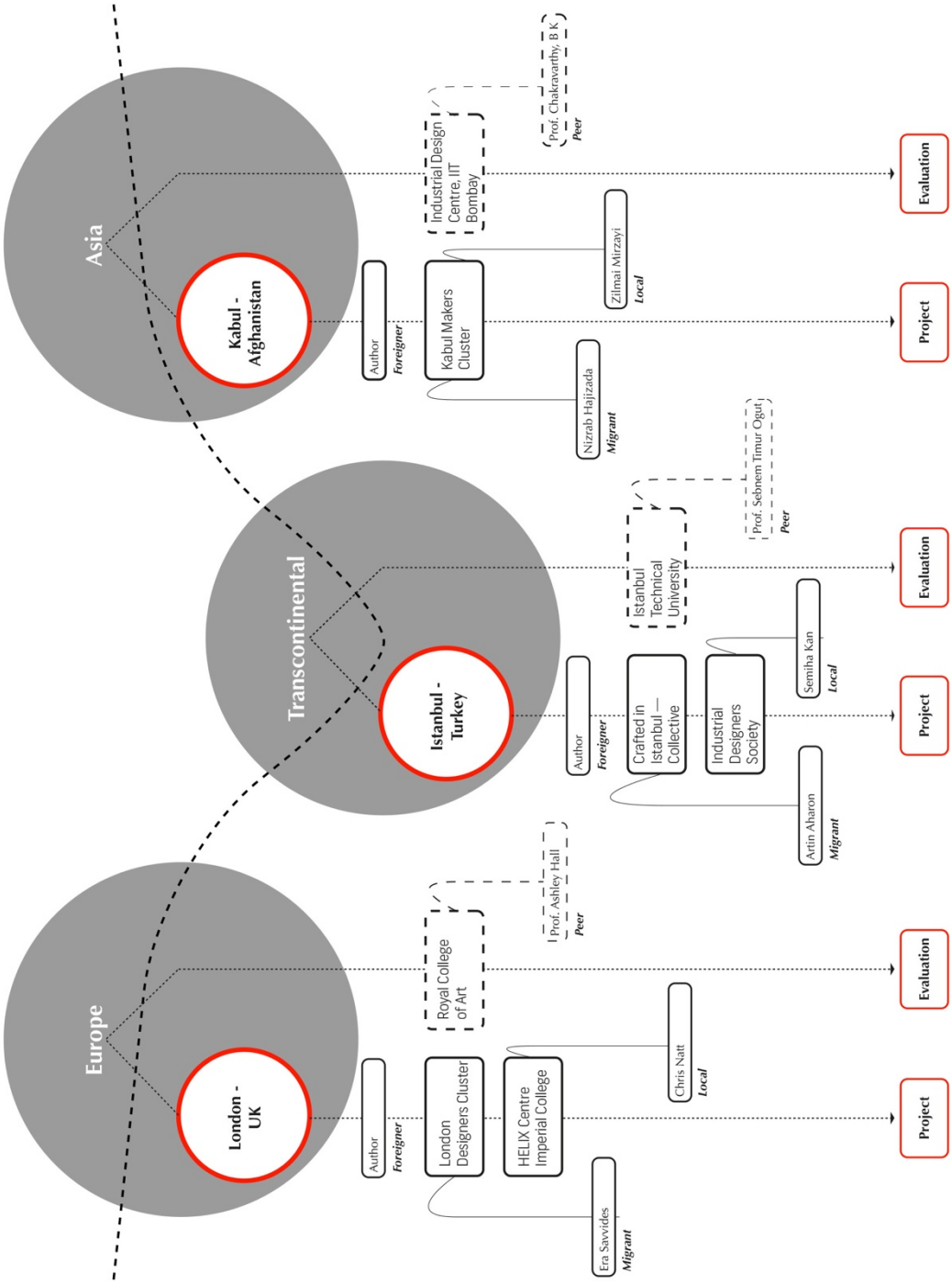


D5 Project Network Map

Explored through action research, a set of two-week-long experimental projects were carried out over a period of fourteen months, starting with *Istanbul, Turkey,* in April 2019, then moving onto *Kabul, Afghanistan,* in August 2019, followed by *London, United Kingdom,* in May-June 2020, during the global lockdown prompted by the COVID-19 pandemic.

In preparation for conducting the practice, a risk assessment was carried out and submitted for approval along with ethical approval for the research. The project network map was created to identify potential research participants, who were then approached about granting permission and agreeing to participate in this research.

Research in each of the three locations was planned to have at least two project participants who are established in their field with lived experience as a local and migrant designer, as well as a project peer with similar interests, knowledge, understanding, and expertise of the subject area whose scholarly work would help maintain high standards by acting as a reference point in the evaluation of the qualitative findings (Robson, 2011, p. 159).


Europe
London - UK
Author
Foreigner
London Designers Cluster
Royal College of Art
Prof. Ashley Hall
Peer
HELIX Centre Imperial College
Chris Natt
Local
Era Savvides
Migrant
Project
Evaluation
Transcontinental
Istanbul - Turkey
Author
Foreigner
Crafted in Istanbul — Collective
Istanbul Technical University
Prof. Sebnem Timur Ogut
Peer
Industrial Designers Society
Semiha Kan
Local
Artin Aharon
Migrant
Project
Evaluation
Asia
Kabul - Afghanistan
Author
Foreigner
Kabul Makers Cluster
Industrial Design Centre, IIT Bombay
Prof. Chakravarthy, B K
Peer
Zilmai Mirzayi
Local
Nizrab Hajizada
Migrant
Project
Evaluation

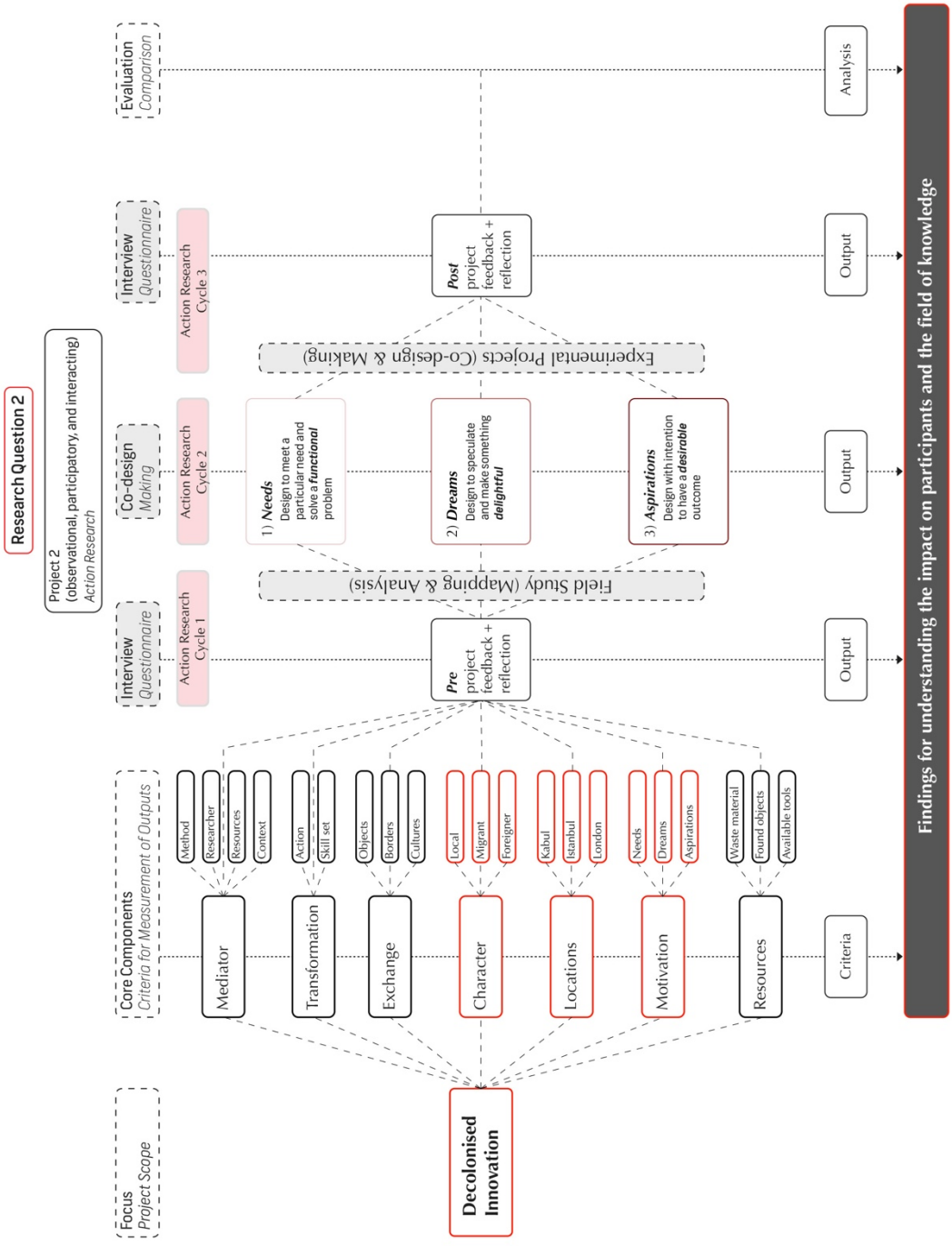
D6 Project Setup Structure

Following the development of the project network map, a project setup structure was developed through the combination of a field study and a semi-structured interview.

The *first step* in the project setup structure focused on *designing research* by investigating how the participants approach innovation under resource constraints. The key challenge was to build trust, get honest and reflective responses, and help identify a suitable participant for the second step.

The *second step* focused on *researching through design* by observing and measuring the behaviour by practicing in the moment of now in a real-world context. A key feature of this step was for me to become physically involved, share experience, and understand the experiences of the observed through the experiences of the observer (Robson, 2011, p. 319). The key challenge was to maintain the dual roles of observer and participant.

Afterwards, the *third step* involved reflecting on the findings through another set of questions that expanded previous activities, with a particular focus on the learnings and changes that were made along the way. The key challenge was to get the participants to critically reflect.


Research Question 2
Project 2
(observational, participatory, and interacting)
Action Research
Focus
Project Scope
Decolonised Innovation
Core Components
Criteria for Measurement of Outputs
Mediator
Method
Researcher
Resources
Context
Transformation
Action
Skill set
Exchange
Objects
Borders
Cultures
Character
Local
Migrant
Foreigner
Locations
Kabul
Istanbul
London
Motivation
Needs
Dreams
Aspirations
Resources
Waste material
Found objects
Available tools
Criteria
Interview
Questionnaire
Action Research
Cycle 1
Pre
project
feedback +
reflection
Output
Co-design
Making
Action Research
Cycle 2
Field Study (Mapping & Analysis)
1) Needs
Design to meet a particular need and solve a functional problem
2) Dreams
Design to speculate and make something delightful
3) Aspirations
Design with intention to have a desirable outcome
Output
Experimental Projects (Co-design & Making)
Interview
Questionnaire
Action Research
Cycle 3
Post
project
feedback +
reflection
Output
Evaluation
Comparison
Analysis
Findings for understanding the impact on participants and the field of knowledge

D7 Initial Literature Review

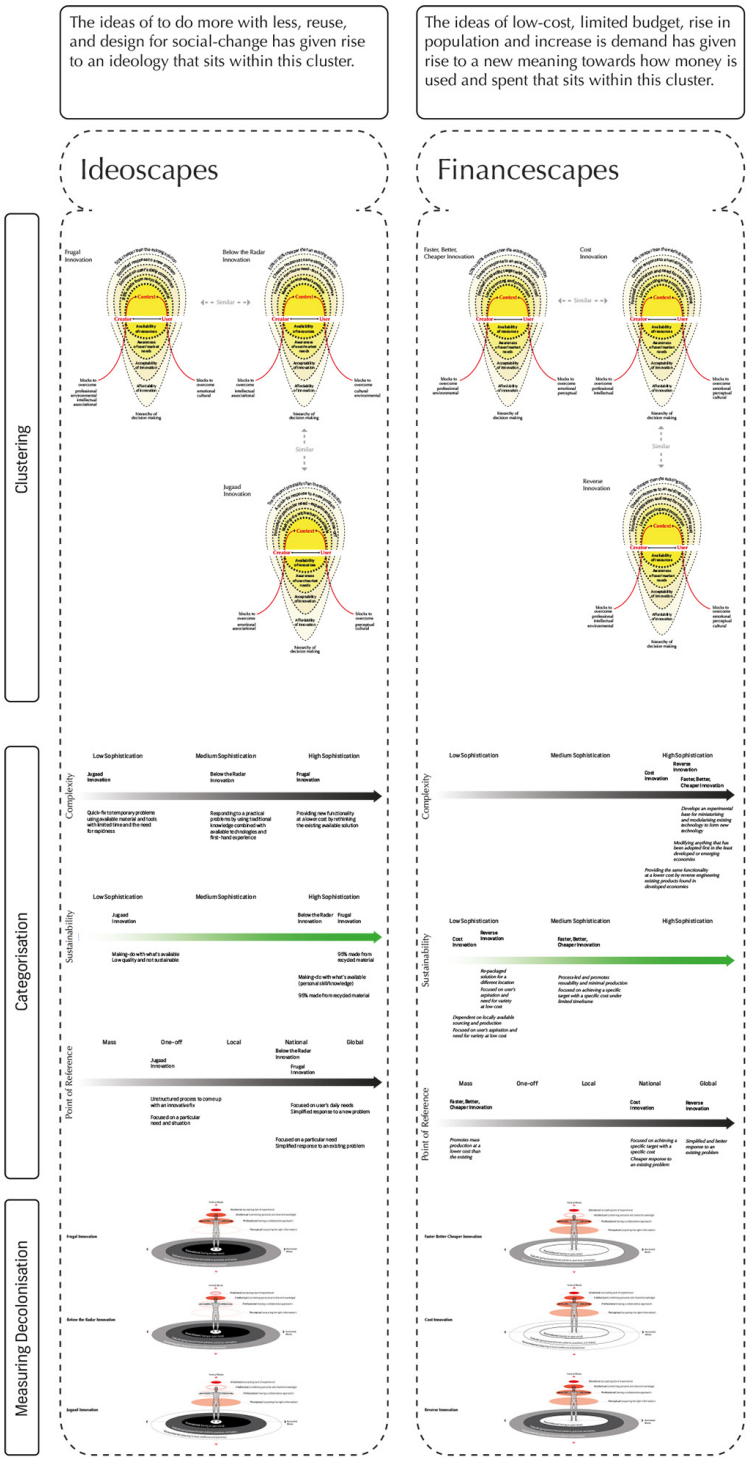
Search String	Limiting Parameters	Number of Articles	Selected Articles
"Resource Constrained" AND "Innovation"	Only scholarly (peer reviewed) journals	11	8

1) Zeschky, M. B., Winterhalter, S. and Grassmann, O. (2014). "Resource-Constrained Innovation": Classification and Implications for Multinational Firms. ISPIM Conference, Dublin, Ireland,	2) Puri, M. and Tavoletti, E. (2013). Resource Constrained Innovation at the Bottom of the Pyramid: Towards a Theoretical Framework. Journal of the Italian Academy of Management. Vol 4	3) Pansera, M. and Owen, Richard J. (2014). Framing Resource-Constrained Innovation at the 'Bottom of the Pyramid': Insights from an ethnographic case study in rural Bangladesh. Elsevier, Vol. 92	4) Winterhalter, S. (2015). Resource-Constrained Innovation and Business Models in Emerging Markets. University of St. Gallen, Bamberg, Germany
5) Berger, C. and Dukaczewski, S. (2014). Comparison of Architectural Design Decisions for Resource-Constrained Self-Driving Cars - A Multiple Case-Study. Proceedings of the INFORMATIK 2014	6) Weyrauch, T. and Herstatt, C. (2014). What is Frugal Innovation? Three defining criteria. Journal of Frugal Innovation. Springer Open	7) Winter, A. and Govindarajan, V. (2015). Engineering Reverse Innovations. Harvard Business Review, Vol. July-August 2015	8) McCaffrey, T. (2015). Find Innovation Where You Least Expect It. Harvard Business Review, Vol. December 2015

D8 Systematic Literature Review

Search String	Limiting Parameters	Search Database	Number of Articles	Selected Articles
"Frugal" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	60	20
		EBSCO	49	7
		ProQuest	71	1
		SSRN	86	6
				34 (Total)
"Cost" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	27	3
		EBSCO	478	2
		ProQuest	9	2
		SSRN	37	1
				8 (Total)
"Reverse" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	102	7
		EBSCO	25	1
		ProQuest	179	1
		SSRN	56	3
				12 (Total)
"Jugaad" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	18	3
		EBSCO	2	1
		ProQuest	10	1
		SSRN	17	0
				5 (Total)
"Bottom of Pyramid" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	43	4
		EBSCO	9	2
		ProQuest	110	1
		SSRN	9	3
				10 (Total)
"Gandhian" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	1	1
		EBSCO	3	1
		ProQuest	52	0
		SSRN	3	1
				3 (Total)
"Empathetic" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	0	0
		EBSCO	13	2
		ProQuest	266	1
		SSRN	1	0
				3 (Total)
"Long Tail" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	5	1
		EBSCO	6	1
		ProQuest	0	0
		SSRN	14	1
				3 (Total)
"Below the Radar" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	1	1
		EBSCO	2	1
		ProQuest	211	1
		SSRN	24	2
				5 (Total)
"Inclusive" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	191	6
		EBSCO	32	1
		ProQuest	1	1
		SSRN	138	1
				9 (Total)
"Good Enough" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	0	0
		EBSCO	9	1
		ProQuest	0	0
		SSRN	34	1
				2 (Total)
"Grassroots" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	25	6
		EBSCO	19	0
		ProQuest	20	0
		SSRN	47	3
				9 (Total)
"Faster, Better, Cheaper" AND "Innovation" (all in the title)	Only scholarly (peer reviewed) journals			
		Google Scholar	9	0
		EBSCO	2	1
		ProQuest	351	1
		SSRN	7	0
				2 (Total)

D9 The 13 Methods of Innovation Under Resource Constraints

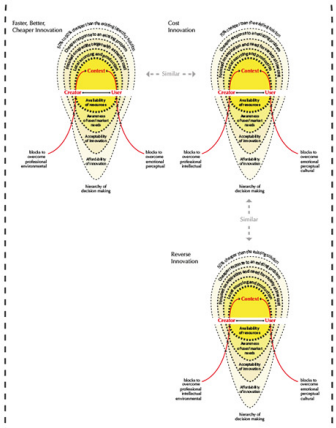


The ideas of low-cost, limited budget, rise in population and increase is demand has given rise to a new meaning towards how money is used and spent that sits within this cluster.

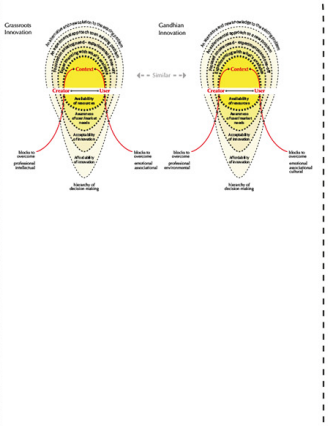
The ideas of possibility and social change, affordability and individualism has given rise to a new ethnoscape that sits within this cluster.

The ideas of boundary-less flow and use of technology, the mix of software and hardware, and using technology for social good has given rise to a new technoscape that sits in this cluster.

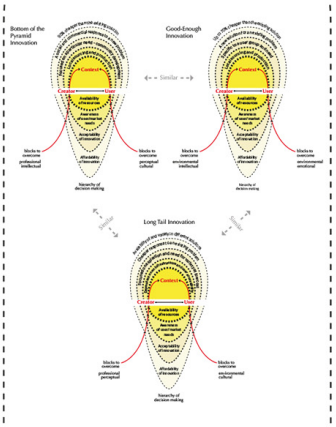
Financescapes



Ethnoscapes

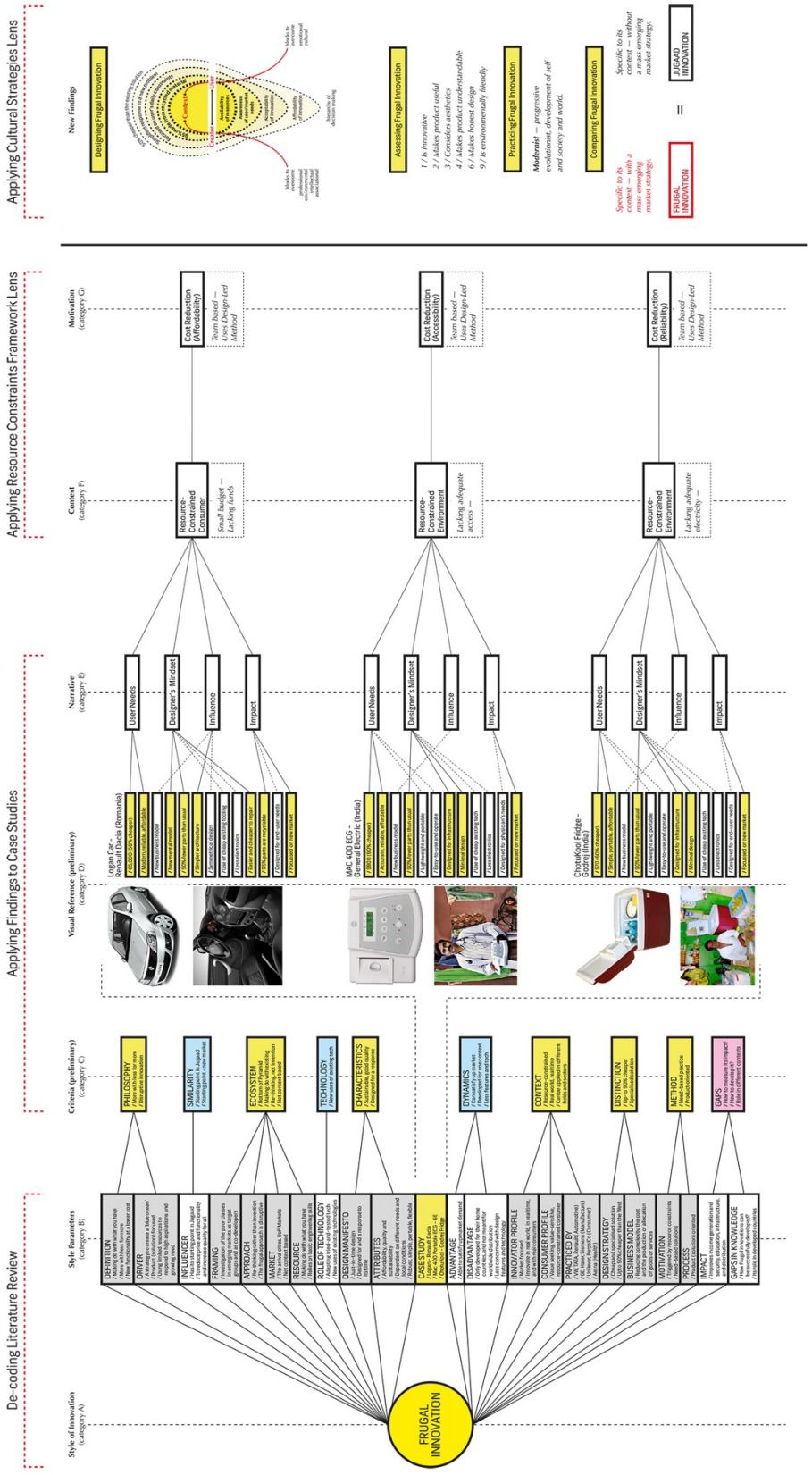


Technoscapes

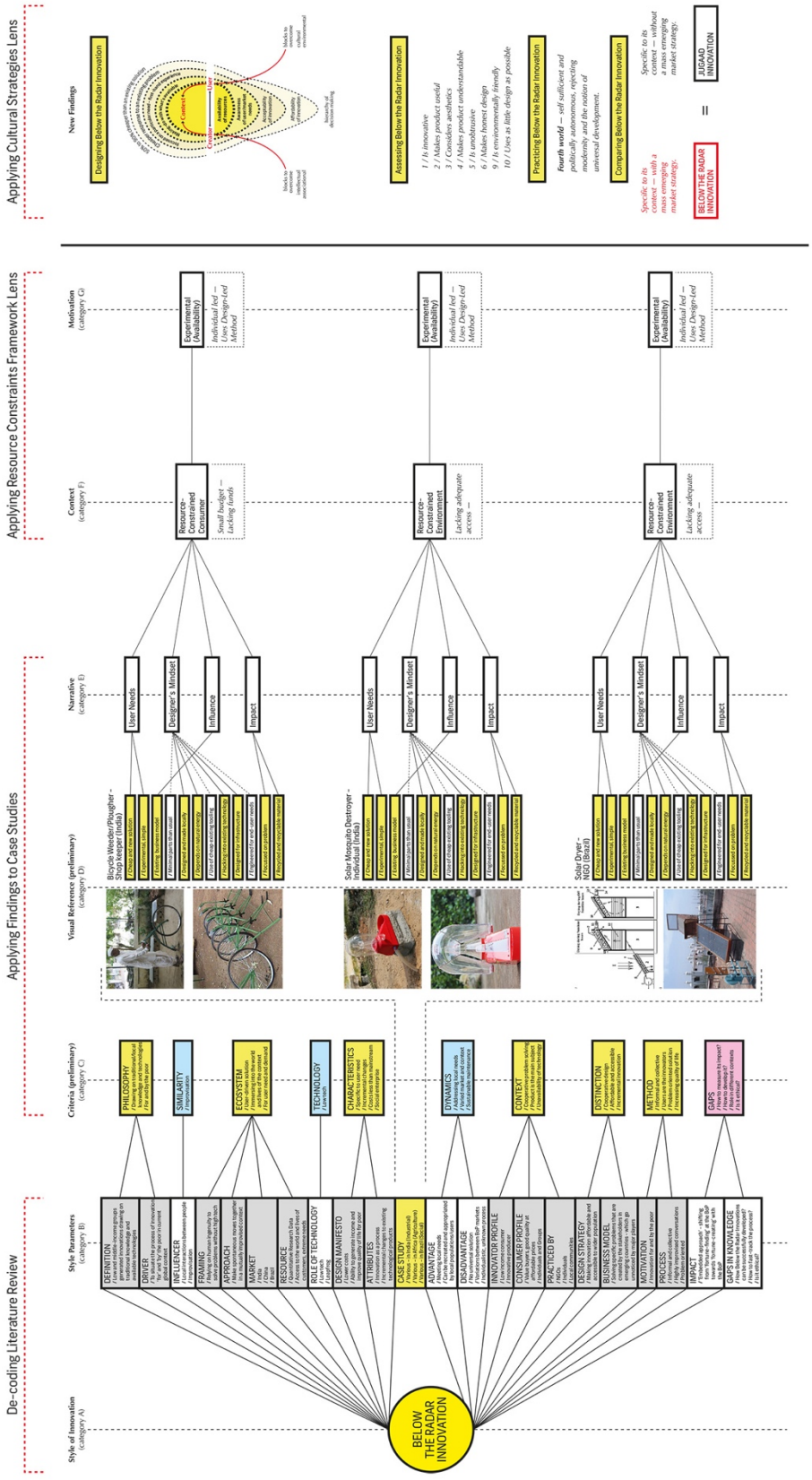


Appendix E
Ideoscapes

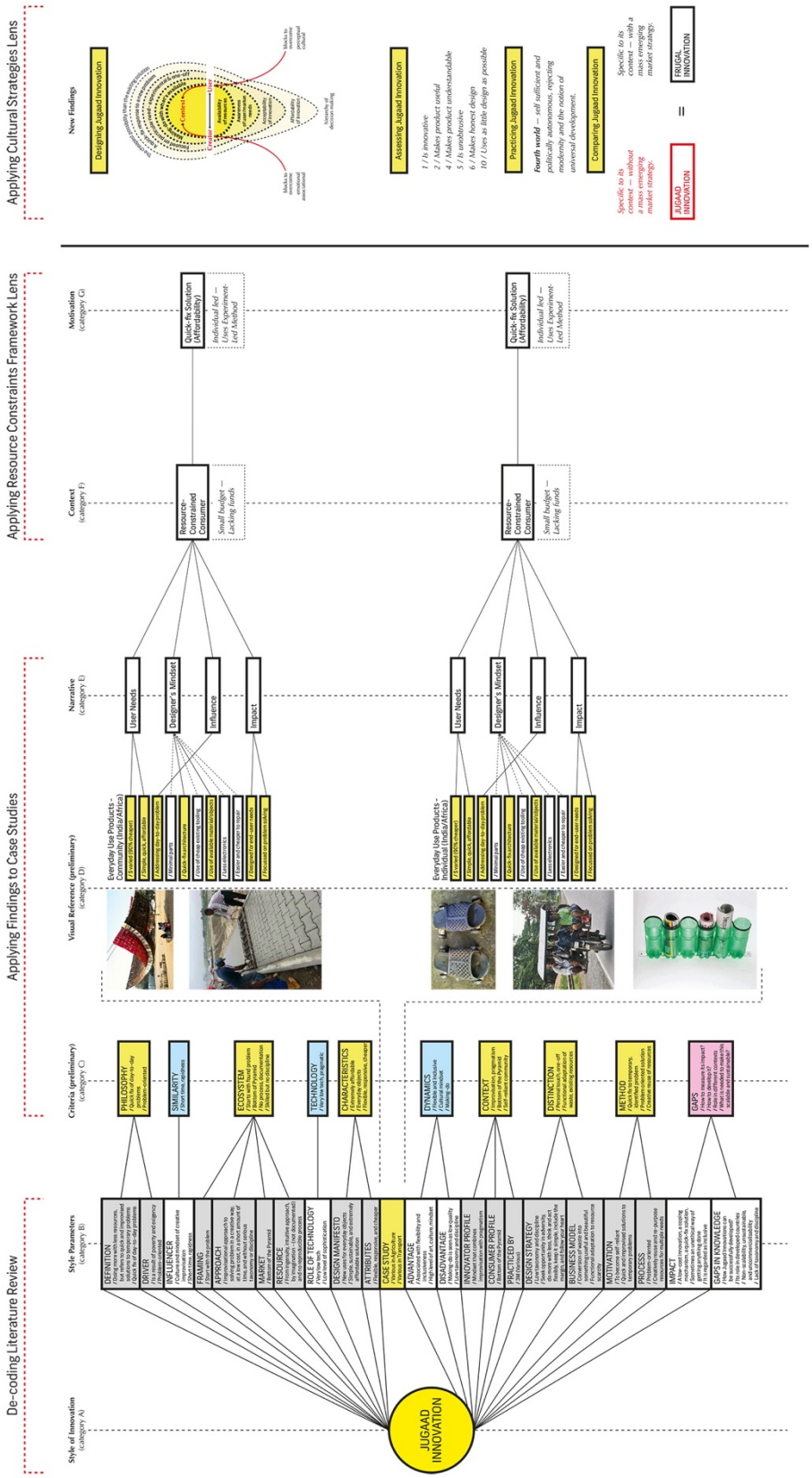
E1 Decoding Frugal Innovation



E2 Decoding Below the Radar Innovation



E3 Decoding Jugaad Innovation



E4 Case Study Analysis

As shown in E4.1, three case studies were selected to analyse *Frugal Innovation* qualitatively. For example, Logan *(left),* was developed as a low-cost car for Europe that married high quality and with affordability. This required an immense cultural and mental shift for those designing and manufacturing a car with 50% fewer parts who had grown up and practiced in a resource-rich economy, such as France. This forced Renault to develop the car with a different breed of people who lived in an emerging economy context, such as Romania, and could innovate under constraints by utilising their cost sensitivity to resources and experiences growing up in a harsh communist environment (Radjou and Prabhu, 2015, p. 2).

Similarly, the MAC 400 ECG *(middle)* was developed as a low-cost electrocardiogram for least developed and developing economies and designed to be portable and robust to suit the environment with power fluctuations and dust. This was achieved by reducing the size and retaining only key functionalities while using standard, off-the-shelf technology, such as charging systems used for mobile phones, resulting in a high-tech device the is cost-optimised (Ramdorai and Herstatt, 2013, p. 12).

On the other hand, ChotuKool *(right)* was developed in response to the erratic power supply in many parts of India. Using off-the-shelf thermoelectric cooling technology, it caters to the financial and spatial limitations facing migrant workers. As a co-created, portable, and battery-powered fridge, its design was defined by its cost and context, which required re-thinking of existing fridge design and reducing 90% of parts (Tiwari and Herstatt, 2012, p. 14).

E4.1: *Frugal Innovation Case Studies*

Left: Logan by Renault Dacia

https://biancar.com.ar/wp-content/uploads/2019/06/renault-logan.jpg

Middle: MAC 400 ECG by General Electric

https://www.gehealthcare.com/insights

Right: ChotuKool by Godrej

http://coldstarlogistics.com/blog/chotukool

For *Below the Radar Innovation*, two case studies were selected (see E4.2). For example, Bicycle Weeder (left) was designed by a frustrated farmer from India who, through trial and error, modified a standard bicycle for the purpose of farm operations with the aim of making innovation affordable and accessible to a wider population within his immediate context (Iizuka and SadreGhazi, 2012, p. 10).

Similarly, the Solar Dryer *(right)* is a response to frustrations with fuel poverty in rural areas. Through a process of collective effort taking place in informal and highly improvised conversations, it was designed for small farmers who cannot afford commercial dehydration units to store and satisfactorily dehydrate agricultural food products using solar energy (Larsen and Bogers, 2014, p. 386).

E4.2: *Below the Radar Innovation Case Studies*

Left: Bicycle Weeder/Plougher by Goal Bhise

https://dawnpages.wordpress.com/2013/03/04/ tiller-turns-engineersowing-a-cycle-andreaping- a-harvest/

Right: Solar Dryer by a Brazilian NGO

https://www.sciencedirect.com/science/article/abs/ pii/S1364032110001255

Due to a lack of taxonomy and discipline, *Jugaad innovation* delivers a one-off solution (Brem and Wolfram, 2014, p. 11). Therefore, the case studies (E4.3) fail to identify an overall process for practicing such innovation; however, its applications include finding quick uses for everyday objects (Radjou et al., 2012, p. 4) and are dependent on flexible making techniques, which compromise on quality (Bhatti and Ventresca, 2013, p. 17).

E4.3: *Jugaad Innovation Case Studies*

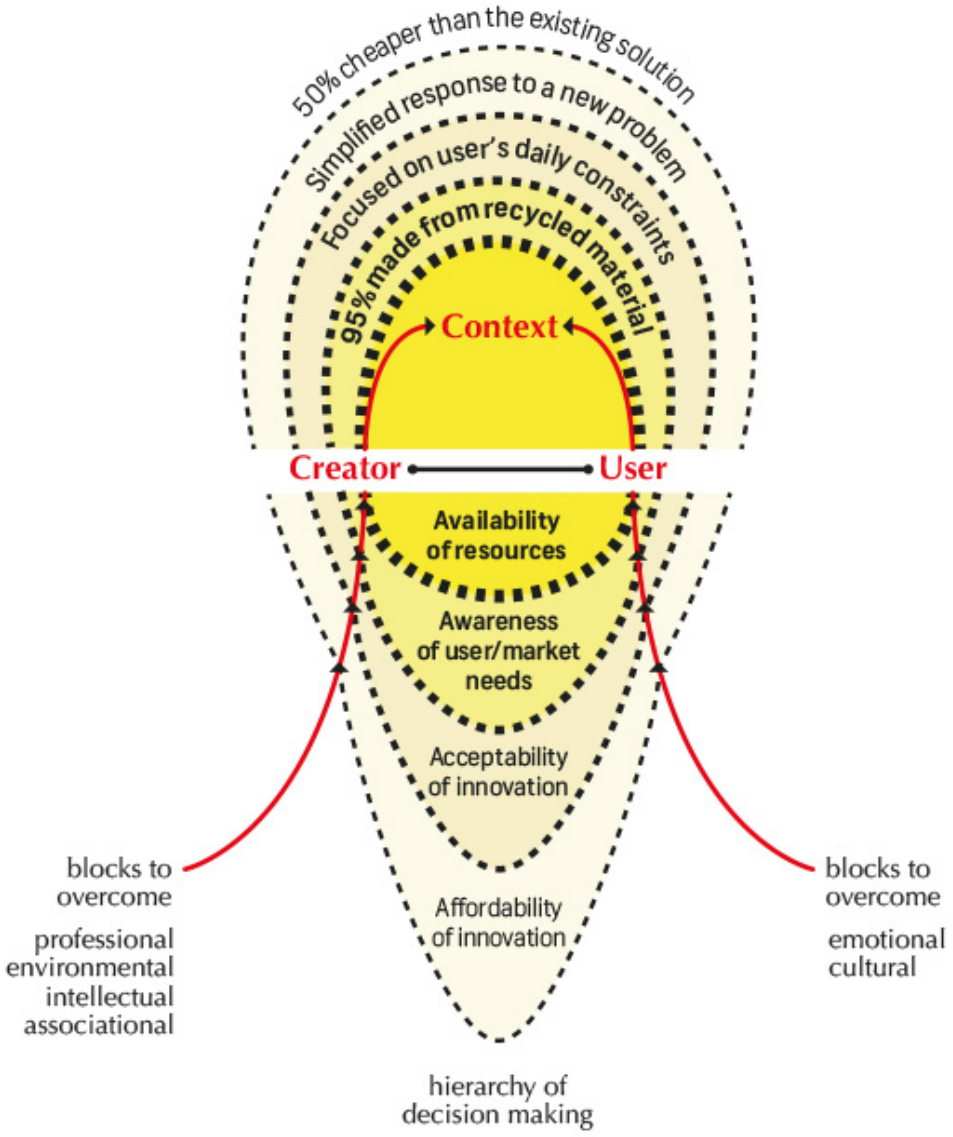
Left: Jugaad Innovation at Community Scale by Sanjeev Shankar

http://www.sanjeevshankar.com/jugaad.html

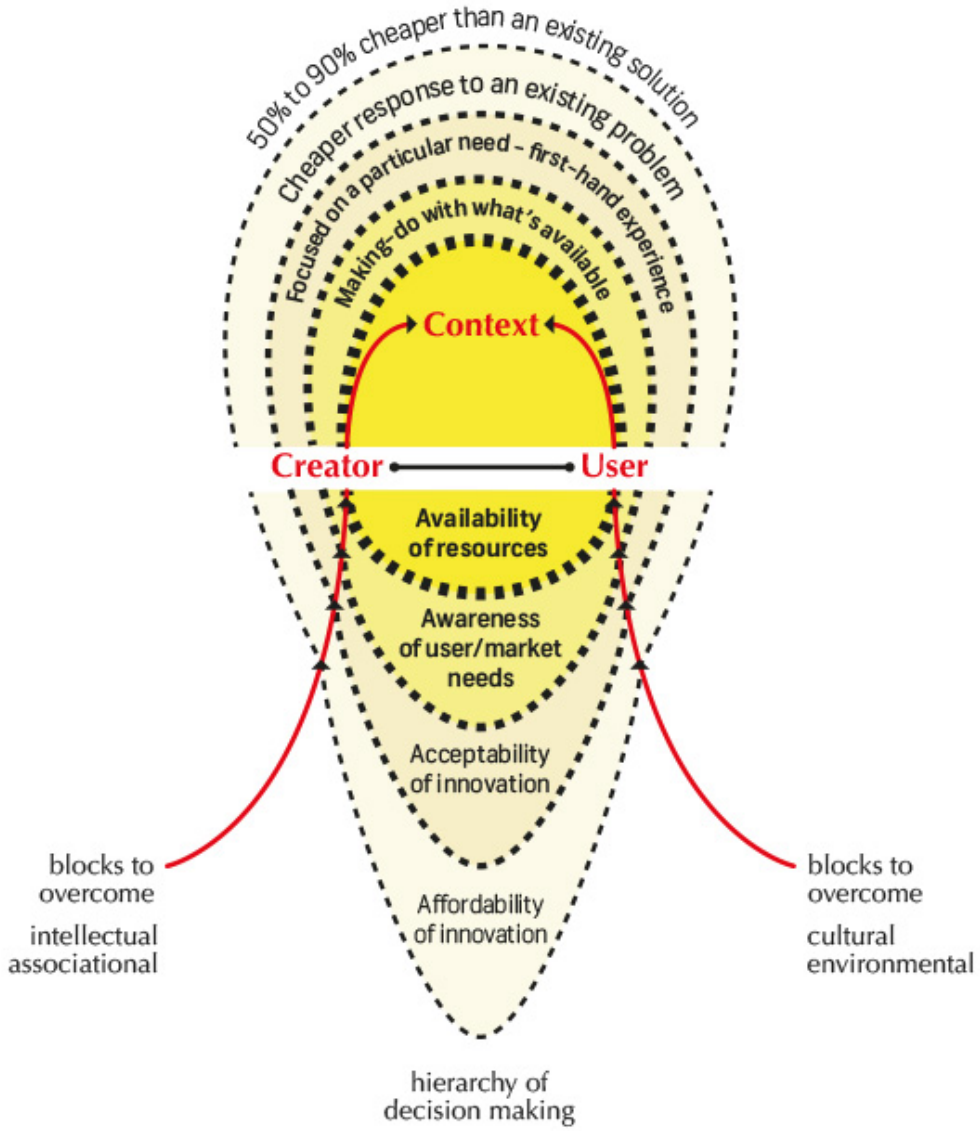
Left: Jugaad Innovation at Individual Scale

https://interestinggyan.blogspot.com/2013/05/ju gaad-innovation-indian-creativity-tool.html

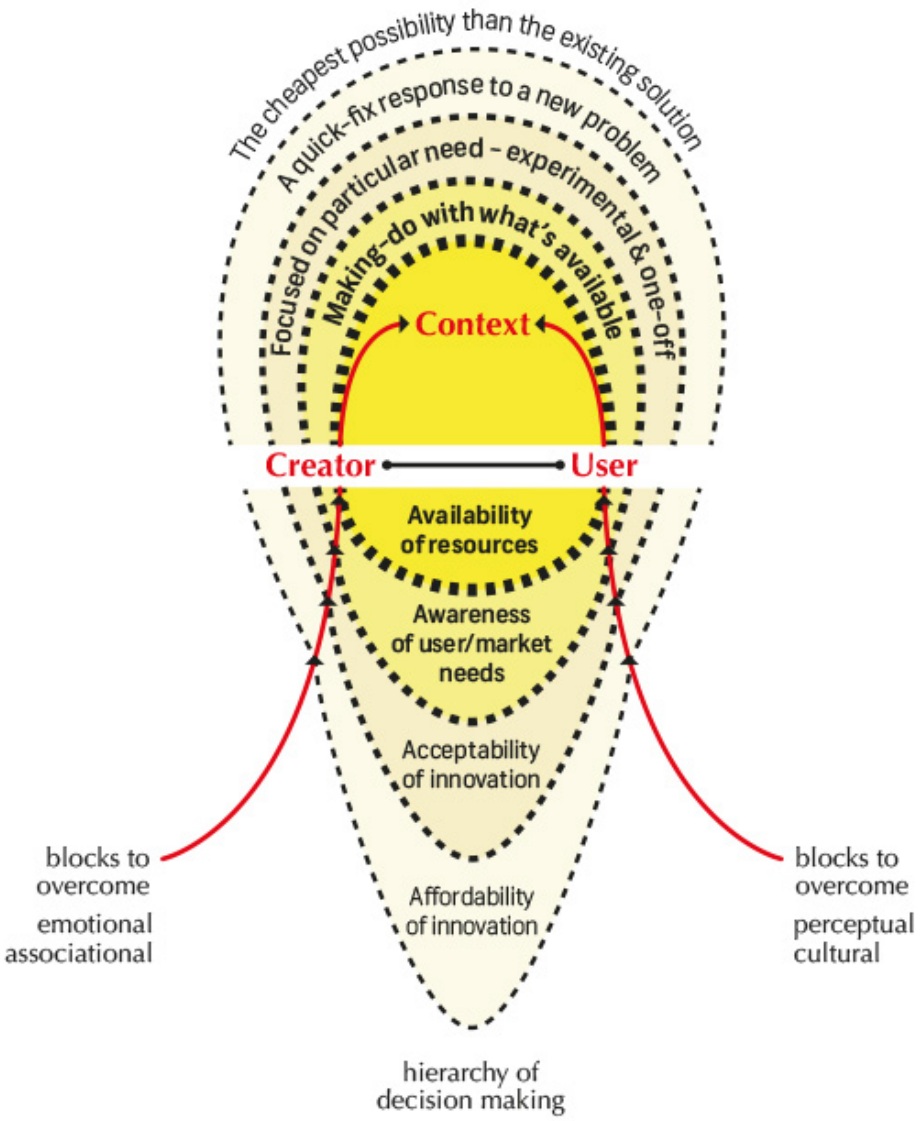
E5 Designing Ideoscapes
Cluster of Innovations



E5.1: *Frugal Innovation Framework*

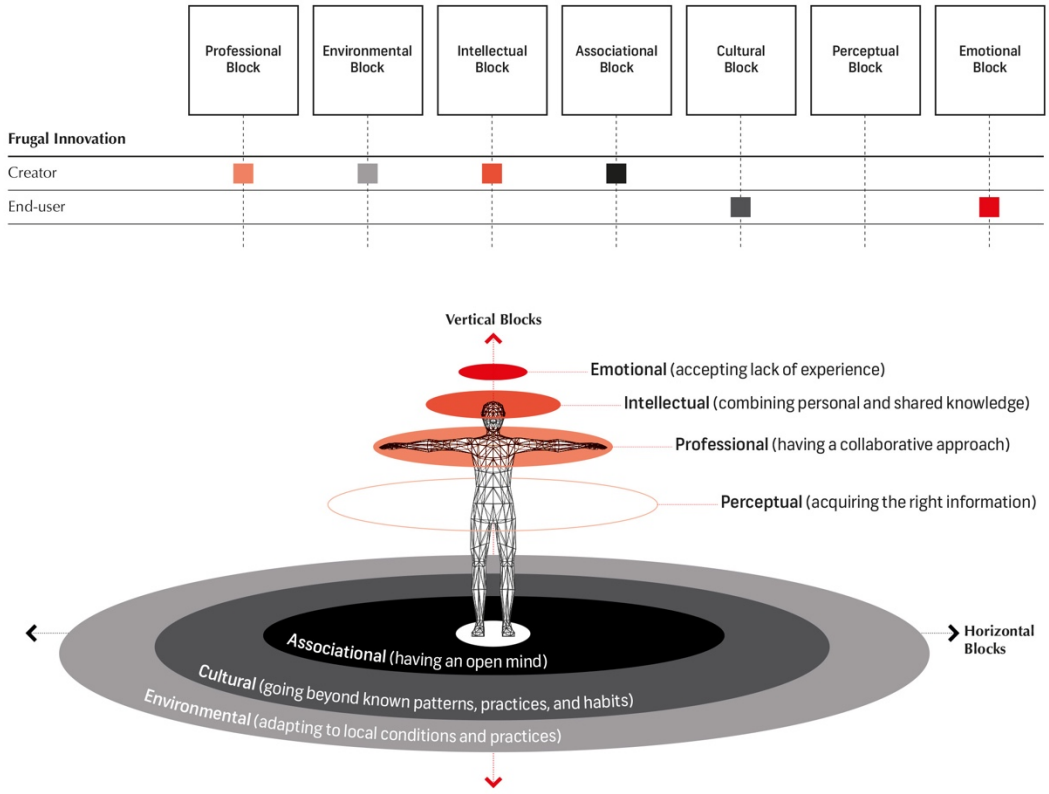


E5.2: *Below the Radar Innovation Framework*

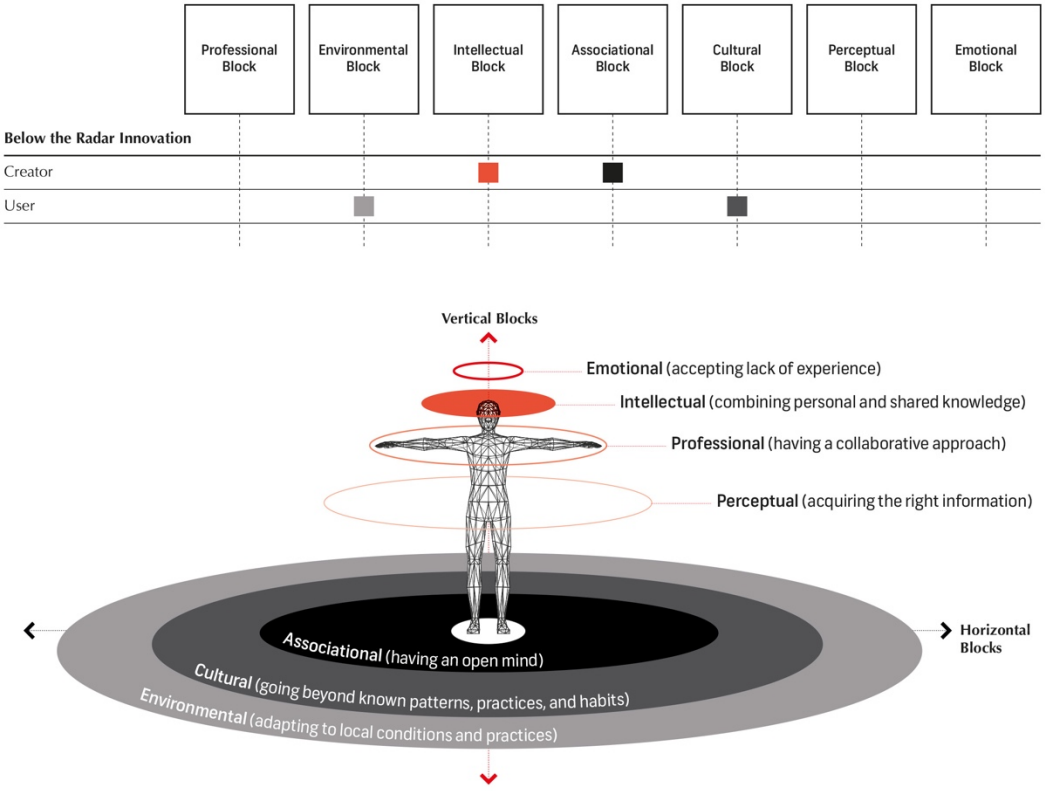


E5.3: *Jugaad Innovation Framework*

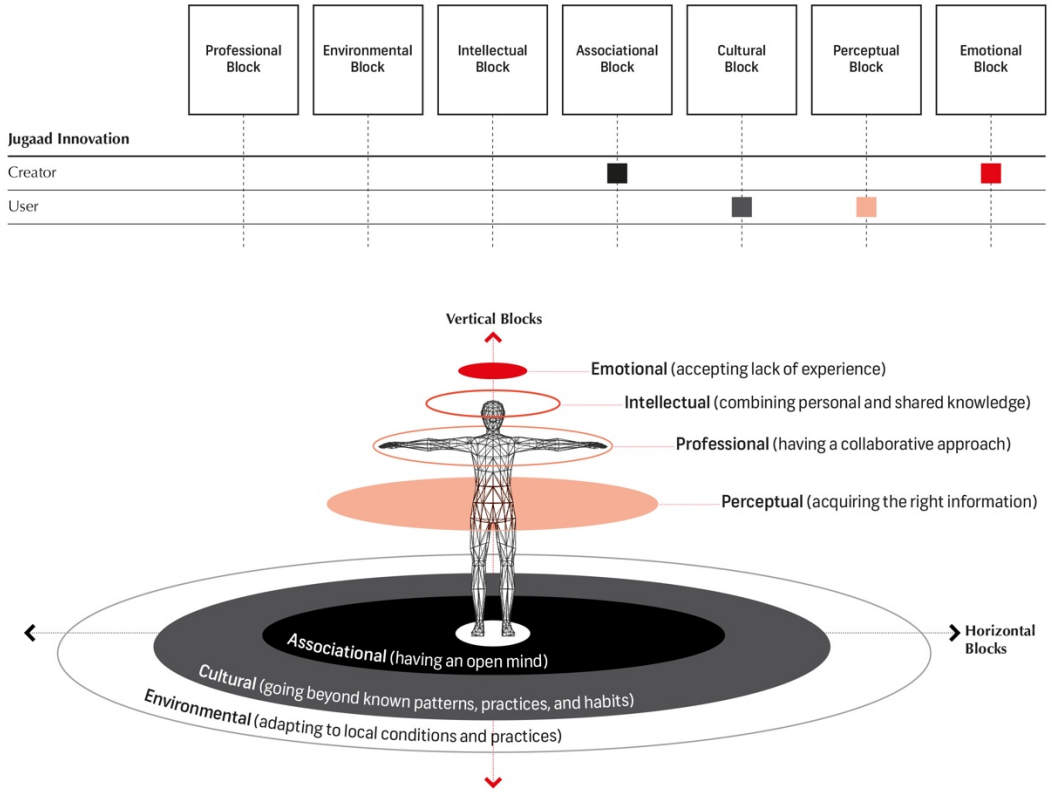
E6 Measuring Decolonisation In Ideoscapes



E6.1: *Measuring Decolonisation in Frugal Innovation*



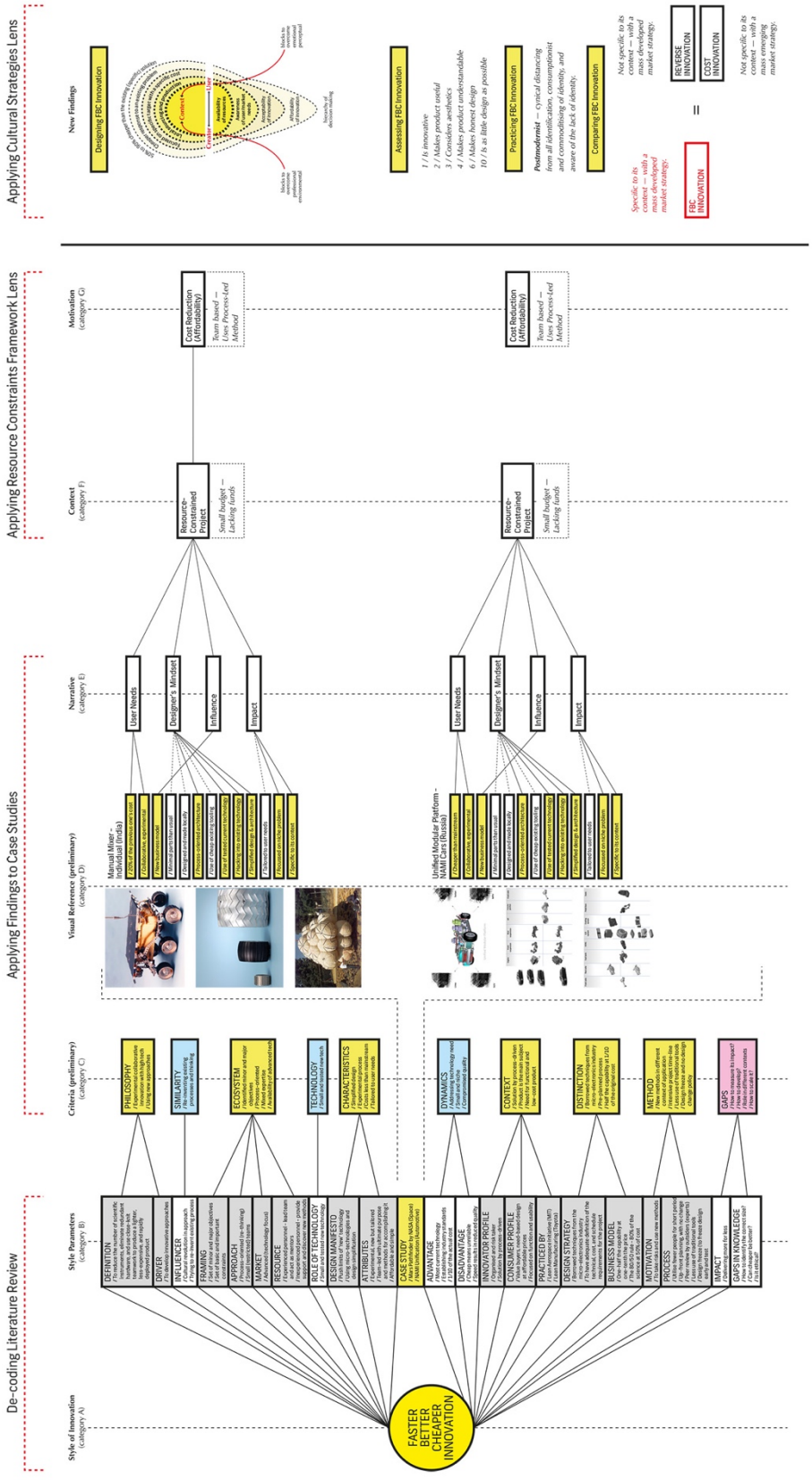
E6.2: *Measuring Decolonisation in Below the Radar Innovation*



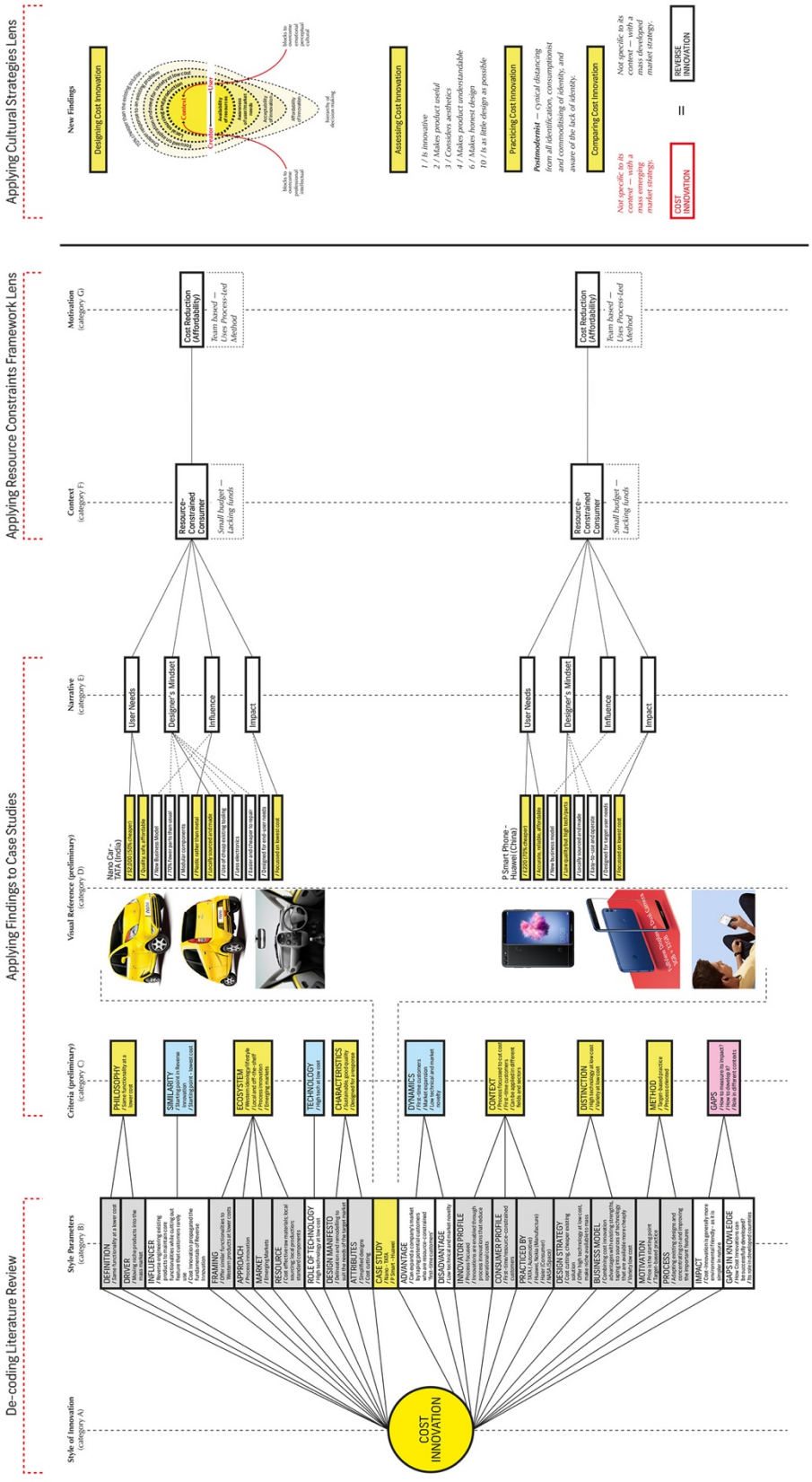
E6.3: *Measuring Decolonisation in Jugaad Innovation*

Appendix F
Financescapes

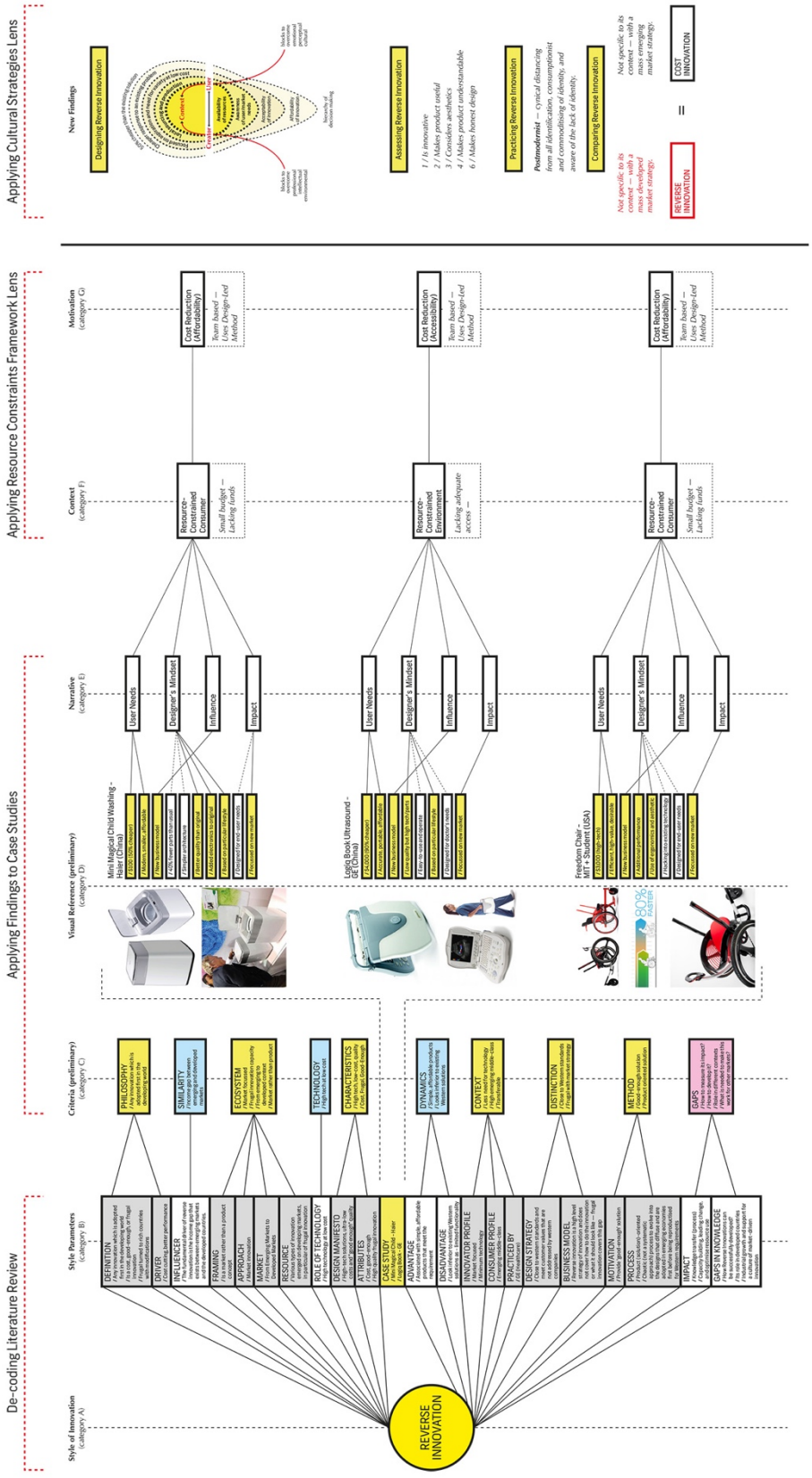
F1 Decoding Faster Better Cheaper Innovation



F2 Decoding Cost Innovation

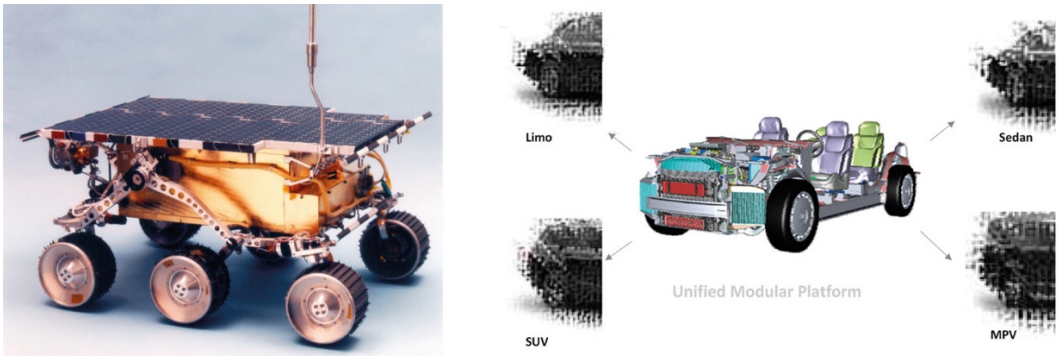


F3 Decoding Reverse Innovation



F4 Case Study Analysis

As shown in F4.1, two case studies were selected to analyse *Faster Better Cheaper Innovation* qualitatively. For example, Sojourner Rover *(left)* was developed as a lightweight wheeled robot to conduct experiments on the Martian surface by bringing together various experimental technologies within a set timeframe and budget. This helped the National Aeronautics and Space Administration (NASA) to begin a cultural revolution that introduced modularity, risk-taking, shorter development cycles, and continuous user feedback loops in their process (Stanko et al., 2012, pp. 753-754) to develop cost-, time-, and quality-specific products and technology that is highly dependent on locally available sourcing and production.



F4.1: *Faster Better Cheaper Innovation Case Studies*
Left: Sojourner Rover by NASA
https://en.wikipedia.org/wiki/Mars_Pathfinder
Right: Unified Modular Platform by NAMI Cars
https://aurus-avilon.ru/en/senat/

Similarly, Unified Modular Platform *(right)* enables variations of domestic vehicles to be built for government officials using ready-made components and local production facilities. Designed as a response to rising government expenditure on official vehicles, it enables exclusive, premium, and business segment cars to be produced at a fraction of cost and time using a single platform.

For *Cost Innovation*, two case studies were selected (see F4.2). For example, Nano *(left)* was developed in response to the needs of those with a growing family and low income. Priced at 2,000 USD, it is a re-engineered and much simplified version of any four-wheeler vehicle designed by utilising low-quality materials such as plastic rather than metal. While an attractive and cost-effective means of transportation for the underprivileged, the repositioning of the car directly at low-income users resulted in building a stigma that cheaper products are of low quality and can be associated with those at the bottom of the pyramid (Singh and Joshi, 2015, p. 90).

Furthermore, P Smart Phone *(right)* was developed using low-cost materials and high technology with the aim to reduce the cost of a smart phone by 70% through locally sourced and standardised components as well as minimal design aesthetics (Zeschky et al., 2014, pp. 4-5).

F 4.2: *Cost Innovation Case Studies*

Left: Nano by TATA

https://www.carbodydesign.com/ar chive/2009/03/24-tata-nano/

Right: P Smart Phone by Huawei

https://consumer.huawei.com/pk/phones/

To understand *Reverse Innovation*, three case studies were selected (see F4.3). For example, Mini Magical Child Washing *(left)* is a washing machine designed for small and cramped households that wash regularly and in daily

loads due to a growing urban lifestyle evident across different geographies (Widenmayer and Gassmann, 2014, p. 256). Logiq Book *(middle)*, on the other hand, was designed as a portable and affordable ultrasound system for least developed and developing economies; however, its use and application have been considered suitable for developed economies, too.

On the contrary, the Freedom Chair *(right)* was designed as a lever-powered wheelchair that enables end-users in least developed and developing economies to move around easily and quickly; however, its application and value are understood to be suitable for users in developed economies as well due to similar challenges but less severe (Judge et al., 2015, p. 8).

F4.3: *Reverse Innovation Case Studies*

Left: Mini Magical Child Washing by Haier

https://www.ippinka.com/blog/haier-mini-washer/

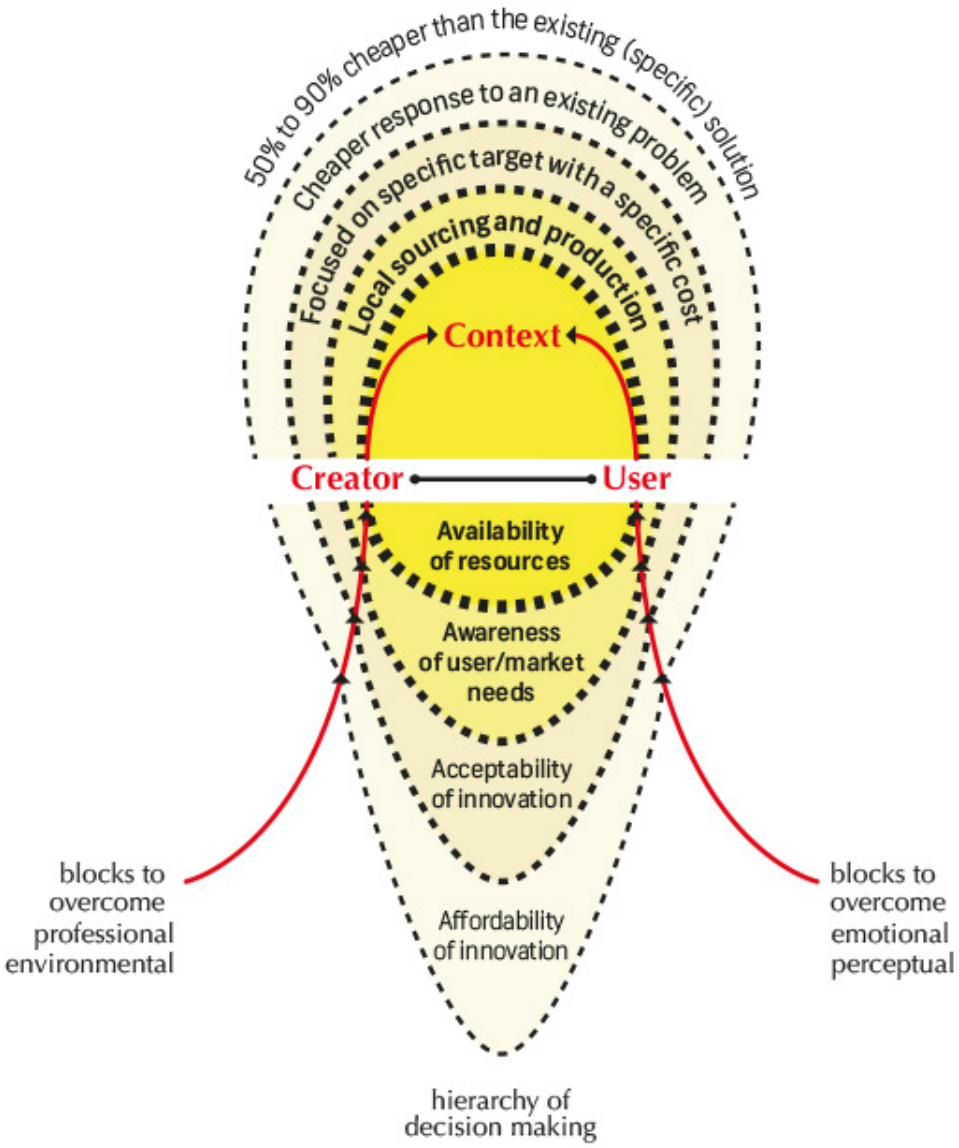
Middlet: Logiq Book by General Electric

https://www.kpihealthcare.com/products/ultrasound -machines/ge-ultrasound/ge-logiq-book-portable/

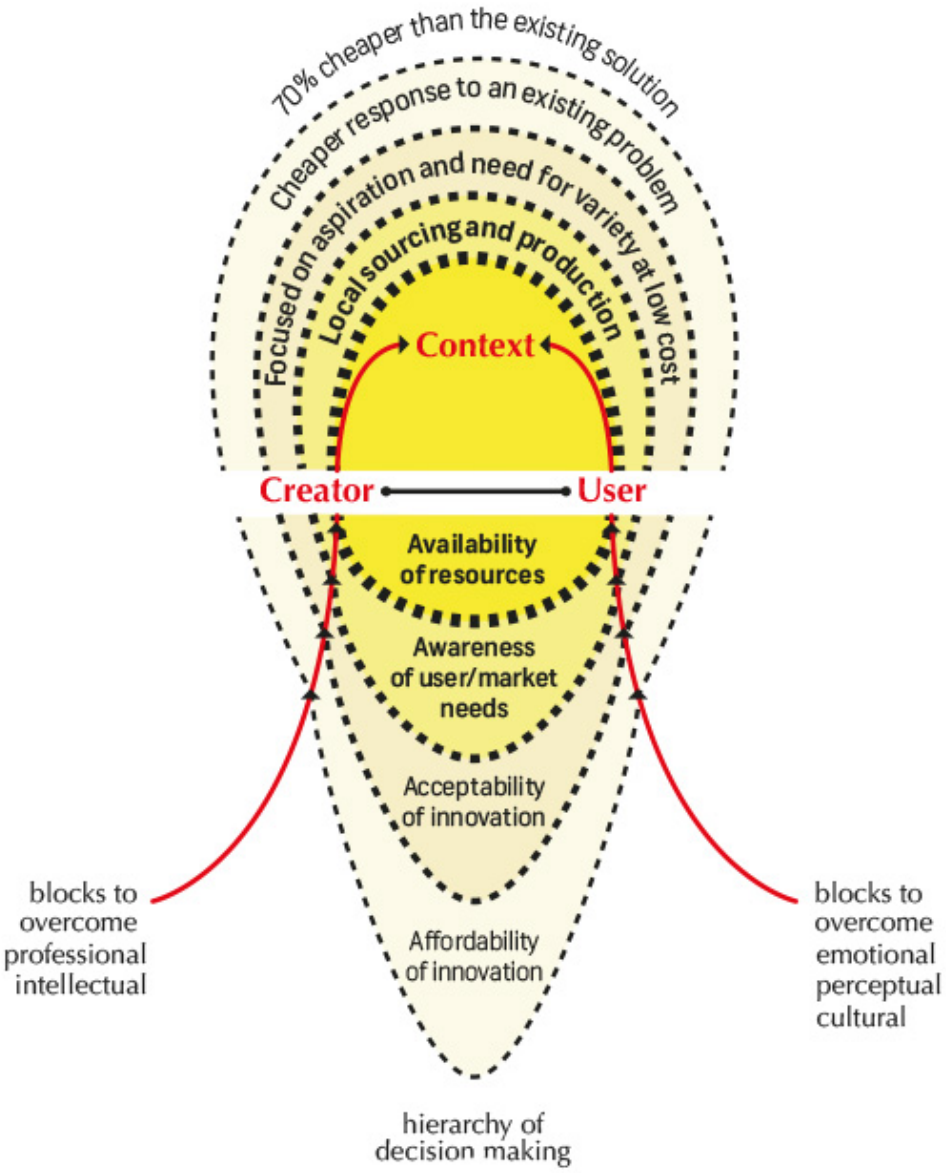
Left: Freedom Chair by MIT

https://www.behance.net/gallery/4544555/Mobili ty-Beyond-Pavement

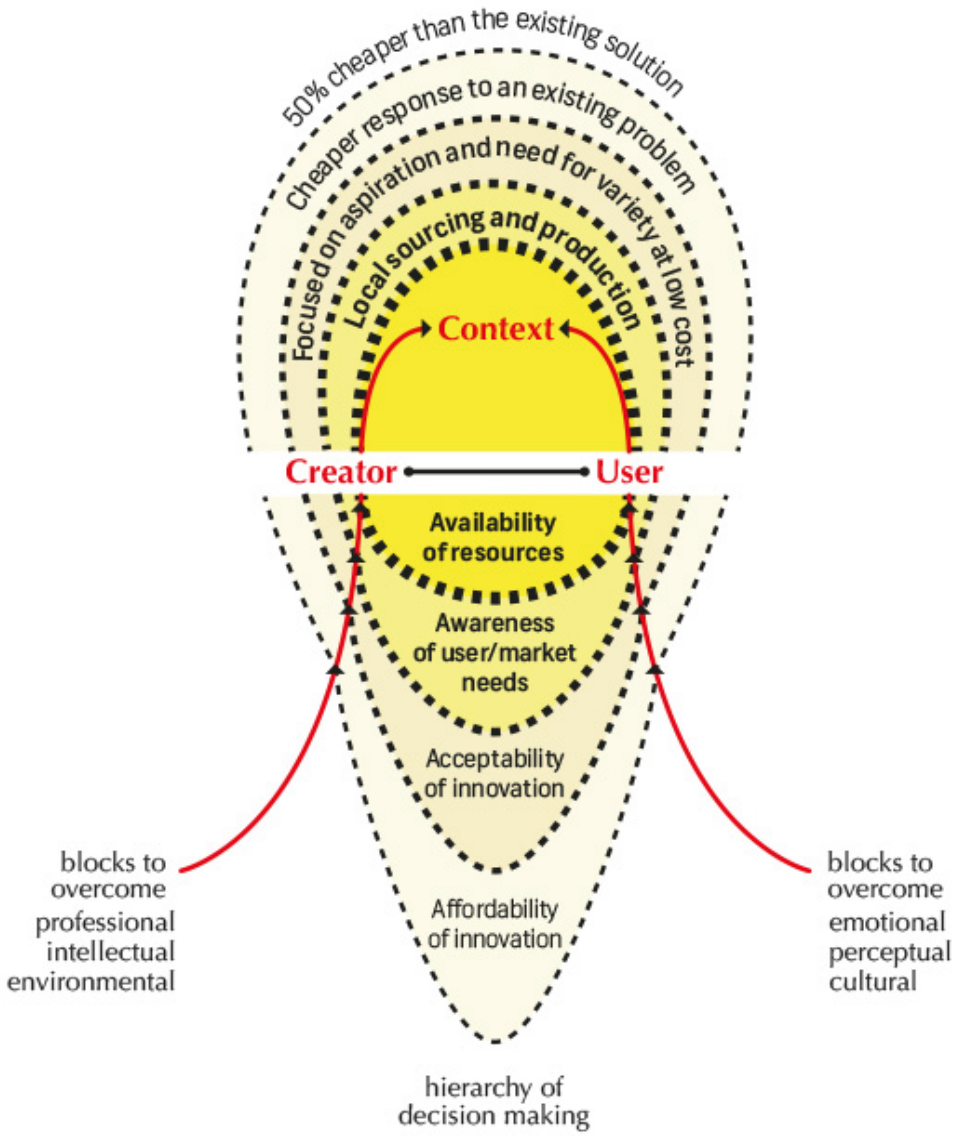
F5 Designing Financescapes Cluster of Innovations



F5.1: *Faster Better Cheaper Innovation Framework*

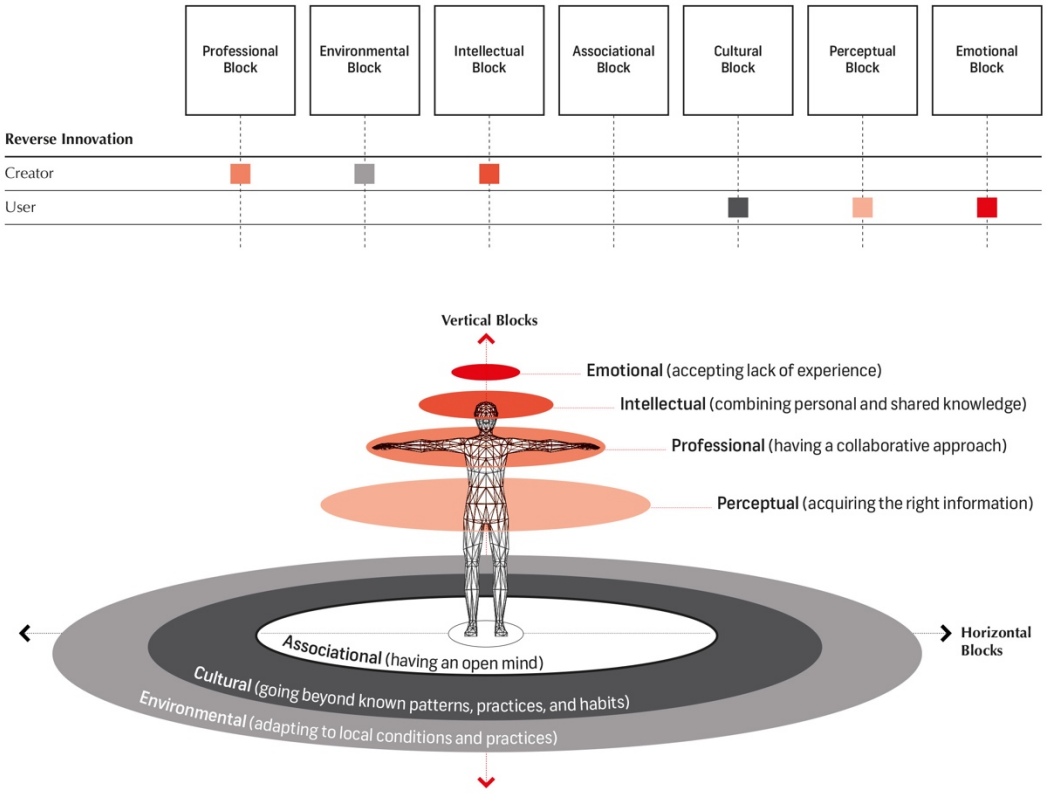


F5.2: *Cost Innovation Framework*

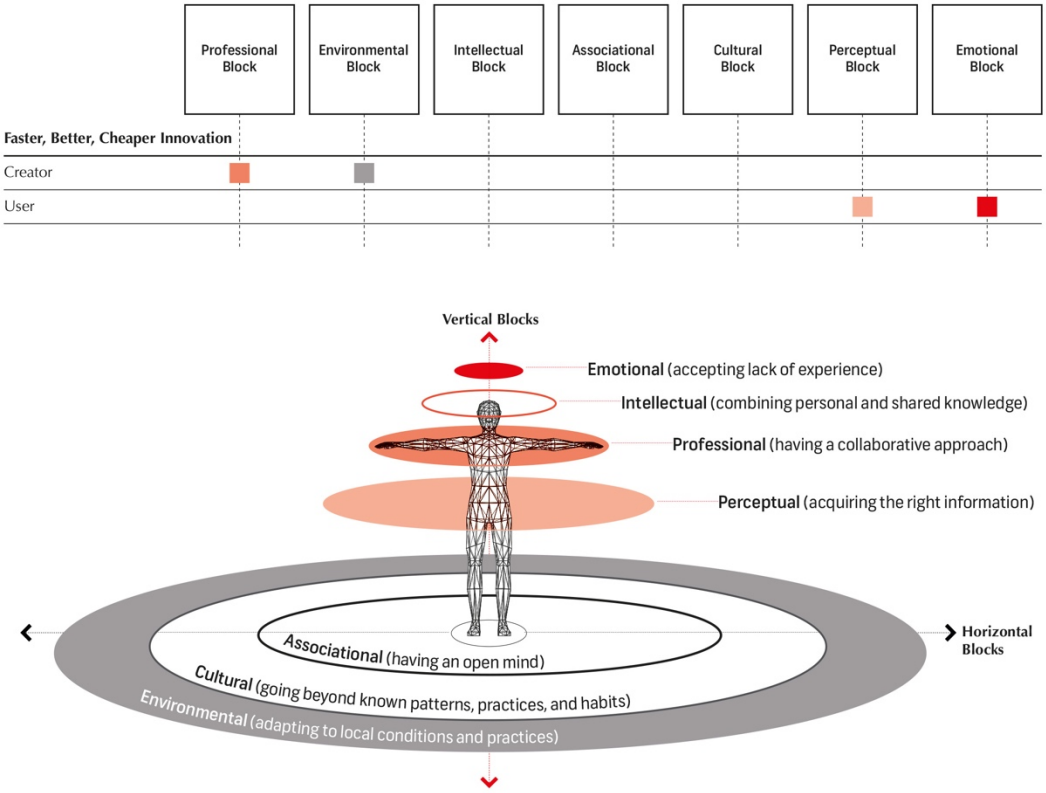


F5.3: *Reverse Innovation Framework*

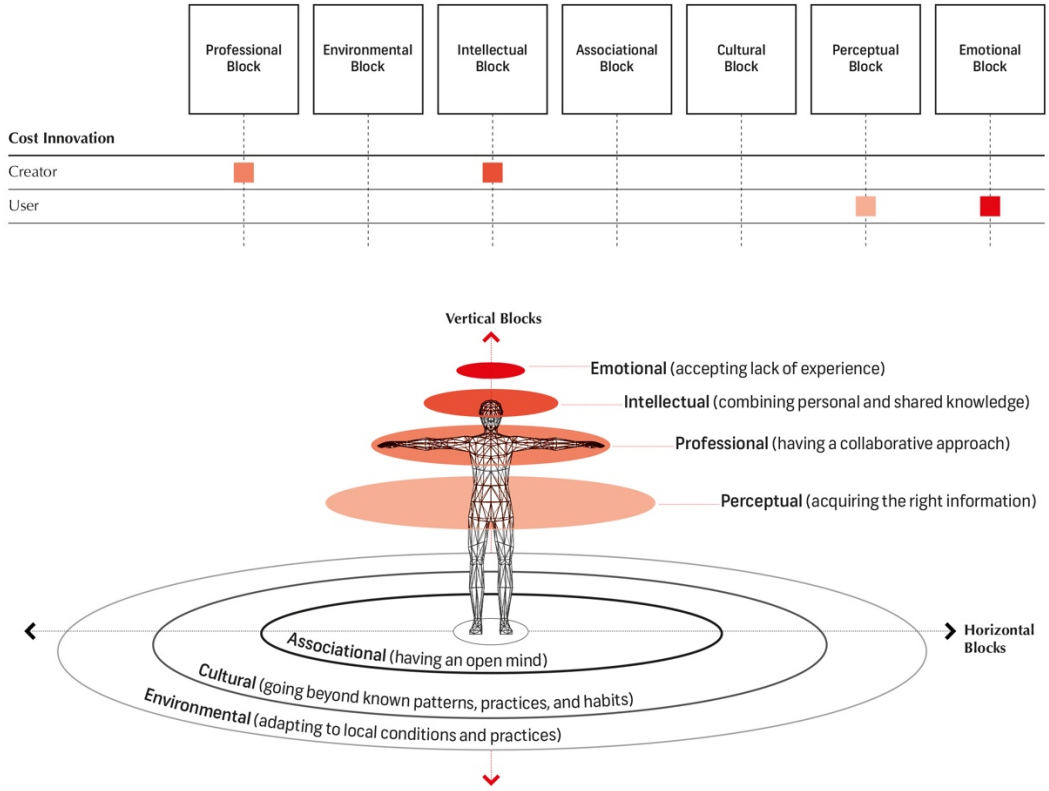
F6 Measuring Decolonisation In Financescapes



F6.1: *Measuring Decolonisation in Reverse Innovation*



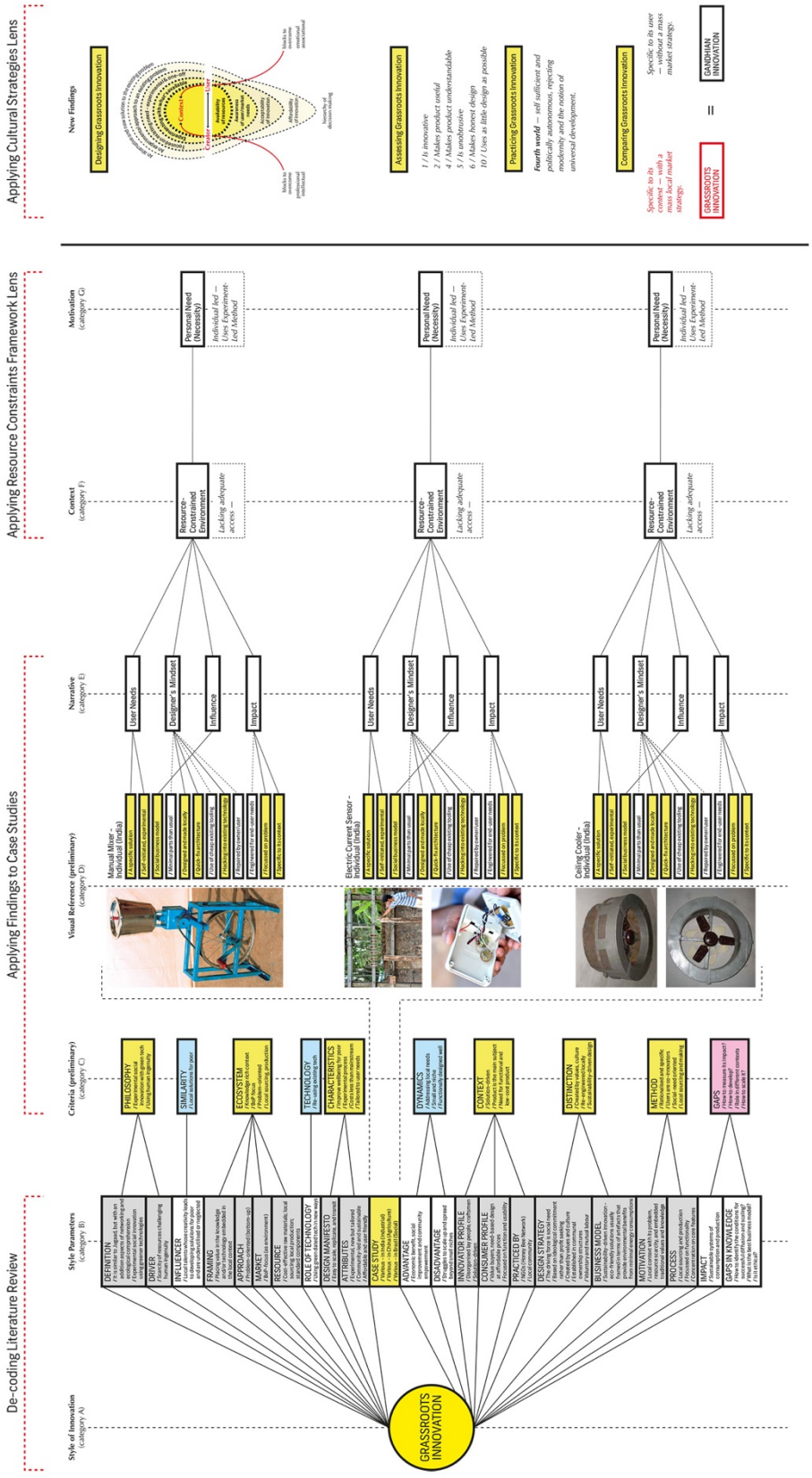
F6.2: *Measuring Decolonisation in Faster Better Cheaper Innovation*



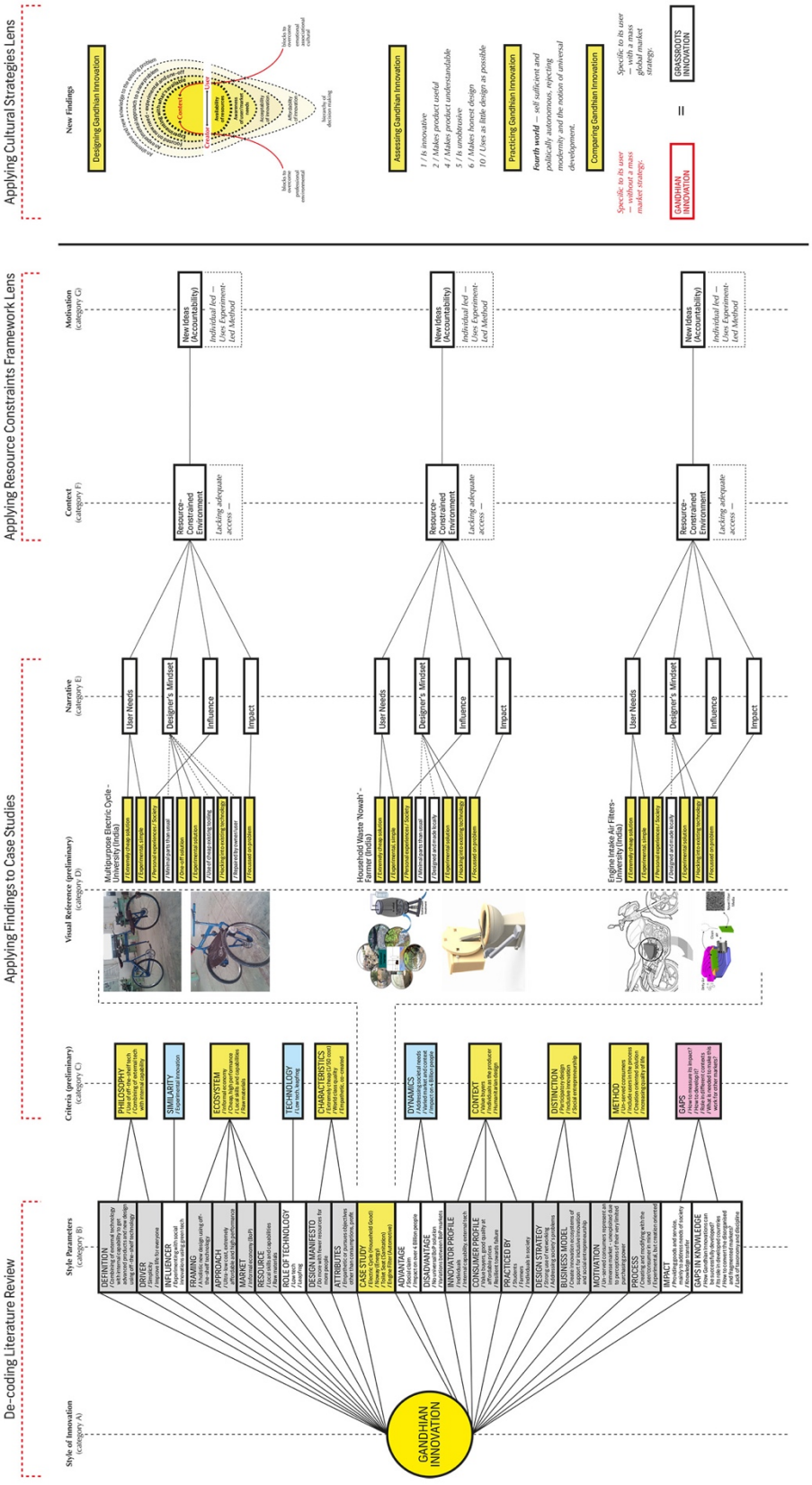
F6.3: *Measuring Decolonisation in Cost Innovation*

Appendix G
Ethnoscapes

G1 Decoding Grassroots Innovation



G2 Decoding Gandhian Innovation



G3 Case Study Analysis

As shown in G3.1, two case studies were selected to analyse *Grassroots Innovation* qualitatively. For example, Manual Mixer *(left)* is a self-initiated project conceived through observing the issues surrounding the unavailability of electricity and its impact on local food businesses that heavily relied on electric mixers. Designed through hacking into locally available technologies and techniques, it provides a reliable source of income for the end-user and enables them to be mobile and accessible in remote areas.

Similarly, Electric Current Senor (right) is also a self-initiated project conceived through personal experience to prevent electric shock incidents in rural areas where misuse of electricity is high and so is the number of incidents related to electricity. Designed as a handheld and portable electric current sensing device, it allows end-users to check electric current in transformers and in concealed wires to prevent receiving electric shock.

G3.1: *Grassroots Innovation Case Studies*

Left: Manuel Mixer by Chandakant Pathak

http://nif.org.in/dwn_files/award-books-biennial/NIF_8th_Award_book_2015.pdf

Right: Electric Current Sensor by Rishikesh S.C

http://nif.org.in/dwn_files/award-books-biennial/NIF_8th_Award_book_2015.pdf

For *Gandhian Innovation* two case studies were selected (see G3.2). For example, the Multipurpose Electric Cycle *(right)* is a modified version of an existing bicycle turned into an experimental dual-purpose device that also becomes a wheelchair. Furthermore, House Waste Nowah *(left)* is an attempt to retrofit a Western toilet seat with a manual system to change human waste into a bioreactor and subsequently into a sustainable energy source.

G3.2: *Gandhian Innovation Case Studies*

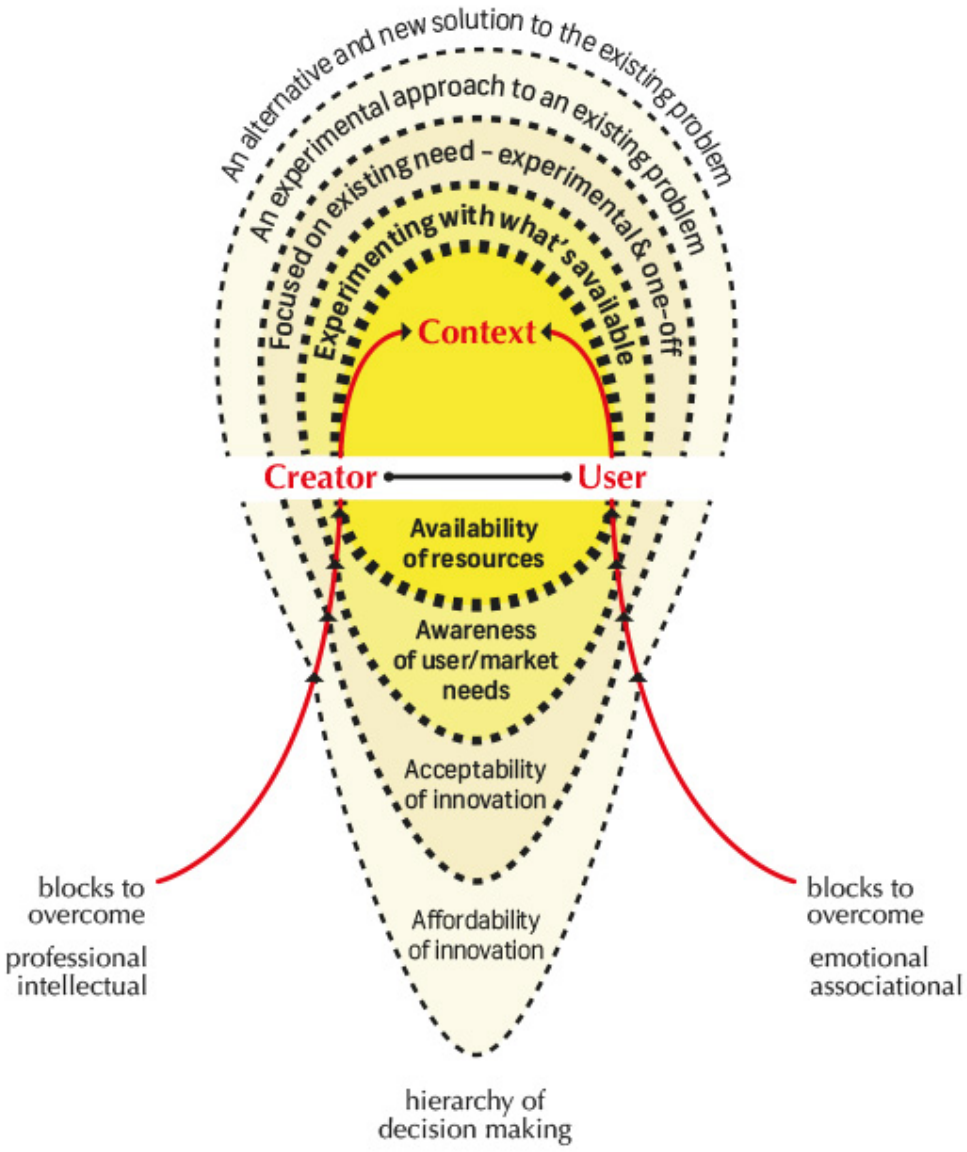
Left: Multipurpose Electric Cycle by a Student

http://gyti.techpedia.in/project-detail/design-and-development-of-multipurpose-electric-cycle/4813

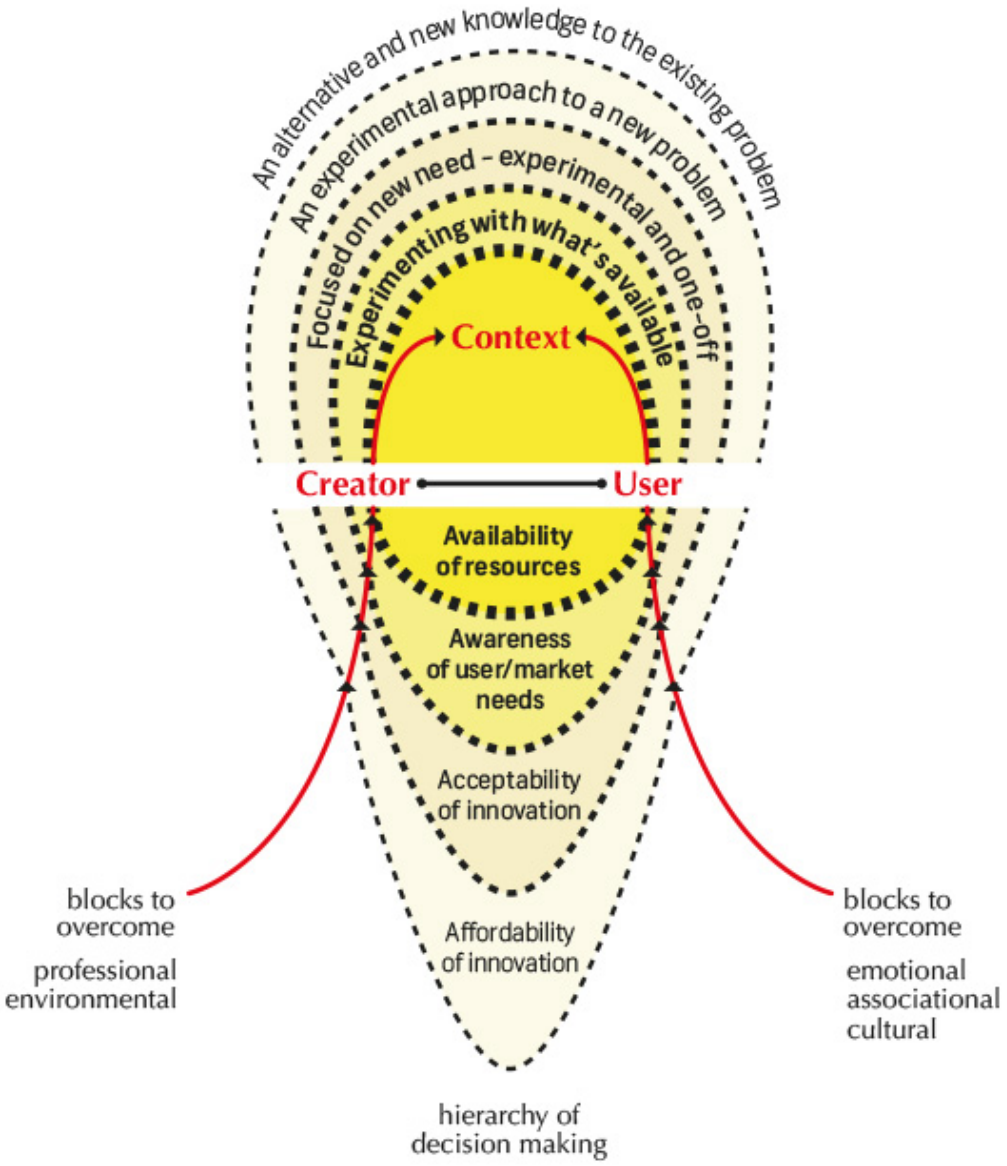
Right: Household Waste Nowah by a Farmer

http://gyti.techpedia.in

G4 Designing Ethnoscapes Cluster of Innovations

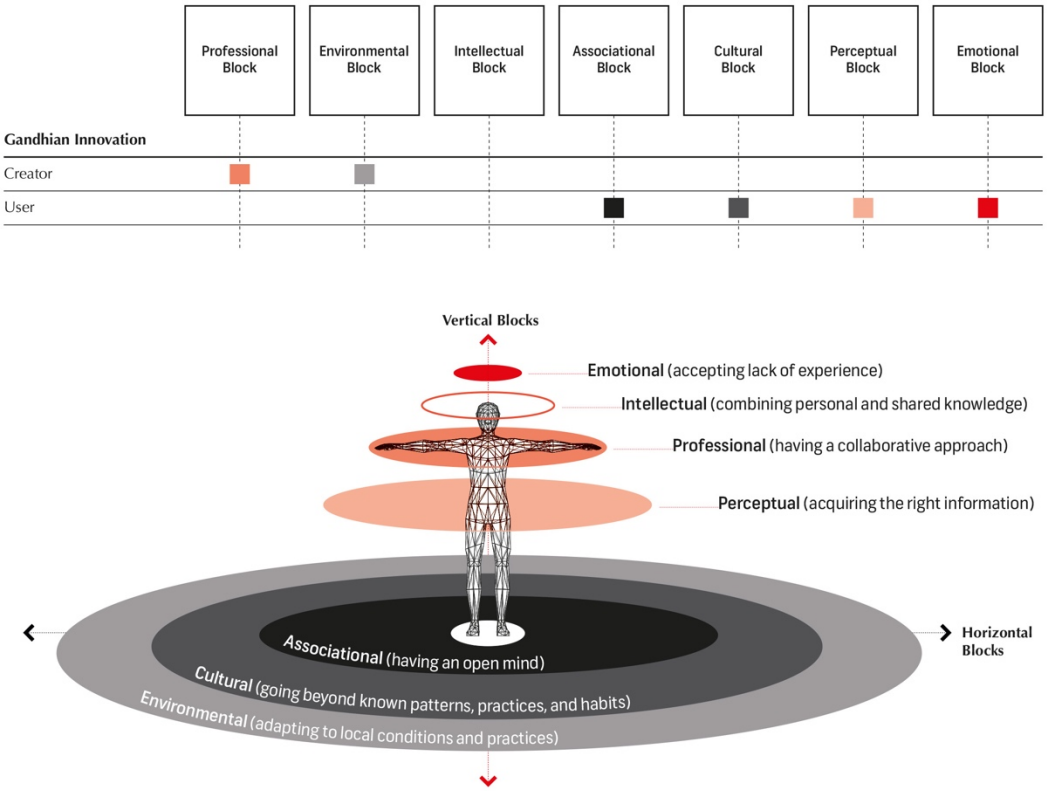


G4.1: *Grassroots Innovation Framework*

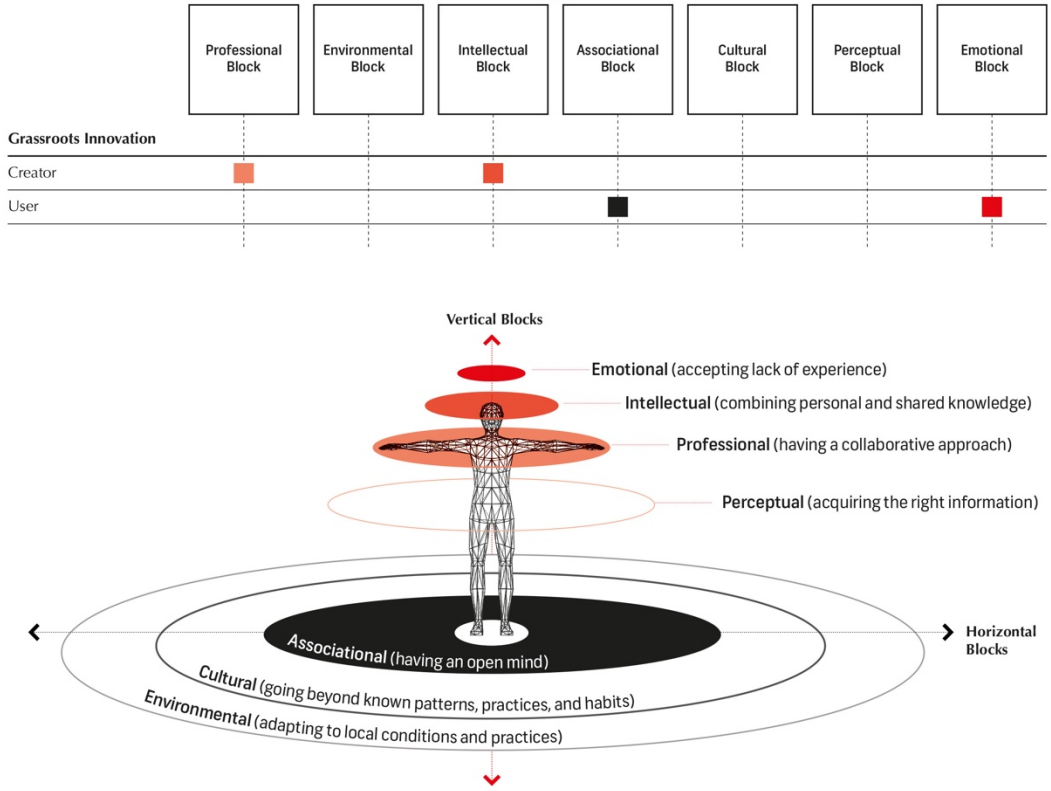


G4.2: *Gandhian Innovation Framework*

G5 Measuring Decolonisation In Ethnoscapes



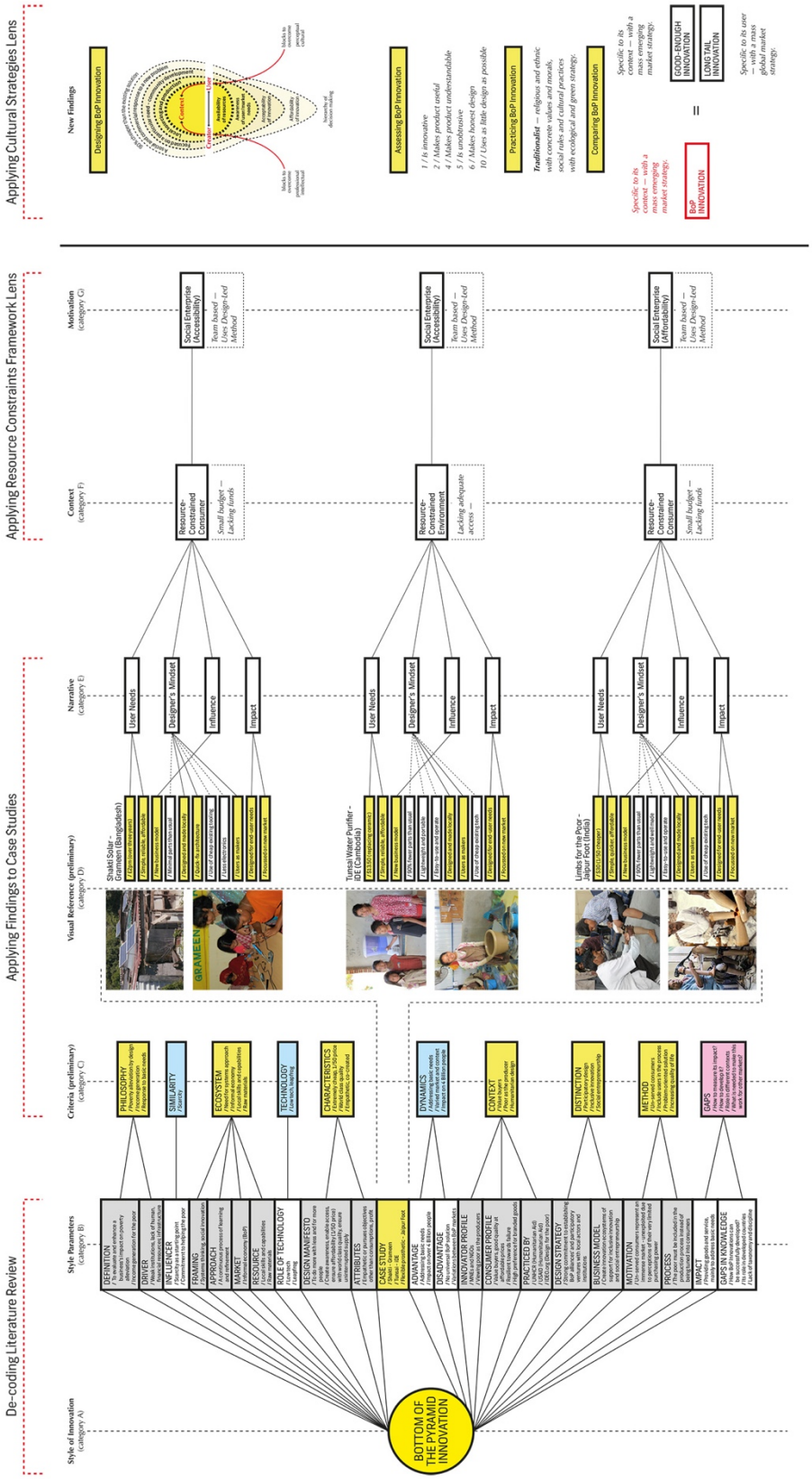
G5.1: *Measuring Decolonisation in Gandhian Innovation*



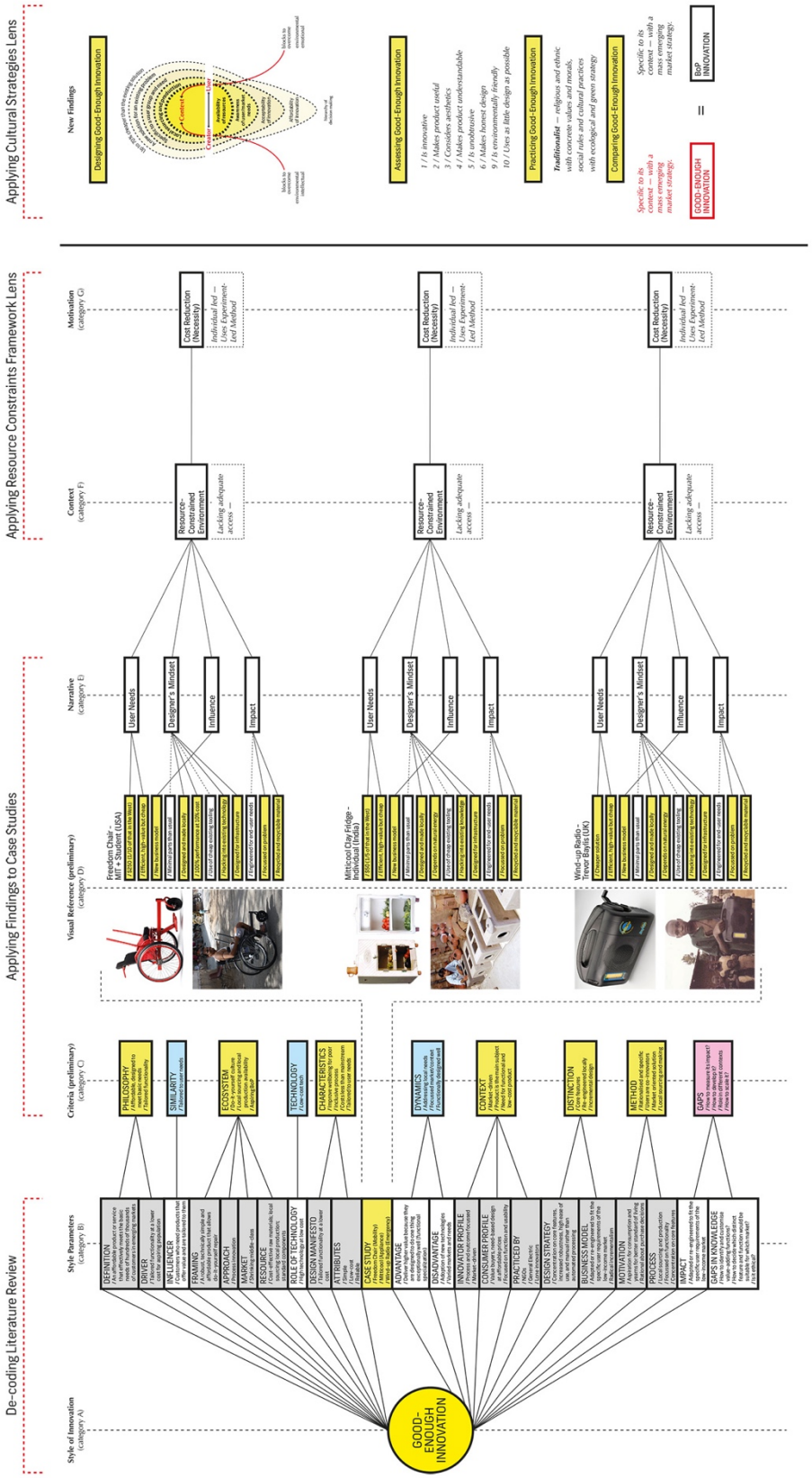
G5.2: *Measuring Decolonisation in Grassroots Innovation*

Appendix H
Technoscapes

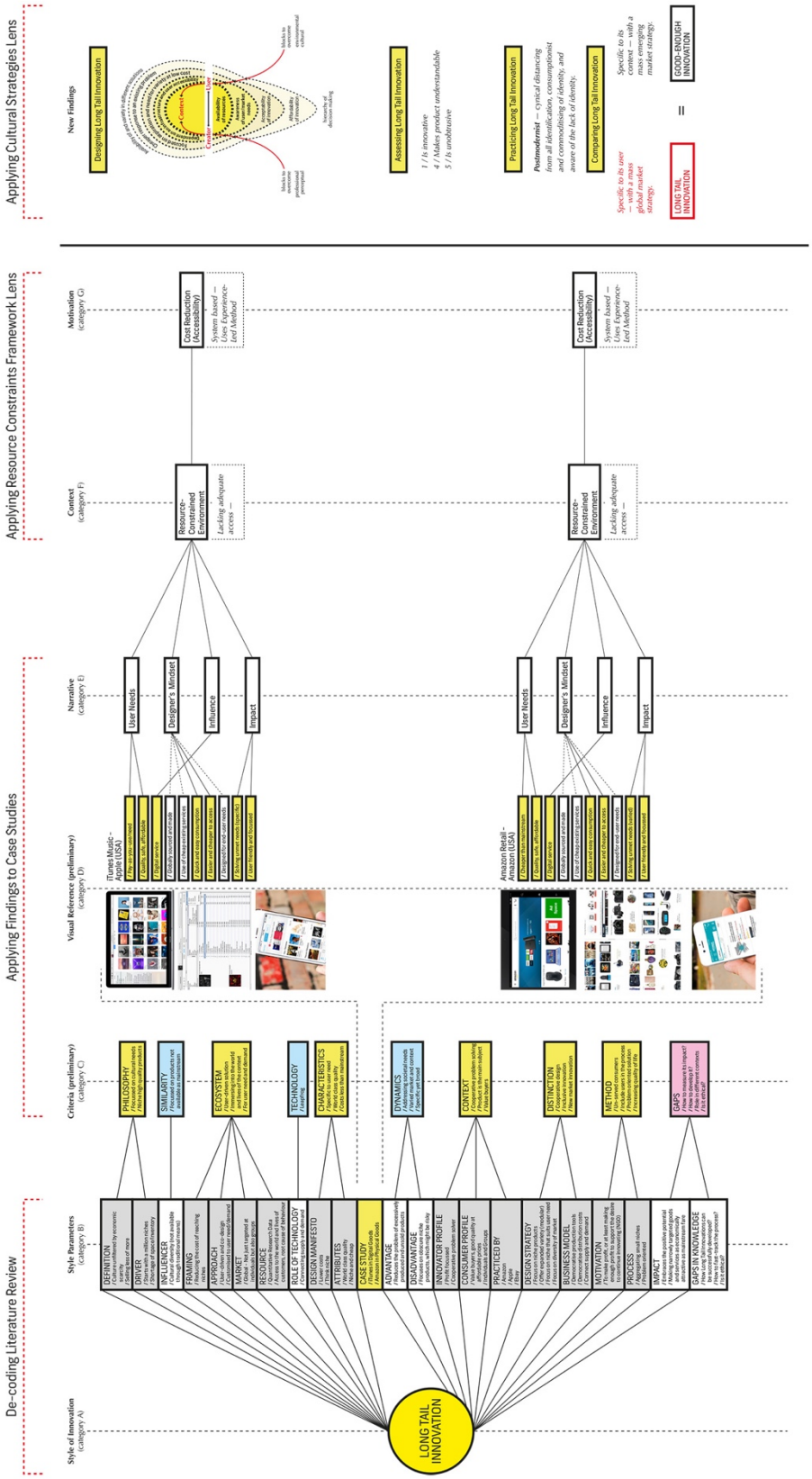
H1 Decoding Bottom of the Pyramid Innovation



H2 Decoding Good-Enough Innovation



H3 Decoding Long Tail Innovation



H4 Case Study Analysis

As shown in H4.1, three case studies were selected to analyse *Bottom of the Pyramid Innovation* qualitatively. For example, Shakti Solar *(top left)* is a solar energy system developed in Bangladesh as a quick-fix architecture that is retrofitted to existing houses and sheds. It is based around a user-centred business model that allows the end-user to pay for it monthly while getting trained by the lender to learn how to set up and repair the technology. In this process, the key objective of accessing sustainable energy is achieved alongside the possibility of gender empowerment, energy poverty alleviation, and giving the end-users the capacity for personalisation and the opportunity for ownership (Prahalad, 2012, p. 7).

Similarly, both Tunsai Water Purifier *(bottom left)* and Limbs for the Poor *(bottom right)* focus on end-users as their main producers and suppliers and provide a low-cost solution that is context-specific, supports inclusivity, and provides opportunity for social entrepreneurship.

H4.1: *Bottom of the Pyramid Innovation Case Studies*

Top Left: Shakti Solar by Grameen

https://www.ashden.org/winners/grameen-shakti

Bottom Left: Tunsai Water Purifier by iDE

https://www.ashden.org/winners/ide-and-hydrologic

Bottom Right: Limbs for the Poor by Jaipur Foot

https://mea.gov.in/photo-features.htm?868/Jaipur+Foot+A+Small+Step+with+a+Big+Footprint

For *Good-Enough Innovation* two case studies were selected (see H4.2). For example, Freedom Chair *(left)* is all-terrain wheelchair that gives its users independence and control while being more efficient, versatile, and cheaper than other wheelchairs on the market. Designed from bicycle parts, it is targeted for the emerging economies' rough terrain and local industries where people can build and repair their own using off-the-shelf components.

Similarly, the MittiCool Clay Fridge *(right)* is a refrigerator for storing and cooling without electricity. Designed using traditional craftsmanship for users who live off-grid, it is made from natural clay and uses air and water vapour as a cooling source to remove heat from the inside out.

H4.2: *Good-Enough Innovation Case Studies*

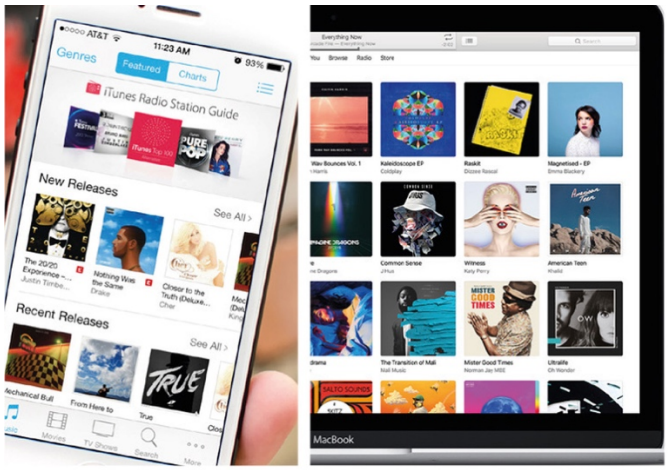
Left: Freedom Chair by GRIT

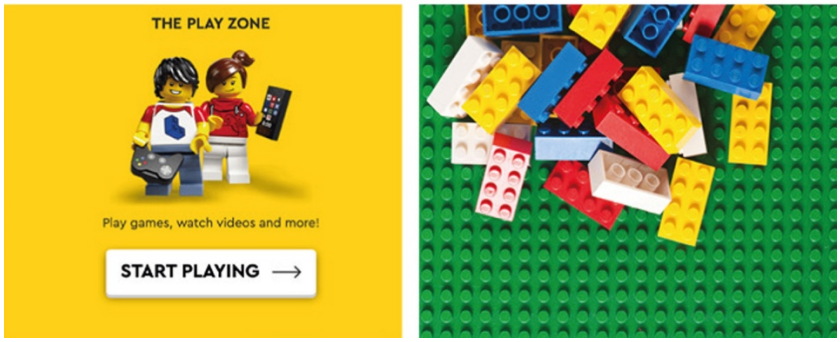
https://www.wired.com/2011/02/lever-powered-offroad- wheelchair-for-developing-world/

Right: MittiCool Clay Fridge by MittiCool

https://mitticool.com/product/mitticool-clayrefrigerator50-liter

To understand Long Tail Innovation, two case studies were selected (see H4.3). For example, the iPhone and Apple Music *(top)* combine communication and music to enable a seamless user experience and, at the same time, allow the users to share and build trust with their device. Similarly, Lego Bricks and Play Zone (bottom) combine education and playfulness through a modular system that enables the end-user to have control over their choices and share or track their consumption.





H4.3: *Long Tail Innovation Case Studies*

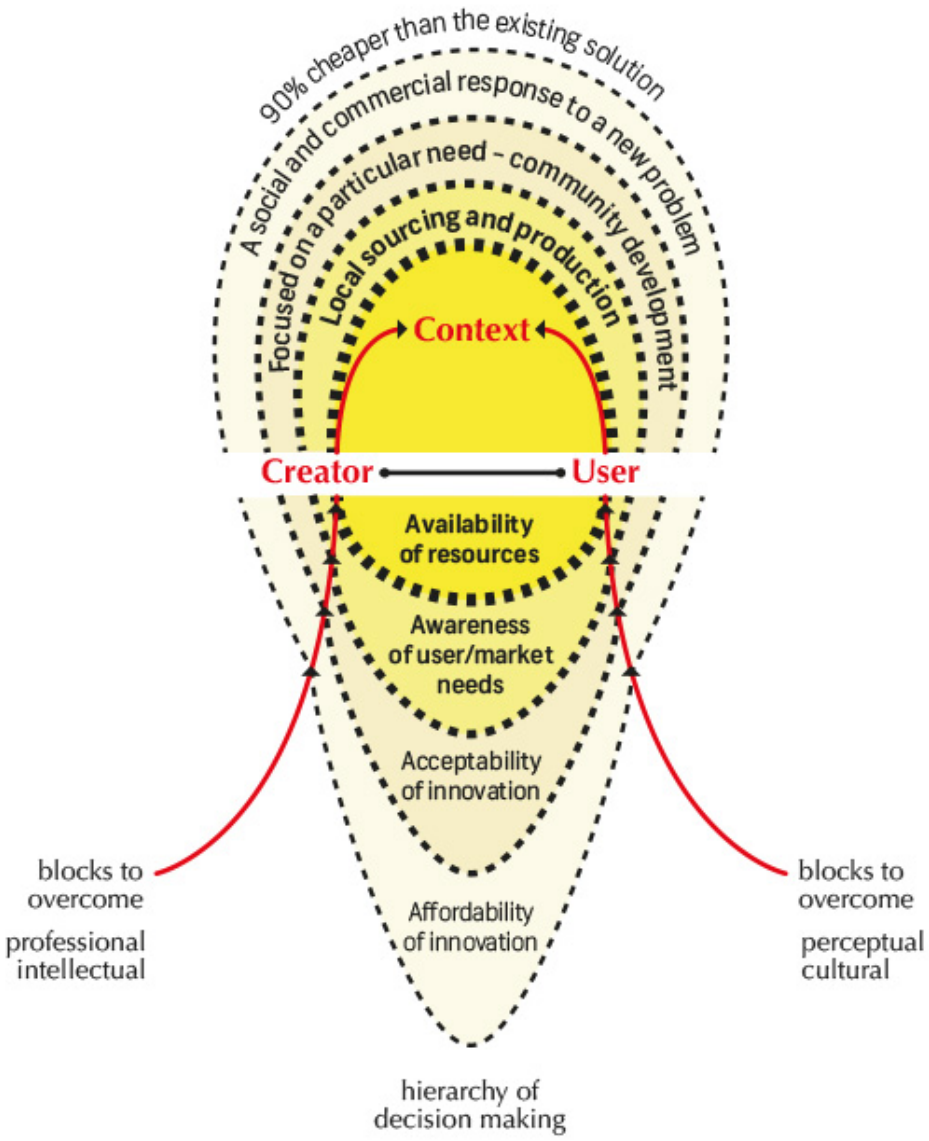
Top: iPhone and Apple Music by Apple

https://www.imore.com/your-itunes-store-appcrashing- after-updating-ios-7-heres-how-fix-it

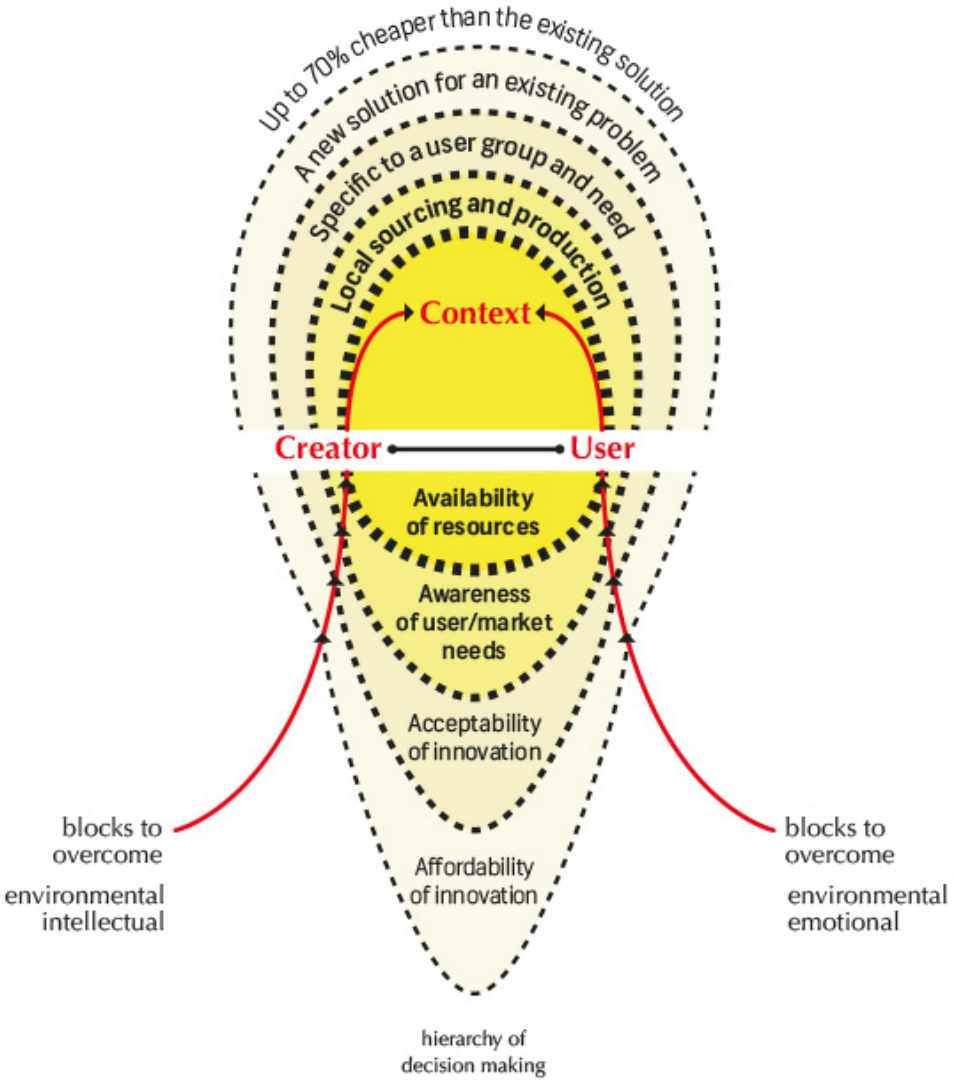
Bottom: Lego Bricks by Play Zone

https://www.lego.com/en-gb

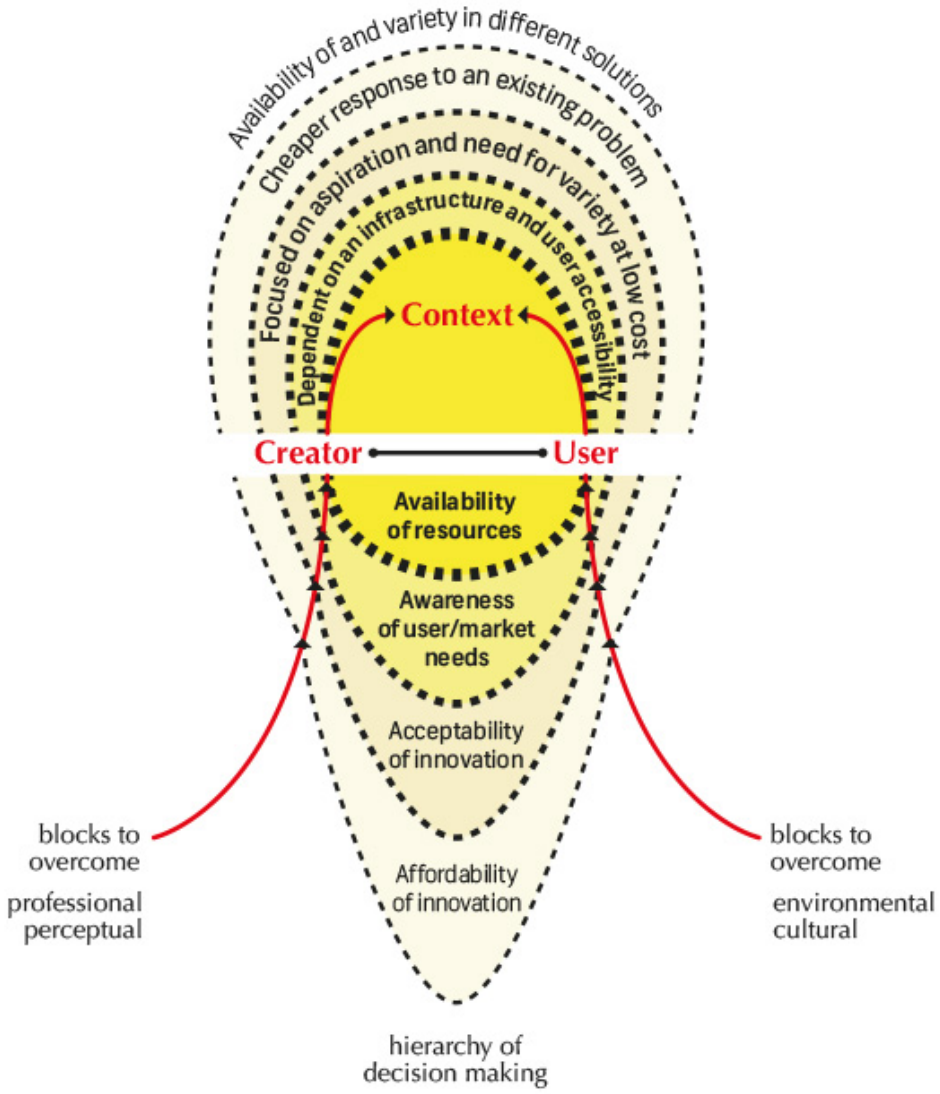
H5 Designing Technoscapes
Cluster of Innovations



H6.1: *Bottom of the Pyramid Innovation Framework*

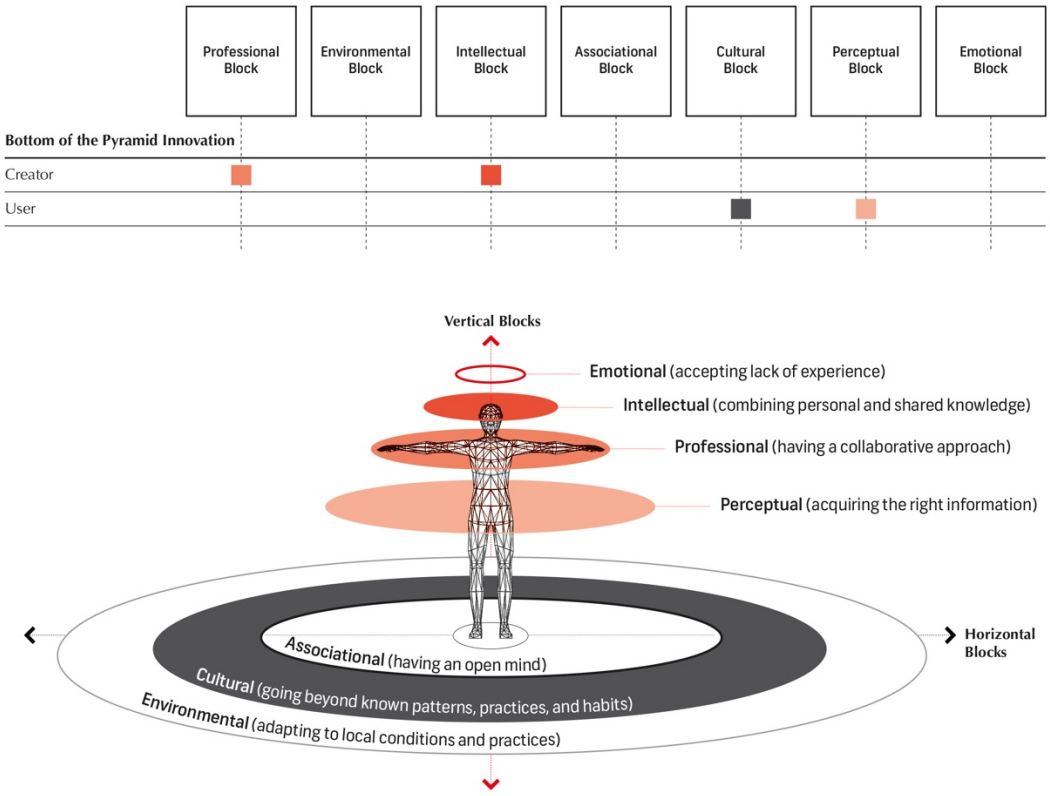


H6.2: *Good-Enough Innovation Framework*

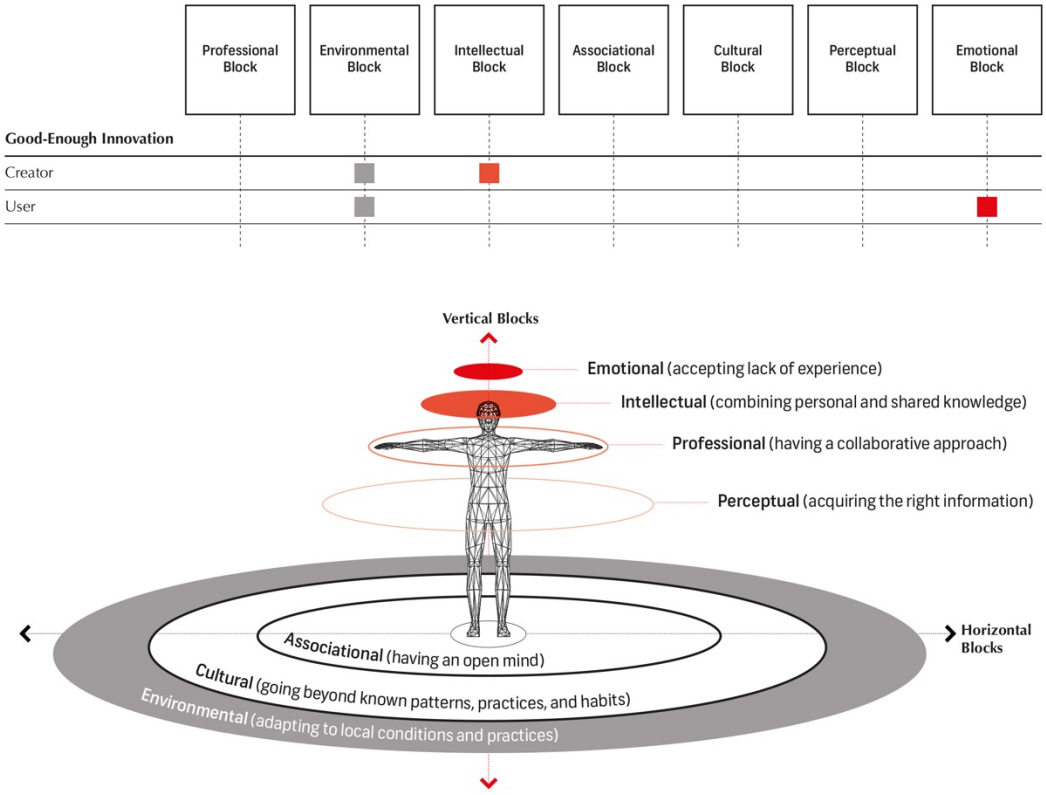


H6.1: *Long Tail Innovation Framework*

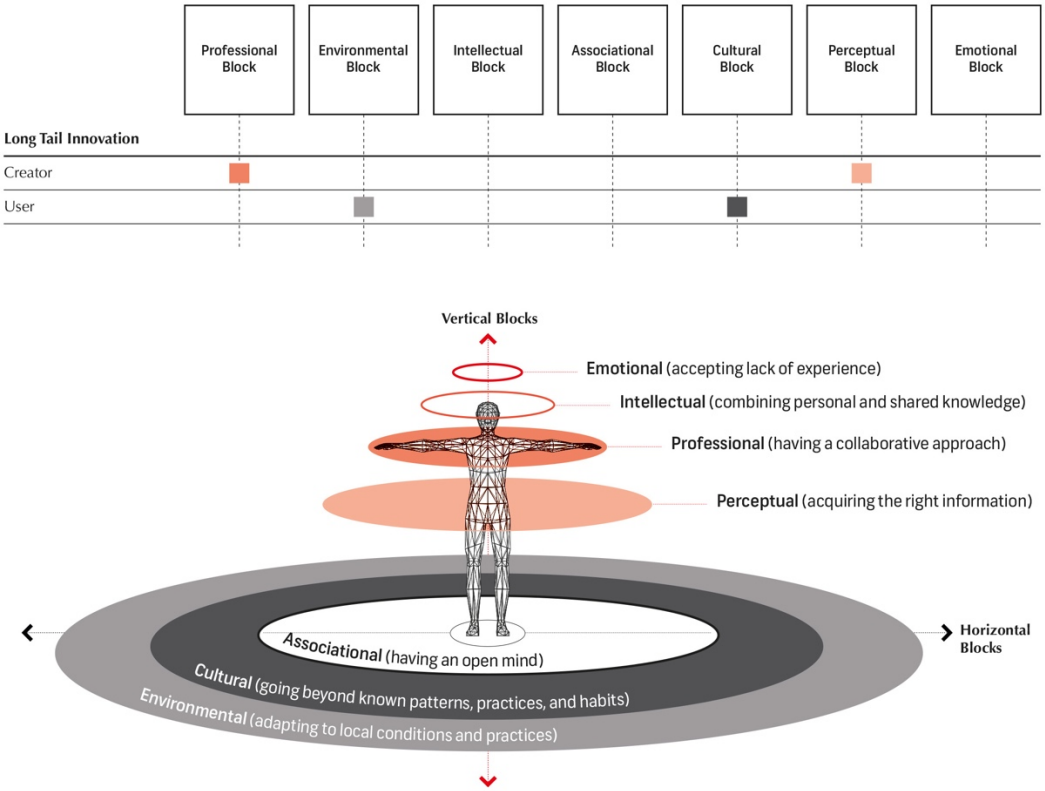
H6 Measuring Decolonisation In Technoscapes



H6.1: *Measuring Decolonisation in Bottom of the Pyramid Innovation*



H6.2: *Measuring Decolonisation in Good-Enough Innovation*



H6.3: *Measuring Decolonisation in Long Tail Innovation*

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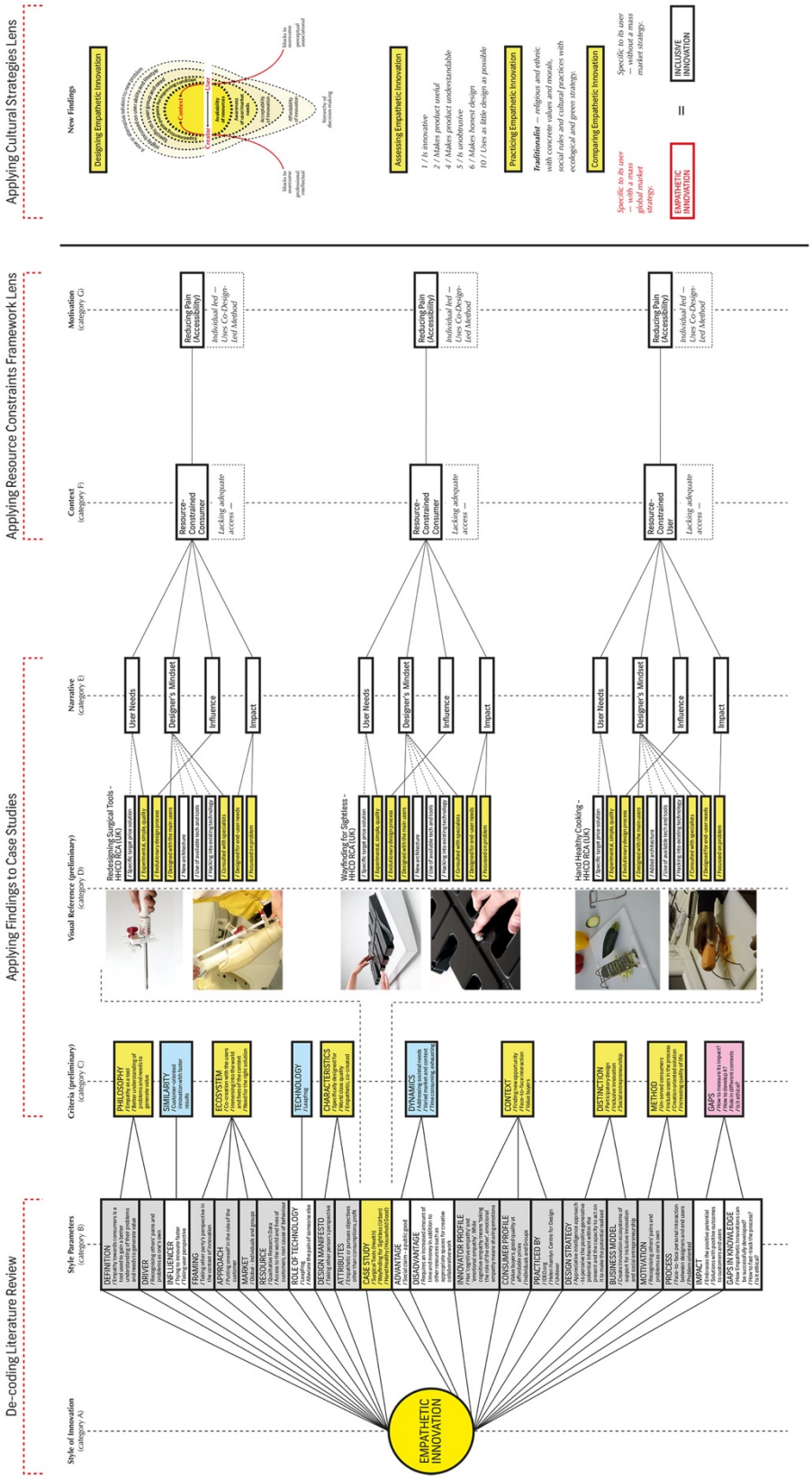
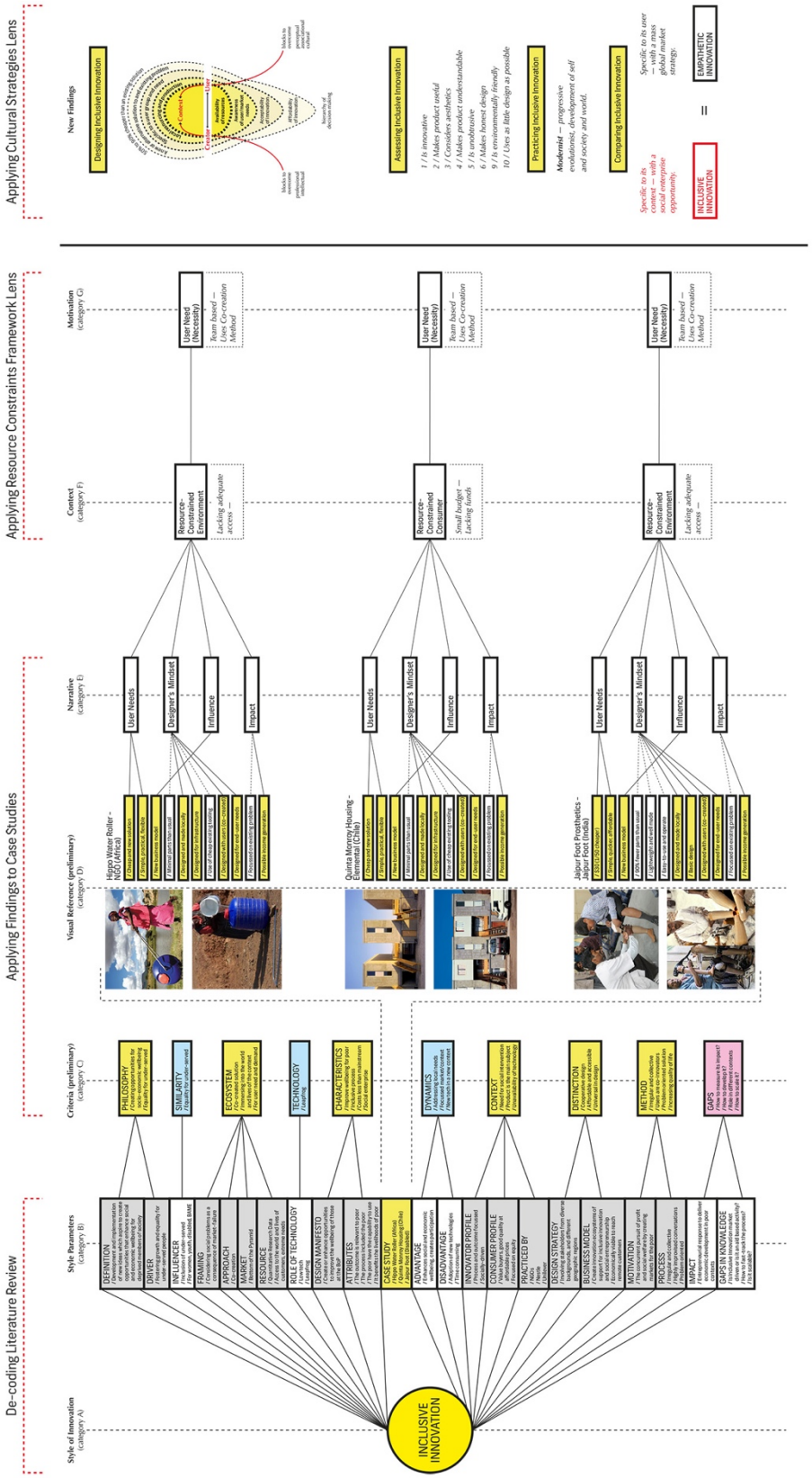
Appendix J
Mediascapes

J1 Decoding Empathetic Innovation



J2 Decoding Inclusive Innovation



J3 Case Study Analysis

As shown in J3.1, two case studies were selected to be analysed qualitatively for *Empathetic Innovation*. For example, Hand Healthy Cooking *(top)* evolved by looking at how older people with osteoarthritis use the kitchen and the available utensils to make their daily food. The project started with researching people with different degrees of arthritis, manipulating existing tools, and reconfiguring existing practices by experimenting with off-the-shelf technology and drawing insights from different cultural and ethnic backgrounds to develop the final solution.

Similarly, Wayfinding for Sightless *(bottom)* was developed by understanding the shortcomings of wayfinding solutions for a specific group of people (those with low vision) and is designed to enable visually impaired users to navigate and access places of their interest easily by using available tools and technology to address the restricted ability and lifestyle of the end-user. The explorative nature of this approach triggers purpose-led experimentation that results in adding various features to an existing technology to alleviate the pain of someone else, with a focus on improving conditions for end-users.

J3.1: *Empathetic Innovation Case Studies*

Top: Hand Healthy Cooking by The Helen Hamlyn Centre for Design
https://www.rca.ac.uk/research-innovation/research-centres/helen-hamlyn-centre/research-projects/2015-projects/hand-healthy
Bottom: Wayfinding for Sightless by David Sweeney
https://davidasweeney.myportfolio.com/ wayfinding-for-visual-impairment

For *Inclusive Innovation* (see J3.2), two case studies were selected. For example, the Hippo Roller *(top)* is a simple way to use the rolling motion to help people transport drinking water home far easier and in larger quantities. Developed for rough terrain and locations that lack access to water, it is designed with the end-user's needs in mind, with a focus on his/her physical capability, and provides an opportunity for transforming its use into a successful enterprise for the benefit of the end-user and their community.

Similarly, Quinta Monroy Housing *(bottom)* is also designed with the end-user's needs in mind, with a focus on his/her financial capability. Based in Chile, this social housing project, known as 'half-a-house' was designed with

families who cannot afford the cost of a full house and allows them to expand and self-construct the other half of the house gradually, which in turn will provide the end-user with the opportunity to tailor the structure to their needs and customise the house at their own pace, expense, and labour, and the house becomes an investment for the low-income residents as it gains value overtime and could also provide rental income.

J3.2: *Inclusive Innovation Case Studies*

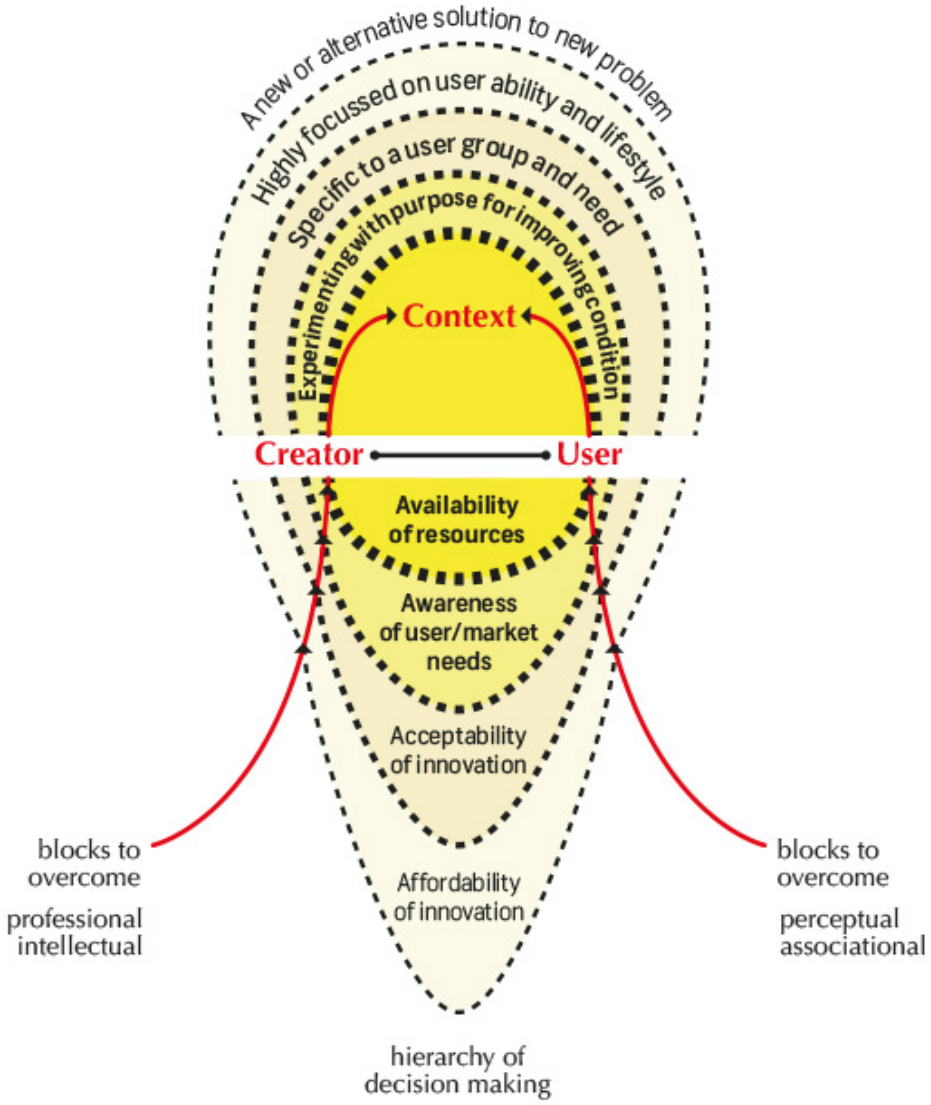
Top: Hippo Roller by Hippo Hub

https://hipporoller.org

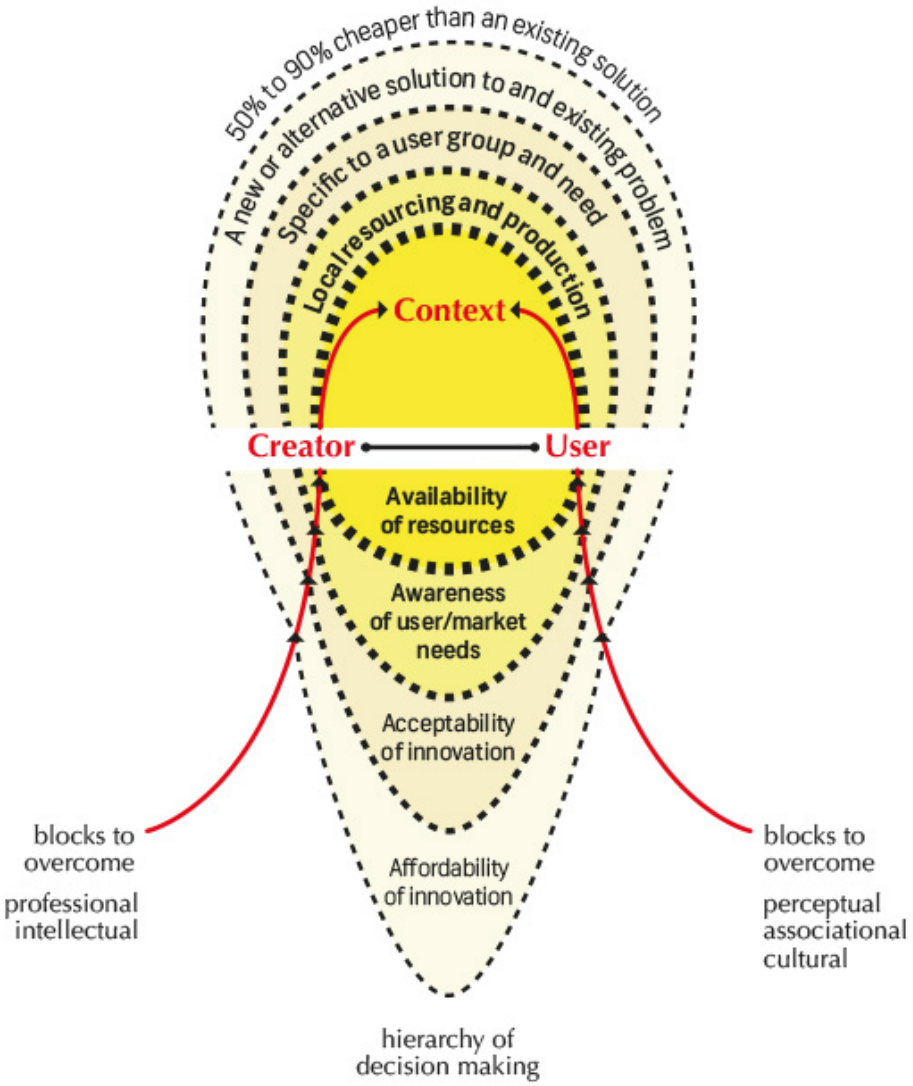
Bottom: Quinta Monroy Housing by Elemental

https://www.archdaily.com/10775/quinta-monroy-elemental

J4 Designing Mediascapes
Cluster of Innovations

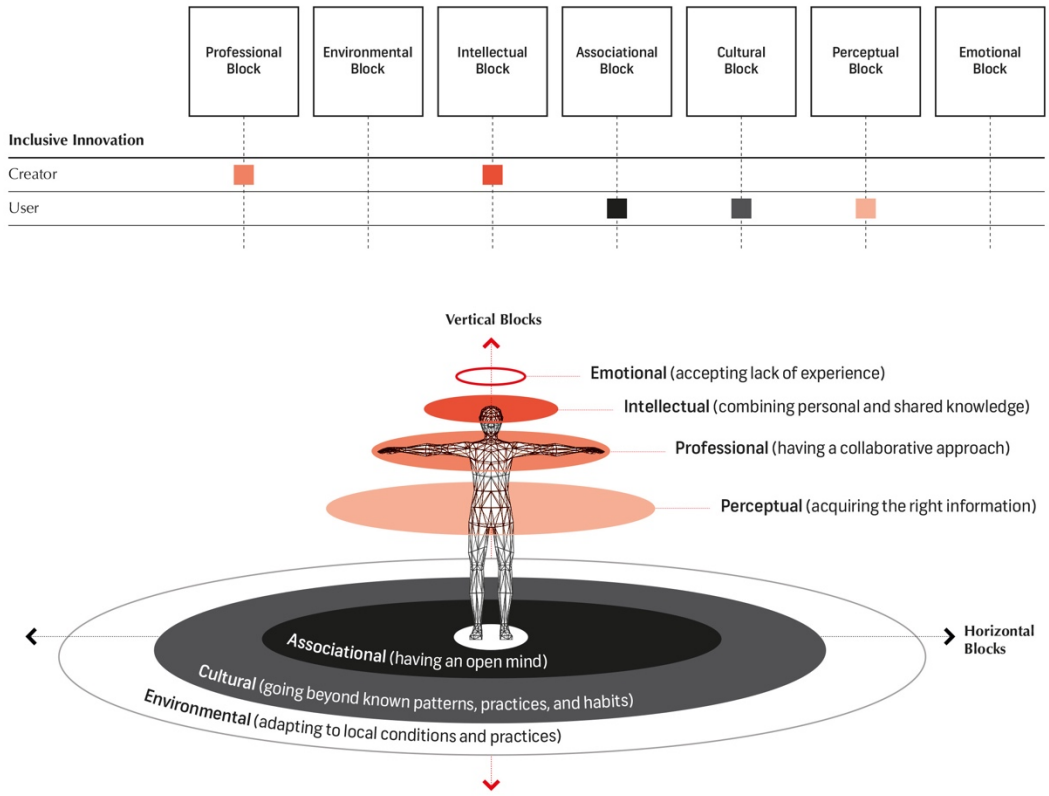


J4.1: *Empathetic Innovation Framework*

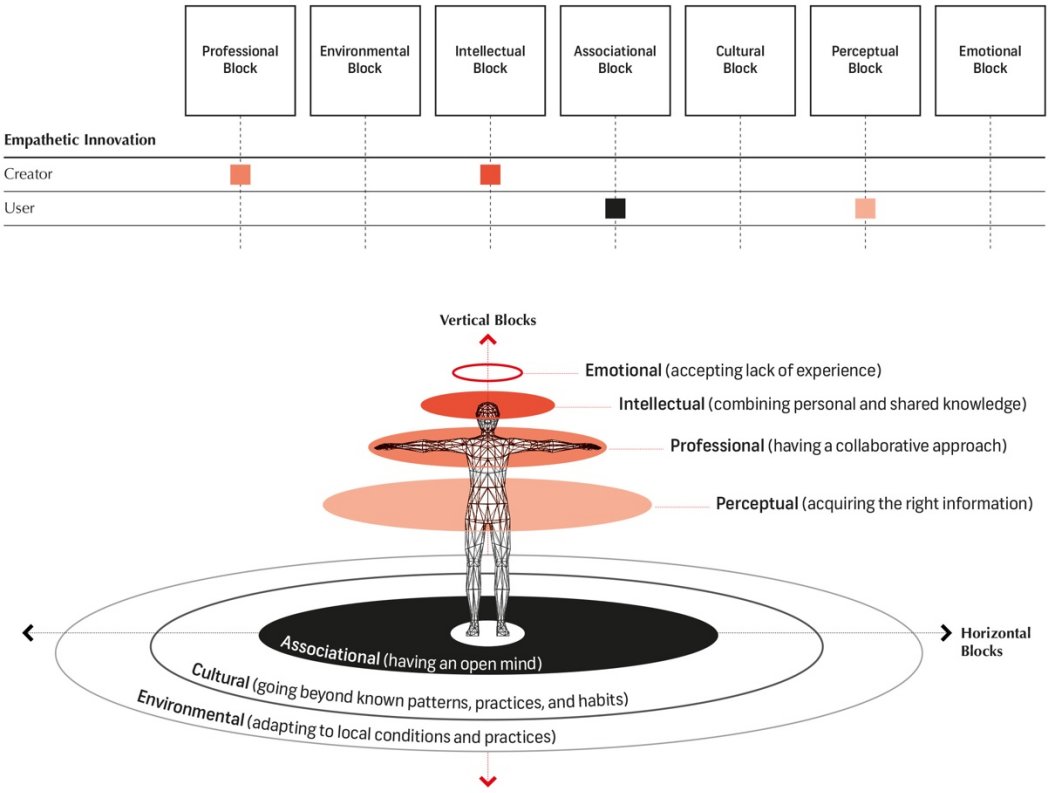


J4.2: *Inclusive Innovation Framework*

J5 Measuring Decolonisation In Mediascapes



J5.1: *Measuring Decolonisation in Inclusive Innovation*



J5.2: *Measuring Decolonisation in Empathetic Innovation*

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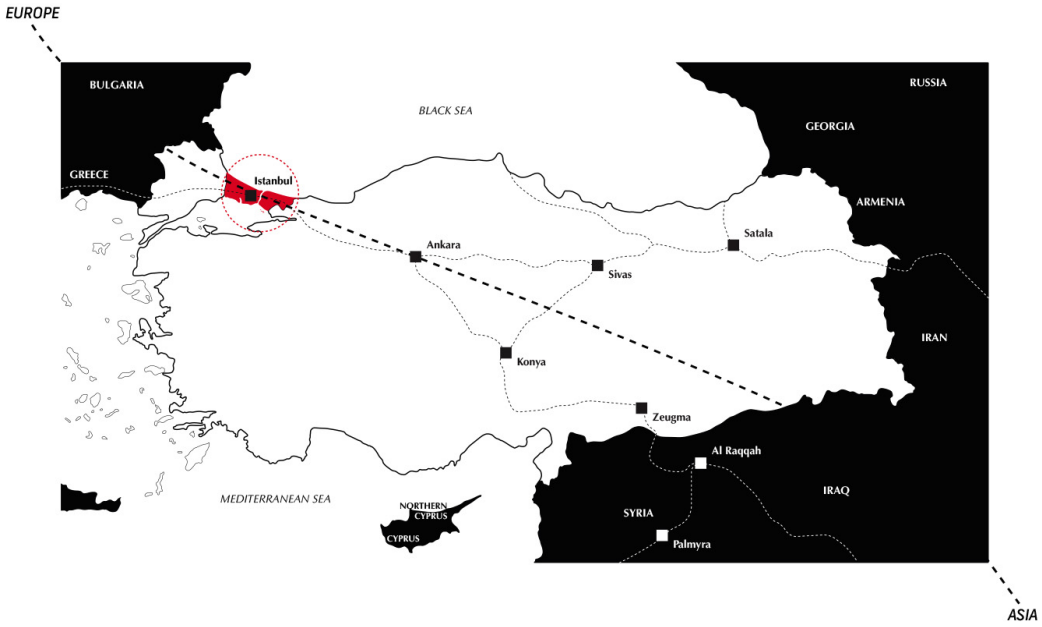
Appendix K
Context for Research

K1 Istanbul, Turkey (Developing Economy Context)

Istanbul was chosen as a starting point for research within the sequence of locations due to its historical and geographical significance, strategic and political positioning, convergence of modernity, globalisation, and tradition, and unique constraints. Located between the south and north sides of the world and between Europe and Asia, the cultural values translocated through the historic Silk Roads have determined the city's identity throughout the years, resulting in the formation of formal and informal neighbourhoods of *transitional character* and activities.



K1.1: *Understanding Contextual Dynamics of Turkey and Mapping Historic Silk Roads Connecting Asia to Europe*

Dynamics between the city's mix of Asian and European cultures have created differentiated modes of thinking while making cultures have been formed by several waves of cultural and economic influences, including the Byzantine Empire and the Ottoman Empire, the flows of migrants throughout

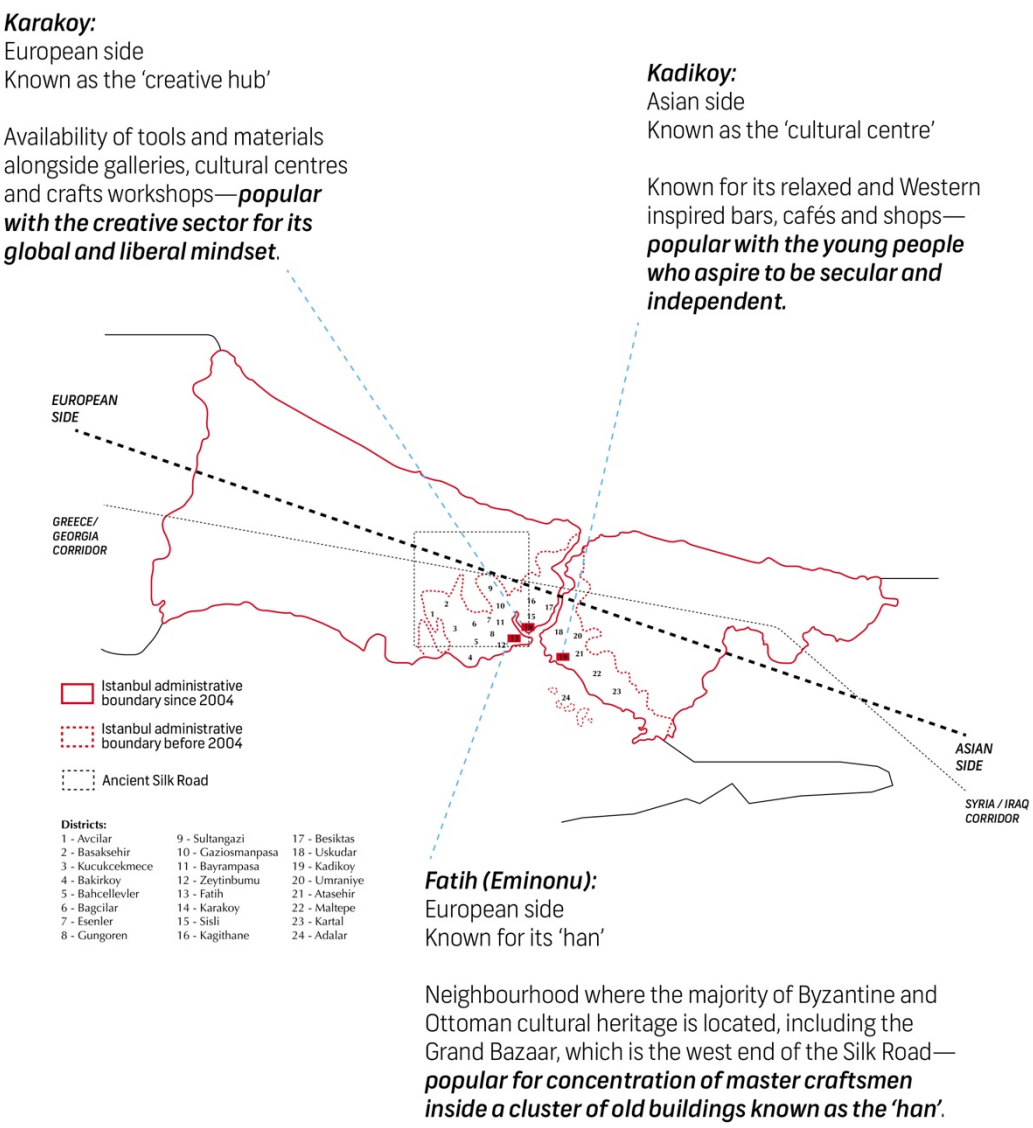
the centuries through the connection to the Black Sea and the Mediterranean, and the urban configuration through numerous fires, earthquakes, riots, and invasions, which have determined its resources and people's mindset.

Istanbul, considered a developing economy context, is a link between the East and the West that connects cross-cultural flows, ideas, and people and acts as a melting pot of nationalities from across the borders—creating a concentration of *intercultural design practices and production methods* that are neither transformative nor critical, making it an ideal place for starting this design research.

Design in Turkey originated in the 1950s because of the economic transition needed from an industrial economy to a post-industrial economy and was based on the German schools of design, which provided education as an extension of the Bauhaus education model with the idea of a community of designers and makers working together. Following this and by the 1970s, when Turkey was among the newly industrialised countries, design education in Turkey expanded into Anglo-American and Continental European models with the tendency towards copying designs from foreign cultures and contexts (Ogut et al., 2015, p. 41) rather than innovating for purpose.

However, many acts of design in Turkey have been embodied in craft practice, and the transition to a foreign model of design education did not fully represent the cultural background and the regional design heritage. Kaya and Yagiz (2011) contend that the modes of production in Istanbul are highly dependent on social relationships, such as apprenticeships and vocational training, and as a result, different design processes can be expected to emerge (p. 59). In this light, modernist design education has created a cultural rift between the emerging motivations of designers, the needs of the local industries, and the changing habits and ambitions of people (Er and Ilhan, 2016, p. 21).

K2 The Field: Kadikoy, Karakoy, and Fatih —Istanbul, Turkey



K2.1: *Understanding Contextual Dynamics of Istanbul and Mapping Site of Practice*

On the right side of the Golden Horn, Kadikoy is known as the *cultural centre* of the city and is famed for its locally sourced food and Anatolian streetscape (see K2.2). Located on the Asian side of the city, Kadikoy is a residential neighbourhood with relaxed and Western-inspired bars, cafes, and shops and is a popular location for young people with an independent mindset and the willingness to diversify local culture. Several old buildings within this area

house imported household equipment and stores selling off-the-shelf components on the ground floor and numerous artist studios, collaborative working spaces, and creative thinkers on the upper levels.

K2.2: Kadikoy, Asian Side 'Known as the Cultural Centre'

On the top part of the Golden Horn, Karakoy is known as the creative hub of the city and is famed for its community of glass blowers, mould makers, and welders, along with galleries, cultural activities, and making facilities (see K2.3). Located on the European side of the city, Karakoy is a commercial neighbourhood with hardware suppliers serving the fishing and water transport industries. It leads to the 14th century Galata Tower, and markets for the consumption of locally produced goods, and various galleries and designer studios. Narrow alleyways house numerous workshops that include mould makers, welders, metal workers, and jewellers belonging to Christian migrant master makers belonging to a large community of Armenian and Greek populations living in Istanbul for many centuries.

K2.3: *Karakoy, European Side 'Known as the Creative Hub'*

In contrast, on the left of the Golden Horn is the Fatih neighbourhood, with its Byzantian and Ottoman heritage, located on the European side of the city (see K2.4). This area houses a large concentration of traditional metalsmiths, woodworkers, and master craftsmen inside a cluster of old buildings known as the 'han' and is in proximity to the Grand Bazaar, referred to as the west end of the Silk Road (Kaya, and Yagiz, 2011, p. 62).

K2.4: *Fatih, European Side 'Known for the Han'*

Han has been known as a place where cultures and generations meet in one-

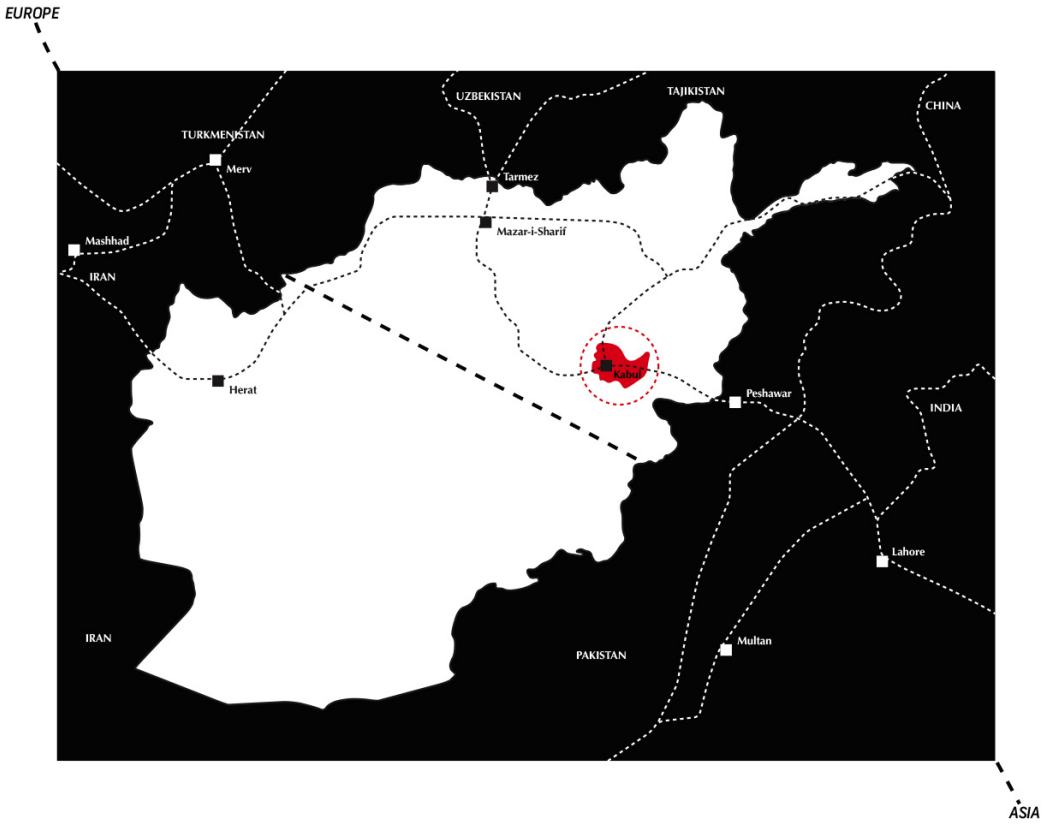
room workshops and collaborate around the activities of making and commercial production of traditional products. Run by Muslim master craftsmen, Hans have acted as reference points from which new cities or towns grew and built their identity and purpose over centuries, and they have been the place for locals and migrants to meet and form new communities of people around mutual skills and interests. More interestingly, its architecture is dictated by the type of making and production community it accommodates, and as techniques and technology change, so do the programme and spatial arrangements within the Han.

K3 Kabul, Afghanistan (Least Developed Economy Context)

After conducting research in Istanbul, the next location for this research was Kabul due to similar factors as the previous location, but with stronger cultural and traditional constraints as well as volatility. Located in the south part of the world in Central Asia, it has been a conflict zone for over forty years with poor infrastructure and a prevailing atmosphere of constant fear and distrust. Cultural values translocated through the historic Silk Roads have remained the same, but the city's identity has been shaped and reshaped by various foreign powers, resulting in the formation of a *punctuated character* and activities.

Dynamics between the city's varying degrees of intensity, such as new forms of power, marginalisation, and violence, volatile government, and unpredictability, and urban reordering have created differentiated modes of thinking while making cultures have been formed by several waves of environmental and economic influences. The 1970s Russian invasion followed by the post-9/11 invasion by the international coalition led by the United States of America, the flows of international media and foreign aid workers, and the social configuration through numerous conflicts, physical separations, financial hardships, and environmental degradation have determined its resources and people's mindset.

Kabul, considered a least developed economy context, is an extreme and unusual location for design research where cross-cultural flows, ideas, and people are in constant shift and rearrangement—creating a concentration of *multicultural design practices and production methods* that are neither functional nor contextual, making it an ideal place for continuing this design research.



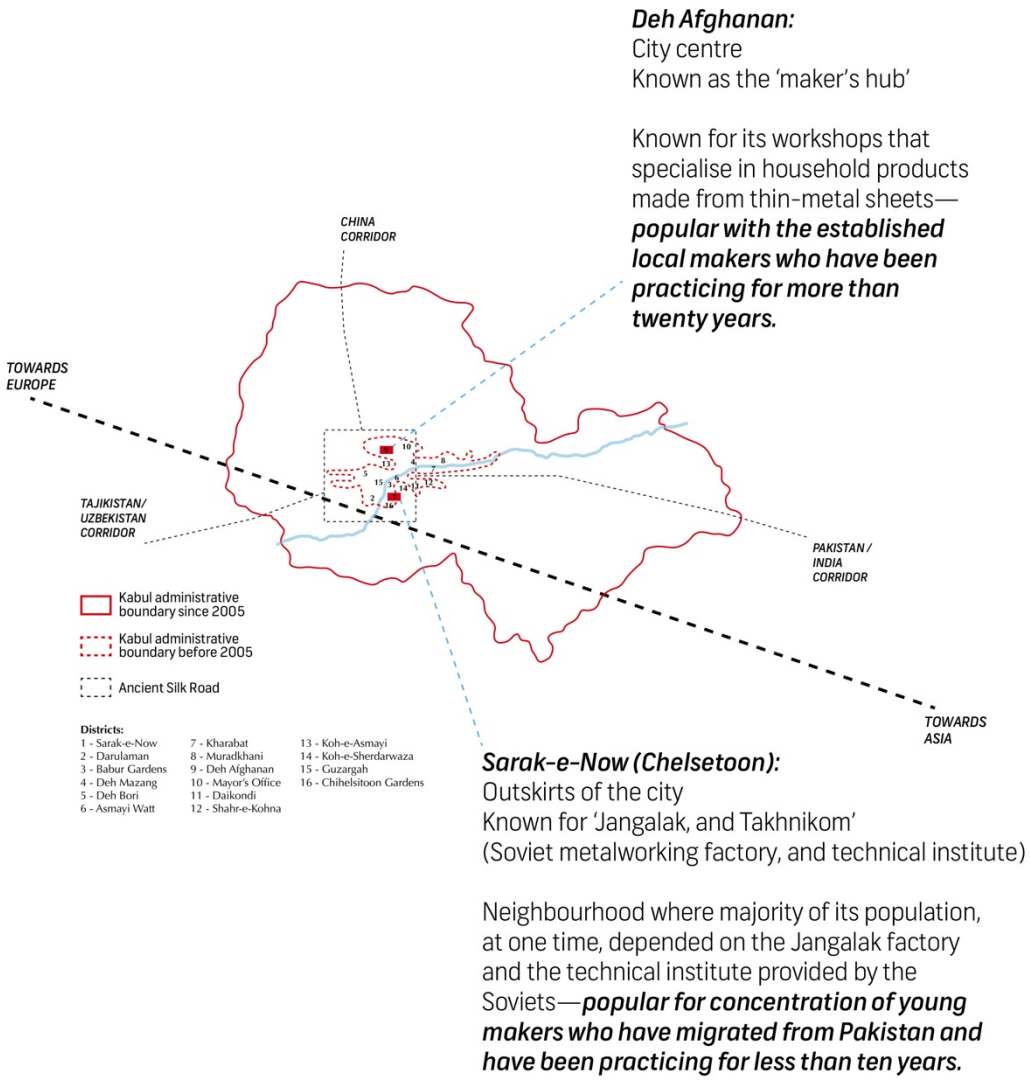
K3.1: *Understanding Contextual Dynamics of Afghanistan and Mapping Historic Silk Roads Connecting Asia to Europe*

Design in Afghanistan originated in the 1930s because of policies of national consolidation to expand foreign relations and internal development using Afghan funds alone and was based on the Soviet Union schools of design, which provided education as an extension of the Vkhutemas education model with the idea of individual workshops where designers and makers worked under a master of their choice. Following this and by the 1970s, when Afghanistan was introducing socioeconomic reforms and in an attempt to move away from its dependency on the Soviet Union, design education in Afghanistan expanded into Anglo-American and Continental European models, with a tendency towards copying designs from regional cultures and contexts rather than innovating for purpose or with contextual significance.

However, the four decades of war that followed did not allow for the

development of design as a field within Afghan society, and new forms of power and imported culture have been superimposed, resulting in methods, pedagogies, and practices that are confused, unethical, and untenable, resulting in the absence of context-specific modes of being, thinking, knowing, and innovating.

K4 The Field: Deh Afghanan, and Sarak-e-Now —Kabul, Afghanistan



K4.1: *Understanding Contextual Dynamics of Kabul and Mapping Site of Practice*

On the north side of the Kabul River, Deh Afghanan (which means Village of the Afghans in Dari) is known as the *maker's hub* and is considered one of the historic parts of the city where key government officials used to reside during the monarchy that ended in 1973 (see K4.2). It is located beside other historic areas such as Dehmazang and Deh Bori and borders more recently developed areas such as Shahr-e-Now and Joy Shir. Today, it is one of the

city's main commercial districts and is home to residential, administrative, and commercial neighbourhoods with shops that make and sell household products lined up on one side and government buildings on the other side of the main road, while houses are located on the mountains above.

K4.2: *Deh Afghanan, City Centre 'Known as the Maker's Hub'*

A popular destination for office and administrative workers to commission or purchase everyday household items, the lower part of Deh Afghanan was recently designated as a place for established local makers to setup shops and have easy access to the city's resources as well as its citizens. Several shop units within this area house traditional creatives who have been making and selling household equipment specific to the local population for generations and share their space and tools to lower costs and compete with each other.

In contrast and on the south side of the Kabul River, Sarak-e-Now Chelsetoon (which means New Street in Dari) is known for Jangalak (a metalworking factory setup in the 1960s that quickly became the nucleus of Afghanistan's emerging working-class and a neighbourhood inhabited by Western-educated technocrats and civil servants but was destroyed during the civil war in the 1990s), described by the Los Angeles Times (2002) as:

> *"Jangalak was a factory like few others in the world, providing materials for virtually every industrial need in the nation.*
>
> *Having grown out of a small brick factory and metal works and further enlarged by the Soviets during the 1980s, Jangalak manufactured everything from ball bearings to generators. Its 3,000 workers built electric transformers, shaped parts for helicopters, and bottled ether for hospitals. Jangalak was the nation's main brick factory, its main tool shop, its only manufacturer of car bodies, and its only semi-modern lumber mill."*

This location is also known for Takhnikom (see K4.3), which used to be, and to some degree still is today, a technical and vocational training institute built in the 1950s and run with the help of the Soviet Union until their invasion in 1979, where students were prepared for key sectors of agriculture, vehicle maintenance, and construction. However, soon after the invasion, communist ideology took precedence over all aspects of education, and the

institute was left dismembered until the collapse of the communist government (The Borgen Project, 2021).

K4.3: *Sarak-e-Now Chelsetoon, Outskirts of the City 'Known for Jangalak (Metalworking Factory) and Takhnikom (Technical Institute)'*

K5 London, UK (Developed Economy Context)

Following Istanbul and Kabul, the practice concluded in London due to the city's role in becoming a centre and pivoting point of design and industry via the 18th century Industrial Revolution as a result of its Enlightenment tradition and the Great Exhibition in 1851, which cemented its position as a hub for innovation and creativity and dubbed it 'the workshop of the world', written in detail in Chapter 1, Section 1.2. Additionally, London's role in using design to tackle the biggest challenges of post-war rebuilding and economic recovery, improving quality of life through improved products and services, fostering the convergence of arts, science, and technology, and reforming design education has long been celebrated for its contribution to civilisation, past, present, and future.

Located in the northern part of the world in Europe, its cultural values have remained the same while being renowned for influencing other cities around the world in an unequal form of exchange that only suited the West through the historic Silk Roads throughout the years, resulting in the formation of dominant and diverse neighbourhoods of *composite character* and activities.

Dynamics between the city's English and global cultures have created differentiated modes of thinking, while making cultures have been formed by several waves of technological and economic influences, including the move from industrial to digital, the specialisation and internalisation of skills, the concentration of ideas and innovation, and the positioning of design as an important factor for raising standards and driving the local economy towards sustainable and social wellbeing.

K5.1: *Understanding Contextual Dynamics of the UK and Mapping Historic Silk Roads Connecting Asia to Europe*

London, considered a developed economy context, has played a key role between the East and the West by being a centre for culture, theatre, museums, education, and cinema—creating a concentration of *systemic design practices and production methods* that are neither diverse nor inclusive, making it an ideal place for concluding this design research.

Design in the UK originated in the 1860s because of the need to improve social conditions and the quality of manufactured goods and was based on the Arts and Crafts movement, which provided education as a way to develop designs that not only had more integrity but were also made in a less dehumanising way (Victoria and Albert Museum). Later in the years, this way of thinking was championed by the leading art critic John Ruskin, who believed in an ideal template for both better design and better living. However, this ideology never transpired into the expansion of design in other parts of the world, mainly due to the conceptual tools and structures of

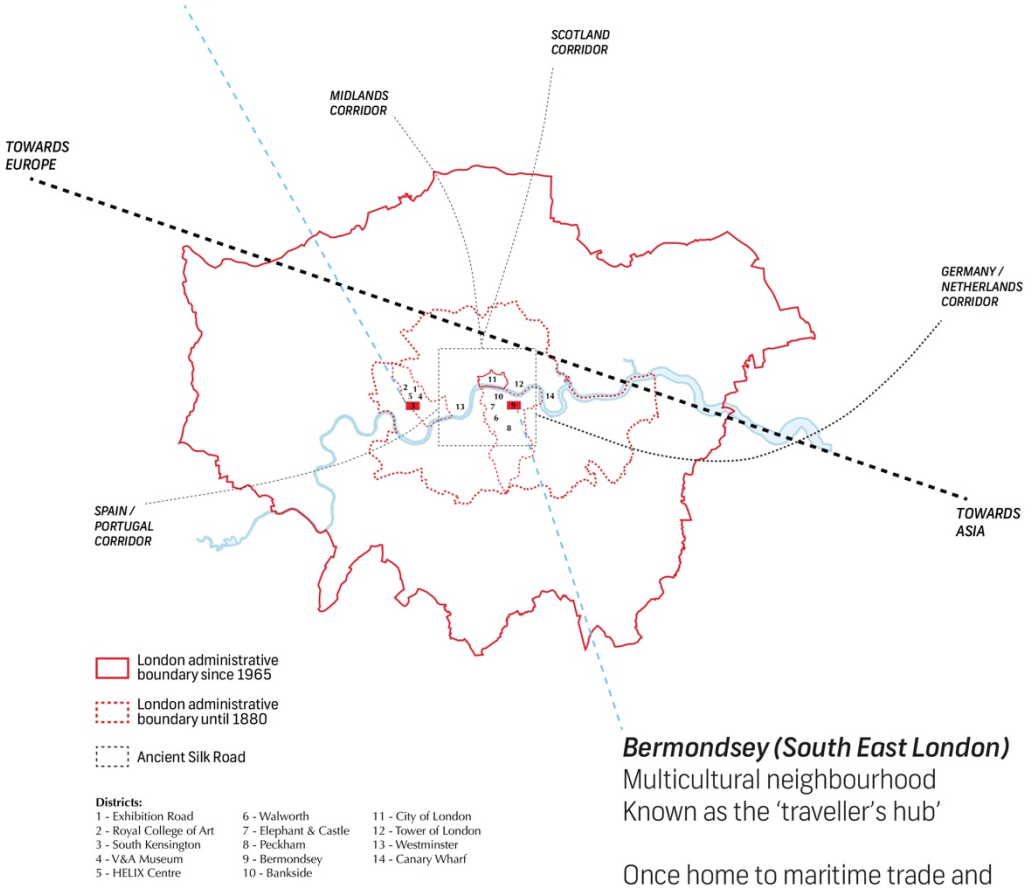
colonialism and the global constructs of modernity and capitalism that followed.

Thus, the research projects undertaken across Istanbul, Kabul, and London aim to identify a set of approaches that are led by people in different economic and cultural settings who organise themselves in their local context to detach from the colonial matrix (Mignolo and Walsh, 2018, p. 115) and compare them with the findings from Chapter 4 to understand what is specific to such a context and what helps different characters to delink from the imported and inappropriate models of design education and practice—requiring new responses and a shift towards decolonising the present and subsequently eliminating the burden of the past and the hopes for the future.

K6 The Field: Southwark, and Kensington —London, UK

South Kensington (West London):
Cultural centre
Known as the 'museum quarter'

A unique collection of cultural and educational institutions that specialise in arts, sciences, and engineering—***it is popular with the European diaspora since WW1, and home to Exhibition Road following the 1851 Great Exhibition in adjacent Hyde Park.***



Bermondsey (South East London)
Multicultural neighbourhood
Known as the 'traveller's hub'

Once home to maritime trade and factories, it is an area that today epitomises the modern urban life—***it is a place of great contrasts and popular with the young locals and migrants as the cheapest and diverse part of the city.***

K6.1: *Understanding Contextual Dynamics of London and Mapping Site of Practice*

On the north side of the river Thames, South Kensington is known as the *museum quarter* and is considered a place of creative and educational establishments following the 1851 Great Exhibition, making west London home to some of the world's most famous and prestigious museums (see K6.2). The area retains a quiet and relaxed environment and houses some of the world's leading arts and sciences centres and cultural institutions, such as the Royal College of Art, the Victoria and Albert Museum, Imperial College London, and the HELIX Centre, and the Design Museum. Today, it is one of the city's main venues for contemporary design and provides the basis for bringing together artistic and scientific research, making, and manufacturing.

A popular destination with the European diaspora since WW1 as well as Middle Eastern expatriates, it sits adjacent to affluent centres such as Knightsbridge, Chelsea, and Hyde Park, which are considered exclusive real estate locations. Several research and development centres within this area house start-up companies and creatives who have been designing and developing physical and digital experiences and artefacts for a global population and get to use and share space and tools across several educational and cultural institutions.

K6.2: *South Kensington, West London 'Known as the Museum Quarter'* (by (from top left) The Great Exhibition Road Festival, Fonts in Use, RIBA Journal, Archdaily, Discover South Kensington)

In contrast, on the south side of the river Thames, Bermondsey is known as the *traveller's hub* and is considered one of the city's multicultural neighbourhoods due to its history as a home for maritime trade and the arrival of industrial plans, docks, and immigrant housing (see K6.3). Where once food and leather goods were stored in warehouses, today they are converted into high-end flats, offices, and restaurants, as well as contemporary art galleries, artist studios, fashion and textile museum and antique markets.

With its public squares and historic landmarks, the area has seen an increase in the development of studio and event spaces with the aim of providing workspace for artists, designers, and fabricators to support co-working and collaboration, resulting in the development, construction, and assembly of projects for local communities alongside public training and workshop events.

K6.3: *Bermondsey, Southeast London 'Known as the Traveller's Hub' (*by (from top left) Alex & Matteo, Assemble, the Worshipful Company of Glass Sellers of London, Domus, and the Culture Map)

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Appendix L
Research in Context

L1 Researching in Istanbul

In Istanbul, language and cultural differences meant relying on an interpreter, Semih Arsalan, a final-year undergraduate industrial design student at the Istanbul Technical University, who understood design and helped with translating verbal as well as written information and documents.

The research was undertaken in April 2019 to avoid busier periods and ensure the availability of participants and stronger motivations. The participants in Istanbul were chosen based on recommendations from Crafted in Istanbul, a collective that brings together designers and local craftsmen; academics from the Istanbul Technical University's Department of Industrial Design; and the Industrial Designers' Society of Turkey.

While the economic effects and political sensitivities of 2016's unsuccessful coup made it challenging to involve participants in research that is led by a foreigner, additional personal safety concerns arose during fieldwork due to the ongoing war in neighbouring Syria. To maintain safety and the quality of output in such a volatile environment, the site for research was chosen based on its proximity to the main road, the confidence of the participants, their familiarity with the location, having a helper in the form of an interpreter, and the project setup.

L2 Researching in Kabul

In Kabul, language and cultural barriers were minimal due to my own background and previous experience; however, one of the key challenges was getting the participants to understand the purpose of the research and to help them identify their role in the research. This meant relying on making some cultural adjustments, such as changes in attire and dialect to look and sound like a local rather than a foreigner, and having a local person, Aimal Estanakzai, a high school graduate, who helped me contextualise my aims and objectives and acted as a moderator between me and the participants.

The research was undertaken in August 2019 to avoid potential risks and disruptions that would have been caused by the September elections and ensure the availability of participants and stronger motivations. The participants in Kabul were chosen based on recommendations from the Kabul Makers Cluster, a physical space dedicated to the local craftsmen, and contacts and networks from previous visits and projects.

While the economic effects and political sensitivities of the ongoing conflict made it challenging to involve participants in research that is led by a foreigner, additional personal safety concerns arose during fieldwork due to the chaos and fear created by the coming elections, the unreliable sources of communication, and the mortality of participants. Learnings from Istanbul were applied to maintain safety and the quality of output in such a volatile environment, with a stronger consideration for the site of research, ensuring it is in a visible and known part of the city, the ability and capability of the participants, having a helper in the form of a local guide, and the project setup.

L3 Researching in London

In London, COVID-19 changed the way in which research was conducted in the previous locations due to national lockdowns and restrictions to ensure the safety of the participants as well as my own safety; however, one of the key challenges was to minimise exclusion and carry out ethical research via distant and virtual approaches. This meant conducting research through digital communication, mainly e-mail, in which the participant responded when they found it convenient rather than face-to-face.

The research was undertaken in May 2020, when there was clarity on the guidelines by the government, the National Health Services, and the Royal College of Art on how to conduct research during COVID-19, with an emphasis on ensuring that the participants have adequate access to the tools and technology needed for participating in the research and completing the required tasks. The participants in London were chosen based on my personal network of past collaborators as well as academics at the Royal College of Art and Imperial College London.

Whilst the lockdown and restrictions resulting from the COVID-19 pandemic helped with increasing ethical considerations, such as breaking geographical barriers and allowing for detailed elaboration of the participant's thinking and making processes, it generated unforeseen challenges for both me and the participant by blurring the understanding of the research setting, particularly when people were only allowed to work from within their homes. Limited connectivity and contact meant less discussion and low levels of motivation. Therefore, to maintain safety and the quality of output, the research followed the project setup and allowed the participants to communicate openly and clearly in the comfort of their homes.

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Appendix M
Interviews and Practice (Developing Economy)

M1 Semiha Kan Interview Responses

PARTICIPANT NAME: **Semiha Kan**
ACTIVITY: Designer and President of Industrial Designers Society, Turkey
DATE: 10.04.2019
LOCATION: Istanbul

1. **Have you ever designed under constraints, if so what were the constraints and how do you react to available material, know what to design and how to make in the moment of 'now' with limited resources?**

   Yes, the most important constraint for me is always the availability of material and production technique. Every company or in the professional context, client, that I work with wants similar type of design. This creates the need for similar looking collection of products, which means that almost everyone is trying to find the same type of material and similar production technique.

   I make research to inform my work in order to make sure I will be able to achieve my vision; this usually starts with finding the material and the production technique that I require. So, if they are not available I will then review my design and the cycle goes on until there is a match.

   If my design is considering the idea of making in the moment of 'now' then I try to be experimental and look for finding new technology (such as new material or production technique that is new to Turkey), but the problem is that nobody says - there's this new technology and new ways of making let's try it - this makes it difficult to take risk or even find new ways of doing/thinking. It is not usual in Turkey to challenge new design briefs because the producers (either big manufacturers or local makers) they lack main brief and lack the will to take risk, and the clients refrain from investing.

2. **How do you approach a project with limited resources in unsettled context - can you talk me through an example of a recent project that you have designed and draw or describe your process?**

   I try to find common things - for example, if I need to design something or make something new, I try to stich similar looking things with one another. Then reflect upon them and then try again. Similar to 'mix and match' - which I believe is a Turkish way of designing. The problem with this approach is that whilst you make new product, you don't necessarily end up with a new design or innovation. However, we consider this approach to be a 'smart' way of producing.

   Another way that I approach a project with limited resources (time, budget or material) is by trying to find commonalities between my design and my friend's mould. What I mean is that if I am considering using a type of material that my friend or a designer/maker that I know has used recently or previously, then I consider my design to suit the available or found mould, but I make sure I use it differently by changing the shape or type of material, or change the context of the design to make it different from that of my friend's.
   It is a good way to cut time and also to minimize material use and product time.

3. Do you have different approaches to designing under constraints, if so how do you:

Yes, but in Turkey, design process is not important, but rather the outcome. Nobody cares about how you approach a project, nobody understands creative processes but only the designer or those who work in the design industry. So I will try to explain as clear as possible:

a) Design to meet a particular need and solve a functional problem?

Originally, I designed in a linear way because that's what I was taught at university when approaching functional problems, but since working in the industry, my boss told me it is a waste of time and that I need to be faster. So, now for solving functional problems I look for objects that looks similar to my idea and then I put them together physically to see how they work, and then design around it.

For example, I start with an idea in my mind – usually the idea is centered around the type of material that I have in mind. I go and look around suppliers or friends and ask them if you have something similar to this or that, then I bring it to my studio – then I test it by putting them together the way I had imagined in my head, and see if it can be this or that. Once I find the function working, then I sketch and work my design around it.



With this project, I was considering designing a new sugar container that would appeal to high-end market. All three parts that you see here are found from different and separate suppliers and friends, with each part coming from a different design that was designed for a different purpose. Sometimes, if there needs to be some minor changes, such as size or colour, then I get this done by finding the main source of the object.

b) Design to speculate and make something delightful?

For this type of approach, which I mentioned earlier as experimenting, I start the process by visiting manufacturers and see what mould are available that I can re-use, but with a twist or totally new purpose. Then I think, how to make a different product from the mould.


With the pomegranate project, the white pomegranate vase was designed by a friend of mine who decided to lend me the mould and work with the same manufacturer, however, with a condition that it should not look the same or serve the same purpose. I took the mould and worked around it with the manufacturer, implementing their production technique and material. This allowed me to reflect on the size of the mould and transform the context of such shape to introduce it as a desk object but for a different purpose.


Similarly, here I was following the same process but with an introduction of my own design to replace the lid and re-contextualise the purpose of the object.

c) Design with intention to have a desirable outcome?

For this approach, I think I combine both of the above, however, it usually starts with a predetermined idea and set of targets and questions - such as reflection on the culture or context of my design, understand what would be the use or function and also making sure it appeals to the type of people or market. In a sense, in this approach my focus is usually to create a new story whilst making sure the materials and production techniques are locally available.



For this project, I was asked to design a new candleholder that

looked luxurious and culturally suitable. As I was planning the project, I was looking around in my room and then I noticed the base of a bulb and I had a coffee drinking cup in front of me. So, then I thought why not try and see how they look when put together. After seeing that it meets my initial idea, I approached the manufacturer of bronze and also clay-based objects to see if they can give me some ideas on the cost and possibilities of working with such materials. What this meant is that the found objects influenced my choice of material as well as production technique.

4. Do you think your work is influenced by an approach or motivation that is related to your culture, if so how do you reduce cultural influence in the discovery, creation and delivery of your design?

Yes, the most evident one is the mix-and-match or found and made, which I call it 'smart production' - It is a balance of you and what is there to use. Whilst this influence is not something that I consider a negative influence, it does make me limited in what I can imagine and design.

5. Are you influenced by cross-cultural and cross-border exchanges, such as religion, conflict, knowledge and lifestyle, if so has it changed the way you think and design?

Yes, Turkish people are strongly influenced by Arabic (Middle-eastern) culture, and it influences most of design language. I can say that it is to do with people's taste and that which seems shiny and attention seeking.

6. Have you ever redirected or transformed your approach to design in order to suit what is available within the context, if so can you show me an example to see how did it change the way you design? Can you describe the reasons behind the changes in materials, tools, shape and form of your object?

Yes, as you have seen from my projects, they are influenced by what is available and what can be produced.

7. When designing under constraints, what measures do you take to make sure your design is suitable for the end-user and sustainable for the environment?

Generally, I say, why we need to do new things? - I start my design process with available material, available production method and target price. I consider good ways to minimize material use, production costs and cut time to make my products affordable whilst creating a narrative around culture.

M2 Artin Aharon Interview Responses

PARTICIPANT NAME: **Artin Aharon**
ACTIVITY: Designer Maker
DATE: 08.04.2019
LOCATION: Istanbul

1. Have you ever designed under constraints, if so what were the constraints and how do you react to available material, know what to design and how to make in the moment of 'now' with limited resources?

Yes, all the time. Look around my workshop and you can see some examples of reused materials that I have collected over time and use them for different purpose.

The usual constraints for me is that I am not always able to fully express myself through my work, mainly it is to do with the political situation here or that people don't really value artistic thinking, which sometimes makes it difficult for me to explain what or why I want to do something before doing it. I don't draw, and I haven't studied design. I started working in a workshop about fifty years ago because I have a strong passion and interest in making things. And my making is always in the moment of now, but I learn and develop my thinking whilst making things, you could say that I design along the way, like an artist who paints and improves his technique gradually.

2. How do you approach a project with limited resources in unsettled context – can you talk me through an example of a recent project that you have designed and draw or describe your process?

I consider myself to be an artist, so I kind of have artistic approach to my projects. There are three separate approaches that I apply when considering the available materials. One approach is related to making use of available materials and tools in my workshop to make something functional and for a purpose, which usually is a type of collaborative project with a designer or client that leads to mass-production. For example, this light cover, which was commissioned to be made from metal and originated by exploring ideas through magazines and looking through product manuals – followed by a number of manipulations and experimenting with metal by applying pressure on to it.




The second approach is kind of experimental where I have an idea in my mind and I play with the available materials and tools in my workshop to create artistic objects, which also helps me explore new things and to learn new making techniques. The outcome becomes a learning journey, source of new knowledge of something like a sculpture, which is left for people to judge.



The third approach is when I mix the first and second approaches to generate something that is functional but at the same time artistic, which is a one-off type of project/object.



For example, for this project I was asked to make a moving arm for a scientific project that needed to demonstrate motion. So, I went around to find something that would define the idea of an arm in a more experimental way whilst making sure the practical aspect of the project remained as simple and direct as possible.

3. Do you have different approaches to designing under constraints, if so how do you:

Yes, maybe you can consider the three approaches as mentioned above, and in addition I would explain some more details:

a) Design to meet a particular need and solve a functional problem?

I usually depend on my experience when solving a functional problem, for example the first approach as mentioned above. I start with exploring visual references, magazines, books that I find at a local market every so often. And then try and test ideas from it, for example if I find an interesting shape, form or making technique I try it out. If tools are not available, I make my own tools, for example my pressing machine, which I created several years ago, and it lets me do a lot of different variations of pressing.



b) Design to speculate and make something delightful?

To make something delightful, I usually try and test things in order to validate my ideas, which again takes the form of testing and trialling with available material. This approach lets me improve my thinking and making skills and helps me transform my practice. I

consider this to be a method of self-preparation for something that is yet to come, such as a particular project or idea that I would need to be prepared for in advance. For example, here I was exploring the technique of making a continuous form out of steel and experimenting with carbon fibre to see how I can achieve true form.


c) Design with intention to have a desirable outcome?

When designing intentionally, this approach is usually when I am working or collaborating with someone else and if it requires me to plan, then I will need some sort of drawing from which I can understand what is required and also to prepare for. As I mentioned earlier, my approach is artistic, so I use the planning time as an opportunity for discussion and dialogue, and along the way, if I enjoy what I am doing or if I like the person I am working with, then I suggest or develop several things as I am making or working out how to make it.


For this stand project, the collaborator that I was supposed to make this for had no prior experience of working with metal, especially metal tube/rods, but he had fully drawn the design. However, I had to reconfigure the design of the joints and connections to best suit the available material and the tools that I had in hand. This meant that I had to find a solution through making in the moment of now.

4. Do you think your work is influenced by an approach or motivation that is related to your culture, if so how do you reduce cultural influence in the discovery, creation and delivery of your design?

Cultures don't affect me, I believe countries that are not developed, artists feel stronger, they have their own community, and they make use of

their own community. This contagious relation between the artists and their community is what motivates me, which is kind of similar here in Karakoy, but not the rest of Istanbul. Turkey is not forbidding artistic ways of designing and making, yet. But I can say that I am strongly influenced by the sea culture surrounding Istanbul, with fishermen, water, and boats/ships part of the everyday. I have spent thirty years working on boats, so I can say that my thinking is influenced by this culture.

5. Are you influenced by cross-cultural and cross-border exchanges, such as religion, conflict, knowledge and lifestyle, if so has it changed the way you think and design?

I have visited many countries in the region and have worked with many foreign designer/makers, and I can say that it has made me more appreciative and aware of my own culture. For example, when I visited the old USSR, there I witnessed the systematic production system. I saw how talented makers and artists were forced to specialise in a particular approach or process. Everyone was made to have a systematic by-the-book approach, coordinated, and repeated making of one part or element of a product, not having independence or able to move forward from what they knew. This made me realise that, in Turkey, I can practice freely, and whilst my culture promotes sense of creation, I am able to use tools and ideas for other purpose rather than just one type of production.
One other thing that I have observed, is that Istanbul in Istanbul, you can find very good Muslim and Christian/non-Muslim makers/craftsmen, however, the Muslim makers/craftsmen follow one type of practice or making technique, whereas the Christian/non-Muslim makers/craftsmen utilise their tools and skills for whatever purpose. I don't know why this is the case, but I have experienced this as I have worked with many, and some are my very good friends.

6. Have you ever redirected or transformed your approach to design in order to suit what is available within the context, if so can you show me an example to see how did it change the way you design? Can you describe the reasons behind the changes in materials, tools, shape and form of your object?

Yes, the leftover materials, as you can see in these boxes, are the waste materials that I use to experiment with, find new ways of doing things. I grew this interest when I found this magazine which had sculptures made from waste material by a Georgian artist, which gave me a new recipe for how I could use the leftover materials.



7. When designing under constraints, what measures do you take to make sure your design is suitable for the end-user and sustainable for the environment?

I try not to harm nature and put my creation in front of people to judge and give feedback.

M3 Artin Aharon Participatory Practice Outcome

To begin with, I and the participant went about *identifying* available materials, followed by finding suitable tools in Artin's studio (see M3.1). Going from room to room and through various boxes and storage units, a stack of metal sheet cut pieces left from a recent project along with a box of metal rod cut pieces were found. Following this, a discussion on the selection of material took place between me and the participant, and it was decided that the metal sheet cut pieces would be more fitting with the limited timeframe to carry out this research.

Once the type of material was identified, a selection of manual and mechanical tools was chosen to carry out the making part of the research, produce outcomes that can be immediately put into context and maintain constant reflectivity about the process. This, according to Vaughan (2017), allowed me and the participant to combine Schon's (1991) *reflective practitioner* and Michel Foucault's (1988) *self-disciplining practitioner* approaches through the act of learning to self-crit and drive for innovation by creating, monitoring their creations, and bending away from conventional thinking (Vaughan, 2017, p. 35).

M3.1: *Identifying Available Materials and Tools*

The next cycle in the process required *looking* through previous examples in outside sources such as magazines and the types of experiments and tests undertaken by the participant where similar material and tools were used to innovate previously (see Figure M3.2).

This act in the process opened the possibility for both me and the participant to look, think, and act with their past and identify situated and embodied knowledges, experiences, and struggles that push towards advance, and open possibilities of an otherwise, which according to Mignolo and Walsh (2018) is sowing the seeds of decolonisation by cultivating, nurturing, and growing, and always being vigilant of what worked and what did not, and what needs

adapting and what needs changing (p. 100). Looking through the past also helped in understanding what previous experiences and beliefs need to be undone to carry them over into the present and which ones require redoing and further testing for creating the future (p. 120).

M3.2: *Looking Through Previous Examples, Experiments, Findings, and Sources of Inspiration*

Following the previous two cycles—identifying available material and tools as well as looking through the past to analyse and reflect upon previous practice—the third cycle was *deciding* on the design of the artefact and

understanding the cultural and social context for the innovation, resulting in the decision to redesign the small decorated saucer (see M3.3) that accompany the elegant and delicate tulip-shaped Turkish tea glasses known as *ince belli* (slim waisted or slender). The decision was based on the discussions with Artin and Semih about the history of tea in Turkey, which was imported through the Silk Roads, and the role of ince belli cup's role within Turkish culture. It was shared that these cups were designed and manufactured in Turkey for the local population from the late 1850s onwards when European style teacups needed to be replaced by smaller and thinner ones due to their high costs.

The key focus here was to delink from cultural influences and narratives that have been controlling new ways of knowing and creating and have been forming the basis for copyist designs. To transcend and thus delink from the copyist culture, a sense of pressure was felt in this cycle of the process, where I and the participant had to constantly look back at the findings from the previous cycles and relink them together to understand the impact on local culture and social forms of life that needed preserving rather than making them hostages of innovation and personal desires.

M3.3: *Deciding on the Context and Usability*

Once the decision was made to design and create a newer version of the

Turkish teacup's saucer, a worktable was formed where the outcomes of the previous three cycles were placed and used as a point of reference for the next set of cycles. The *making* cycle was a combination of trialling and testing the findings from cycles one and two, which included reusing previous creations as tools to expedite the formation and gradually shaping the new design (see M3.4).

The act of *using experiences and outcomes* of the past to connect to the needs of the present to shape the future helped me and the participant to develop a decolonial perspective and proposition of thought and sow experiences, existences, and emotions with practices of speculation, finding, and knowing in the moment of now. In addition, these shifts in movement were influenced by the layout of Artin's studio and were unstable and based on a constant process of rearranging and production that created a non-linear approach and helped break the permanence and continuity of conventional thinking and making.

One of the key aspects of this cycle was moving from the location of making to the location of validation to check the progress that is being made and the quality and viability of the design. This meant building dialogue and conversation with knowledge that is specific to the context and allowing me and the participant to liberate our assumptions and beliefs by learning, unlearning, relearning, reflecting, and taking action on the go.

M3.4: *Making and Testing the Initial Idea*

To understand the aesthetic qualities of the artefact, usability tests were conducted, which revealed that the key functionality of the new design still lacks the depth needed for the teacup to sit comfortably, which is a key

cultural aspect of the tea ceremony where the teacup is left to sit for a while so that the glass becomes cool enough for the user to pick up and drink from. This meant visiting the previous cycles once again to *finding* objects or previous experiments that would work as a tool to help make the aesthetics and the making process easier (see M3.5).

Unlike the third cycle, where the focus was to delink from cultural influences and narratives, a sense of pressure was also felt in this cycle, which required me and the participant to contemplate the relation between the design of their artefact and the end-user by considering some degree of renewal, restoration, and revival rather than a completely new design that would interrupt their understanding, acceptance, and experience of the innovation.

M3.5: *Finding Additional Tools to Increase Aesthetics Qualities and Improve the Making Process*

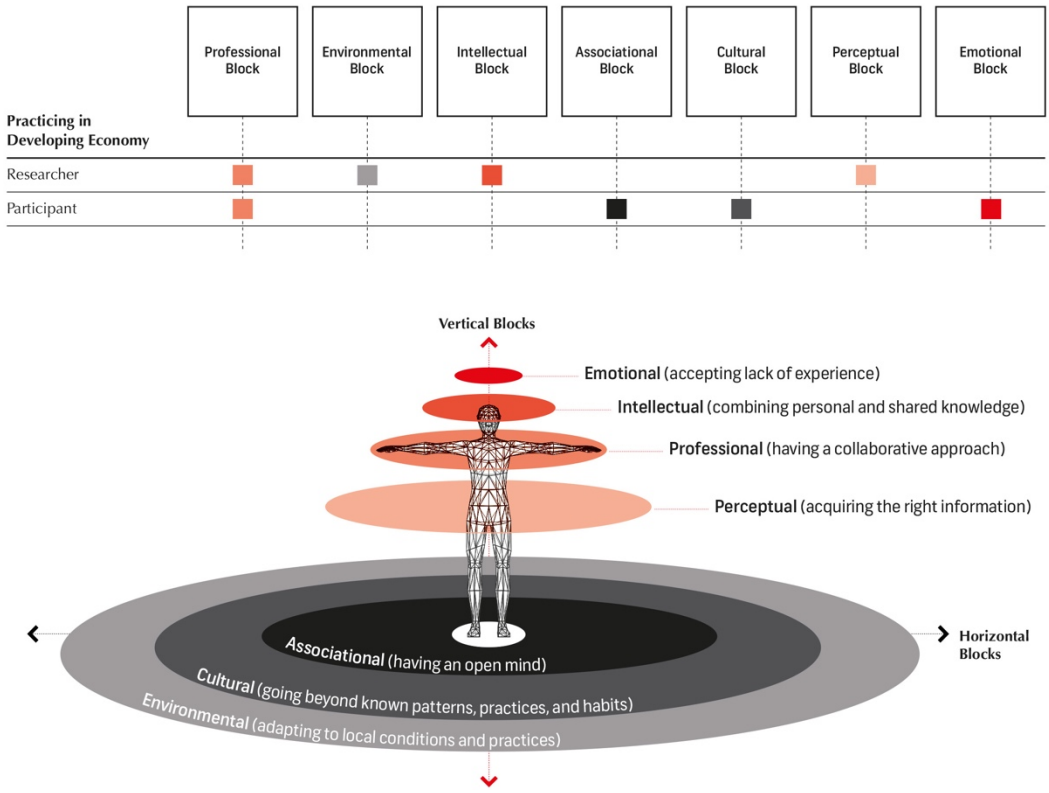
The final cycle was concerned with *validating* the outcome of the project (see M3.6). To understand the cultural and social significance of the innovation, it was compared with the existing offer to interpret the results and discuss the findings. One of the key aspects of this cycle was to evaluate the possibility of mass producing the design and reflect on the weaker elements of the project outcome.

This process was deemed successful as an outcome based on the end-user feedback and reflection, which highlighted that the proposed design is more

sustainable, cost-effective, and durable than the existing Turkish teacup saucers and that it is delightful (pleasing and easy to use) and aspirational (lightweight and progressive in its shape and form) while maintaining the original purpose.

M3.6: *Validating and Comparing the Outcome*

M4 Measuring Decolonisation in Developing Economy Context



M3.1: *Measuring Decolonisation in Practicing as a Migrant (Participant) and Foreigner (Researcher) in Developing Economy Context*

Appendix N
Interviews and Practice (Least Developed Economy)

N1 Zilmai Mirzayi Interview Responses

PARTICIPANT NAME: **Zilmai Mirzayi**
ACTIVITY: Designer Maker
DATE: 20.08.2019
LOCATION: Kabul

1. Have you ever designed under constraints, if so what were the constraints and how do you react to available material, know what to design and how to make in the moment of 'now' with limited resources?

Yes, this is the country of constraints. Money is the main constraint for me, I cannot invest in new tools/machinery and also cannot afford to waste material to have the opportunity to make new things. I work with hand and manual tools most of the time so the materials that I use are good for manual tools, and when there is a bigger and complex project I hire electronic machinery, that again is dependent on the availability of electricity and at most time diesel generator.

In order to make, it is important for me to find out what to make. Making is dependent on what is available and what I can and am able to make. For example, before I make something, first I have to make sure there is enough material available because the material that we use (thin metal sheet) comes from Pakistan, therefore any small issue at the Afghanistan/Pakistan border would tremendously affect the cost and availability of this material. Secondly, I have to know what tools I will require and hire them in advance. The availability of tools mostly defines my thinking and working pattern, for example if I am working with electronic tools and then there is no electricity I will have to fall back on using hand tools, which results in modifying and simplifying what I will make within the timeframe.

2. How do you approach a project with limited resources in unsettled context – can you talk me through an example of a recent project that you have designed and draw or describe your process?

I have been making household appliances from metal sheets for about forty years. In these forty years, my workshop has moved three times across the city of Kabul due to war, with each of these movements my practice and approach to making has been shaped by my location.

For example, the sudden move to another part of the city meant that I could only take limited number and types of tools with me, and if any

specific piece of tool was lost in the process then that would mean that I had to compromise with my making technique as well as the outcome. The major change in this process, for example the air extractor, would be its aesthetics – it would be all about the function and very less about quality. The one of the right is the simplified version of the one on the left, which was made without the availability of the creasing machine. The problem with the simplified version is that people do not understand its purpose, because it looks different to the one that they are used to - which means that they are used to looks of objects than its function.


Working with limited tools and material forces me to over-think the process, especially cutting and working without guidance or sample. Therefore, it is easier for me to copy and make repeated designs than to make new or experiment. This makes my approach to focus on three things - get the right type of material, cut once and cut correctly, and work on agreed outcome.

3. Do you have different approaches to designing under constraints, if so how do you:

Yes, I think so:

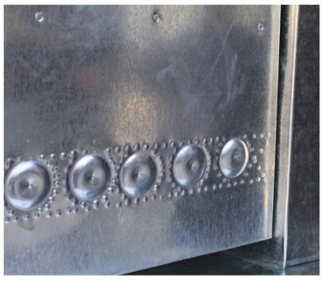
a) Design to meet a particular need and solve a functional problem?

This usually starts with understanding three things: availability and amount of material to suit size of object, available tools, and the cost of making or timeframe for its completion. I start this approach by considering the design as a box, which is the easiest and cheapest way to make something out of metal sheets.



b) Design to speculate and make something delightful?

This is done by thinking 'decoration' – this is usually when I think about my learning from my master, and reflect on how they made something and how can I make it better. I apply decoration to make my designs standout and make people attracted to it. The decoration is applied by using hand tools, which is time consuming. The shape and style of decoration is first tested on a sample and once approved then applied onto the design. The decoration can be our signature and also made-to-order.


c) Design with intention to have a desirable outcome?

This for me is the situation when I am making something that is made-to-order. In this approach, I reflect on feedback that I receive from people, for example, the metal storage boxes that I make were fragile when it had weight on top of them and people would often complain about the dents and deformation of the material. This made me to do two things, first I re-imagined the design of the lid and secondly I had to make use of the tools and techniques that I am familiar with.


The other method that I apply to achieve this outcome is to mix functionality and decoration together, which gives aesthetics a clear purpose that is cultural and useful. For example, this water container is designed to hold a lot of litres of water and at the same time it has to look apart with the Afghan household/culture. The folds on the surface are created by using the creasing machine, which helps make the form more stiffer and stronger whilst the pattern helps usability and gives it a distinct look.

4. Do you think your work is influenced by an approach or motivation that is related to your culture, if so how do you reduce cultural influence in the discovery, creation and delivery of your design?

The people's need is motivation for me. My work is concerned with designing for people's everyday use, therefore, their needs and choices become culture for me. For example, in Afghanistan people are influenced by contemporary Indian and Turkish cultures through television – their taste and lifestyle are also influenced by these foreign cultures. This way, their needs turn into the kind of wants which has no resonance with their local culture – availability of material, quality and standards are different here. However, I combine the local culture with that preferred by the client, take the metal storage for example, it is designed to local and historical taste but the decoration is left to the taste of people.

5. Are you influenced by cross-cultural and cross-border exchanges, such as religion, conflict, knowledge and lifestyle, if so has it changed the way you think and design?

Material is foreign for us and we make things that suit the availability of material. For example, the material that I work with (thin metal sheet) comes from Pakistan – and this is a huge dependency for me. As I mentioned earlier, the availability of this material is dependent on our political situation – if this material is in short supply or expensive to buy then my work is highly impacted. This material is not recyclable, but it is reusable/reparable, so it has influenced my making and designing method to one that suits the notion of reparability. However, there is very less income for me to make a living from repairing old appliances than to make

new ones - on the other hand, in Afghanistan due to changes in culture, people have started to prefer new things rather than repairing old ones.

6. Have you ever redirected or transformed your approach to design in order to suit what is available within the context, if so can you show me an example to see how did it change the way you design? Can you describe the reasons behind the changes in materials, tools, shape and form of your object?

I have always worked with the same tools, but recently I have been working with building contractors to make air extract/ventilation pipe for buildings. This was a very new type of work for me and one that needed me to reconsider how I approach large-scale technical projects.

In the beginning, I was asked to make the air vents, which I did not know how to make - but then started to copy from an existing model brought from Turkey. I realised that the air vent required precision and required layers of pieces to work together - something that needed me to learn new making techniques in order to complete this project. However, I refused to make the air vents as I could not afford the time and effort it required to learn the technique, but agreed to make the large ventilation pipes that met my own expectations, skills and experience.





7. When designing under constraints, what measures do you take to make sure your design is suitable for the end-user and sustainable for the environment?

As I mentioned earlier, I have started to see reparability as a possibility for designing and making appliances that would help me and my country to become independent from relying on foreign material - and explore new design and making techniques that take into consideration locally available material. Additionally, I use patterns on my designs to help with the strength and usability factors of the appliances whilst helping to decorate them.

N2 Nizrab Hajizada Interview Responses

PARTICIPANT NAME: **Nizrab Hajizada**
ACTIVITY: Designer Maker
DATE: 24.08.2019
LOCATION: Kabul

1. Have you ever designed under constraints, if so what were the constraints and how do you react to available material, know what to design and how to make in the moment of 'now' with limited resources?

Yes, and I have three main constraints and three approaches for this situation. First is the unreliability of electricity, which forces me to consider change of tool/machinery to hand tools/machine when there is no electricity.


Secondly, limited availability and high cost of material, which forces me to consider mixing different materials in order to get an outcome.



Thirdly, time is very precious in a country where life is unreliable, this forces me to rely on practical testing and making in order to design in the moment of now.



2. How do you approach a project with limited resources in unsettled context – can you talk me through an example of a recent project that you have designed and draw or describe your process?

My approach is reliant on three things – tools, material, and time. My practice runs by renting tools and machinery, and most importantly diesel generator, as availability of electricity is very unreliable. This requires me to be very flexible with my design and at the same time very specific. The flexibility part of it requires me to consider aesthetics as a work in progress, whereas the specific part requires me to be very careful with the cutting of material and to continuously think about the reuse/repurposing of off-cuts when working on projects. In addition, I must work on multiple projects simultaneously to make the best of my time and tools.

For example, I was making a metal gate for a client for which I was using these metal profiles. The material was ordered to suit the design of the gate, however, whilst cutting the material into shapes I was considering another project (metal barriers) that required the same type of material. So, I was trying to make use of the tools, material, and time simultaneously for the other project.

3. Do you have different approaches to designing under constraints, if so how do you:

Yes, I do have, maybe they are different or maybe they are similar:

a) Design to meet a particular need and solve a functional problem?

In Afghanistan, need is driven by function of a design - it is very important, and people rely on function and purpose before considering their need, because sometimes they do not know what is available to them or know how to use it. Function is seen as a necessity, and therefore it must be the cheapest and easy-to-use (e.g., light, portable) option to buy. I try to make things cheaper by making designs that are simple to understand and use, but with today's need and type of users in mind – creating designs that help direct someone towards understanding its use, such as opening or closing.

For example, take the sweet wrapper – very few people here would know how to open it, they don't think before using something, because they rely too much on the looks of something in order to understand its function and use.

b) Design to speculate and make something delightful?

For this approach, I use the cut-out pieces to use them for new objects – they create a new look and tend to be different. I think about the of cut-outs from the beginning or projects, and my process for this is usually as to cut first, then check to see what they could be used for, and then play with shapes to test what could be made.

c) Design with intention to have a desirable outcome?

I get influenced by objects that I see and magazines. I often use shapes and designs that are foreign in order to attract my customers. For example, the cleverness of the opening of wrappers and the car air-condition outlet, which I aspire to use in my

designs but sometimes tend to be very difficult due to technicalities and limited tools.


4. Do you think your work is influenced by an approach or motivation that is related to your culture, if so how do you reduce cultural influence in the discovery, creation and delivery of your design?

Saving of material in the process of making is good for me, both in terms of creativity but also economically as I use the cut-outs to make other designs. Also, sometimes thinking and doing at the same time proves to be difficult, requiring having a second option, which is kind of a cultural practice.

One of the biggest problems that I have, which is a cultural influence, is that before any project, my motivation and energy levels are usually very high, but as the project progresses, I tend to lose interest, focus and the time to deliver the expected quality - resulting in designs that seem unfinished or feels like they are still work-in-progress. This is mainly due to the limitations and constraints that arise during my work - such as unreliable electricity, limited material, or not being able to work out technicalities that are out of my reach.

5. Are you influenced by cross-cultural and cross-border exchanges, such as religion, conflict, knowledge and lifestyle, if so has it changed the way you think and design?

I have had the opportunity to travel to India on many occasions for medical purposes, and in there I have seen that people react to situations differently. For example, asking for pardon rather than fighting over accidents was something that made me think differently about my own practice - I have now started to work with other makers and my approach to experiments and mistakes is very open, more friendly and accepting mistakes more regularly.

I also experienced that the quality of material at its origin is much better than the imported ones found in Afghanistan - this has made me realise that I should consider the life of such material when making new designs, so that it reflects the quality of the imported material and not the general/universal view of such material's quality.

6. Have you ever redirected or transformed your approach to design in order to suit what is available within the context, if so can you show me an example to see how did it change the way you design? Can you describe

the reasons behind the changes in materials, tools, shape and form of your object?

Transformation and redirecting of my approach happen daily – mainly caused by the unreliable availability of electricity. This affects the length and use of tool, which in turn undermines the quality and finish of my work.

The prospect of limited possibility for cutting and welding means that a lot of work is redirected towards planned and scheduled production – and then filling the gaps with hand tools. In some cases, it has required the change of material, size, and quality of material. This in turn has two drastic influences on the quality of the output – cutting and making not to precision, and rushing through the project, which forces me to search for ready-made objects and items that would look and work similarly to makeup the shortcomings.

7. When designing under constraints, what measures do you take to make sure your design is suitable for the end-user and sustainable for the environment?

Reusing of material and making designs that are easy to use and repair are my main measures – this allows me to think about designs that take into consideration less of material from the beginning, as well as considering the culture and type of people that would use my designs.

IDREES RASOULI, ROYAL COLLEGE OF ART
PRE-WORKSHOP INTERVIEW, KABUL, AFGHANISTAN
DECOLONISED INNOVATION: DESIGNING NEEDS, DREAMS AND ASPIRATIONS UNDER RESOURCE-CONSTRAINTS

N3 Nizrab Hajizada Participatory Practice Outcome

To begin with, I and the participant went about *identifying* available materials and tools in Nizrab's shop (see N3.1), searching through piles of leftover metal cut pieces from previous projects, unsuccessful prototypes, and found objects. Following this, a discussion on the findings took place between the me and participant, where it was realised that the available material would need electricity and advanced equipment. A phone call was made to order a rented electric circular saw, and arrangements were made to make sure there was enough fuel in the electricity generator.

After identifying the type of material, a selection of manual and mechanical tools was chosen to carry out the making part of the research. Unlike Artin, who used cross-cultural references, for example, images from magazines or the internet, as a starting point, collaboration with Nizrab required pre-planning and having an idea of the end outcome in advance—which was to design and make a new household product that would enable people to dry and dehydrate food at home. This, according to Rheinberger (1997, p. 11), is adjusting between the known idea and that which is beyond imagination that allowed me and the participant to *reshape* our design agenda on-the-go by *reflecting* the reality on the ground through shared action for innovation, understood as renewing, restoring, reviving, and continuing contextual and relational thinking (Mignolo and Walsh, 2018, p. 18).

N3.1: *Identifying Available Materials and Tools*

The second cycle required *adapting* the found material and objects to the design idea through cutting, shaping, combining, and adjusting using both electric and manual tools to create new functionalities and uses (see N3.2).

This act in the process opened the possibility for both me and the participant to transform our space of practice into a space of discovery and experimental manipulation by bending and contextualising the past through shared performance, which, according to Rheinberger (1997), is a situation where we find ourselves confronted with a network of horizontal and nonlinear practices that lead to epistemic investigative operations. Adapting materials and objects from the past also helped in operationalising empirical findings and making them function as tools to produce new knowledge (p. 16).

N3.2: *Adapting Available Materials and Tools*

Following the previous two cycles—identifying available material and tools as well as adapting the found material and objects to the design idea—the third cycle was *reflecting* on the technical features of the artefact (food dryer

and dehydrator) and finding off-the-shelf components that would transform the functional aspects of the innovation into a delightful experience for the end-user, resulting in the exploration of mechanical and electrical parts (see N3.3) found in existing household products familiar to the local population, including discarded ceiling fan panels, computer cooling fan, washing machine dryer fan panels, and a small heat exchanger.

Deciding to design and make a food dryer and dehydrator was based on discussions with Nizrab and the local people and the role of food drying and dehydrating within the Afghan household. It was shared that food drying and dehydrating have been used in Afghanistan for many centuries as a cultural method by people in communities with limited access to fresh produce during the winter, however, without consideration for their design and use in an urban context.

The key focus here was to design and make a multipurpose product that would allow the end-users to dry and dehydrate different types of food at home in a safe and healthier way through a device that is contextually and culturally suited to local needs. To transcend and thus relink to the local context and culture, a sense of pressure was felt in this cycle of the process, where I and the participant had to constantly look back at the findings from the previous cycles and relink them together to understand the impact on local culture and social forms of life that needed preserving rather than making them hostages of innovation and personal desires.

N3.3: *Reflecting on Potential Technical and Functional Aspects and Deciding on the Design Outcome*

After exploring different options, the decision was made to use the discarded fan blades as a source of manual opening and closing mechanisms to control airflow and temperature inside the food dryer and hydrator, resulting in a

cycle of *repurposing* where a combination of shaping and testing the fan blades was carried out to further develop the design and functional aspects of the product (see N3.4).

Like the findings in Istanbul, the act of *using experiences and outcomes* of the past to connect to the needs of the present in order to shape the future helped me and the participant to develop a decolonial perspective and proposition of thought and sow experiences, existences, and emotions with practices of speculation, finding, and knowing in the moment of now. In addition, these shifts in movement were influenced by the layout of Nizrab's shop and were unstable and based on a constant process of reshaping and remaking that created a non-linear approach and helped break the permanency and continuity of conventional thinking and making.

One of the key aspects of this cycle was moving from a private location of identification to that of making and testing in a public space to help contextualise the outcomes instantly. This, like the findings from Istanbul, meant building dialogue and conversation with knowledge that is specific to the context and allowing me and the participant to liberate our assumptions and beliefs by learning, unlearning, relearning, reflecting, and taking action on the go.

N3.4: *Repurposing Discarded Fan Blades as a Manual Opening and Closing Mechanism*

Further *exploration* was carried out in the following cycle to identify methods for adapting the repurposed fan blades and develop the functional aspects of the artefact. Through studying the air conditioner vent outlet of a car, it was decided to develop a similar opening and closing mechanism where the end-user can control the airflow manually and based on their specific needs (see N3.5).

The approach taken in this cycle was both functionalist (responding with the available tools and skills to achieve a rational choice) as well as artificial

(responding with the intent to improve user experience and achieve an ideal lifestyle) (Wang, 2013), which brought to the core the notion of delight as an interactive vehicle to integrate social, cultural, economic, and emotional elements in framing my motivation as well as the participant's.

N3.5: *Exploring Methods for Adapting the Repurposed Fan Blades*

The next cycle focused on *contextualising* the key functionalities with the aim of further developing the opening and closing mechanism and allowing the end-user to flexibly operate at different temperatures and angles (see N3.6).

This meant building upon the method acquired from the air conditioner vent outlet found in a foreign car and moving away from the notion of a copyist thinker to becoming an active thinker by developing a new context-specific method using off-the-shelf components that are known and used locally.

Throughout this cycle, the relationship between the shared motivation of both mine and the participant was being shaped by the site of practice, where interactions and encounters with the place of making as well as attention to localities were continuously influencing decision-making—from linear to more indirect and multidimensional. Despite the novelty, a lack of know-how and limited tools resulted in discarding the findings from this cycle with a view to considering a simpler response, which is described in the following cycle.

N3.6: *Contextualising the Key Functionalities*

Retrieving back to the initial idea, the next cycle involved *articulating* the key functionalities of the artefact by devising a rough plan to build upon and bring together a sense of joint envisioning and imagining (see N3.7).

N3.7: *Articulating the Key Functionalities*

Following completion of the functional aspects, the design of the artefact lacked reference to the local material landscape and needed articulations that could help the end-user understand and relate to its aesthetics as well as its purpose and significance to the local culture. This required *collaboration* with a local craftsman to help the innovation become more responsive to the existing material forms and be able to share the space with other local household products (see N3.8).

The key aspect of this cycle was to place emphasis on practicing co-

relationality as a way of making that produced empathy and meaning with the immediate context by becoming more responsive and sharing the joy and wonder of designing a new artefact with others to disrupt, shake, or surprise the local culture, perceptions, and expectations (Wilson, 2017).

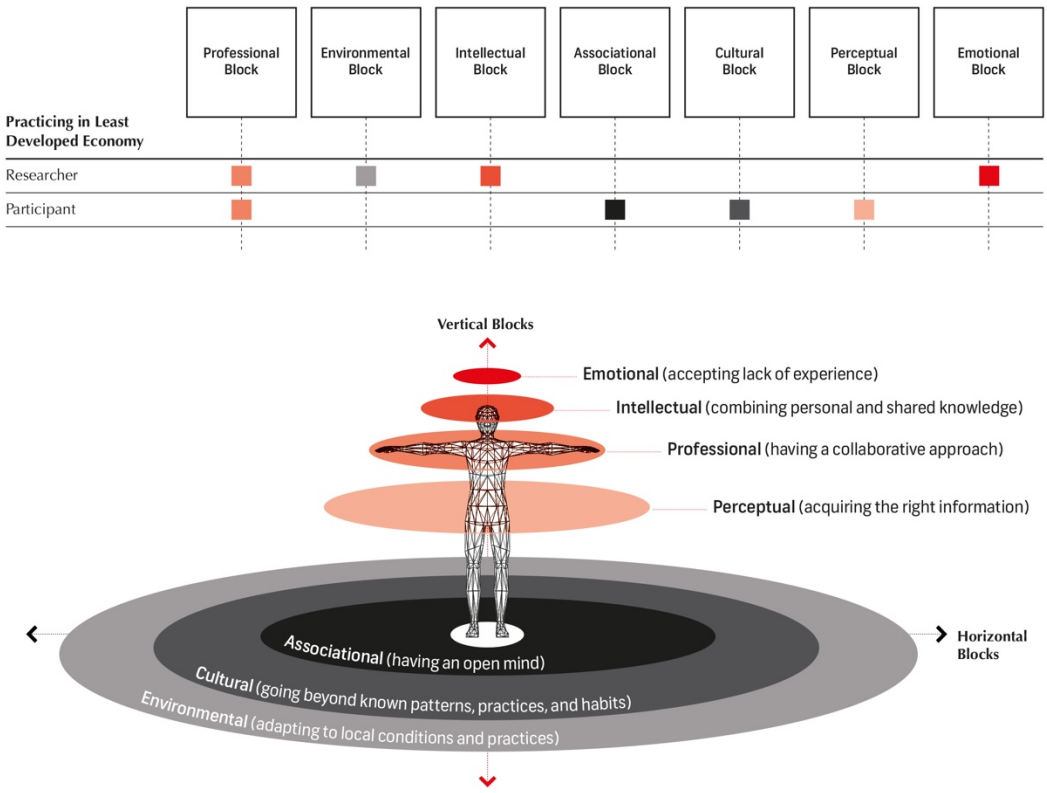
N3.8: *Collaboration with Local Craftsman to Shift Perceptions and Expose Expectations*

The final cycle was concerned with *adding* features that would allow the end-user to move and operate the artefact with ease (see N3.9). To understand the cultural and social significance of the innovation, it was decorated with off-the-shelf features that are known to the local population as handle knobs and wheels. One of the key aspects of this cycle was to evaluate the possibility of self-repair as well as maintenance and reflect upon the shortcomings of the project outcome.

This process was deemed successful as an outcome based on the end-user feedback, which highlighted that the proposed design brings together various cultural practices in a safer, cleaner, and more inclusive manner than the existing food dryer and dehydrator systems and that it is delightful (multipurpose and easy to use) and aspirational (compact and environmentally friendly) while maintaining the original purpose.

N3.9: *Adding Local Features to Contextualise and Articulate*

N4 Measuring Decolonisation in Least Developed Economy



N4.1: *Measuring Decolonisation in Practicing as a Migrant (Participant) and Foreigner (Researcher) in Least Developed Economy*

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Appendix P
Interviews and Practice (Developed Economy)

P1 Chris Natt Interview Responses

PARTICIPANT NAME: **Chris Natt**
DATE: 11.06.2020
LOCATION: London

1. Have you ever designed under constraints, if so, what were the constraints and how do you react to available material, know what to design and how to make in the moment of 'now' with limited resources?

I led a project exploring the future of low-cost prosthetics in Cambodia. Since the 1950s, the 'Polypropylene Prosthetics System' developed by the International Committee of the Red Cross (ICRC) has commonly been the only affordable option available through NGOs to amputees in low income settings.

The solution needed to be:

- Technically Feasible - be comparable with current fabrication methods (vacuum forming, welding, lamination) - we spent a huge amount of time in the prosthetic clinics with technicians breaking down current processes and with local manufactures (injection molding and rubber casting factories) to understand what solutions could be produced locally, and what the current quality control measures are (it can be hard to raise existing quality control measures, I've found its often best to try and work within current practices.

- Desirable - in line with cultural norms and belief systems and meet key needs - we worked across 3 different states in Cambodia running in-depth interviews and participatory activities with amputees.

- Commercially Viable - affordable (near to the cost of the existing system)

2. How do you approach a project with limited resources in unsettled context – can you talk me through an example of a recent project that you have designed and draw or describe your process?

You have to value the input of those with 'lived experience' in both defining the problem and solution. Defining the problem is relatively straight forward using established Human Centered Design methods etc. in-depth interviews, shadowing, participatory exercises / tools.

Defining solutions is trickier in an 'unsettled context', problems and the technologies available to solve them are both dynamic and change over time. I proffer to think about solutions as being multi-faceted - what could we implement in 3 months (solutions which saves / improves lives on a short-term basis and allows for further mid-term 6-36 months and long term 36+ months learning.

Involving 'users' in this process (especially ones who are not familiar with technology) requires tools which stretch their 'reality'. E.g. During interviews with prosthetic leg users in rural Cambodia, the most frequently expressed issue related to the function of their prosthetic foot was the speed at which it wore down, its look, its interaction with specific surfaces, putting on / taking off shoes etc. When asked what changes they would make to the foot, the reply was almost always the same - a foot which is more durable / last longer. The introduction of basic tools (very basic / sketched concepts) helped to stretch the perception of what could be possible.

3. Do you have different approaches to designing under constraints, if so, how do you:

Like most designers I switch / modify tools, but the core approach is user or systems centered.

a) Design to meet a particular need and solve a functional problem?

Be technically feasible - comparable with current fabrication methods found in the context to meet the technical requirements.

b) Design to speculate and make something delightful?

Be in line with cultural norms and belief systems and meet key needs – combining participatory activities and decision making in the process to understand the delight aspect of the end product.

c) Design with intention to have a desirable outcome?

Be commercially viable – considering the economic impact and benefits to end-user alongside the practical and delightful needs of the end product.

4. Do you think your work is influenced by an approach or motivation that is related to your culture, if so, how do you reduce cultural influence in the discovery, creation and delivery of your design?

In 2017, I spent 10 weeks at a NASA research facility in California learning about exponential technologies and their application to solve global challenges. This undoubtably shifted my perspective on the potential role of emerging technologies in some of the work I do.

The way we engage local population in the design process is critical in reducing our own biases. Its critical to work in close proximity to the people and places where problems exist, with teams that include nationals who are familiar with the culture.

5. Are you influenced by cross-cultural and cross-border exchanges, such as religion, conflict, knowledge and lifestyle, if so, has it changed the way you think and design?

Discussion around cultural values (sometimes routed in religion) often comes up whilst in transit with locals / nationals on the team. It has reinforced how much we have in common whilst how beliefs and cultural norms can vary… in turn its reinforced how important it is to understand the local context and value local knowledge on the team.

6. Have you ever redirected or transformed your approach to design in order to suit what is available within the context, if so, can you show me an example to see how did it change the way you design? Can you describe the reasons behind the changes in materials, tools, shape and form of your object?

Frequently when prototyping, in Cambodia role play is something people are more comfortable with when compared to the UK. It means prototyping services can be done more efficiently and quite a playful way.

7. When designing under constraints, what measures do you take to make sure your design is suitable for the end-user and sustainable for the environment?

End user - I look to engage the user throughout the process.

Sustainable for the environment - Map out product life cycle and product journey (this is something I've done less of).

P2 Era Savvides Interview Responses

PARTICIPANT NAME: **Era Savvides**
ACTIVITY: Designer Maker
DATE: 01.05.2010
LOCATION: London

1. Have you ever designed under constraints, if so what were the constraints and how do you react to available material, know what to design and how to make in the moment of 'now' with limited resources?

I have designed under constraints of budget for a facade re-design. The project (Snow Wall) was to design a 30m span facade cladding system to front a client's site. The objective was to present a state-of-the-art robotic paneling design using locally available marble while showcasing the capabilities of the client's 7-axis stone carving robot. Constraints on the project were to do with machining time and costs. To counter this I developed an approach to the design aesthetic that was directly tied to the limitations provided by the robot. By working with the robot's original software to simulate roughing operations and adjusting the original programming of the machine, I was able to develop a design texture that would create the appearance of a finished texture entirely through roughing toolpaths. This was able to reduce time/costs in robotic production by 60-80% through customised machine operations.

The success of this project relied on developing a very close relationship with the local stone mason. Through almost daily interaction and visits to the yard, he was able to share with me his immense knowledge on traditional masonry techniques and knowledge on the robotic software while I exchanged with him knowledge/training on 3d design and design thinking and innovation. Without me gaining an understanding from him on traditional manufacturing and hands-on understanding of the robotic and software limitations and without him gaining an understanding/idea from me on how to innovate with the machine and adjust it for bespoke machine operations it would have never been possible to arise to a design thinking that was able to

become informed by the mason's experience into a successful manifestation of the original idea.

2. How do you approach a project with limited resources in unsettled context - can you talk me through an example of a recent project that you have designed and draw or describe your process?

Ongoing project: Curating Cyprus pavilion for Venice Biennale 2020 under quarantine conditions in Cyprus and UK. For this to work, again, we have been developing very close relationships with the makers and manufacturers to make sure that there is a direct line of communication with them and that the design is, as above, developed in discussion with the makers at concept stage and throughout the design development. This ensures the project is informed with understanding of making from concept stage, the designer can process this

information and develop ideas for how the design responds to certain limitations at the early stages and therefore before the idea is too mature to change and adapt.

3. Do you have different approaches to designing under constraints, if so how do you:

Yes, and they are as follows:

a) Design to meet a particular need and solve a functional problem?

Under constraints of budget where multiple prototypes of the design could not be financed, I have turned to learning to understand production simulation software to resolve as much of the functional issues as possible prior to prototyping.

b) Design to speculate and make something delightful?

Design to speculate for me is done through intuitive experimentation with available materials and manual tools.

c) Design with intention to have a desirable outcome?

For me, the main concern/constrain is the unavailability of makers who have true digital manufacturing understanding. There are not many facilities that house robotic fabrication on the island, and those who do have a relatively basic experience with the machines in terms of skill set or pushing the machine's capabilities into new territories (experimentation). In a situation where the design you provide to the manufacturer is relatively ambitious, they will usually come back with a set of criteria or opinions that will

compromise it. For a desirable outcome to arise, it is often the case that a close relationship needs to be nurtured between designer and maker so that the maker can truly understand the designers' intentions (the why behind the what) and the designer to fully understand the makers limitations and machine workings (the why behind the not). In this way real innovation in design/making can become synthesised into the final result.

4. Do you think your work is influenced by an approach or motivation that is related to your culture, if so how do you reduce cultural influence in the discovery, creation and delivery of your design?

My approach to building relationships with craftsmen has arisen from my cultural background and having lived in the UK for 14 years I consider this a big plus. In terms of reducing cultural influence - when working in Cyprus where production is usually slow and less professional, as mentioned in answers above, I either work with someone I have an ongoing relationship of trust with or otherwise I am prepared to constantly oversee the production by visiting the facilities daily.

5. Are you influenced by cross-cultural and cross-border exchanges, such as religion, conflict, knowledge and lifestyle, if so has it changed the way you think and design?

Coming from Cyprus I feel this has probably influenced me in more ways than I am aware of. Coming from a place which has gone through a long series of conquerors and has absorbed many architectural influences, from the Phoenicians, to the Venetians, Ottomans etc., the Cypriot vernacular is a hybrid mash up of many cultures and the island itself has inherently struggled with its own sense of identity, always trying to mirror a visual identity closer to the West so as to disassociate itself from middle eastern visual references - although the local culture in essence is identical to its right side neighbours.

As a young designer I was perplexed by the political situation on the island. During my Bachelor years I was reading a lot of critical theory on cultural identity, community, architecture and around the time when I was graduating from my Bachelor studies I became very interested in the notion of the global - global identity, global architecture, starchitects, the generic. It was probably this that led me to enroll in a digital unit for my MA and in a sense created a final project and thesis that was heavily criticising digital design and globalisation. In an attempt to understand global aesthetics vs local vernacular/poetics better, I focused my research in building an expertise on digital design so as to be able to connect what I felt was missing from the digital with my inherent values of community, materiality, craft that came from my local upbringing. This agenda is still driving my studio philosophy.

6. Have you ever redirected or transformed your approach to design in order to suit what is available within the context, if so can you show me an example to see how did it change the way you design? Can you describe the reasons behind the changes in materials, tools, shape and form of your object?

I have always tried to push the limitations of what we could achieve in terms of design although yes most of my work did use locally available materials like stone and marble - an example of this would be the project below.

Holy Poly rocking bench was a commission for a public bench in London, commissioned by the LFA and GLA under a budget of £1.5k. Being largely accustomed to working with much higher sums of money, the restricted budget provided both a constraint and an opportunity for us to question our existing practice and seek alternative means of realizing out idea.

My initial approach was to adopt a hands-on approach to production where I would take the role of both designer and manufacturer, using a CNC machine I had free access to in order to construct the carcass out of plywood, create a polythene

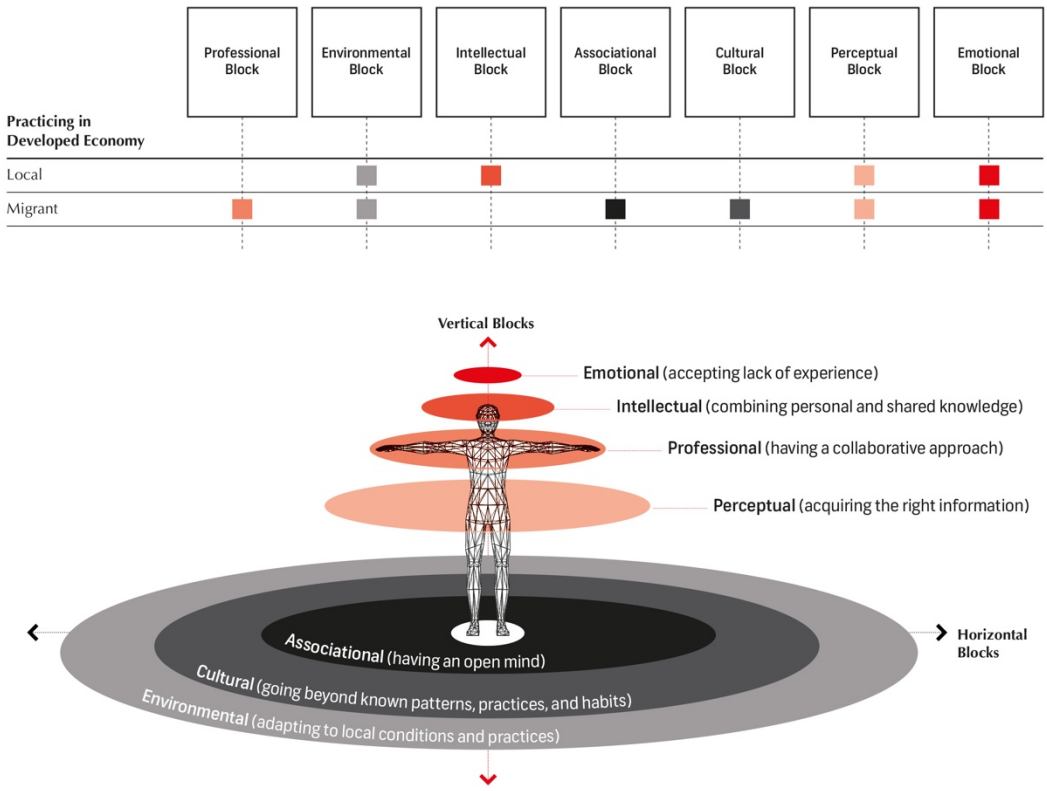
skin by hand and finish the design through sponsored, cheap, materials. This would have been a feasible option for us since we already had the manufacturing know-how as to produce the piece ourselves, although would come at a cost in terms of taking up a lot of our time and requiring a lot of unpaid physical output. In the end I ended up adopting a more suitable approach that came about through opening the discussion to previous manufacturers we had worked with in terms of material they were looking to unload from previous projects. As a result, the opportunity arose when one of the manufacturers had a lot of leftover cork material which they could provide to us for free. I adjusted the design to accommodate and re-use this leftover material and tested out various techniques to seal it and make it suitable for public use and longevity. Working together with the manufacturers to test various ideas for strengthening the cork was a process which provided me with valuable insight as to how unconventional materials can become appropriated to respond to design and functional criteria when you open the discussion to include the hands-on knowledge and expertise that comes from makers and craftspeople prior to finalising the design package.

7. When designing under constraints, what measures do you take to make sure your design is suitable for the end-user and sustainable for the environment?

Creating designs that are sustainable for the environment is an issue that still perplexes me. It is a hot subject right now, but my feelings are that few designers can respond to this with honesty; and many that do will tend to portray this as a selling point of their studio, perhaps because they are either compromising on design/aesthetics or their costs are higher, and they need to be able to price this. Sadly, I don't feel I can say that what I design now is driven by a desire for sustainability. Hopefully in future and with the right clients I might be able to take a stronger stand on this - as is probably the case with many designers at the current moment. When designing under constraints especially, I feel this can be difficult. I am one who sees beauty and value in using locally sourced materials, craftsmen and techniques and have often incorporated this in my work and thinking, but I am reluctant to say that this is enough to claim a sustainable thinking, especially towards the environment, embodied energy etc. I do wish I had a better answer to this question.

IDREES RASOULI, ROYAL COLLEGE OF ART
PRE-WORKSHOP INTERVIEW, LONDON, UK
DECOLONISED INNOVATION: DESIGNING NEEDS, DREAMS AND ASPIRATIONS UNDER RESOURCE-CONSTRAINTS

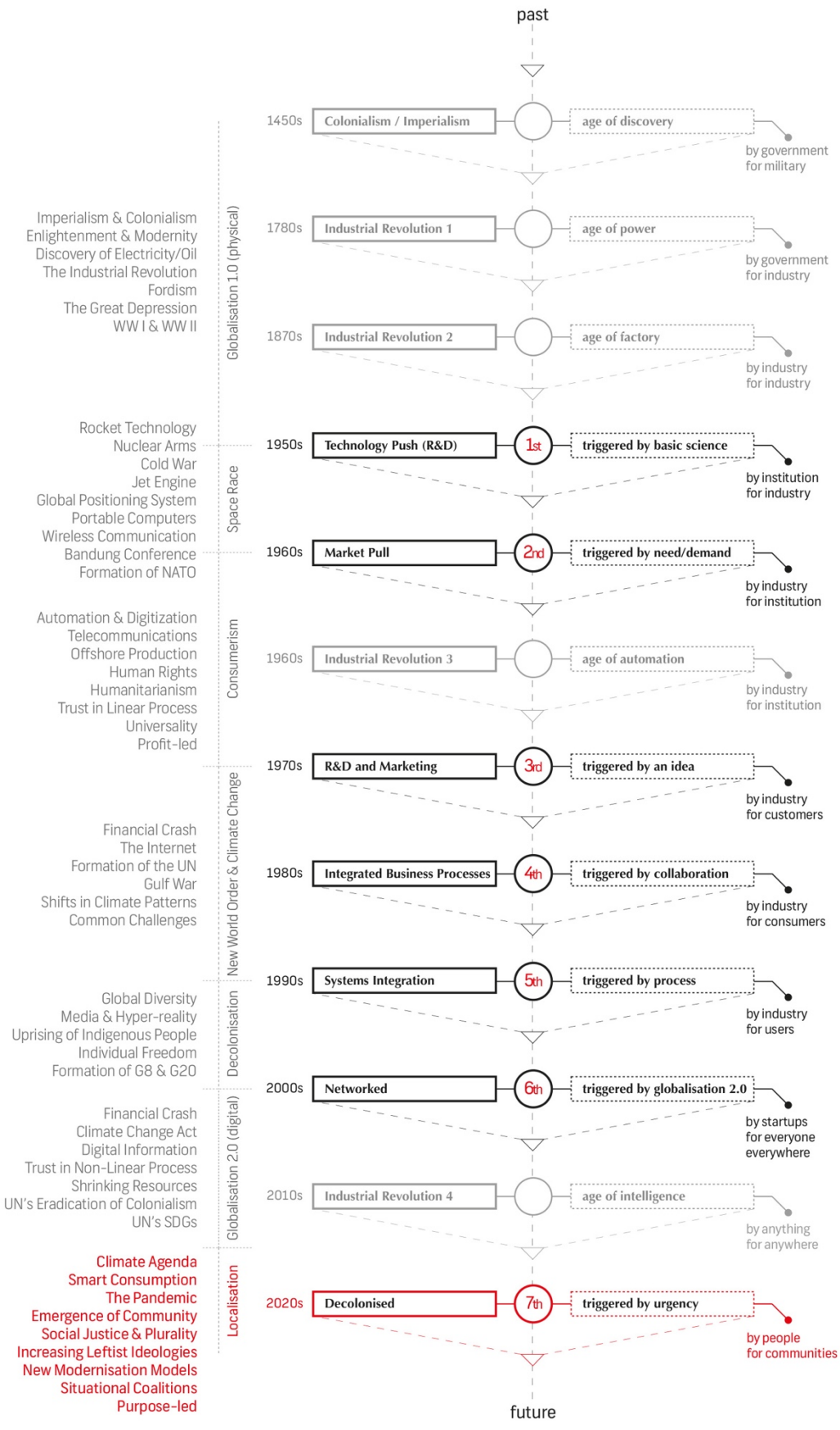
P3 Measuring Decolonisation in Developed Economy Context



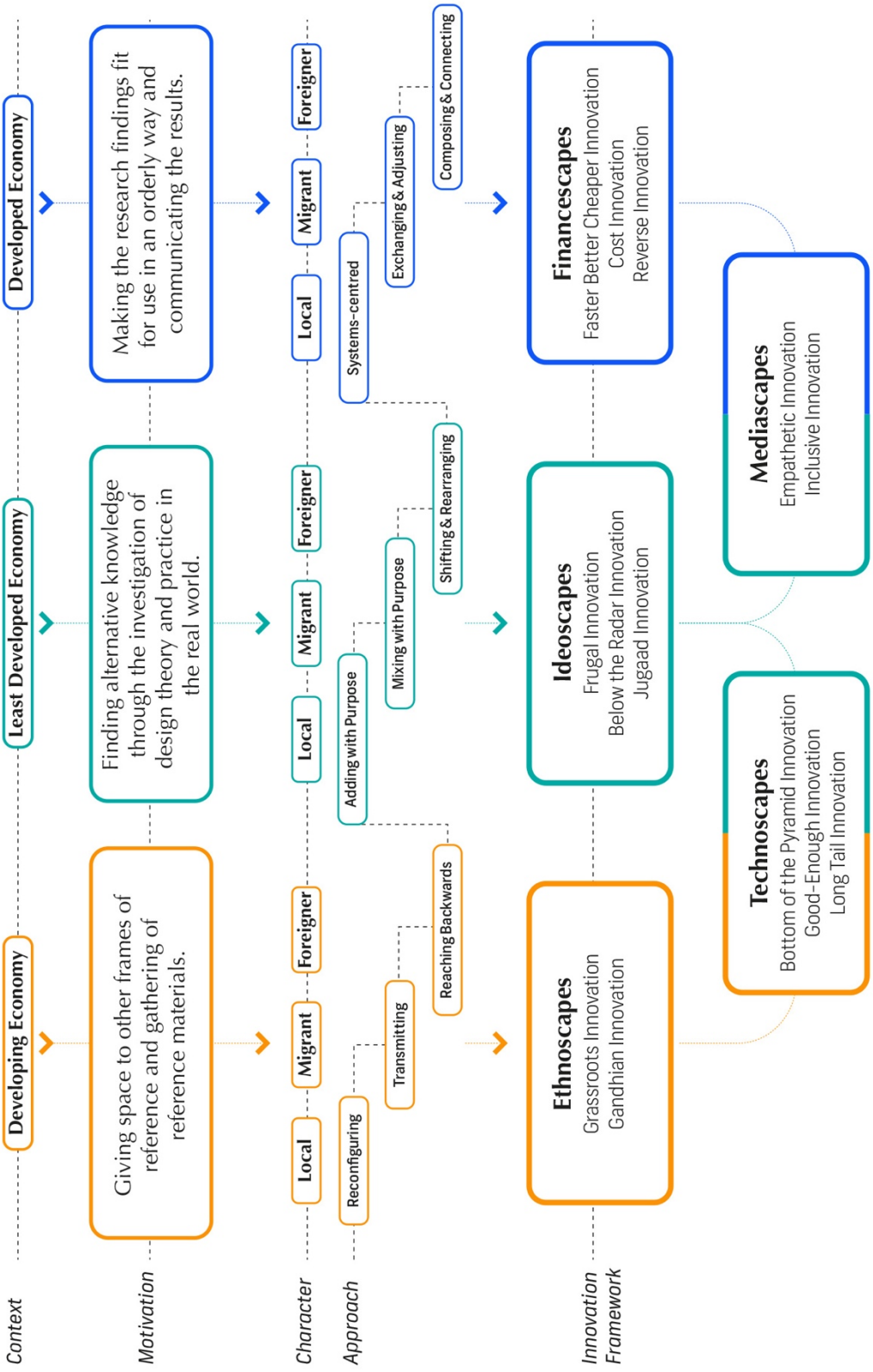
P3.1: *Measuring Decolonisation in Practicing as a Local and Migrant (Participants) in Developed Economy*

Appendix Q
Mapping Decolonised Innovation Under Resource Constraints

Q1 The 7th Generation of Innovation



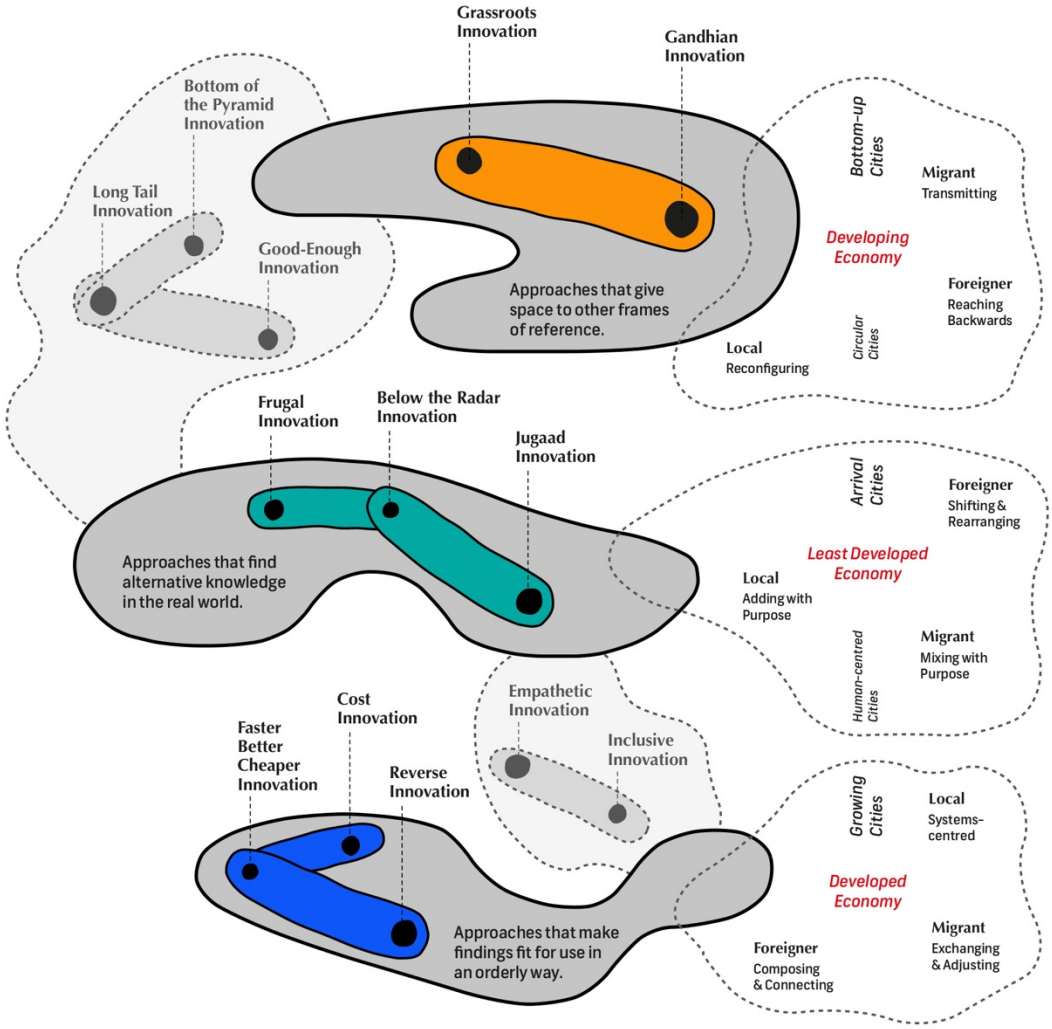
Q2 Designing Decolonised Innovation Under Resource Constraints



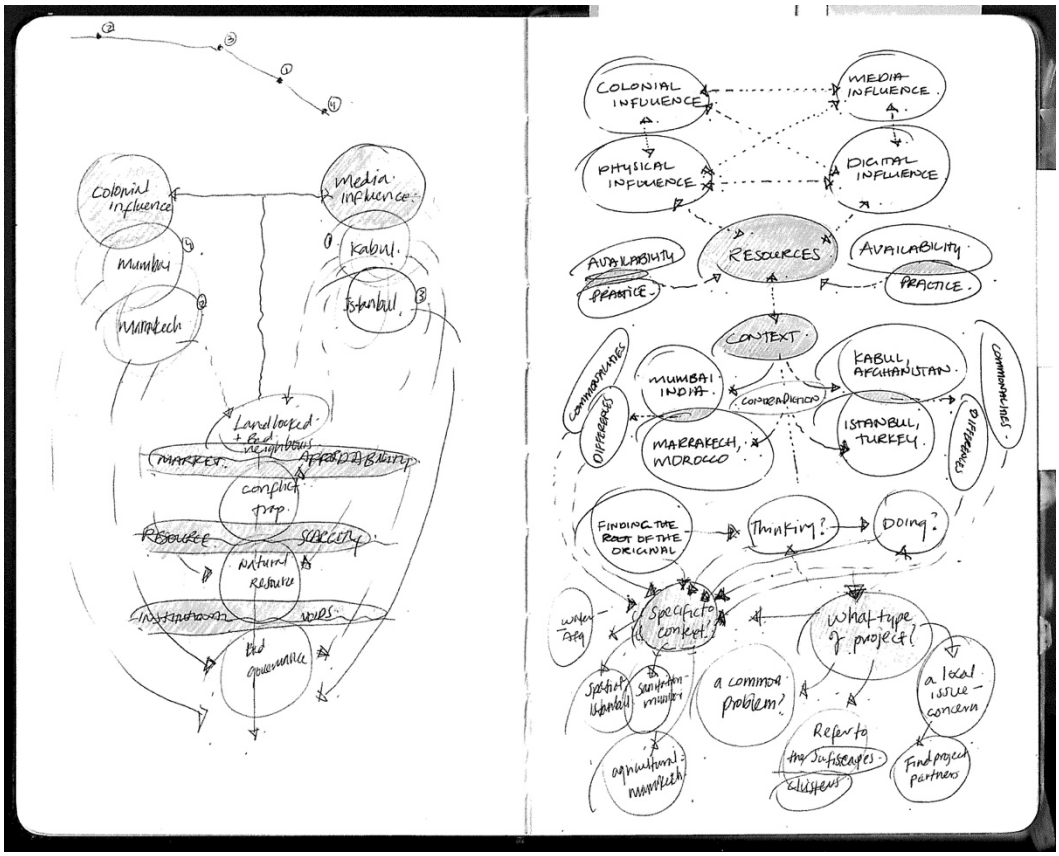
Q3 Decolonised Methods of Innovation Under Resource Constraints

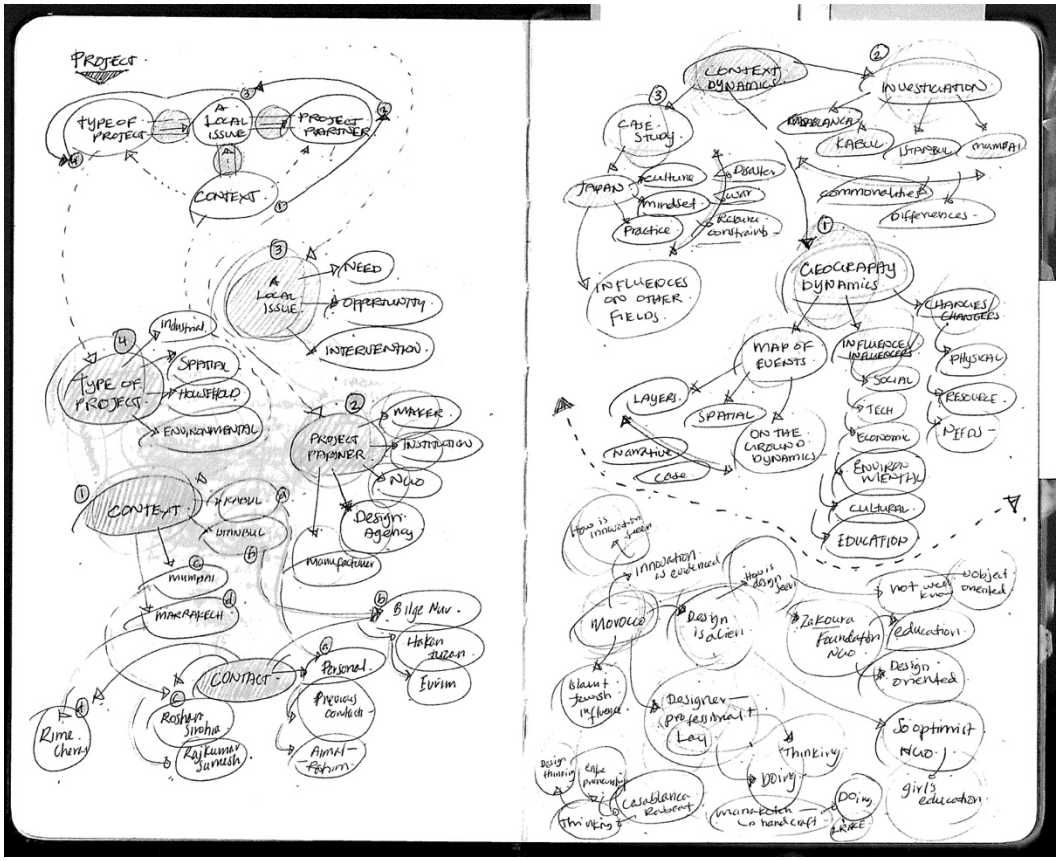
Projects	Main Constraint	Designing Needs	Designing Dreams	Designing Aspirations
Project 6 Practicing in Developing Economy	**Limited Production Options and Artistic Freedom**	**Instant Re-purposing** (finding objects that look similar) **Referencing** (finding solution from outside sources)	**Organised Mix & Match** (working with confined production technique and existing moulds) **Self-preparation for Future** (experimenting and trialling)	**Re-purposing the Existing** (re-thinking and creating a theme around existing objects) **Collaboration** (planned dialogue)
Project 7 Practicing in Least Developing Economy	**Unavailability of Electricity**	**Simplification** (easiest possible way) **Directional** (focus on purpose)	**Culturally Influenced Aesthetics** (personalised decoration) **Controlled-experiment** (planned cutting)	**Made-to-Order** (functional and decorative) **Imitative** (sophisticated technique)
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 to understand user delight) **Experimenting with Intent** (digital speculation)	**Commercially Viable** (economic impact alongside technical and delightfulness) **Synthesised Exploration** (expanding capability)

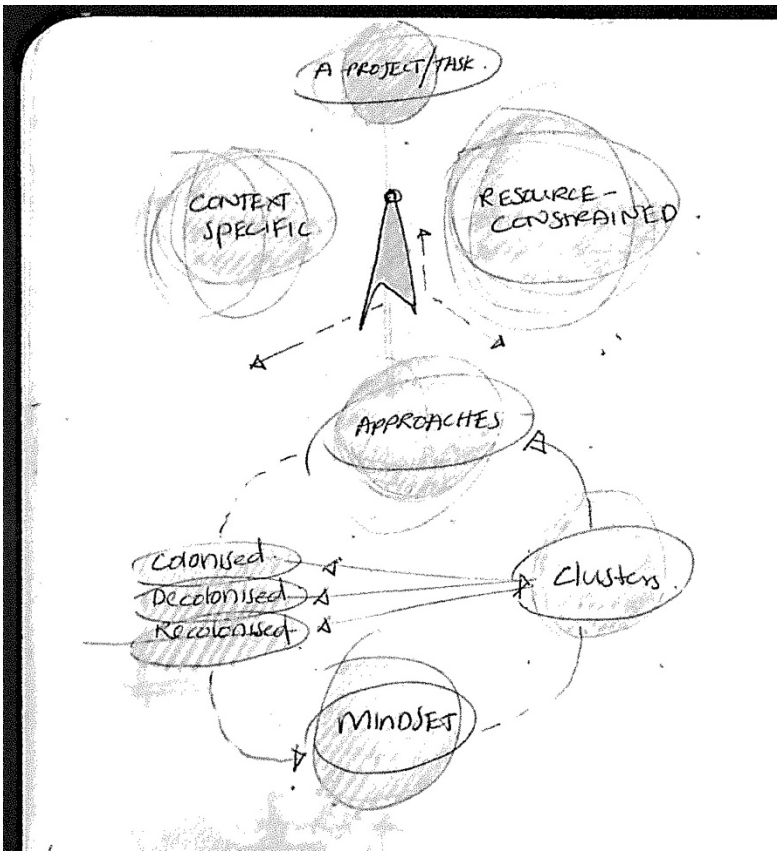
Q4 Contextually Appropriate Methods of Innovation Under Resource Constraints

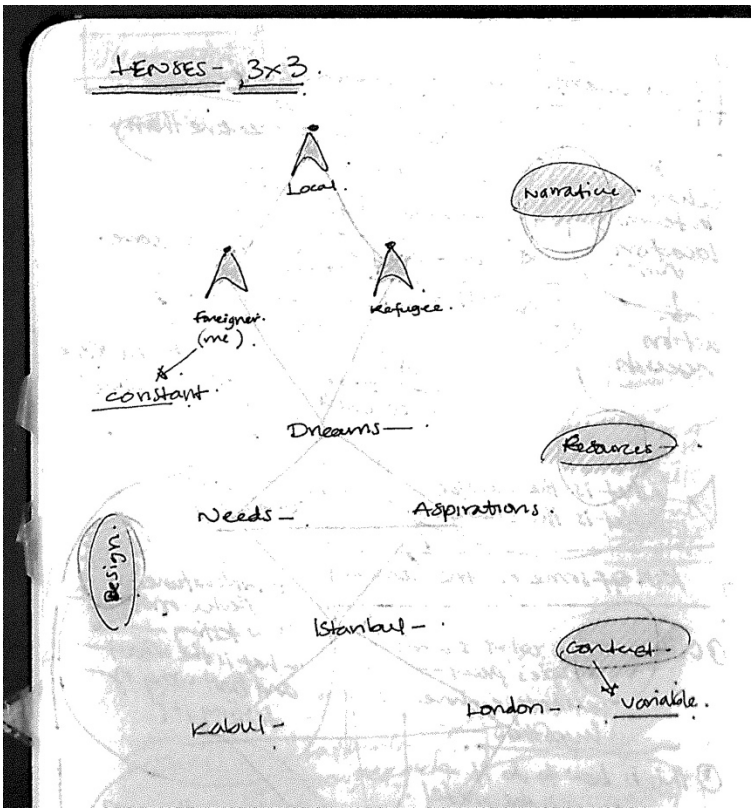


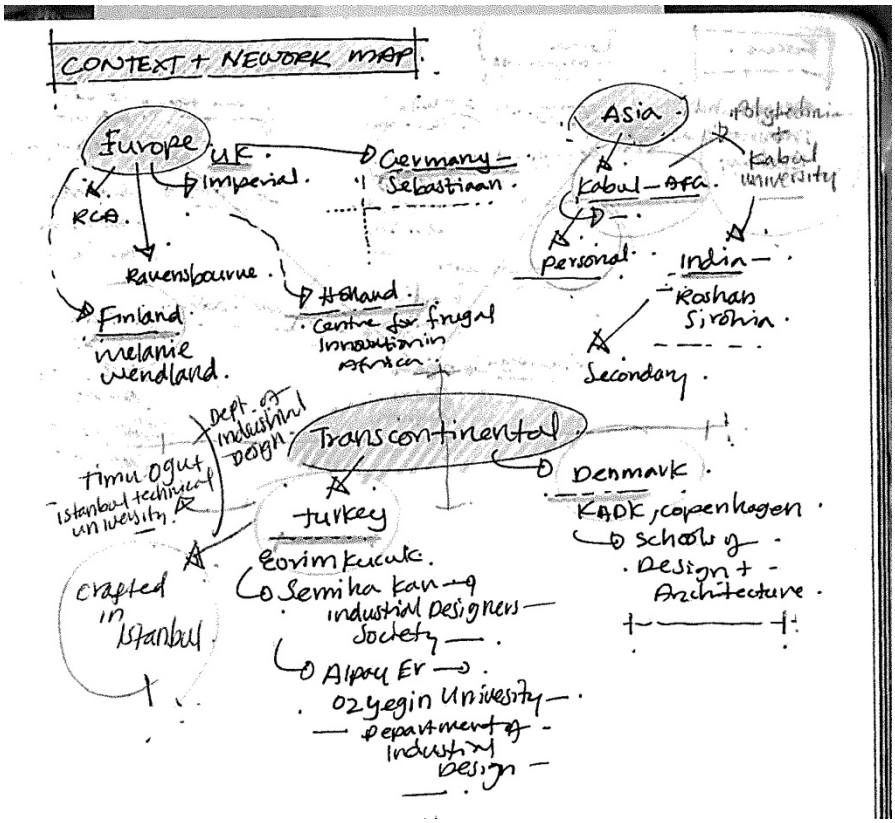
Appendix R
Thoughts and Processes During Research

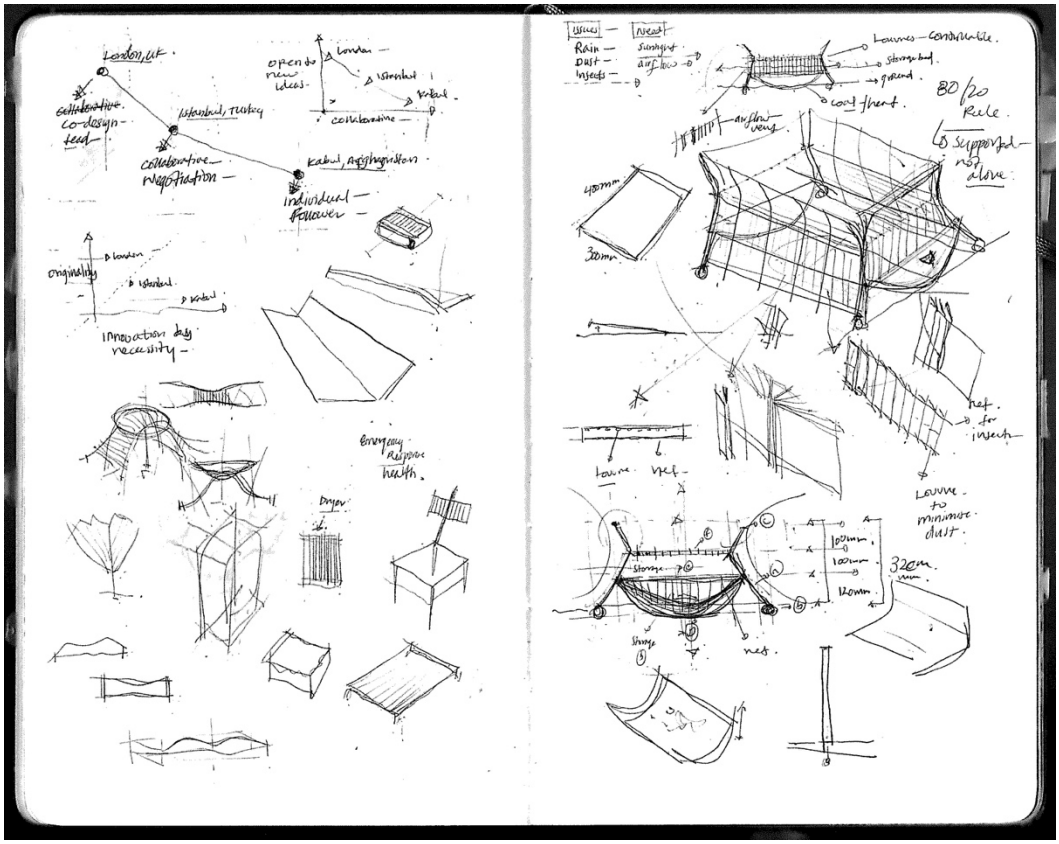

Colonial influence
Media influence
Mumbai
Kabul
Marrakech
Istanbul
Landlocked + bad neighbours
MARKET
conflict prop.
RESOURCE
SPECIFIC
natural resource
bad governance
COLONIAL INFLUENCE
MEDIA INFLUENCE
PHYSICAL INFLUENCE
DIGITAL INFLUENCE
AVAILABILITY
PRACTICE
RESOURCES
CONTEXT
MUMBAI INDIA
KABUL AFGHANISTAN
ISTANBUL, TURKEY
MARRAKECH, MOROCCO
COMMONALITIES
DIFFERENCES
FINDING THE ROOT OF THE ORIGINAL
Thinking?
Doing?
What type of project?
a common problem?
a local issue - concern
Refer to
Find project partners

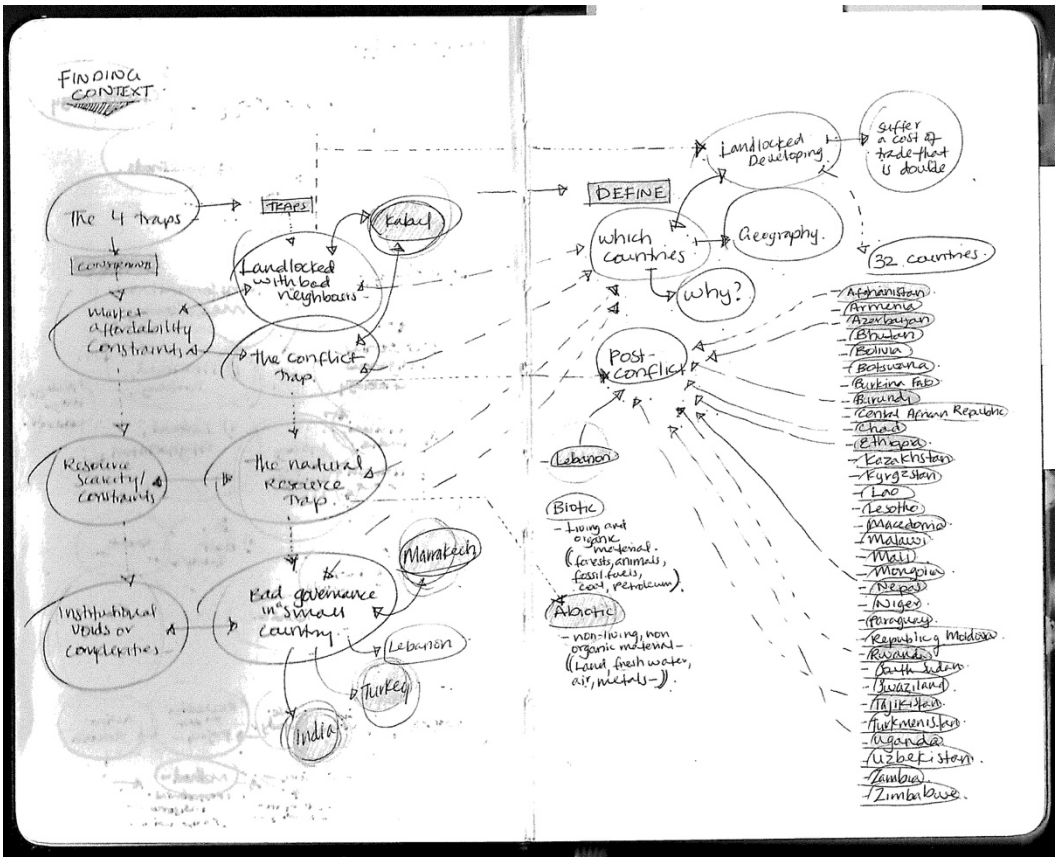

PROJECT
TYPE OF PROJECT
LOCAL ISSUE
PROJECT PARTNER
CONTEXT
NEED
OPPORTUNITY
INTERVENTION
Industrial
SPATIAL
HOUSEHOLD
ENVIRONMENTAL
MAKER
INSTITUTION
NGO
Design Agency
Manufacturer
KABUL
DIYARBUL
MUMBAI
MARRAKECH
Bilge Nur
Hakan Aygen
Evrim
CONTACT
Personal
Previous contact
Rime Cherif
Roshan Sirohia
Raj Kumar Sarnesh
CONTEXT DYNAMICS
INVESTIGATION
CASE STUDY
CASABLANCA
KABUL
ISTANBUL
MUMBAI
JAPAN
culture
disaster
mindset
war
Practice
Resource constraints
commonalities
differences
INFLUENCES ON OTHER FIELDS
GEOGRAPHY DYNAMICS
CHANGES
MAP OF EVENTS
INFLUENCES
PHYSICAL
SOCIAL
RESOURCE
TECH
NEED
ECONOMIC
LAYERS
SPATIAL
ON THE GROUND DYNAMICS
NARRATIVE
CASE
ENVIRONMENTAL
CULTURAL
EDUCATION
How is innovation seen?
innovation is evidenced
How is design seen?
not user centred
object oriented
MOROCCO
Design is alien
Zakoura Foundation NGO
education
Design oriented
Glaoui - Jewish influence
Designer - Professional
Lag
Thinking
Doing
Jo optimist NGO
girl's education
design thinking
Edge philanthropy
Casablanca Restaurant
Thinking
Doing
marrakech - handicraft
Doing
RARE

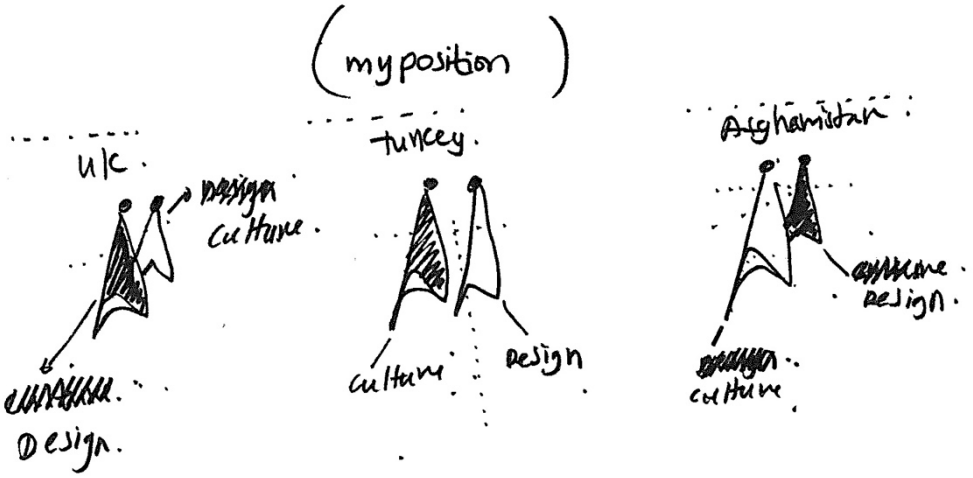

A PROJECT/TASK
CONTEXT SPECIFIC
RESOURCE-CONSTRAINED
APPROACHES
colonised
Decolonised
Recolonised
Clusters
MINDSET

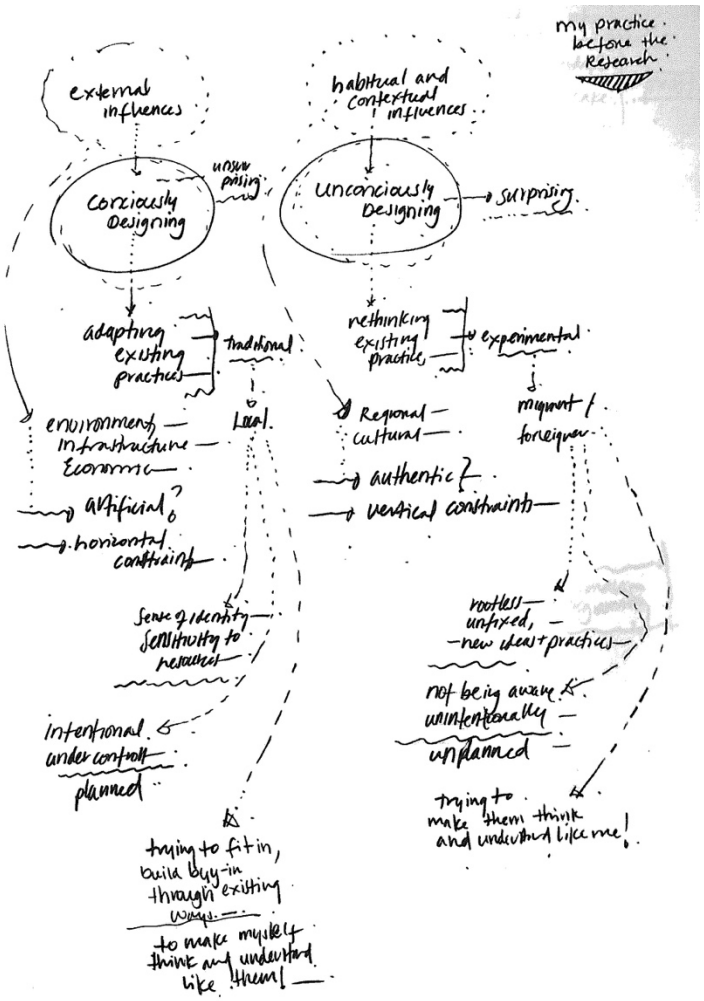

TENSES - 3x3
Local
Narrative
foreigner (me)
Refugee
constant
Dreams
Resources
Needs
Aspirations
Design
Istanbul
Context
variable
London
Kabul

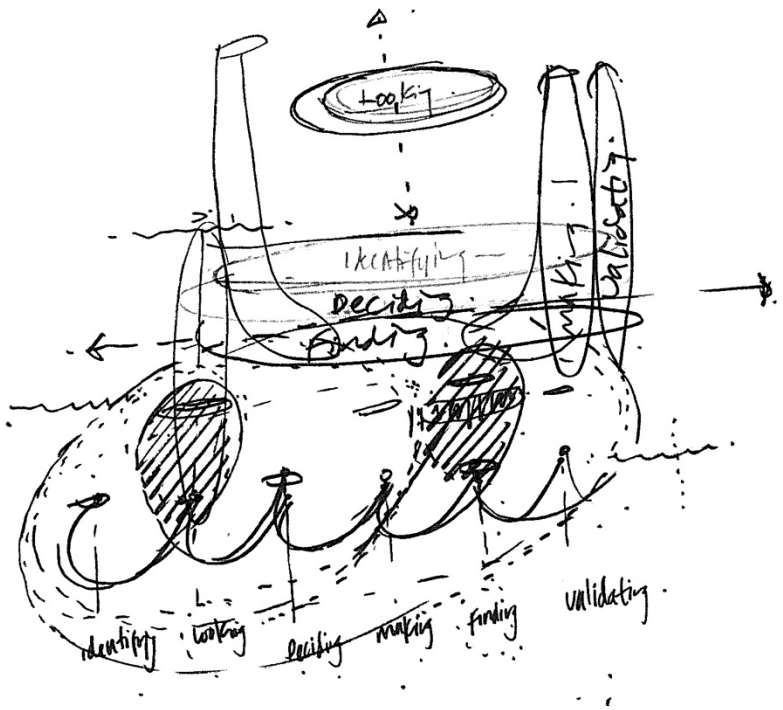

CONTEXT + NEWORK MAP
Europe
UK
Imperial
Germany
Sebastiaan
RCA
Ravensbourne
Finland
melanie wendland
Holland
Centre for frugal Innovation in africa
Asia
Kabul - AFG
Kabul University
personal
India
Kashan Sirohia
Secondary
Dept. of Industrial Design
Transcontinental
timur ogut
istanbul technical university
crafted in Istanbul
turkey
Eorim Kucuk
Semiha kan
industrial designers society
Alper Er
Ozyegin University
department of industrial design
Denmark
KADK, copenhagen
school of Design + Architecture

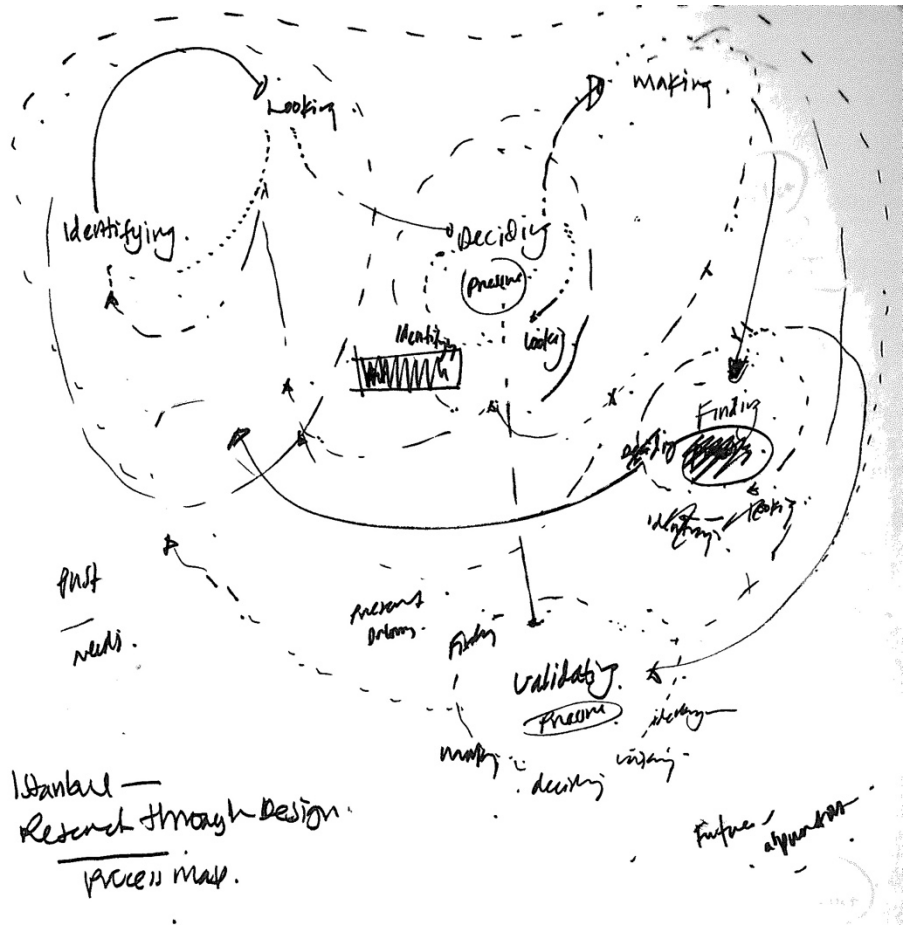

London, UK
collaborative co-design-led
Istanbul, Turkey
collaborative negotiation
Kabul, Afghanistan
individual follower
originality
innovation by necessity
Emergency Response Health
Layers
Louvres - controllable
cool sheet
80/20 Rule
supported not alone
400mm
300mm
net
Louvre to minimise dust
320mm
Straps

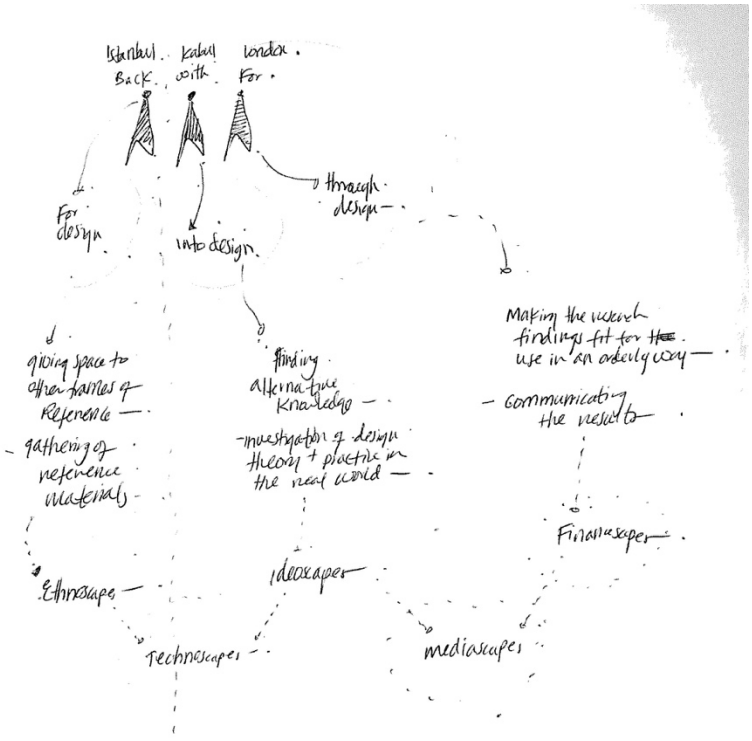

FINDING CONTEXT
The 4 traps
TRAPS
Landlocked with bad neighbours
Kabul
Market affordability constraints
The conflict trap
Resource scarcity/ constraints
The natural Resource Trap
Marrakech
Bad governance in small country
Lebanon
Turkey
India
Institutional voids or complexities
DEFINE
landlocked Developing
suffer a cost of trade that is double
which countries
Geography
32 countries
why?
post-conflict
Lebanon
Biotic
- living and organic material (forests, animals, fossil fuels, coal, petroleum)
Abiotic
- non-living, non organic material (land fresh water, air, metals)
Afghanistan
Armenia
Azerbaijan
Bhutan
Bolivia
Botswana
Burkina Faso
Burundi
Central African Republic
Chad
Ethiopia
Kazakhstan
Kyrgyzstan
Lao
Lesotho
Macedonia
Malawi
Mali
Mongolia
Nepal
Niger
Paraguay
Republic of Moldova
Rwanda
South Sudan
Swaziland
Tajikistan
Turkmenistan
Uganda
Uzbekistan
Zambia
Zimbabwe


(my position)
UK
culture
Design
Turkey
culture
Design
Afghanistan
culture
culture


my practice before the Research
external influences
habitual and contextual influences
consciously designing
unconsciously designing
surprising
adapting existing practices
traditional
rethinking existing practice
experimental
environment
infrastructure
economic
local
regional
cultural
migrant / foreigner
artificial?
horizontal constraints
authentic?
vertical constraints
sense of identity
sensitivity to resources
rootless, unfixed, new ideas + practices
not being aware
unintentionally
unplanned
intentional
under control
planned
trying to fit in, build buy-in through existing ways
to make myself think and understand like them!
trying to make them think and understand like me!


looking
identifying
deciding
finding
identifying
looking
deciding
making
finding
validating


Looking
Making
Identifying
Deciding
Finding
Validating
Istanbul —
Research through Design
process map.


Istanbul
Back
Kabul
with
London
For
For design
into design
through design
giving space to other frames of Reference
gathering of reference materials
finding alternative knowledge
investigation of design theory + practice in the real world
Making the research findings fit for the use in an orderly way
communicating the results to
Ethnoscape
ideoscapes
Technoscapes
mediascapes
Finanscapes

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Endnotes

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