[in]formal Pattern Language
- a guide to **Handmade Improvitecture ©** in Cairo

by
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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

READING THIS THESIS ON THE [IN]FORMAL

As unpacked in this thesis, informality in Cairo is a unique and controversial topic as it is highly ordered. To represent this ambiguity, the thesis reframes informal as [in]formal. Every time this word is encountered, it should provoke readers to reflect on a redefinition of, and restore their relation to, the [in]formal.

Throughout the thesis, references to global and local patterns, present in the [in]formal Pattern Language manual, are provided on the side of each page. The intention is to feed readers with a theoretical framework and allow them to draw connections to the compiled patterns in the manual.

Figure i.1 A girl in an [in]formal area in Cairo, ©Yasser Alaa Mobarak

ABSTRACT

The thesis is situated in Cairo, a city with 64% of the population living in informal settlements. Cairo's informality transcends, however, the boundaries of these areas and manifests itself daily in spatial and temporal appropriations: street vendors invading Downtown Cairo and formal urban pockets, construction of barricades, security systems and high-way developments by community members taking charge; improvising their way through the battle for resources and social justice, and claiming their "right to the city."

In contrast to many misconceptions, informal settlements in Cairo don't depict the typical characteristics of slums and respond to the needs of the lower-middle class. The uncontrolled expansion of informal settlements on scarce agricultural land in Egypt constitutes a nation-wide environmental and self-sufficiency problem. Moreover, it triggers the following issues: lack of open green space, insufficient infrastructure, accessibility and garbage accumulation. Forced eviction and relocation of informal communities, undertaken by the government, result in their further marginalization, loss of vitality and lack of communal responsibility. Participatory programs sometimes have the pitfalls of offering short-term solutions because the main roles are still played by experts.

In this context, where the informal has become mainstream, the thesis raises the following questions: How can the [in]formal be redefined? What is the role of the architect in self-organized communities? What are the tools to optimize current and future informal growth, while empowering communities and celebrating their improvisation?

The thesis introduces the term *Improvitecture©* (improvisation + improvement + architecture) as a catalyst for development and the architecture from, and for, informality. Improvitecture redefines traditional borders between architect and community member, planned and improvised, and, finally, formal and informal. Inspired by Christopher Alexander's *A Pattern Language*, and through the case study of Ard El Lewa, the thesis proposes a process and an [in]formal Pattern Language manual, which serves as a guide for community members, designers, planners and officials to improve [in]formal areas and embed productive green spaces, sustainability, communal responsibility and ownership in the resident's daily life. Within the framework of an open-source website, collaborative sessions, a workshop with children and an exhibition on site, community members, architecture students and experts collaboratively broke down the complex physical reality of [in]formal settlements and their urban narratives into patterns. Patterns were then analyzed and combined with a set of tools and in-situ design solutions, which optimize them and allow for a more sustainable built environment. To further document and compile patterns for the manual, the wider community is encouraged to take part in this on-going open process by completing a pattern template and/or posting geo-tagged images of patterns to the website, which will then appear on an interactive map and catalogue that communicate the identify of [in]formal areas.

informalpatternlanguage.com

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DEDICATION

To the improvisers
in Ard El Lewa

&

my mother

CONTENTS

i.	Reading this Thesis	iii
ii.	Abstract	iv
iii.	Acknowledgements	v
ix.	Dedication	viii
x.	Table of Contents	x
xi.	List of Illustrations	xi
xii.	Preface	xx
xiii.	Introduction	1
00	**Context**	
	A Critique	19
	Urban Revolution	21
	Theoretical Framework	23
01	**Part 1: Handmade Improvitecture**	
	Redefining the [in]formal through Improvitecture	35
	[in]formal Pattern Language	37
02	**Part 2: The Process**	
	I. Designing the Process	41
	Scope	44
	Methodology	46
	Selecting a Site	49
	Forming the Agents of Change Committee	52
	Replicable Tools + the Typologies of Participation	55
	II. Testing the Process	68
	Introductory Session	70
	Site Visits	71
	Working Session	80
	Presenting the Process to Abdelhalim Ibrahim	81
	Talk	83
	Workshop	87
	Exhibition	115
03	**Part 3: Results**	
	Workshop Outcomes	121
	Pattern Templates	128
04	**Part 4: [in]formal Pattern Language**	
	101 Patterns	163
	An Analysis of Forces	169
	How to optimize a Pattern?	172
	The Improvitecture Toolkit	176
	Selection Process	188
	Optimizing 3 Patterns	196
05	**Reflection**	
	Towards an [in]formal Pattern Language initiative	243
	Endnotes	251
	Bibliography	255

LIST OF ILLUSTRATIONS

All diagrams and photos by the author, unless otherwise indicated.

INTRODUCTION

Figure i.1 A girl in an [in]formal area in Cairo, ©Yasser Alaa Mobarak iii
Source: http://wird.com.ua/archives/358059

Figure i.2 Informal Urbanism - Favela in Brazil 1
Source: A Teaser to 'The Empire of Poverty': The First Volume of The People's Book Project, 2013

Figure i.3 Informal appropriation of a street in Cairo, ©David Lazar 3
Source: http://davidlazarphoto.com/galleries/middle-eastern/#jp-carousel-305

Figure i.4 [in]formality governs - Downtown Cairo, ©CLUSTER 6
Photo by: Yasmina Taha, CLUSTER
Source: Beth Stryker and Omar Nagati, *Archiving the City in Flux* (Cairo: CLUSTER, 2013), 31.

Figure i.5 Seven Large Informal Agglomerations in Greater Cairo, ©Séjourné & Sims, 2009 7
Source: David Sims, *Understanding Cairo: The Logic of a City Out of Control* (Cairo: The American University in Cairo Press, 2011), 17.

Figure i.6 [in]formal urban fabric and density in Cairo 8

Figure i.7 [in]formal settlements in Cairo, ©Amanda Mustard 10
Source: http://proof.nationalgeographic.com/2015/01/20/finding-respite-among-cairos-pigeon-fanciers/

Figure i.8 High-way exist, ©CLUSTER 10
Photo by: Lasse Lau
Source: Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 83.

Figure i.9 AL- Mu'timidiya exist, ©CLUSTER 10
Photo by: Omar Nagati
Source: Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 82.

Figure i.10 Construction on agricultural land, ©David Sims, 2011 12
Source: David Sims, "Understanding Greater Cairo in Twenty Minutes" (lecture, Learning from Cairo, Cairo, April 12, 2013).

Figure i.11 Urban growth in Cairo 13

Figure i.12 Remaining agricultural land, ©Marwan Abdel Rahman 16
Source: http://www.panoramio.com/user/119057?with_photo_id=51066269

Figure i.13 [in]formal sprawl, ©Marwan Abdel Rahman 16
Source: http://www.panoramio.com/user/119057?with_photo_id=51066269

CHAPTER 00

Figure 0.1 [in]formal fabric in Cairo, ©Hamed Mostafa, 2015 17
Source: http://hamedmostafa.deviantart.com/gallery/

Figure 0.2 Woman in Sayeda Zeinab, ©Egypt Photowalk, 2014 19
Source: https://www.behance.net/gallery/15305391/Sayeda-Zeinab-Photo-Walk

Figure 0.3 Nice day for a revolution, ©Hatem Kotb, 2013 22
Source: http://h-g-k.deviantart.com/art/Nice-Day-for-Revolution

Figure 0.4 Patterns and The Building Ceremony 25
Source: https://www.pinterest.com/maromohamed1
Figure 0.5 The Great Mosque of Djenné, ©Bjarke Ballisager, 2010 27
Source: https://www.behance.net/gallery/The-Great-Mosque-of-Djenn-Mali/707111
Figure 0.6 The Timeless Way of Building 28
Source: Christopher Alexander, *The Timeless Way of Building* (New York: Oxford University Press, 1979), 169.
Figure 0.7 Former sugarcane field, Cairo , ©Bas Prin & Storefront, 2009 28
Source: http://www.dutchdesignevents.com
Figure 0.8 Dissecting the Building Ceremony concept *(top)* 29
Figure 0.9 Cultural Park for Children, Sayyida Zeinab *(right)* 29
Source: James Steele,"Culture Park for Children." Architecture for a Changing World: The Aga Khan Award for Architecture (London: Academy Editions, 1992),104.
Figure 0.10 Transformation in users' and architect's role 31

CHAPTER 01

Figure 1.1 The daughter of a fancier holding a squab, ©Amanda Mustard, 2015 33
Source: http://proof.nationalgeographic.com/2015/01/20/finding-respite-among-cairos-pigeon-fanciers/

CHAPTER 02

Figure 2.1 Gustavo in La Vega, Caracas, ©Nohely Oliveros 39
Source: http://radiocomunaelhatillo.blogspot.ca/2009/08/el-gran-dudamel-en-el-barrio-la-vega.html
Figure 2.2 Designing the Process 43
Figure 2.3 Thesis scope 44
Figure 2.4 A Ladder of Citizen Participation, Sherry R. Arnstein, 1969 45
Source: Sherry Arnstein, "A ladder of Citizen Participation," *Journal of The American Institute of Planners* (Boston: American Institute of Planners, Vol. 35, No. 4, 1969), 216-224.
Figure 2.5 The Process (right) 47
Figure 2.6 Site Selection 50
Figure 2.7 formal [in]formal boundary and the undeveloped green strip in Ard El Lewa 52
Figure 2.8 Agents of Change Committee in Ard El Lewa 51
Figure 2.9 Compiling the [in]formal Pattern Language manual 53
Figure 2.10 Format of the Pattern Template 58
Figure 2.11 Replicable tools & the typologies of participation 65
Figure 2.12 Testing the process 69
Figure 2.13 Micro-bus traffic organizers under the bridge 72
Figure 2.14 Pigeon breeder 72
Figure 2.15 Toktok driver having a rest under the bridge 72
Figure 2.16 Parking lot owner and service men 72
Figure 2.17 Soccer field owners 72
Figure 2.18 A boy in Palestine Street, Ard El Lewa 72
Figure 2.19 Concierge planting vegetables in El Karama school court 72
Figure 2.20 Toktok parking lot owner 72
Figure 2.21 'Feteera (Pie) Maker, street vendor at the market 72
Figure 2.22 Fruit vendors at the market 72
Figure 2.23 Abo Rahma, Toktok driver and retired employee 72
Figure 2.24 Toktok drivers waiting for passengers under the bridge 72
Figure 2.25 Sugarcane and carob juice mobile vendor 72
Figure 2.26 Community members in Ard El Lewa 72

Figure 2.27 Site analysis 73
Figure 2.28 Pedestrian bridge and former canal 75
Figure 2.29 Community-owned market 75
Figure 2.30 Urban void rented as an amusement park, privately-owned 75
Figure 2.31 Urban void: unclear ownership 75
Figure 2.32 Urban void appropriated as a parking lot, unclear ownership 73
Figure 2.33 Types of ownership along the formal [in]formal border 76
Figure 2.34 Children locating their homes and communal hubs on the map 77
Photo: A girl in Palestine Street, community member
Figure 2.35 A boy documenting toktok as a pattern 77
Photo: Ahmed Fawzi, community member
Figure 2.36 Children revealing their urban narratives 77
Figure 2.37 A boy registering his father's and uncle's workshop 77
Photo: Ahmed Fawzi, community member
Figure 2.38 Remaining agricultural land, ©GIS, 2010 77
Source: GIS
Figure 2.39 Construction infill and loss of agricultural land, ©Google, 2015 77
Source: Google
Figure 2.40 [in]formal construction dynamics, before and after 78
Photo before: Author
Photo after: Nancy, community member
Figure 2.41 Market condition before and after closing the railway crossing 78
Figure 2.42 Site condition before and after re-opening the pedestrian bridge 78
Figure 2.43 Improvised shed in Ard El Lewa 79
Figure 2.44 Improvised structure in Ard El Lewa 79
Figure 2.45 Compiling patterns 80
Figure 2.46 Adding pictures 80
Figure 2.47 Discussing connections 80
Figure 2.48 Drawing connections 80
Figure 2.49 Completing pattern templates 80
Figure 2.50 Abdelhalim Ibrahim 81
Source: Al Ahram Weekly, 18 March 1999.
Figure 2.51 Poster of the Talk: Towards an [in]formal Pattern Language (right) 82
Figure 2.52 Panel 1 84
Photo: Salma Nassar, AUC
Figure 2.53 Panel 2 84
Photo: Salma Nassar, AUC
Figure 2.54 Moderation 84
Photo: Salma Nassar, AUC
Figure 2.55 Registration station for taking Pattern Templates and viewing the website 85
Photo: Architecture Association at AUC
Figure 2.56 Thesis work 85
Photo: Architecture Association at AUC
Figure 2.57 Exhibition in Margo Veillon Gallery, AUC 85
Photo: Architecture Association at AUC
Figure 2.58 Urban narratives 85
Photo: Architecture Association at AUC
Figure 2.59 Attendees: Experts & Students 85
Photo: Salma Nassar, AUC
Figure 2.60 Fruit boxes as display 85
Figure 2.61 Discussion 85
Photo: Salma Nassar, AUC
Figure 2.62 Architecture students contemplating urban narratives 86

Figure 2.63 Working efficiently during power cuts 87
Figure 2.64 Workshop stages 88
Figure 2.65 Workshop participants 89
Figure 2.66 Mapping 3 urban conditions in Ard El Lewa 91
Figure 2.67 Workshop exercises and layers of representation 93
Figure 2.68 Workshop participants departing for photography and mapping tours 94
Photo: Mohamed, supermarket owner in Ard El Lewa
Figure 2.69 Workshop participant placing his pattern in context 94
Figure 2.70 Mapping urban voids 95
Figure 2.71 Urban condition 1: urban x urban 96
Figure 2.72 Urban condition 2: formal [in]formal border 96
Figure 2.73 Urban condition 3: endangered edge (1),©Google, 2015 96
Figure 2.74 El Esseiry Street 96
Photo: Karim, community member
Figure 2.75 Below the bridge 96
Photo: Ahmed El Leithy, Artellewa
Figure 2.76 Agricultural land 96
Figure 2.77 Urban voids 96
Photo: Nancy (community member) & Author
Figure 2.78 Street vendors 96
Photo: Ahmed El Leithy, Artellewa
Figure 2.79 A small farm in a school 96
Figure 2.80 Palestine Street 96
Photo: Mai Mahmoud, Cairo University
Figure 2.81 Pedestrian bridge 96
Photo: Mai Mahmoud, Cairo University
Figure 2.82 Former agricultural land 96
Photo: Hawazen, community member
Figure 2.83 Geotagged Photography 97
Photo: Heba El Sawy, AUC
Figure 2.84 Framing Patterns 97
Photo: Ehsan Aboushadi, AUC
Figure 2.85 Documenting building typologies 97
Photo: Mai Mahmoud, Cairo University
Figure 2.85 Drawing existing layout of an urban void 97
Figure 2.87 Negotiating ownership of the found pigeon 98
Photo: Heba El Sawy, AUC
Figure 2.88 Interviewing a local builder 98
Figure 2.89 Interviewing local construction workers 98
Figure 2.90 Urban x urban photography tour 98
Figure 2.91 Finding a floor plan of an apartment 98
Figure 2.92 Local construction workers in Ard El Lewa 98
Photo: Malak El Shazly
Figure 2.93 Creating pattern matrices (left) 99
Figure 2.94 Discussing framed patterns 100
Figure 2.95 Filtering patterns 100
Figure 2.96 Group discussions 100
Photo: Mai Mahmoud, Cairo University
Figure 2.97 Finding connections between patterns 100
Figure 2.98 Discussing connections 100
Figure 2.99 Layer 1: Google map, ©Google, 2015 101
Figure 2.100 Layer 2: Building footprint with numbers 101

Figure 2.101 Cross referencing with geo-tagged images 101
Figure 2.102 Drawing building typologies 101
Figure 2.103 Collaborating on drawing the map 101
Figure 2.104 Cognitive mapping of patterns (right) 102
Figure 2.105 Layer 3: Reference lines for building height 101
Figure 2.106 Updating the maps with more feature 103
Figure 2.107 Adding information 103
Figure 2.108 Generating Improvitecture tools 103
Figure 2.109 The 10 driving forces proposed by architecture students 103
Figure 2.110 Participants visualizing green roofs (top) 104
Figure 2.111 Architecture students creating the pattern matrix 104
Figure 2.112 Existing condition on Save the Children Rooftop 105
Figure 2.113 Selected Improvitecture tools generated by workshop participants 105
Figure 2.114 Cleaning games 106
Figure 2.115 Cleaning creates space 106
Figure 2.116 Organizing tires 106
Figure 2.117 Cleaning tires for reuse 106
Figure 2.118 Testing the assembled seating area 107
Figure 2.119 Building the library shelves from wooden palettes 107
Figure 2.120 Attaching the shelves with rope 107
Figure 2.121 Testing different configurations 107
Figure 2.122 Building a positive seating corner (right) 108
Figure 2.123 Completed library shelves and painted tires 109
Figure 2.124 Mothers joining the building ceremony 109
Figure 2.125 Mixing colours to create more colouts 109
Figure 2.126 Painting the tires 109
Figure 2.127 Completed seats from reused tires and rope 109
Figure 2.128 Painting assembled library shelves 109
Figure 2.129 Painting assembled library shelves (top right) 110
Figure 2.130 Curious children from the neighbourhood joining the workshop (bottom right) 110
Figure 2.131 A guide on installing the urban farm prototype 111
Figure 2.132 Selected patterns during the workshop 113
Figure 2.133 Architecture students presenting pattern matrix and optimized patterns 114
Figure 2.134 Discussing Results 114
Photo: Teacher, Save The Children
Figure 2.135 Exhibition in Ard El Lewa 115
Figure 2.136 Open street exhibition 115
Figure 2.137 Exhibition at night 115
Figure 2.138 Participants welcoming experts 115
Figure 2.139 Wall displaying maps & process 115
Figure 2.140 Display 115
Figure 2.141 Displaying the process 115
Figure 2.142 Participants writing their names and cross referencing patterns 116
Figure 2.143 Children updating maps with new informaltion 117
Figure 2.144 Children updating matrices with new patterns 117
Figure 2.145 Local architect 117
Figure 2.146 Geotagging the exhibition 117
Figure 2.147 A boy tracing his home 117
Figure 2.148 Children viewing Pattern Templates 117
Figure 2.149 Boys writing their friends' names 117
Figure 2.150 Compiled Urban Narratives 118
Figure 2.151 Participants and attendees filling speech bubbles with urban narratives and needs 118

CHAPTER 03

Figure 3.1 Exhibition in Ard El Lewa 119
Figure 3.2 Layers of representation in relation to workshop outcomes 121
Figure 3.3 A selection of framed patterns 122
Figure 3.4 urban x urban, ©Google, 2015 122
Figure 3.5 formal [in]formal border, ©Google, 2015 122
Figure 3.6 endangered edge, ©Google, 2015 122
Figure 3.7 Map 1: urban x urban 122
Map: Workshop participants
Figure 3.8 Map 2: formal [in]formal border 122
Map: Workshop participants
Figure 3.9 Map 3: endangered edge 122
Map: Workshop participants
Figure 3.10 Pattern matrix attempt 1 by group1 123
Pattern Matrix: Workshop participants
Photo: Mirette Khorshid, MIT
Figure 3.11 Pattern matrix attempt 1 by group 2 123
Pattern Matrix: Workshop participants
Photo: Mirette Khorshid, MIT
Figure 3.12 A selection of Improvitecture tools 124
Figure 3.13 Pattern matrix attempt 2 124
Illustration: Architecture students (workshop participants)
Figure 3.14 The 101 [in]complete Pattern Matrix 126
Illustration: Architecture students & author
Photos in the matrix: Workshop participants

Chapter 04

Figure 4.1 SANAA human figures 161
Source: http://forgemind.net/media/?s=sanaa
Figure 4.2 Presence of forces in each category 170
Figure 4.3 Quantifying the influence of forces 170
Figure 4.4 Influence of forces in each category 171
Figure 4.5 Reading the Pattern-Forces-Design Objectives Chart 172
Figure 4.6 How to optimize a pattern? 173
Figure 4.7 Pattern-Forces-Design Objectives Chart 174
Figure 4.8 Swing ride in Ard El Lewa 175
Figure 4.9 Extracting Improvitecture tools 176
Figure 4.10 Improvitecture tools 185
Figure 4.11 Vacant land in Ard EL Lewa 187
Figure 4.12 Occurrence of selected patterns 188
Figure 4.13 Selected patterns 188
Figure 4.14 Extracting patterns from map 1: urban x urban 189
Map: Workshop participants
Illustration: Author
Figure 4.15 Extracting patterns from map 2: formal [in]formal border 191
Map: Workshop participants
Illustration: Author
Figure 4.16 Extracting patterns from map 3: endangered edge 193
Map: Workshop participants
Illustration: Author
Figure 4.17 Sandwich City, ©Jesse Sharratt 195
Source: Life Inside The City Of The Dead, 2009

https://jessesharratt.wordpress.com
Figure 4.18 Occurrence Rooftops in Ard El Lewa 197
Figure 4.19 Analysis of rooftop typology in relation to urban condition 198
Figure 4.20 Pattern-Forces-Objectives Chart for sandwitch city 199
Figure 4.21 Sitting corner in a pigeon tower 200
Figure 4.22 Pigeon tower 200
Figure 4.23 Rooftops in Ard El Lewa 200
Figure 4.24 Installing a satellite dish 200
Figure 4.25 Garbage dumps 200
Figure 4.26 Lightweight structures 200
Figure 4.27 An extension of the home 200
Figure 4.28 A small roof garden 200
Figure 4.29 Breadmaking on rooftops 200
Figure 4.30 A rooftop garden, ©Hanaa Gad 200
Figure 4.31 Proposed optimization in relation to rooftop typology 201
Figure 4.32 Proposed hybrid system combining micro-economies and urban farming 203
Figure 4.33 Optimized Prototypes 204
Figure 4.34 Operation of optimized pigeon tower during daytime 205
Figure 4.35 Operation of optimized pigeon tower during evenings & night time 206
Figure 4.36 Pigeon breeder in Ard EL Lewa 207
Figure 4.37 Urban void as a car parking lot 211
Photo: Hammad, community member
Figure 4.38 Urban void as a car parking lot 212
Figure 4.39 Location of case study 213
Figure 4.40 Case study of an urban void in Ard El Lewa 213
Figure 4.41 Extracting patterns and tools from the case study (right) 214
Figure 4.42 Occurrence of urban voids in Ard El Lewa 215
Figure 4.43 Pattern-Forces-Design Objectives Chart for urban void as a parking lot 216
Figure 4.44 Exisiting layout for an urban void 217
Figure 4.45 Main entrance to parking lot 218
Figure 4.46 Dead end and community members 218
Figure 4.47 Dead end 216
Figure 4.48 Building under construction and street 218
Figure 4.49 Vegetable vendor around the corner 218
Photo: Hossam, community member
Figure 4.50 Guard's room and sitting area 218
Photo: Nancy, community member
Figure 4.51 Car wash services 218
Photo: Nancy, community member
Figure 4.52 Wild plants 218
Photo: Hossam, community member
Figure 4.53 Dump of old carts 216
Figure 4.54 Building under construction 218
Photo: Nancy, community member
Figure 4.55 Incomplete structure 218
Photo: Hossam, community member
Figure 4.56 Rooftop of a low rise building 218
Figure 4.57 Proposed layout 219
Figure 4.58 Improvitecture tools and optimization of urban void as a parking lot 220
Figure 4.59 Optimized plan with new patterns: Structure 1: Ground Floor 221
Figure 4.60 Optimized plan with new patterns: Structure 1: First Floor 222
Figure 4.61 Optimized plan with new patterns: Structure 2: First Floor 223

Figure 4.62 Optimized incomplete structure with patterns 224
Figure 4.63 Proposed construction diagram for an urban void as a parking lot applying the Building Ceremony concept 229
Figure 4.64 Proposed operation diagram for an urban void as a parking lot applying the Building Ceremony concept 230
Figure 4.65 Waiting agricultural land 231
Figure 4.66 Occurrence of waiting agricultural land in Ard El Lewa 233
Figure 4.67 Waiting agricultural land at the formal [in]formal border 233
Figure 4.68 Preparing waiting agricultural land for construction Photo: Nadia Abotaleb, AUC 233
Figure 4.69 Land subdivision Photo: Nadia Abotaleb, AUC 233
Figure 4.70 Pattern-Forces-Design Objectives Chart for waiting agricultural land 234
Figure 4.71 Optimized waiting agricultural land 235
Figure 4.72 Improvitecture tools and operation of optimized waiting agricultural land 236
Figure 4.73 Improvitecture tools and operation of small parcels 237
Figure 4.74 Urban naratives gathered by the invisible choreographer 241

CHAPTER 05

Figure 5.1 In the coops of Cairo, ©Amanda Mustard Source: http://yourshot.nationalgeographic.com/photos/3565735/ 243
Figure 5.2 The architect, a choreographer of forces Photo: Ahmed El Leithy, Artellewa 250

PREFACE

In 2013, I had the opportunity to be the program coordinator of *Learning from Cairo*, co-organized by The American University in Cairo and CLUSTER (Cairo Lab for Urban Studies, Training and Environmental Research). The symposium inspired me to further explore the generated local and international dialogue on informality, political and social urban transformations after the January 2011 Revolution in Egypt, and the expanded role of the architect.

Informality is a global phenomena and the focus of interest of many planners, designers and socio-economists such as Teddy Cruz, Urban-Think Tank, Robert Neuwirth and Mike Davis. When it comes to Cairo, however, informality requires a special investigation because circumstances make it highly ordered and the dominant form of urbanization. Yet, in most cases it is still ignored, ill-defined and mal-treated.

In search for new urban orders after the January 2011 Revolution, I believe it is time to move beyond discussing learning from informality to changing conventional modes of practice and offering practical in-situ solutions. Through the [in]formal pattern language initiative and the case study of Ard El Lewa, the thesis creates a platform for community members, architects and officials to operate responsively in the context of governing informality, marginalized communities and reduced means. The thesis hopes to traverse the gap between microscopic needs and urban environmental concerns, while encouraging inclusiveness.

Participants in the [in]formal Pattern Language initiative and I invite you to explore 101 patterns and an optimization tool-kit compiled from Cairo's informality, not to take sides and, most importantly, adopt multiple perspectives. We ask you to lose control but keep your invisibility cloak. Embrace the unplanned and the incomplete. Be prepared for alternative aesthetics and messy outcomes of 'doing architecture' on site, full of different fingerprints and blessed by bird droppings. The thesis does not aim to present neat architectural drawings and urban wonderland renderings. It portrays snapshots from reality and urban narratives in the hope of doing justice to the complexity of [in]formal communities and restoring prejudiced relations with the [in]formal.

Whatever is written here about Ard El Lewa and [in]formal settlements in Cairo is based on what we observed and learned. Every participant inspired me and contributed to the process in a very unique way.

INTRODUCTION

Over the past decade it has been documented that rapid urbanization has become one of the most powerful global trends. Coupled with the global economic and resource crisis, such rapid growth makes it nearly impossible for local governments and infrastructure to adequately support the growing population and cities. As a result, overcrowded informal settlements, or 'slums,' are created in cities that, according to UN Habitat, lack one or more of the following five aspects: access to sufficient water, access to sanitation, security of tenure, durability of housing and sufficient living area.[1] Informality has become an imposing urban reality, reaching 30% worldwide and more than 50% in developing countries.[2]

Informal urbanism is defined as "the production of urbanization independent from formal frameworks and assistance (if they exist) that do not comply with official rules and regulations."[3] This definition is, however, one-sided and fails to recognize that informality has become the prevailing force of urbanization and, for many, the only available housing and employment option close to the city.

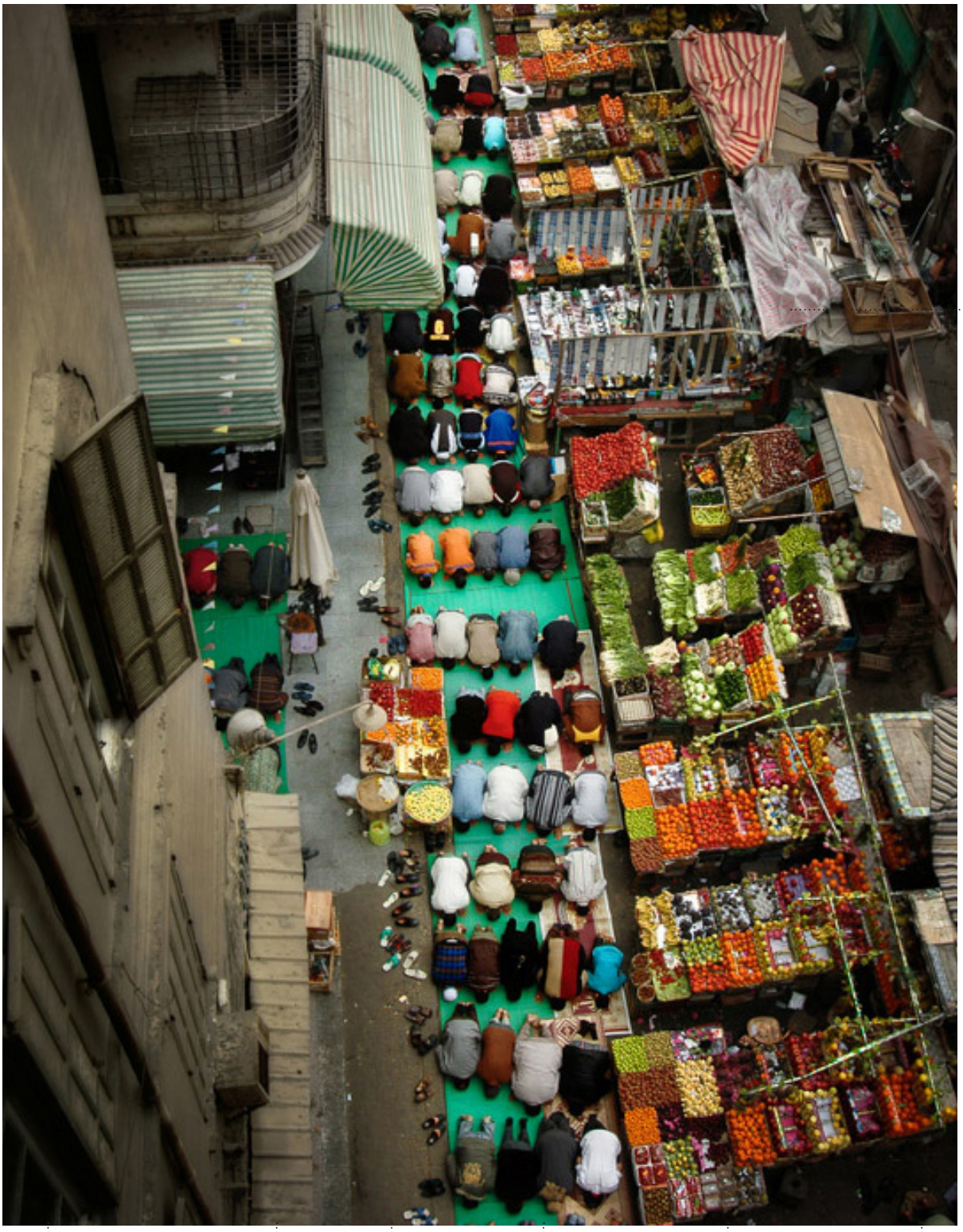
With informality emerging as an alternative way of city construction, one cannot help questioning how architectural practice and education should respond to an approaching future, where most of the built environment is neglected and overcrowded. In "How to Rebuild Architecture", Steven Bingler and Martin Pederson spoke of a paradox: "While architects design a tiny percentage of all buildings, our powers of self-congratulation have never been greater."[4] Emerging from this reality, where the needs of 90%[5] of the population worldwide are not addressed by architects, and 1 out of 3 people are estimated to be living in informal areas in developing countries by 2050[6], the main objectives of the thesis can be summarized in designing a process for responding to informality, while redefining it as a typology and expanding the role of the architect and users.

Figure i.2 Informal Urbanism - Favela in Brazil

The thesis takes place in Cairo, a city governed by extreme informality. It is estimated that 60-70% of the population is living in informal settlements.[7] While no one knows for sure how many informal settlements there are in Egypt, this percentage reveals that Cairo alone has over 12 million people residing in informal communities.[8] In other words, everyday, millions of needs and rights remain unmet and ignored. The rapid growth of the city is explained by the growth of informal settlements, which absorb the majority of the population increase. It was noted by Sims that informal areas attracted 78% of additional population between 1996 and 2006.[9] Moreover, Sims argues that construction in informal areas increased 2.5 times after the revolution.[10] TADAMUN, an urban solidarity initiative founded by architect Kareem Ibrahim and Diane Singerman, Associate Professor at the School of Public Affairs at AUC, support this claim by revealing that informality in Cairo has become the mainstream: "Informal construction of housing is the norm; formal construction is, by far, the exception."[11]

Moreover, Cairo's informality transcends the boundaries of informal areas and manifests itself daily in spatial and temporal street appropriations: street vendors invading Downtown Cairo and formal urban pockets, construction of barricades, security systems and highway developments by community members taking charge, improvising their way through the battle for resources and social justice and claiming their "right to the city." Today, Cairo depends 40% on informal economy and 80% of the city's garbage is collected and recycled by residents of Manshiet Nasser, an informal settlement.[12] In his book *Understanding Cairo: The Logic of a City out of Control*, David Sims argues that the future of people and employment lies in the informal because they are home to many micro-, small- and medium-scale economies.[13] In this context, where informality has become the dominant form of urbanization, and is taking over many layers that form the city such as public spaces, transportation, infrastructure and small economies, the following questions arise: How is the [in]formal still perceived as informal? How is it still ignored, ill-defined and misrepresented?

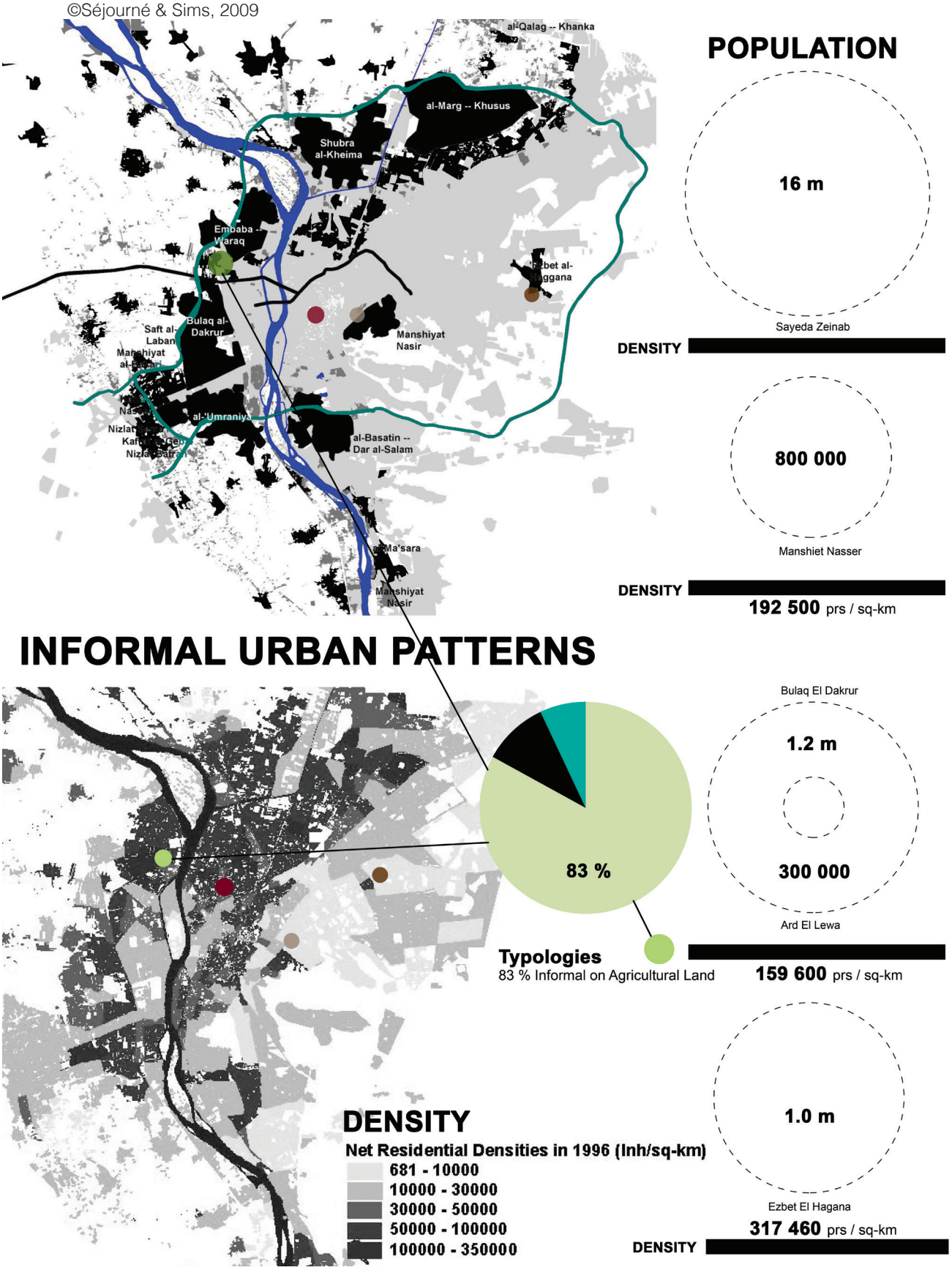
Figure i.3 Informal appropriation of a street in Cairo, ©David Lazar *(right)*

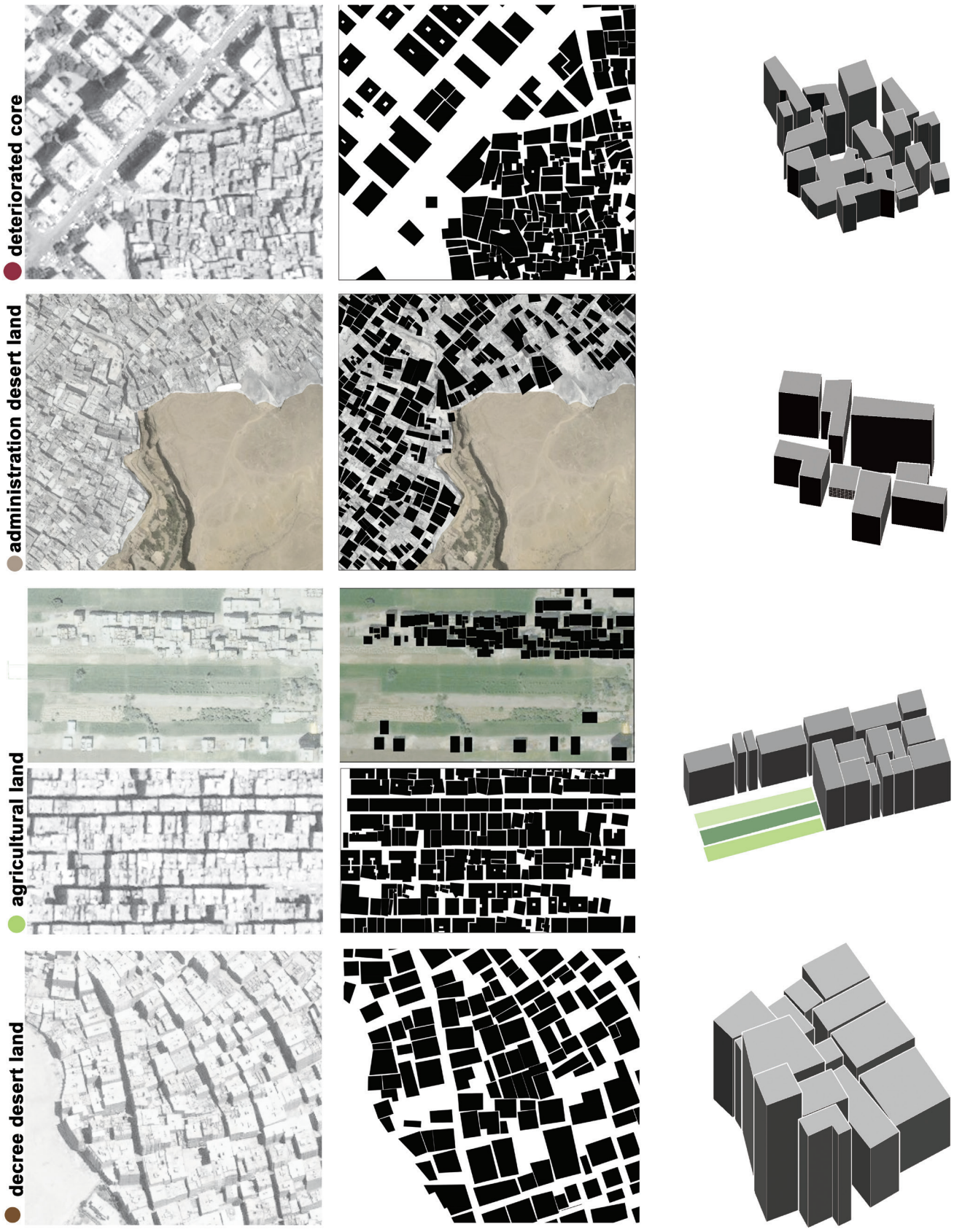

storage
space
on top
building
store
extensions
circulation
praying area
fruit + vegteable
display
building

GAD
جاد
GAD
جاد

Figure i.4 [in]formality governs - Downtown Cairo, ©CLUSTER

Figure i.5 Seven Large Informal Agglomerations in Greater Cairo
©Séjourné & Sims, 2009





[in]formal urban fabric and density in Cairo

According to Sims, and contrary to many misconceptions, the majority of informal settlements in Cairo don‘t depict the typical characteristics of “third world slum“ and work well when compared to the country‘s current state.[14] They are homogeneous and modular reinforced concrete and red brick structures, with a strong framework to support future additions. As presented by Dina Shehayeb in *Learning from Cairo,* they are self-financed, demand-driven, grow incrementally, provide a close work-home proximity, have low energy demands and strong communal ties.[15] The construction of Al Mu‘tamidiya highway exit ramps by the local community, after the Egyptian Revolution in 2011, best illustrates these [in]formal characteristics. As documented in *Archiving the City in Flux*, community members mobilized their resources in the form of cash contributions, donation of construction material, machinery, labour and skills in order to construct a project that costs one million Egyptian Pounds.[16] If the government undertook the project, costs would have been 4 times higher.[17] To celebrate the spirit of the revolution, the Giza Governorate officially integrated the ramp into the formal infrastructure. Al Mu’tamidiya ramp reveals how informality responds to the missing needs and urban concerns, which are not met or are ignored by the government. It also sheds light on how organized communal initiatives, or what we call informal, actually are. [In]formal settlements in Cairo are a true response to available resources, skills and needs. In *Learning from Cairo*, it was further argued that “the significance of Al Mu’tamidiya ... is far more symbolic than the utilitarian role and cooperative economic models it offers - it stands as a testimony of an emerging urban order.”[18]

incompleteness
incremental construction
credit system
shortage in resources

construction networks
credit system
access to highways

In contrast to common perceptions, [in]formal settlements are not only homes to poor and rural migrants, but also offer affordable housing to low-middle class residents, university students and low-government employees. Yehia Shawkat, a built environment researcher engaged in mapping housing and rights for land, water and energy, states that land prices in Cairo‘s new desert cities which are constructed as an affordable housing solution have increased by 1600% in the last 10 years, compared to a rise by 116% between 2003 and 2008 in informal settlements.[19] Moreover, extreme real estate costs in the formal city confirm [in]formal settlements as the housing solution for many.

the [in]formal a housing solution

Figure i.6 [in]formal settlements in Cairo, ©Amanda Mustard

Figure i.7 High-way exist, ©CLUSTER

Figure i.8 AL- Mu'timidiya exist, ©CLUSTER

unplanned growth
loss of agricultural land

To avoid the pitfall of romanticizing informality in Cairo, one has to consider its negative consequences on the future built environment and well-being. The uncontrolled expansion of [in]formal settlements on the 3% total available agricultural land in Egypt constitutes a nation-wide ecological, environmental and self-sufficiency problem, and therefore cannot be neglected when dealing with informality.[20] According to Sims, informal settlements, which began to grow in the early 1960's, are constructed 7% on agricultural reclamation land originally owned by the state, 10% on desert land and 83% on privately-owned agricultural land, where the future expansion is expected to occur.[21] While it is documented in *Sustainable Agriculture and Climate Changes in Egypt* that by 2050 agricultural production has to increase by 70%[22] in order for Egypt to be self-sufficient, each year after the revolution experiences a 2.5 increase in building violations, and a loss of 11.736 hectares of farmland.[23] This is explained by the rigid agricultural laws and taxation imposed by the government, as well as insufficient infrastructure. When struggling to find shelter and making ends meet, agricultural land is sold for construction. Agriculture in Egypt's desert fails to meet the targeted objectives and is a technically, financially and organizationally challenging proposition, as argued by Sims in Egypt's Desert Dreams, Development or Disaster.[24]

don't blame the farmer

big city is a magnet

dense urban environment

The unplanned growth causes the following issues: 100% plot coverage, dense urban fabric, lack of open green space, insufficient infrastructure, accessibility, garbage accumulation, sanitary concerns and hygiene.

tenure rights

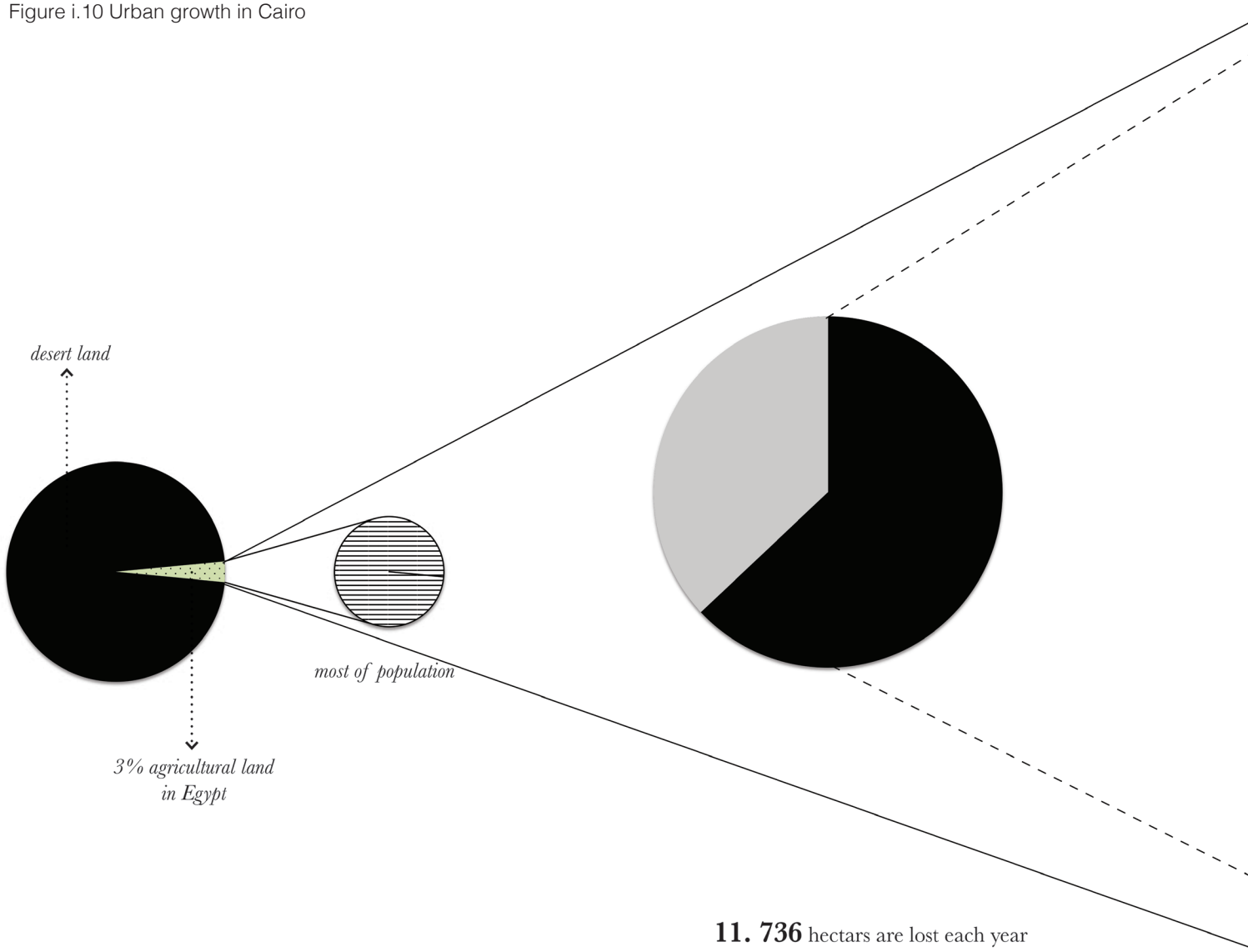
In reference to international discussion on human rights to adequate housing and security of tenure, ownership rights continue to be an issue, and therefore need to be addressed when dealing with informality. Security of tenure is the underlying condition to raise people's sense of ownership, which makes them devoted to upgrade their houses and take care of their community. It is worth mentioning that the majority of [in]formal construction in Cairo doesn't happen on illegally claimed land, as assumed. In fact, it occurs by tweaking formal zoning laws, subdividing land, bribery and personal relations, on privately-owned or state-donated land without building permissions, thus creating a state of unclear tenure rights. Available information on security of tenure is controversial. On the one hand, Sims argues in his article "What is Secure Tenure in Urban Egypt?" that the situation for informal building owners and residents is remarkably good.[25] On the other hand, Shawkat uncovers that this is a misconception because the law number 10, issued in 1990, on revoking of property tenures for public interest could lead to potential abuse and eviction of unclear tenures.[26] When dealing with informality, Shawkat therefore concludes that "laws governing land and housing tenure must be changed, economic and built environment policy must be rewritten and protective measures must be enacted."[27] In order to do justice to the complexity of the situation in [in]formal Cairo, one has to conduct a bottom-up analysis.

legal illegal

Figure i.9 Construction on agricultural land, ©David Sims

Cairo

Figure i.10 Urban growth in Cairo

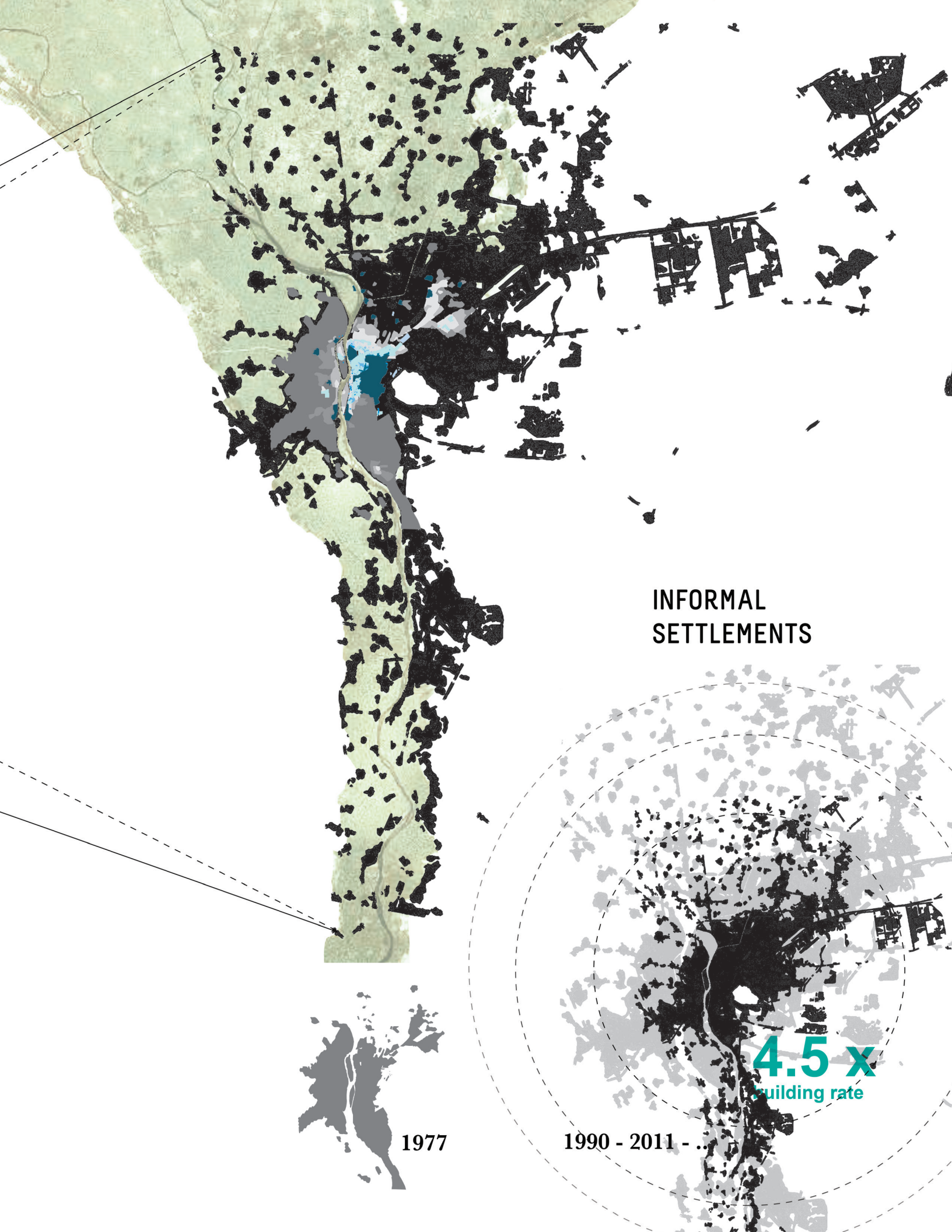


11. 736 hectars are lost each year increasing the existing food gap

4x larger building footprint after revolution

70% increase in agriculture to be self-suficient (2050)

URBAN GROWTH


INFORMAL
SETTLEMENTS
4.5 x
building rate
1977
1990 - 2011 - ..

Before the January 2011 Revolution, the government's way of dealing with informality was through forced eviction and relocation on the outskirts of the city. The new areas lacked services and economic opportunities and failed to recognize the socio-cultural infrastructure governing these areas, which contributed to the residents' further marginalization. The revolution triggered a remarkable shift in the political and urban landscape accompanied by a drastic growth in [in]formality. In search for new orders for the new regime, the government showed more willingness to co-operate with [in]formal communities and negotiate in-situ development plans. Currently, a number of non-governmental actors such as CLUSTER, TADAMUN, Madd Platform and 10 Tooba are engaged in fostering communal initiatives and alternative modes of practice.

In the context of failing conventional approaches, a society governed by informal practices, residents reclaiming their right to the city and the search for new orders in a fast changing urban landscape, the thesis raises the following questions:

1. How can the [in]formal be redefined?
2. What is the role of the architect in self-organized communities?
3. What are the tools to optimize current and future informal growth, while empowering communities and celebrating their improvisation?

Inspired by Christopher Alexander's *A Pattern Language,* and through the case study of Ard El Lewa, the outcome of the thesis is to propose a process, a community-driven website and an [in]formal Pattern Language manual, which serves as a guide for community members, designers, planners and officials to improve informal settlements and embed productive green spaces, sustainability, communal responsibility and ownership in the residents' daily life. To discover and document patterns for the manual, the thesis invites community members, architecture students and experts to complete pattern templates, upload their geo-tagged patterns to an interactive map on the website and/or participate in a photography and mapping workshop with children in Ard El Lewa.

informalpatternlanguage.com

An introductory chapter sets the local context and a theoretical framework for the [in]formal Pattern Language initiative. Falling under the umbrella of tactical and handmade urbanism, the initiative emerges from a shared philosophy between Christopher Alexander's *A Pattern Language* ***and*** Abdelhalim Ibrahim's *The Building Ceremony.*

In response to the raised questions, the first part of the thesis introduces the term Improvitecture (improvisation + improvement + architecture) as a catalyst for development, and the architecture from, and for, informality. Improvitecture allows improvisation and planning to co-exist, thus changing perception from slum upgrading to a directed improvisation. It redefines the [in]formal as self-organized and improvised. The thesis argues that, in self-organized communities, the architect should operate as an invisible choreographer of forces and accept the role of an outsider for a

sustainable community empowerment to occur.

The second part of the thesis focuses on the proposed process that contributes to the creation of the [in]formal Pattern Language manual as a tool for handmade development and long-term community empowerment. First, it introduces the design of the process, which includes building the method, selecting a site, collaborating with local partners and, designing the tools and typologies of participation before going on site. Second, it describes the fieldwork conducted in Ard El Lewa and events, co-organized by University of Waterloo and The American University in Cairo (AUC), to test the process and compile patterns for the manual.

Part three of the thesis sheds light on unedited outcomes generated by children from Ard El Lewa and architecture students during the workshop and exhibition. A selection of pattern templates, maps and a matrix of 101 compiled local patterns are presented.

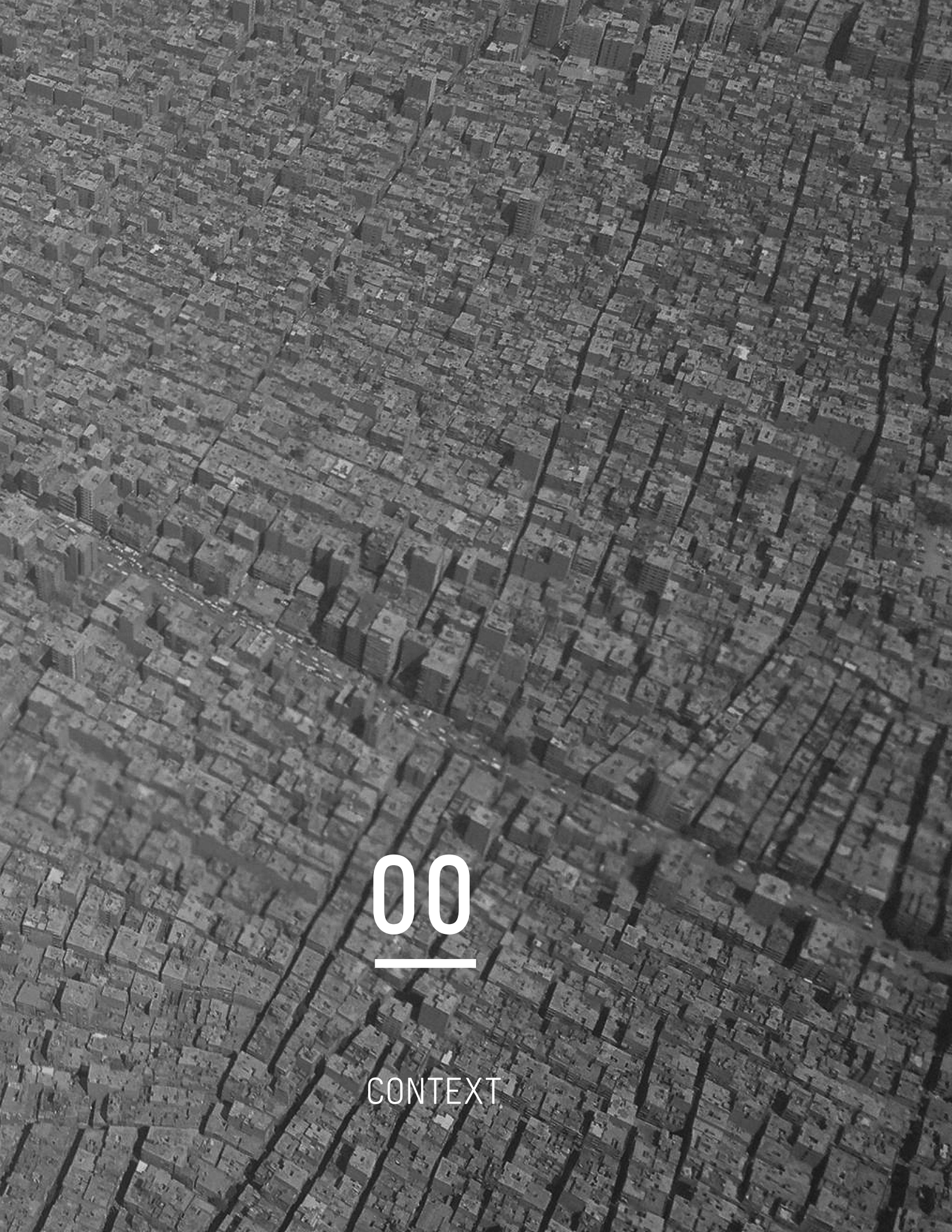
Part four is the [in]formal Pattern Language manual. It starts by zooming-in on the 101 compiled patterns followed by an analysis of driving forces and a guide on how to generate design objectives and the optimization process. The manual then presents an overview of the Improvitecture toolkit. For the purpose of this thesis, the three most influential patterns are selected by the thesis author to demonstrate how the manual should document, analyze and optimize patterns. The selected patterns represent different scales.

The final chapter contains reflections on the process and a summary of lessons that reframe the [in]formal Pattern Language initiative as a replicable method. The aim is to inspire future designers and community members to take the initiative forward and empower other self-organized communities.

Figure i.11 Remaining agricultural land, ©Marwan Abdel Rahman

Figure i.12 [in]formal sprawl, ©Marwan Abdel Rahman

Figure 0.1 [in]formal fabric in Cairo, ©Hamed Mostafa, 2015



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CONTEXT

A CRITIQUE

According to TADAMUN, approaches to [in]formal settlements undertaken by the government fall under two categories: preventative and interventionist approaches.[28] Preventative approaches occur by belting and enforcing urban boundaries with the objective of limiting informal growth. Interventionist approaches include improvement, eviction and relocation of informal settlements to direct them away from agricultural land and high-value land subjected to private sector developments.

So far, government approaches and policies to slow or stop the growth of [in]formal settlements have been unsuccessful. This is because [in]formal areas are perceived only as a problem, which requires them to be removed or reduced. Forced eviction and relocation on the outskirts of Cairo, undertaken by the government, on the one hand don't provide sufficient infrastructure, health and educational services, access to public transportation and economic opportunities. On the other hand they don't consider the underlying socio-cultural infrastructure organizing [in]formal communities and their previous investments in their neighbourhood, which result in their further marginalization, loss of vitality and lack of communal responsibility. Moreover, improving informal areas have been limited to specific communities and therefore have minimal effects in reducing the overall growth of informal areas.

In general, participatory programs in Egypt have the pitfalls of offering short-term solutions. NGO and community-based models are often stalled due to financial, bureaucratic and political reasons, and therefore need to be more formalized and legalized. The GIZ established the largest participatory approach under the Participatory Development Programme (PDP), in collaboration with the General Organization for Physical Planning (GOPP). Elena Piffero reveals that, although advocating for true empowerment, the program struggled from the lack of effective grass root organizations and the indifference to cooperate by both community members and officials.[29]

Moreover, the term 'participation' is usually uncritically accepted. Many participatory approaches fail in generating long-term solutions because the main roles are still played by experts. Participation becomes therefore a performed process rather than a self-generated process. In this context, the thesis argues that there is a need to take existing participatory models in Egypt a step further, and develop a process, which is more appropriate to self-organized communities. This process should emerge from the idea that both designers and community members are considered experts. While designers acquire their skills from education and practice, community members develop improvisation skills from self-generating what the government has failed to provide. The designed process should continue to operate without the expert.

Figure 0.2 Woman in Sayeda Zeinab, ©Egypt Photowalk, 2014

URBAN REVOLUTION

The political system in Egypt has been constantly changing in the last few years, which had drastic effects on the rate of informality and the way it was perceived. Before the January 2011 Revolution, the entire regime was strongly top-down based. [In]formality was therefore dealt with by means of eviction and relocation. During and after the revolution, informality has, however, witnessed remarkable growth and attention. As discussed in *Learning from Cairo*, the 2011 Revolution is considered an urban revolution.[30] Evidence suggests that it was the informal communal initiatives that made it possible to overcome the events of the Arab Spring, during the absence of a regime and the collapse of all state systems. As Magda Mostafa mentioned in *Learning from Cairo* "Informal practice - for a lack of a better word - in Cairo can no longer be ignored, particularly post-January 25th 2011, when the ethos of an entire population shifted from top-down to bottom-up; when taking things into one's own hands seems to have become the modus operandi of the day."[31]

The government's approach in responding to [in]formality evolved in 2014, when the Ministry of Urban Renewal and Informal Settlements (MURIS) was founded by President Abdel Fattah El Sisi. The Ministry was in charge of upgrading informal settlements and implementing Article 78 of the 2014 Constitution stating that,

"*The State shall also devise a comprehensive national plan to address the problem of unplanned slums, which includes re-planning, provision of infrastructure and utilities and improvement of the quality of life and public health. In addition, the State shall guarantee the provision of resources necessary for implementing such plan within a specified period of time.*"[32]

Although the creation of MURIS was regarded as an important step towards accommodating [in]formality, the article still represented a top-down philosophy and centralized power in providing resources and solutions. The article also didn't provide a clear definition of "unplanned slums" and continued to negatively reframe [in]formal areas without considering their self-organized initiatives and the importance of citizen participation. Similarly, Ron Dembo argued in Global Urban Lectures, organized by UN-Habitat, that "When we discuss resilience in cities we usually focus on infrastructure. Little attention is paid to the role citizen engagement and behavior change plays in making cities resilient."[33]

In June 2015, MURIS and other government agencies publically showed willingness to integrate alternative modes of practice in their policies by organizing together with UN-Habitat, the first Egypt Urban Forum (EUF) in Cairo. EUF covered the following five themes: Urban Planning and Upgrading, Urban Governance and Legislation, Housing, Urban Service Delivery and Urban Economy, with a focus on informality. The conference shed light on fifteen community-based urban practices that run parallel to government

development plans, such as Maspero Parallel Participatory plan and 'Know Your City' initiative led by TADAMUN, that aims to restore the lack of knowledge about Cairo's marginalized communities.

With the recent government reforms in September 2015, MURIS was removed as a separate political entity. It is still, however, unclear and too early to predict how this reform will affect current approaches towards [in]formality. With this uncertainty in mind, and the search for alternative modes of practice, the thesis argues that it is essential to contemplate a more transparent and open process in which all stakeholders are included in the decision-making and have equal access to information. Going beyond consultation and assessing community's needs, undertaken by experts and government agencies, the process needs to integrate community members in every stage from planning to management and maintenance.

Figure 0.3 Nice day for a revolution, ©Hatem Kotb, 2013

THEORETICAL FRAMEWORK

In order to answer the proposed questions and design the process, the thesis explored four main domains: Informal urbanism, *Handmade*- and *Tactical Urbanism*, the role of the architect, and local and international community-based modes of practice.

DEFINING THE [IN]FORMAL

In relation to the on-going global discourse about informality, the thesis focused on the unique platform where top-down and bottom-up actions meet in order to negotiate the definition of the [in]formal. The "Syncretic City" proposed by Urban-Think Tank (U-TT), advocates "to see the informal settlements of the world as a potential for innovation and experimentation, with the goal of putting design in the service of a more equitable and sustainable future."[34]

In *Learning from Cairo*, it was discussed that defining the [in]formal is challenging because it depends on the perspective it is being evaluated from. While the question arose whether defining the informal is about legality, ownership, structure, audience or their combination, the thesis strives to find a definition through design and from the perspective of the ordinary, the other 90%.[35] Along similar lines, Dina Shehayeb argued in *Learning from Cairo* that "urban planners set wrong planning, because they don't know how people live, and then we blame people, because they live in slums and abandon formal building... Our way of learning must be changed; it must be multi-disciplinary and humble, we have to learn from people."[36]

In terms of investigating where design can operate in redefining the [in]formal, Lindsey Sherman, Project Architect at U-TT, discussed in *Learning from Cairo* that "informality exists as layers of informality within formality, and that we designers can learn from this hybridity where it exists. Appropriation and adaptation can be learned as processes and constructs for iterative interventions."[37] With informality becoming the new mainstream and conventional modes of practice no longer a common language between authorities and citizens, an alternative multi-disciplinary design approach needs to emerge that resolves the tension between the two extremes.

Handmade Urbanism can be seen as the overarching theoretical framework for this emerging design approach that recognizes the potential of urban transformation embedded in community initiatives. *Handmade Urbanism* is defined as "the way of providing urban change carried out by local residents in their own neighborhoods or communities, with their own hands and means."[38] The process starts with some residents generating solutions to their unmet needs. Single actions then gain momentum and evolve into larger community initiatives, where residents unite their resources and form partnerships to realize daily needs.

Likewise, *Tactical Urbanism* is defined as small-scale and short-

term grass roots interventions meant to inspire long-term changes in the built environment.[39] While *Tactical Urbanism* is celebrated as an alternative city-building approach and in many cases adopted by governments as best practice, it is still undervalued as [in]formal practices when assessed in the context of the southern hemisphere.

The definition of *Handmade Urbanism* and *Tactical Urbanism*, not only correlates with the dynamics of [in]formal communities in improvising solutions and demanding their 'right to the city,' but also necessitates questioning why they are still considered [in]formal and not handmade or tactical. The reality about rapid urbanization and shortage in resources require accepting that parts of our cities are not built according to conventional modes of practice. This claim was supported in Habitat Universities Thematic Hub by stating "the 'informal' cannot be simply equated to illegal, since the informal may be the only possible way of urbanization in cities ... the 'informal' cannot be equated to 'inferior' or 'marginal,' since there are many examples where informally-developed communities become better places to live than dysfunctional public housing and housing estates produced by commercial developers."[40]

This moment where the architectural profession seems to be fading, is the exact same moment in which the expanded role of the architect as an agent of change, mediator, curator and choreographer of forces starts to emerge. It is our responsibility as architects to design a process that, on the one hand, guides self-organized communities to become more sustainable without losing their vitality and, on the other hand, communicates missing needs to authorities.

ROLE OF THE ARCHITECT + ALTERNATIVE MODES OF PRACTICES

The works of Christopher Alexander and Aga Khan Award-winning Abdelhalim Ibrahim Abdelhalim, serve as the main theoretical framework for the thesis in terms of redefining the role of the architect and designing the process. Abdelhalim worked with Alexander during his doctorial dissertation in University of California, Berkeley.

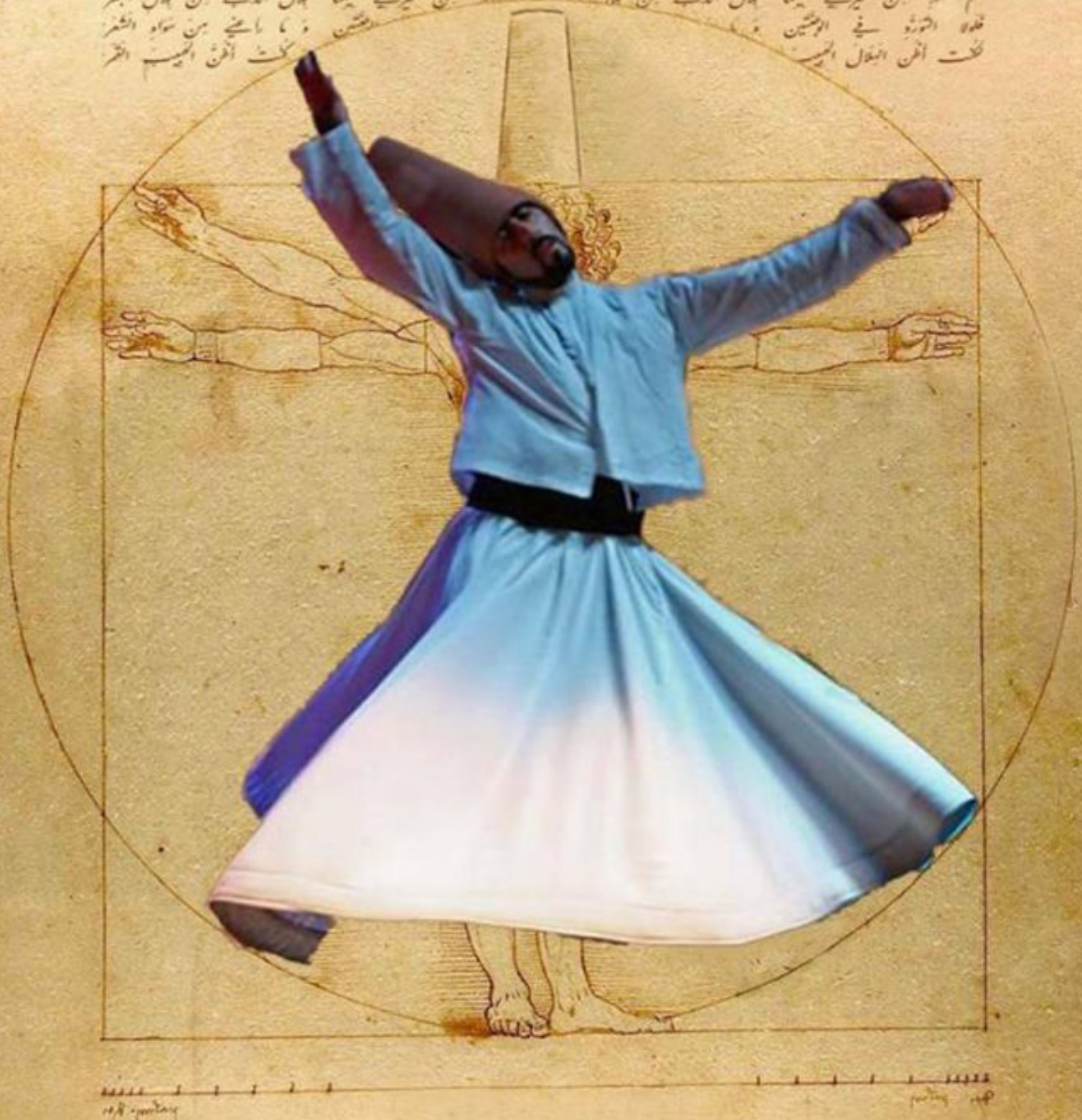
A Pattern Language: Towns, Buildings, Construction, written by Christopher Alexander and five colleagues at the Center for Environmental Structure in Berkeley, California in the late 1970s, offers a vocabulary of elements, which can make people's experience in towns, neighbourhoods and buildings more explicit and easy to understand, thus enabling them to participate in the development of their environment. According to *A Pattern Language*, every town, community and building has its own set of recurring patterns or orders. Each one of these patterns is linked to a spatial logic and is defined as a "morphological law, which establishes a set of relationships in space."[41] A pattern is framed in the manual as a problem, followed by an analysis of its context, and a solution.[42] Together all 253 compiled patterns form an interconnected language that communicates the identity of a region

and allows ordinary people to improve their neighbourhood.[43] More than just being a way to describe good practice, a pattern is a particular configuration, within a language, that integrates and negotiates conflicting forces in a harmonious manner, which might not be the best solution but an optimized one.

Alexander states, “so long as the people of a society are separated from the language which is being used to shape their buildings, the buildings cannot be alive.”[44] This explains why top-down relocation plans end up marginalizing [in]formal communities, and why new imposed cities, foreign to the culture and established social capital, are underdeveloped and abandoned by their inhabitants. The statement also implies that in order to achieve long-term development, the implemented design vocabulary has to come from within and be in-line with existing patterns. For this to happen, Abdelhalim argues that, “the task of a designer is to disentangle the patterns of a community, and discover their underlying geometry.”[45]

In terms of defining the role of the designer, Abdelhalim believes that the architect is the interpreter of culture.[46] He reveals that “the majority of the world‘s population lives in communities in which custom and tradition are the only available organizing forces.”[47] The statement implies that in order to operate in self-organized societies, the architect needs to decode the hidden social, cultural and economic forces governing those communities; in other words, the orders of informality. This requires, however, investigating how the architect should decode and improve patterns of informality in a way that does justice to the complex physical and social reality in [in]formal areas.

Figure 0.4 Patterns and The Building Ceremony



رأيت الهلال و وجه الحبيب كانا جليين عندي النظر رأيت الهلال و وجه الحبيب كانا جليين عندي النظر
فلم أدر من حيرتي فيهما جلال الذهب من جلال البشر فلم أدر من حيرتي فيهما جلال الذهب من جلال البشر
فلولا الثورة في الوعثين و ما رأيتي من سواد الشعر فلولا الثورة في الوعثين و ما رأيتي من سواد الشعر
لكنت أظن الهلال الحبيب و كنت أظن الحبيب القمر لكنت أظن الهلال الحبيب و كنت أظن الحبيب القمر

رأيت الهلال و وجه الحبيب كانا جليين عندي النظر رأيت الهلال و وجه الحبيب كانا جليين عندي النظر
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فلولا الثورة في الوعثين و ما رأيتي من سواد الشعر فلولا الثورة في الوعثين و ما رأيتي من سواد الشعر
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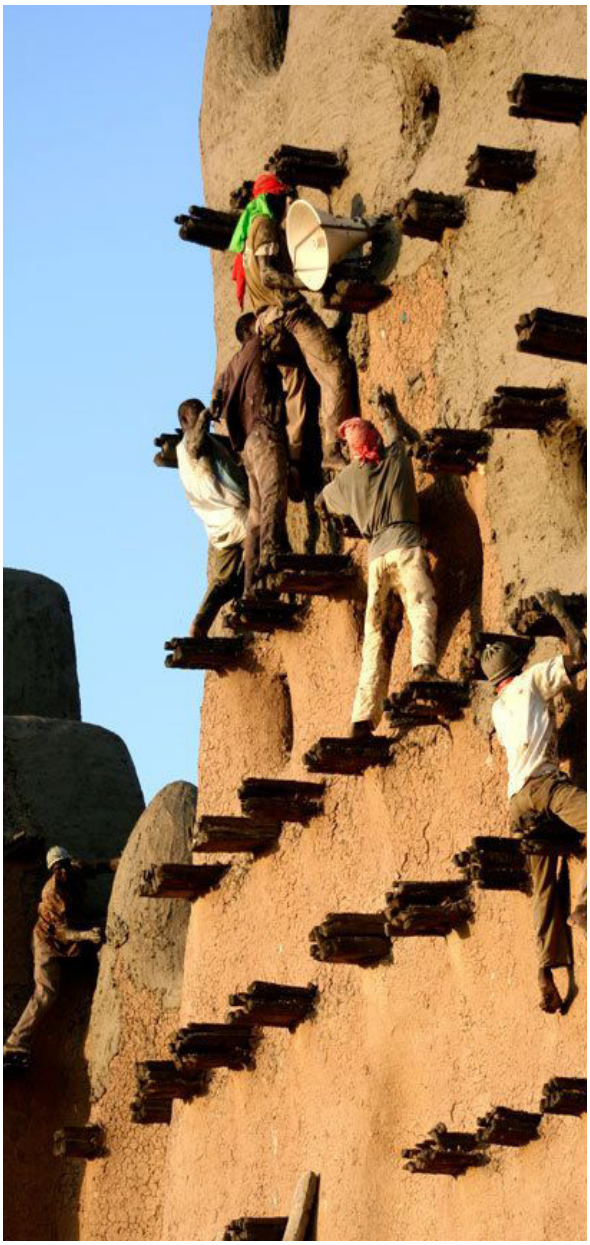
من سواد الشعر فلولا الثورة في الوعثين و ما رأيتي من سواد الشعر فلولا الثورة في الوعثين و ما رأيتي
الحبيب القمر لكنت أظن الهلال الحبيب و كنت أظن الحبيب القمر لكنت أظن الهلال الحبيب و كنت أظن

After long-standing research and observing local and global examples, like the repair of houses in Nubia, the mosque in Mali, the fishing community of Kameshima on Wasaka Bay in Japan and others, Abdelhalim proposes in his doctorial dissertation *The Building Ceremony* concept as a tool to link between the built environment and the community. According to Abdelhalim, *Building Ceremony* is where "the order of the community is identified, the creative energy of the people is released, and the community resources and skills regenerated."[48] Evidence suggests that Building Ceremony "increases productivity, improves performance, and enhances the quality of things that are produced. Building, more than any other productive activity, can combine economic growth with the vitality and creativity of the people and add to the accumulation of capital, knowledge and authority, the regeneration of identity, creative energy and community solidarity."[49]

Taking this theory into account, one can say that *Building Ceremony* is the driving mechanism for how [in]formal communities are governing and financing themselves. All self-generated initiatives in [in]formal areas, from the construction of buildings to small interventions, were undertaken by community members coming together to establish partnerships and mobilizing their skills and resources. By observing and designing the framework for building ceremonies to occur, the architect can identify and decode governing patterns in a society. This is achieved by providing opportunities and spaces that uncover a community's creative potentials and empower individuals.

In a similar paradigm, Christopher Alexander defines *The Timeless Way of Building* as "the process in which the order of the building or towns grow out directly from the inner nature of the people, and the animals, and the plants and the matter which are in it."[50] The dynamics of [in] formal communities share the same vocabulary of the *Timeless Way of Building*. [In]formal settlements in Cairo are a true manifestation of people's immediate needs, skills and available resources. Forming a language of their own, [in]-formal areas embody a set of recurring improvised solutions, repetitive modularity and an honesty in construction techniques and modes of operation.



THE BUILDING CEREMONY
Abdelhalim I. Abdelhalim

Figure 0.5 The Great Mosque of Djenné, ©Bjarke Ballisager, 2010

THE TIMELESS WAY OF BUILDING
Christopher Alexander

Figure 0.6 The Timeless Way of Building

IMPROVISATION IN [IN]FORMAL AREAS
Ordinary People

Figure 0.7 Former sugarcane field, Cairo , ©Bas Prin & Storefront, 2009

Another interesting commonality between Abdelhalim's design vocabulary and [in]formal areas, is the concept of incompleteness. In Abdelhalim's theory, good design has to allow current and future unplanned activities to occur. As present in 'Cultural Park for Children,' Cairo, 1989, this can be achieved by designing incomplete structural compositions that offer great flexibility, are expandable and allow users to interpret them according to current and future needs. In [in]formal areas, incompleteness is found on rooftops, empty workshops, planting steel rebars, unfinished floors and facades. It is a result of incremental construction, a characteristic of [in] formal building dynamics. Following Abdelhalim's design vocabulary, current passive incomplete structures can, therefore, be transformed into a plug-in system for the missing infrastructure in [in]formal areas.

'Cultural Park for Children,' by Abdelhalim Ibrahim, is selected as a local precedent for community-based design. As demonstrated in Figure 0.10, the following lessons were extracted to guide the design of the process and the architect's expanded role:

1. Site and Context
Observe how community members reclaim empty sites and transform abandoned sites into a communal hub that acts as a catalyst for development for other sites.

2. Generate Building Ceremonies to decode the orders of the community.

3. For true ownership, integrate community members in all stages from design to construction, operation and maintenance.

4. Community wall
Reinterpret interfaces as a dynamic boundary and a functional connector to the community. Design a community wall that provides spaces for an uninterrupted flow of cultural, social and commercial activities and unifies different needs.

5. Design for Incompleteness:
Accommodate current and future informality. Reclaim incomplete structures.

6. Locality:
Adjust designs and construction according to existing resources and skills.

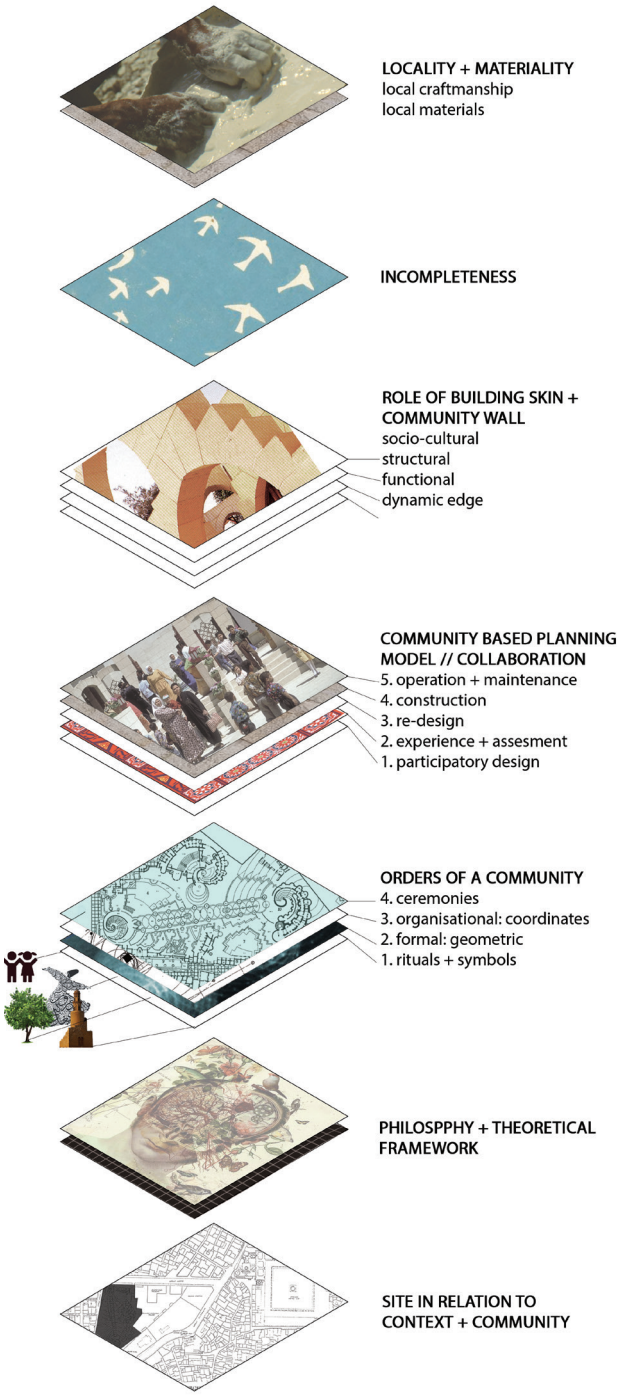
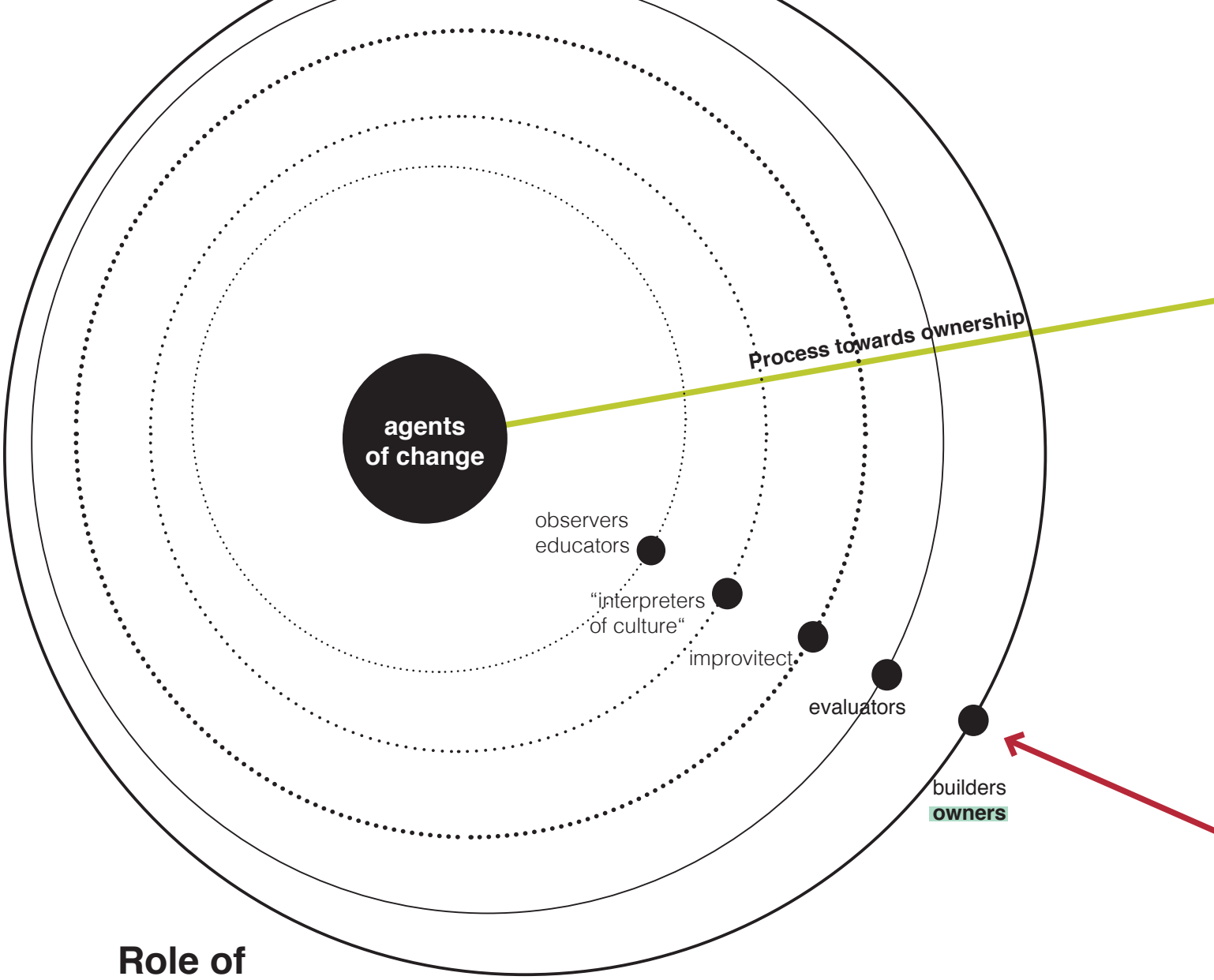


Figure 0.8 Dissecting the Building Ceremony concept *(top)*

Figure 0.9 Cultural Park for Children, Sayyida Zeinab *(right)*



Role of Community Members

Figure 0.10 Transformation in users’ and architect’s role

Role of the Architect

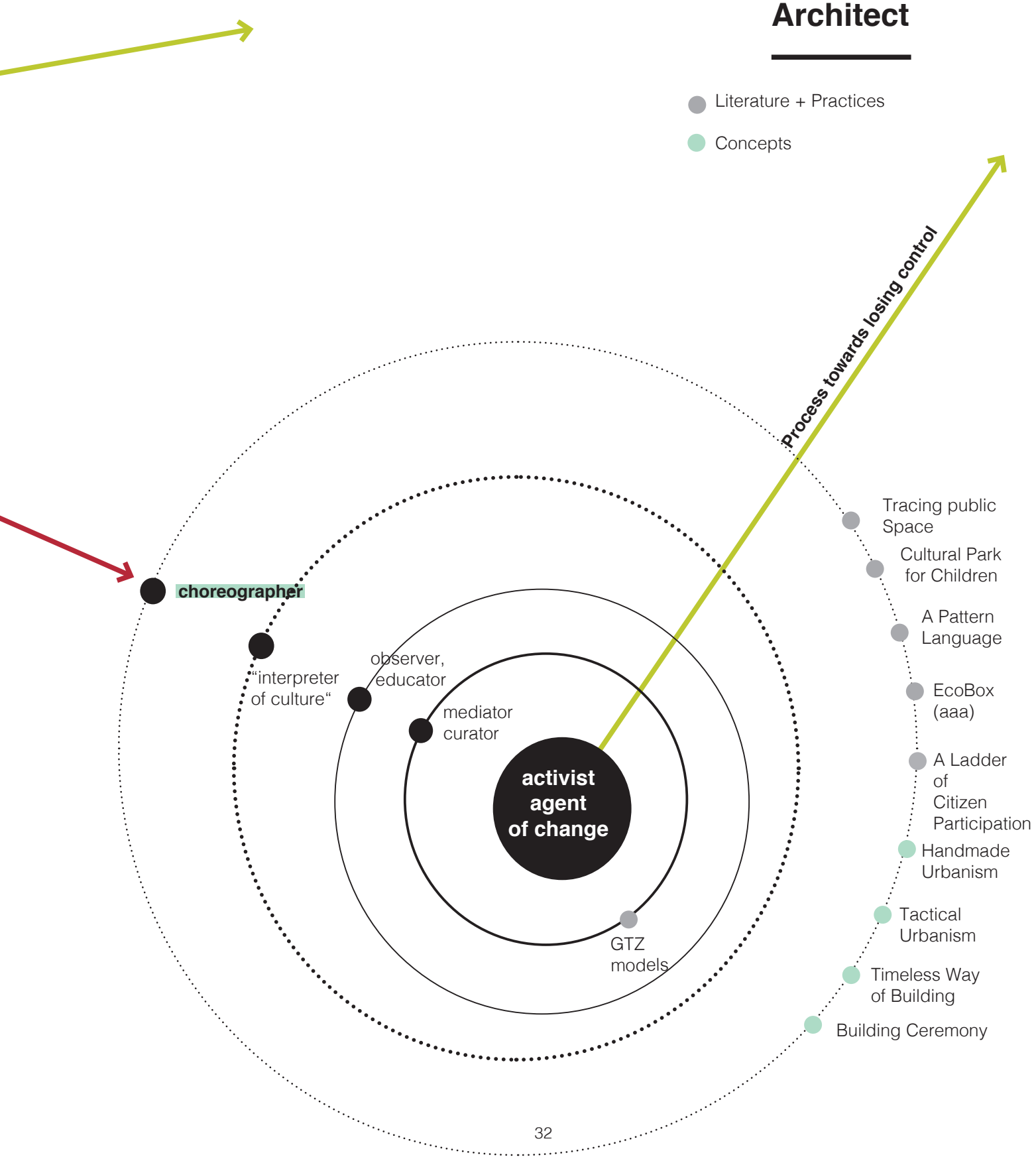
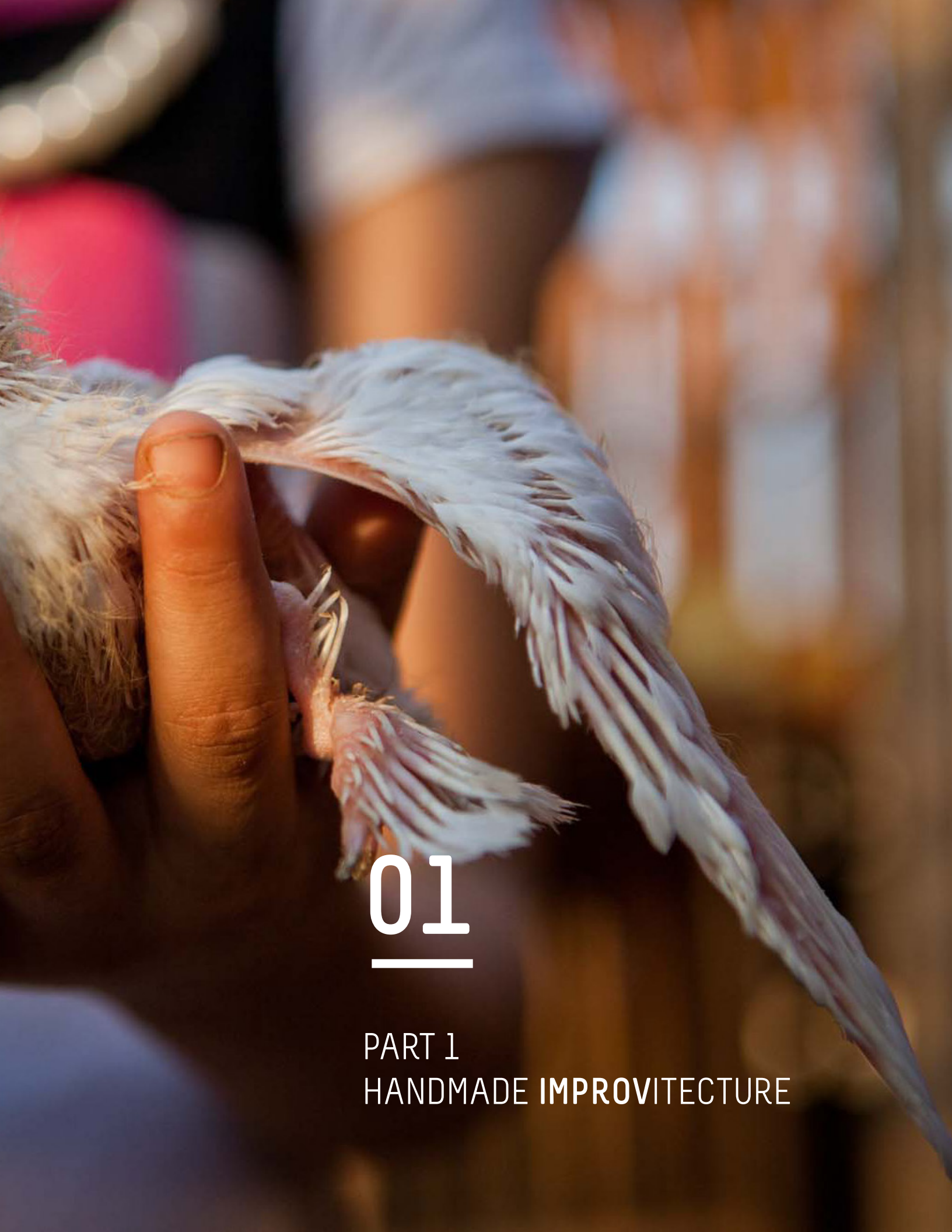


Figure 1.1 The daughter of a fancier holding a squab, ©Amanda Mustard

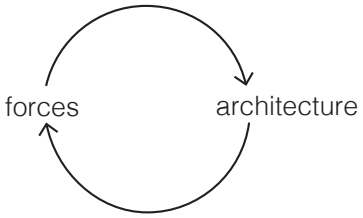


01

PART 1
HANDMADE **IMPROV**ITECTURE

REDEFINING THE [IN]FORMAL THROUGH IMPROVITECTURE

Architecture can no longer be viewed solely as an object. It is an essential component in developing and structuring communities. It is, by definition, a physical manifestation of ideas and needs. Architecture gives form to forces, and formalizes forces that contributed to its creation. It should, therefore, be perceived and created as a responsive and responsible cultural construct where organizing forces are choreographed into productive outcomes.



Improvisation is "the process of devising a solution to a requirement by making-do, despite absence of resources that might be expected to produce a solution", which can be compared to the case of informality as a response to immediate needs.[51] By looking through the lens of the architect trained as a problem solver, with an interdisciplinary educational background, hidden orders of informality and driving socio-cultural and economic forces can be uncovered, represented and thus redefined. Acknowledging informality as a typology and the value of tactical practices, architecture can change perception from unplanned and informal to self-organized and improvised.

The thesis therefore introduces the term **Improvitecture** (improvisation **+** improvement **+** architecture) as a catalyst for development and the architecture from, and for, informality. Improvitecture creates a platform, which allows planning and improvisation to co-exist and mediation between top-down and bottom-up practices. It redefines traditional borders between architect, user and client, planned and improvised, designed and semi-designed, complete and incomplete and, finally, formal and [in]formal. Improvitecture is about discovering and optimizing the potentials of [in]formal and self-organized processes, the 'building ceremonies.' It deals with thinking about the afterlife of a building that includes operation and maintenance, allowing people to grow in spaces, establishing a true sense of ownership and optimizing their future [in]formal activities. Improvitecture could be seen as the first steps towards formalizing the [in]formal and informalizing the formal.

The architect has to shift roles from being an agent of change to a mediator, an interpreter, and finally, to an invisible choreographer of forces. This is not to devalue the role of architects but rather to imply that a transformation needs to occur both in the role of users and architects.

unplanned informal ·····> self-organized **improvised**

slum upgrading ·····> directed **improvisation**

improvisation
(n.)

Improvisation is the process of devising a solution to a requirement by making-do, despite absence of resources that might be expected to produce a solution.

"Neither natural ability without instruction nor instruction without natural ability can make the perfect artist."[52]

-Vitruvius

Improvitecture

improvisation + improvement + architecture

planning
(n.)

Planning is the act or process of developping in advance a scheme or method of acting, doing, proceeding, making, etc.

"Give me the license to build and an architect with standardized drawings to preserve the harmony."[53]

- [in]formal resident

[IN]FORMAL PATTERN LANGUAGE

With the understanding that [in]formality is an inevitable part of the city, a counterpart of eviction is to upgrade them through community-based initiatives. Moreover, there is a need to link between, on the one hand, people pursuing their immediate needs but not recognizing the consequences of their actions on the larger picture, and on the other hand, the government not acknowledging people's needs and rights because it is concerned with large-scale issues. In response, the thesis argues that in order to optimize current and future growth in [in]formal settlements, their complex physical reality and urban narratives should be broken down into patterns.

Inspired by Alexander's *A Pattern Language*, the outcome of the thesis is therefore to create a process and an [in]formal Pattern Language manual, which serves as a guide for community members, designers, planners and officials to improve informal settlements and embed the value of productive green spaces, sustainability, communal responsibility and ownership in the resident's daily life.

The objective of the manual is to create a language that mediates between top-down decision-making and [in]formal practices by connecting people's ordinary microscopic needs and narratives to complex environmental and urban concerns. The [in]formal Pattern Language should be considered a guide for handmade Improvitecture in Cairo. It should allow residents of [in]formal areas to optimize their patterns with available skills and resources.

The format used in Alexander's *A Pattern Language* first describes a problem, which reoccurs in the built environment and then describes the core of the solution.[54] Inspired by this format, once a pattern is identified in the [in]formal Pattern Language manual, it will be then analyzed and combined with a set of Improvitecture tools and in-situ design solutions. Improvitecture tools are actions that improve existing patterns in order for them to continue in a more sustainable way. In the case of the [in]formal Pattern Language, patterns could be a problem, a potential or both.

PATTERNS **+** **IMPROV**ITECTURE TOOLS

Unlike *A Pattern Language*, the thesis will not produce a universal language but a site-specific one. Moreover, the [in]formal Pattern Language will not be a catalogue of good practice patterns but a documentation of patterns found on site with a reference to global patterns operating on the larger scale. This format should reveal the missing services and infrastructure in [in]formal areas.

The thesis claims its originality through the fact that the manual acts as an assembly of patterns discovered and analyzed by community members, experts and architecture students. For this reason [in]-formal Pattern Language is designed as an open source process to allow community members to constantly generate new patterns, and avoid freezing decisions into permanent facts. As noted by Alexander: “Patterns are alive and evolving. The patterns are still hypotheses, all 253 of them are, therefore all tentative, all free to evolve under the impact of new experience and observation.”[55] With this in mind, [in]formal Pattern Language should not be considered as a fixed end product but as an initiator for a replicable process.

Figure 2.1 Gustavo in La Vega, Caracas, ©Nohely Oliveros

02

PART 2
THE PROCESS

I. DESIGNING THE PROCESS

"To work our way towards a shared and living language, once again, we must first learn how to discover patterns which are deep, and capable of generating life"

- Christopher Alexander,
The Timeless Way of Building, x

This chapter presents the process proposed by the thesis. The process is based on a strong bottom-up top-down partnership. The main goal of the process is to create an [in]formal Pattern Language manual, which serves as a tool for genuine participation and community empowerment. The first part of this chapter is focused on designing the process, which includes building the method, selecting a site, collaborating with local partners and designing the tools before going on site. The process in not only designed to be carried out by a representative group in [in]formal communities, but is also conceived as an open source initiative. The second part of this chapter deals with testing the process on site towards forming a bottom-up replicable method.

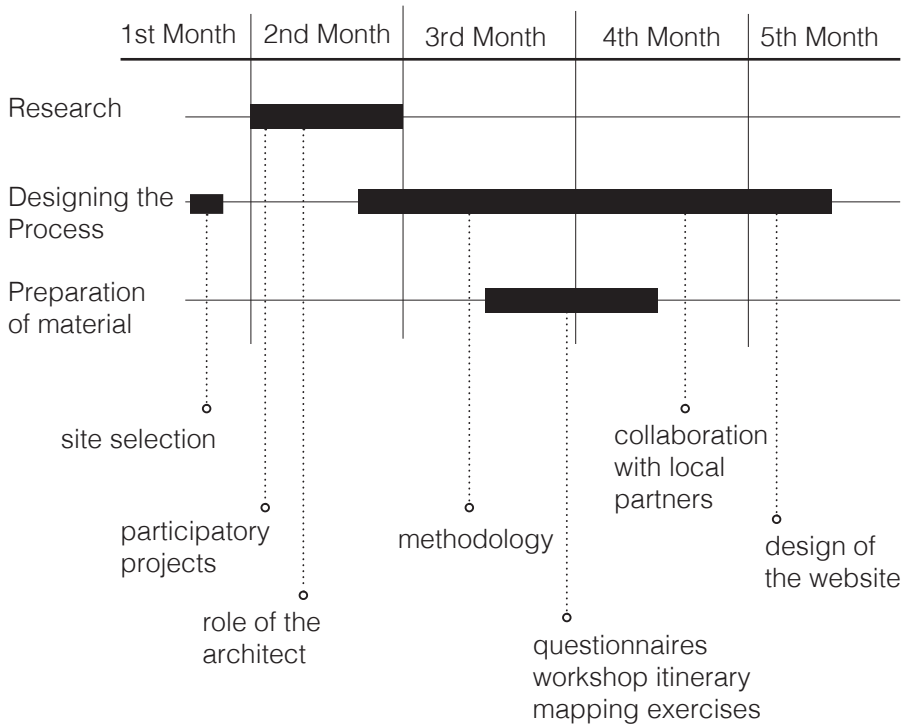


Figure 2.2 Designing the Process

SCOPE

Based on the shared vocabulary between Abdelhalim, Alexander and [in]formal communities, the thesis was able to extract a methodology for designing the process and the [in]formal Pattern Language manual. While *A Pattern Language* frames patterns from the scale of the region to the details in rooms, followed by a section on construction, the scope of the thesis covers patterns ranging from the scale of a region to the scale of the individual. Similar to the structure of *A Pattern Language*, the thesis differentiates between two kinds of patterns: global patterns and local patterns. Global patterns operate on the larger scale. They are more abstract urban, political and social trends, issues or factors, which cause local patterns to occur. By zooming in on a community, local patterns become apparent. They cannot be preconceived, and can only be gathered and mapped through a close interaction with site and community members.

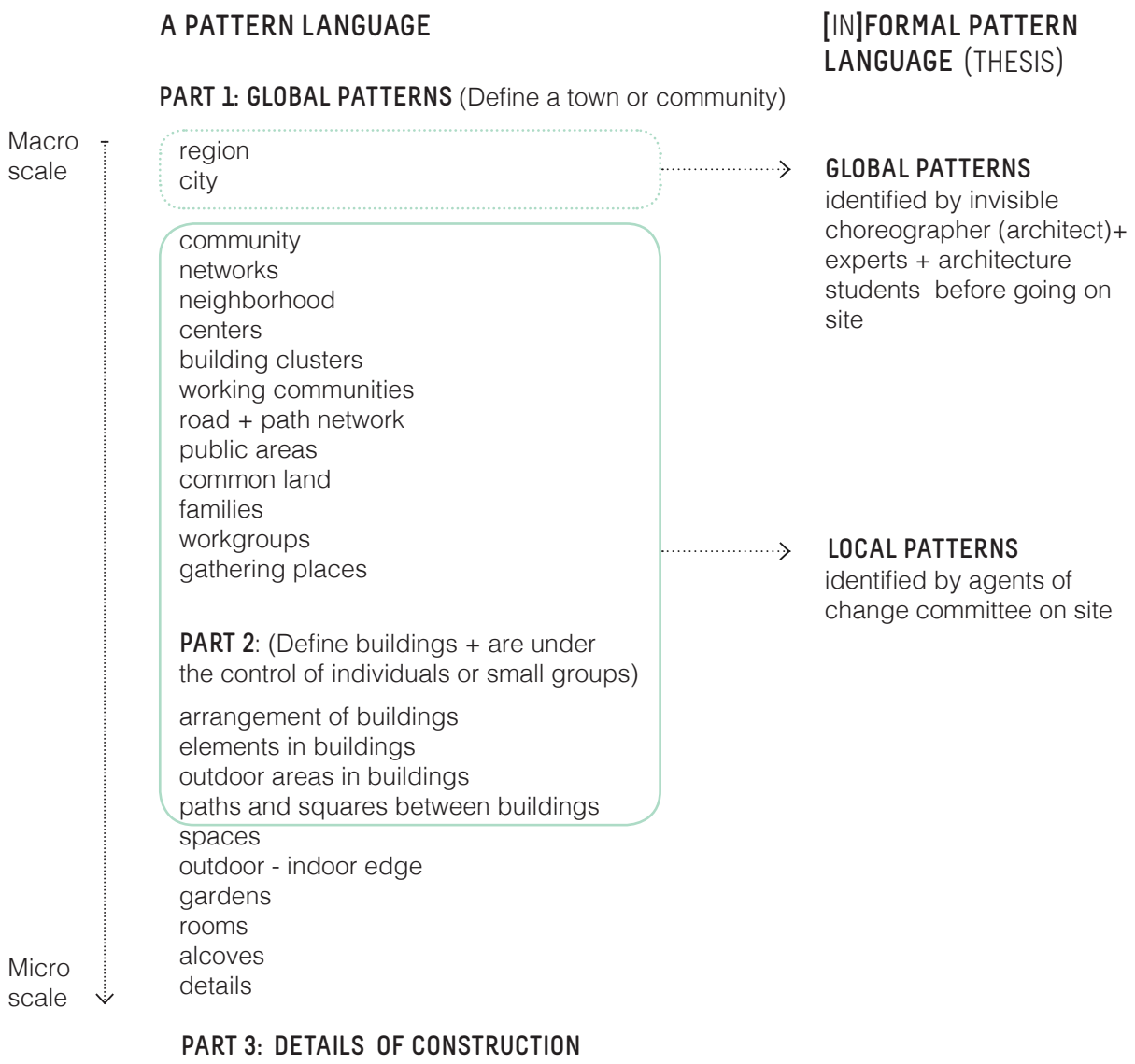


Figure 2.3 Thesis scope

Global patterns were identified by the thesis author, architecture students and experts from the informed urban community. Local patterns were documented by a small group of children from Ard El Lewa and AUC Architecture students in the framework of a workshop on site.

The underlying objective for designing the process was to achieve a genuine, honest and effective participation as much as possible. The intention was also to explore whether community members would actually have a chance to influence final decisions and optimize their patterns with their own hands. As such, the proposed process was evaluated from the start in relation to *A Ladder of Citizen Participation*, developed by Sherry Arnstein; in order to avoid the pitfalls of other participatory models.[56] While the proposed process was designed to achieve citizen control, in reality, the thesis started with partnership and ended with delegated power.

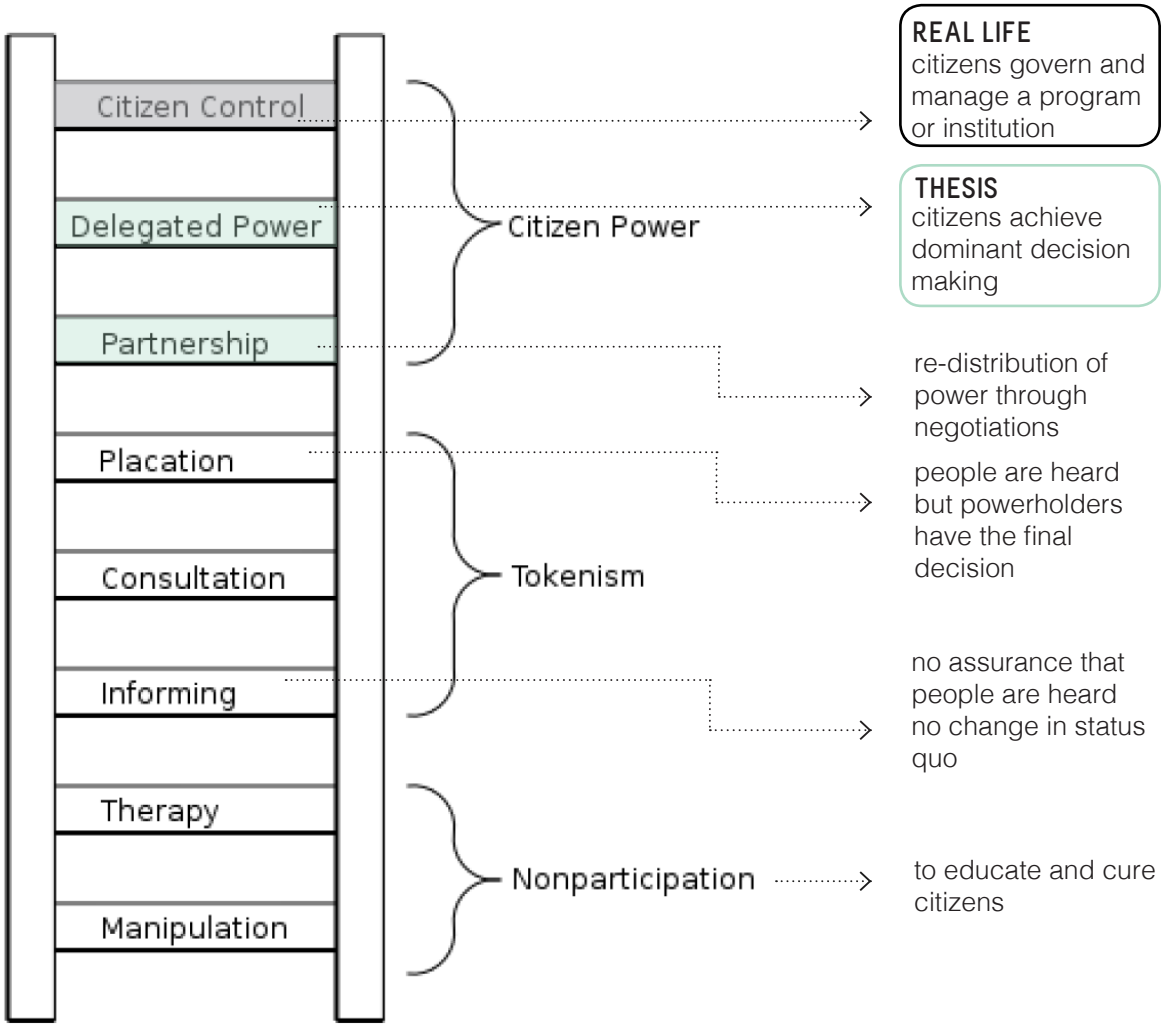


Figure 2.4 A Ladder of Citizen Participation, Sherry R. Arnstein, 1969

METHODOLOGY

The diagram (Figure 2.5) outlines how roles of community members and architects should transform, combines each role with a set of skills and identifies the output of each stage with a link to *A Ladder of Citizen Participation*. The objective is to dissolve the aggressiveness of architecture and the forced passivity of the user, in a condition of creative and decisional equivalence that is more appropriate to self-organized communities. In addition, the process should trigger an exchange of knowledge and skills between community members and architects.

1-2 The process starts with the architect deciding to be an agent of change and activist. The architect undertakes a thorough site analysis, makes observations, interviews community members. The architect accepts that in self-organized communities s/he needs to accept losing control and become an invisible agent. At this stage, the architect identifies global patterns.

3-4 Being a mediator, the architect forms a team with local partners from the community who, together, become the Agents of Change Committee.

5 In this stage, both community members and architect undertake an exchange of knowledge. Community members educate the architect with local perspectives, while the architect makes them aware of their immediate surroundings from an architect's eye. The architect passes on tools that will allow community members to re-shape their world, such as mapping and documentation skills, and identifying patterns.

6-10 Once a pattern is identified, it will be first analyzed and then combined with a set of Improvitecture tools and in-situ design solutions, which optimize it. Finally, after acquiring local knowledge and evaluation from community members, based on their daily experiences, the architect prepares diagrams showing construction, assembly, operation and maintenance.

11 The architect steps back. Community members take charge of construction, management and maintenance.

12 The Agents of Change Committee, is responsible for following up, and consulting and monitoring community members. The committee organizes regenerative events to keep the process going and direct the discovery of new patterns.

The cycle then starts all over again, with identifying new patterns and updating old ones to maintain a long-term development. Participation thus becomes a self-generated, rather than a staged, process.

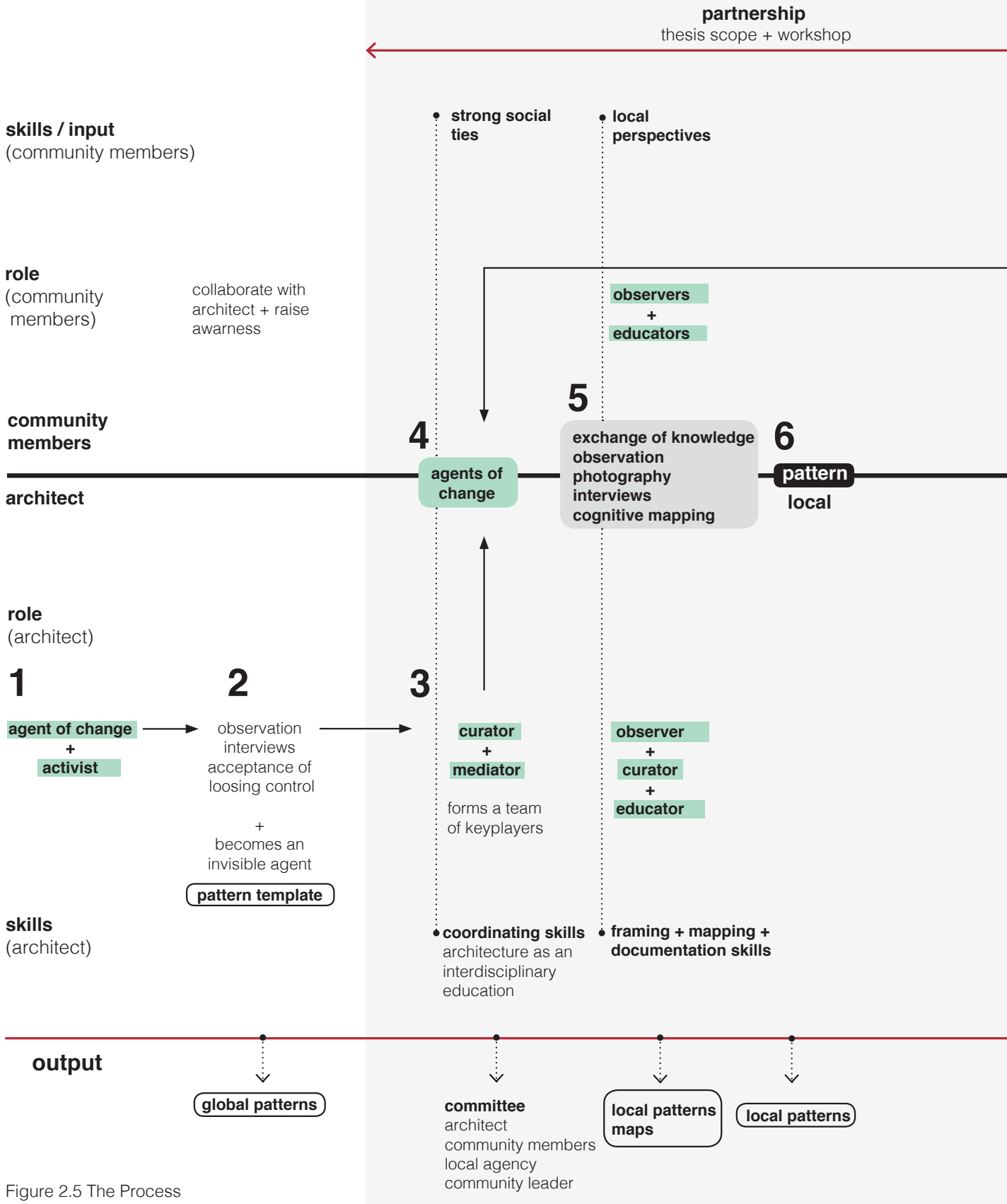
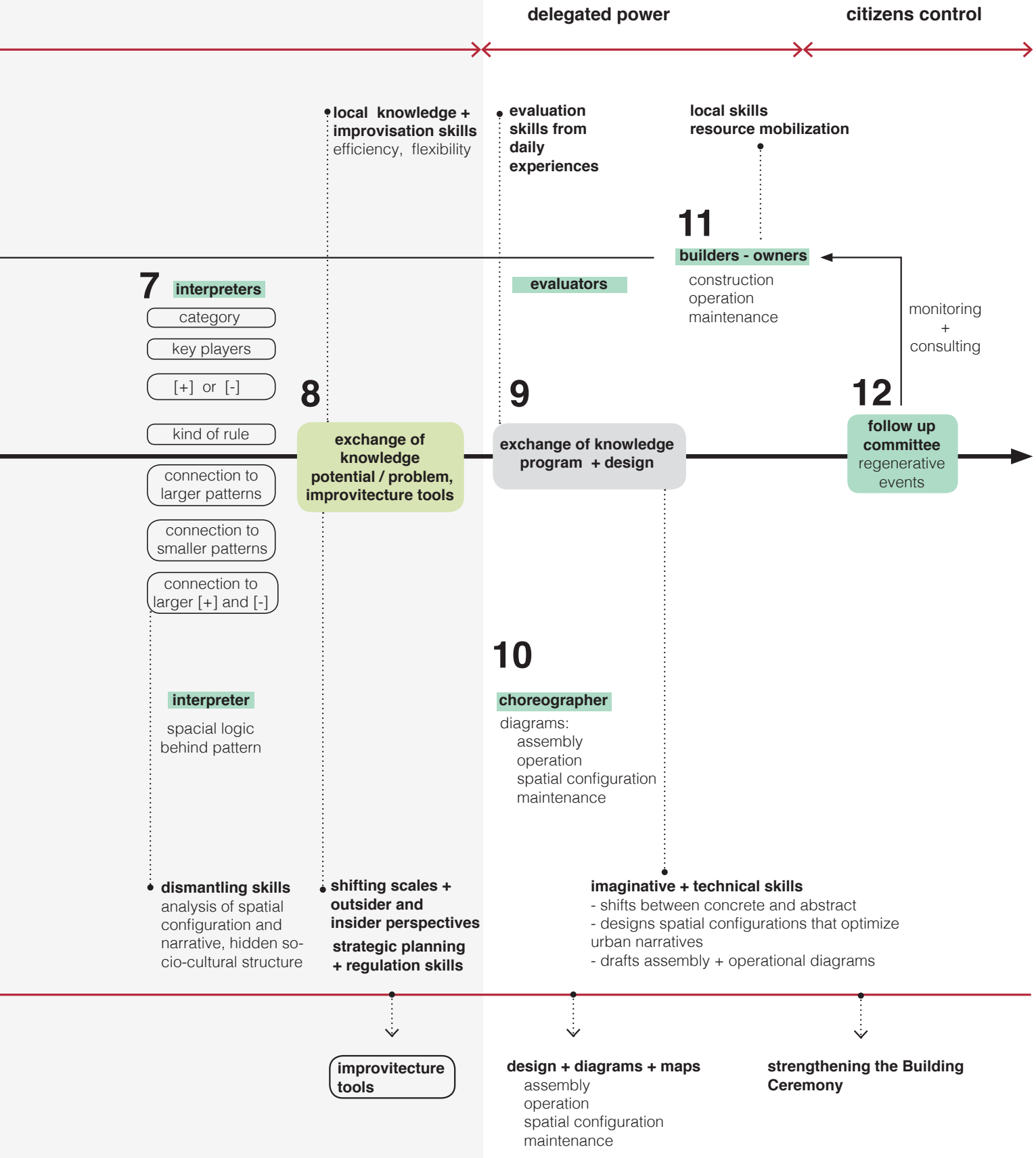


Figure 2.5 The Process


delegated power
citizens control
local knowledge + improvisation skills
efficiency, flexibility
evaluation skills from daily experiences
local skills resource mobilization
11
builders - owners
construction
operation
maintenance
monitoring + consulting
7
interpreters
category
key players
[+] or [-]
kind of rule
connection to larger patterns
connection to smaller patterns
connection to larger [+] and [-]
evaluators
8
exchange of knowledge potential / problem, improvitecture tools
9
exchange of knowledge program + design
12
follow up committee
regenerative events
10
choreographer
diagrams:
assembly
operation
spatial configuration
maintenance
interpreter
spacial logic behind pattern
dismantling skills
analysis of spatial configuration and narrative, hidden so-cio-cultural structure
shifting scales + outsider and insider perspectives
strategic planning + regulation skills
imaginative + technical skills
- shifts between concrete and abstract
- designs spatial configurations that optimize urban narratives
- drafts assembly + operational diagrams
improvitecture tools
design + diagrams + maps
assembly
operation
spatial configuration
maintenance
strengthening the Building Ceremony

SELECTING A SITE

This section narrates why Ard El Lewa was selected as a site to test the process. The following selection criteria applied:

- [in]formal settlement constructed on agricultural land
- presence of typical problems: density, traffic congestion, garbage accumulation
- close proximity to the formal
- presence of active community engagement

Ard El Lewa, an [in]formal settlement on agricultural land, is selected to test the proposed process and develop the [in]formal pattern language manual. Progressively encroaching on valuable agricultural land, Ard El Lewa was built over the past 30 years, following the typical rule of aggregation through accumulation, and apart from official planning. It is estimated that Ard El Lewa houses 300,000 residents occupying around 1.9 km^2, which equals a population density of 158,000/km^2.[57] Parcel dimensions can range from 175m^2 to 500m^2. Ard El Lewa's location, [in]formal patterns, potentials and problems and, most importantly, communal initiatives, make it an ideal case study for this thesis.

unplanned growth
dense urban environment

The boundaries of Ard El Lewa are defined by 3 major transportation corridors: the Ring-Road, 26th July Corridor and the railway, making it highly visible for daily commuters and travellers to and from the city. These corridors, as stated by Omar Nagati and Noheir El Gendy, paradoxically contribute to Ard El Lewa's misfortune and potential development opportunities.[58] While they limit accessibility, they offer great visibility and public attention to Ard El Lewa.

Ard El Lewa's location on the border between formal and [in]-formal Cairo, presents itself as an interesting boundary condition to negotiate distorted relations between the formal and [in]formal. Its close proximity to formal services and work opportunities makes it a preferable, and affordable, habitat for low-wage employees, drivers, housekeepers, refugees and students of Cairo University. Ard El Lewa could therefore be seen as the 'back of the house' of formal Cairo. For this thesis, Ard El Lewa offers an ideal platform to redefine the [in]formal and help marginalized and dependent [in]formal communities become self-sustaining and develop a symbiotic relation to the formal.

the [in]formal a housing solution
[in]formal sprawl in proximity to the formal

Active communal engagement in Ard El Lewa makes it the perfect candidate for implanting the proposed process initiative, until the [in]formal Pattern Language initiative gains momentum and resonates awareness in other [in]formal communities. Ard El Lewa communal initiatives are lead by the 'Public Coalition in Ard El Lewa,' which started as one of the many popular committees organically

popular committees

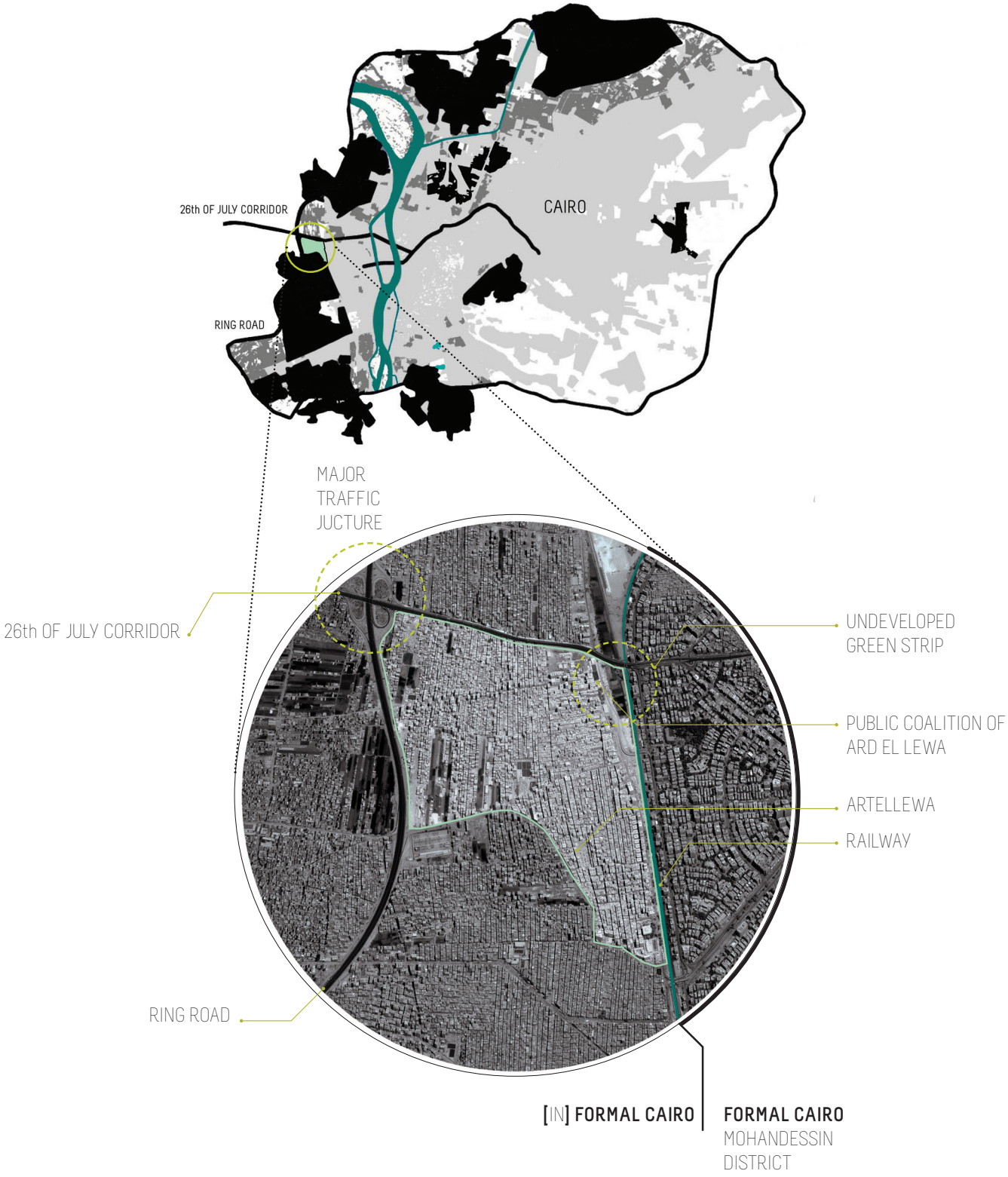


Figure 2.6 Site Selection

formed during the revolution in the absence of a security system. Realizing the power of the collective, as Hanaa Gad frames it in a talk organized by Tadamun, the coalition advanced from providing security and political awareness to mobilizing community resources to upgrade the area, and communicating its demands to the government.[59] Some of the coalition's achievements and integration attempts include the construction of a ramp off and to the Ring Road, which was previously inaccessible from their community, paving streets, garbage collection and successfully pressuring the government to provide the area with natural gas and two pedestrian bridges connecting Ard El Lewa with Mohandesin, a formal district in Cairo. In 2012, a group of residents and the coalition protested against a housing project to be constructed on the still-undeveloped green strip of 12-14 acres, located along the formal [in]formal edge. Ever since, they have been collaborating with CLUSTER (Cairo Laboratory for Urban Studies, Training and Environmental Research), founded by Omar Nagati and Beth Stryker, and government agencies to transform the vacant land into a community park with the lacking gardens, educational and health facilities. The coalition, however, is still facing bureaucratic difficulties in obtaining usage rights from the Ministry of Endowment.

construction networks
credit system
access to highways

schools
repetitive need for a hospital

Another grass roots initiative in Ard El Lewa that strongly activates civic and cultural life is Artellewa, an art space founded by artist and community member Hamdi Reda in 2007. Artellewa houses a workshop/exhibition space, rooftop, small library and residence for local and international artists. It therefore creates an ideal platform for accessing community networks, forming the agents of change committee and hosting photography and mapping workshops to document local patterns, needs and urban narratives on site. Artellewa could also be responsible for creating and maintaining the regenerative events, the building ceremonies that ensure the continuation of the [in]formal Pattern Language initiative.

art facilities

Figure 2.7 formal [in]formal boundary and the undeveloped green strip in Ard El Lewa

FORMING THE AGENTS OF CHANGE COMMITTEE

The next step, after selecting a site, was to collaborate with local partners on site in order to facilitate access to community networks, and act as a mock-up for the Agents of Change Committee* proposed in the process. The Agents of Change Committee, guided by the architect, should find, document, analyse and then optimize patterns. Moreover, the committee should advocate for the continuity of the process and building ceremonies in order to sustain a long-term development.

As the manual is an assembly of patterns, it should combine top-down and bottom-up perspectives, propositions and evaluations. The thesis, therefore, engaged participants from different backgrounds, gender and age range. Local partners on site included Artellewa, CLUSTER and Hanaa Gad, a member of the Public Coalition in Ard El Lewa and an architect at CLUSTER. Architecture students from the American University in Cairo represented volunteering or co-op students from architecture and agriculture schools. University students and children were included in the Agents of Change Committee, to raise awareness among the young generation to adopt the process. As the future community members, designers, planners and policy makers, they should be trained to think differently, more sustainable and bottom-up. The architect, as a mediator and curator, joined forces with Schaduf, an urban farming enterprise in Cairo, engaged in installing low-cost rooftop urban farms, to add a green sustainable component to the Agents of Change Committee. Figure 2.8 identifies selected partners, in relation to the user group they represent.

* The term 'agents of change' is quoted from *Tracing Public Space: A Participatory approach to transform public spaces in low-income communities,* © Ana Cristina Vargas, 2014.

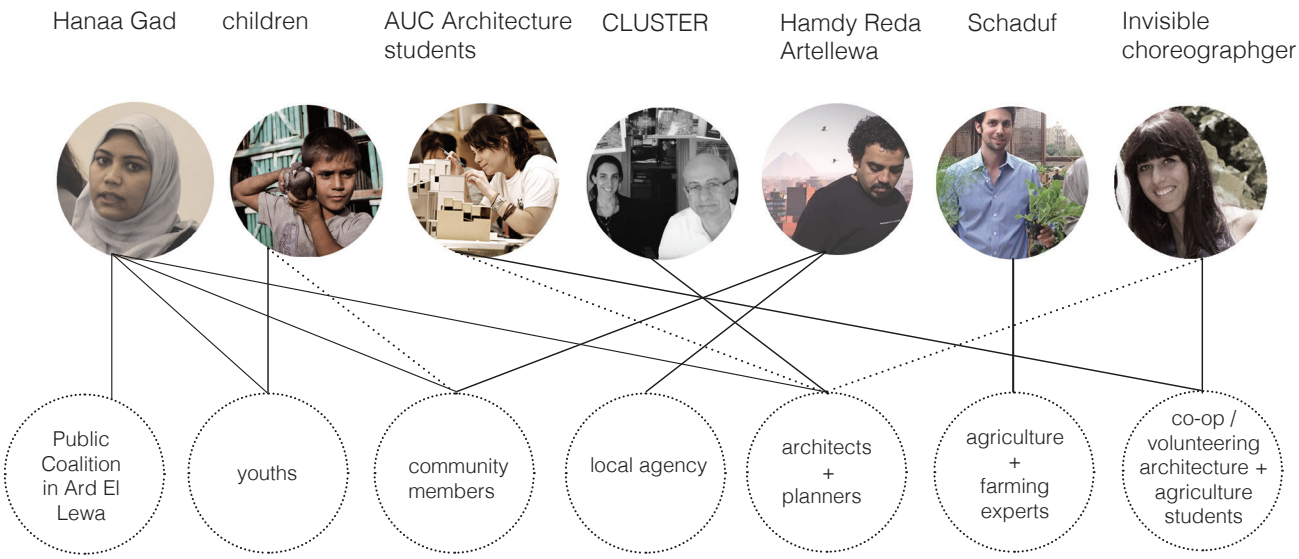


Figure 2.8 Agents of Change Committee in Ard El Lewa

As a choreographer of forces and facilitator, the architect has to design replicable tools to allow different user groups to participate in the formulation of the [in]formal Pattern Language manual and take the initiative forward. As illustrated in Figure 2.9, each tool was tailored to its user group and new connections between different user groups were formed in order to weave bottom-up and top-down decision making together.

Thesis Author - The invisible choreographer
Tool: Site analysis

The architect undertakes several site visits to form a site analysis, and identify potentials and problems. Equipped with the acquired knowledge, the architect operates as a mediator and curator, in terms of collaborating with local partners on site to confirm logistical issues, photography and mapping tours to be followed in the workshop, and interviews with community members. After taking care of all necessary initial arrangements, the architect accepts that working in [in]formal areas will require losing control and operating as an invisible choreographer of forces.

Community members
Tool: Interviews

Community members contribute to the manual by revealing their urban narratives and needs through semi-structured interviews. The invisible choreographer, as well as participants, conduct interviews to include many perspectives and layers of needs, which should guide the process of compiling and optimizing patterns.

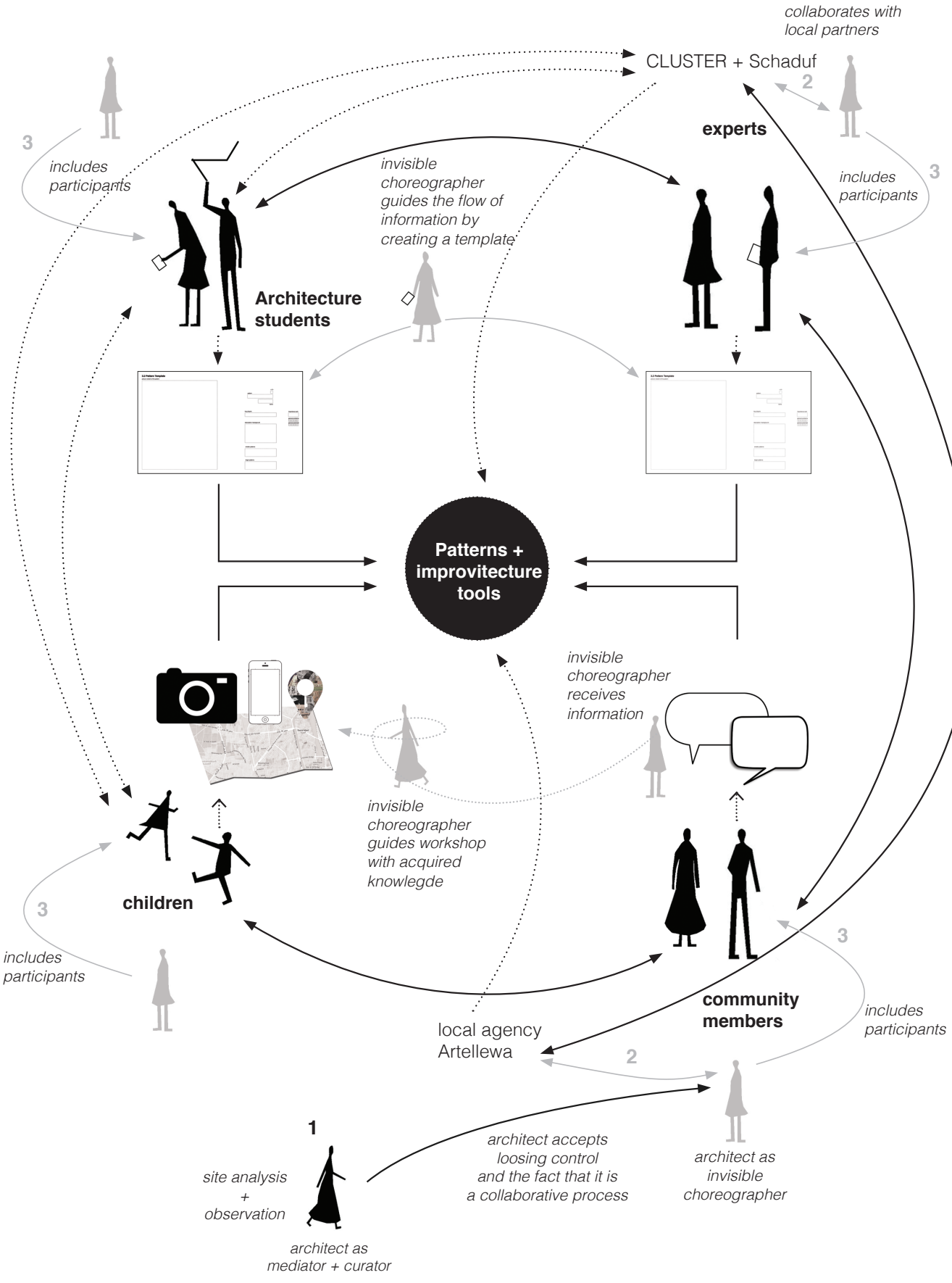
Experts and architecture students
Tool: Pattern template

Architecture students and experts currently involved in the field of informal settlements and community engagement participate through completing a pattern template designed by the invisible choreographer. With the local knowledge acquired from site and interaction with community members, the invisible choreographer guides the flow of information, but does not interfere with what patterns are included in the manual.

Children
Tool: Geotagged photography and mapping

Children from Ard El Lewa collaborate with architecture students in a workshop to discover and document their community patterns through geotagged photography and cognitive mapping. Mapping allows participants to draw an abstraction of their community, which gives them a more global perspective, thus enabling them to recognize repetitive patterns and connections. Recalling and deciding what to include in the maps reveals how important and repetitive a pattern is.

Figure 2.9 Compiling the [in]formal Pattern Language manual


collaborates with
local partners
CLUSTER + Schaduf
2
experts
3
includes
participants
invisible
choreographer
guides the flow of
information by
creating a template
3
includes
participants
Architecture
students
Patterns +
improvitecture
tools
invisible
choreographer
receives
information
invisible
choreographer
guides workshop
with acquired
knowlegde
children
3
includes
participants
community
members
3
includes
participants
local agency
Artellewa
2
1
site analysis
+
observation
architect as
mediator + curator
architect accepts
loosing control
and the fact that it is
a collaborative process
architect as
invisible
choreographer

REPLICABLE TOOLS & THE TYPOLOGIES OF PARTICIPATION

[IN]FORMAL PATTERN LANGUAGE, AN OPEN SOURCE

informalpatternlanguage.com

Worldwide, there is a growing interest in integrating new technology with community development. It is known that digital maps and Geographic Information Systems (GIS) are excellent tools to communicate community voices to authorities and validate development plans. Youth are emerging as leaders in capturing and sharing information about their communities. However, there still remains little documentation and connection between in-depth fieldwork, youth, new technology, and community development, as discussed in *Youth and Digital Mapping in Urban informal settlement*.[60]

The [in]formal Pattern Language initiative is conceived as an on-going process that should achieve real empowerment exceeding the limits of this thesis book and the academic field. For all of the above-mentioned reasons, a website (link: informalpatternlanguage.com) was designed as a tool for encouraging open source collaboration and transparency, which are currently lacking in development projects in Egypt. The website operates as an online and interactive version of the manual, that should be constantly updated by community members, architecture students and experts. The objective of the website is to unite data from bottom-up and top-down sources. It offers community members simple design solutions that enable them to optimize their patterns with their own hands. For architecture students and practicing architects, the website is not only a reference during the design process, but also an invitation to develop the process and take it forward to other [in]formal areas.

The website provides users with general information on Improvitecture and the [in]formal Pattern Language initiative, ways to participate and a list of team members. By completing a pattern template, uploading geotagged patterns to the website and/or participating in the workshop on site, website visitors can become contributors to the manual and recognized as team members.

Moreover, the website offers a platform for architecture students and experts to download other user-generated pattern templates and upload their completed ones. A dynamic and interactive design allows pattern templates to shuffle into the categories, importance rank, and sets of problems and potentials they have been assigned during the analysis process. The objective is to demonstrate how patterns can be contemplated from different perspectives, creating layers of analysis, and breaking down the complexity of each pattern.

Community members and all other users are invited to upload geo-tagged photographs of their patterns to the website. Through a series of tags and questions, carefully designed by the invisible

choreographer, they are guided on how to categorize their patterns. The categorization process teaches users how to analyze a pattern in terms of breaking it down into its forces, key players, dominating gender and associated problems and potentials, etc.

The main goal of uploading geotagged patterns is to create a dynamic map that brings to the surface potentials, problems and hidden microscopic needs. For community members the map is a way of reflecting back what they already know, but in a more abstract and connected form. Containing references to global patterns, the map links people's microscopic patterns to nationwide urban and environmental concerns. As architect Richard Wurman writes in the preface of *The Exposed City: Mapping the Urban Invisibles*, digital maps trigger "the visualization of changing complex data that allow one to see the things they've always seen but never seen."[61] In response, that new knowledge should create awareness among people to optimize their patterns.

Authorities in Egypt often turn a blind eye to [in]formal areas. They choose to keep data about [in]formal settlements discreet, controversial and unmapped, for those areas to remain in a state of uncertainty and away from public attention. Representing [in]-formal practices on an online map, accessible to everyone, is an acknowledgment of their existence, thus a step further towards formalizing the [in]formal. The website also presents an assembly of narratives and photo essays, linking people's microscopic needs to urban and environmental issues. It communicates the voices and the identity of the marginalized, and restores misrepresented relations to the [in]formal. The website is a tool to empower the vulnerable in [in]formal communities.

PATTERN TEMPLATES

Experts and architecture students

The pattern template was designed by the invisible choreographer as a tool for experts and architecture students to participate in the compilation of the manual. There are three main objectives behind the format of the pattern language: First, to homogenize the analysis process for convenience and clarity. Second, as Alexander formulated, to present how each pattern is connected to other patterns, and comprehend all compiled patterns as a whole, as a language. Each pattern is connected to larger patterns, which come above it in the language, and to certain smaller patterns, which come below it. The third objective educates readers and participants to adopt multiple perspectives before imposing a strategy or a self-generated intervention, and to recognize that a pattern can be a hybrid of both a potential and a problem.

In designing the format of the pattern template, the thesis adopted the same sequence of analysis as *A Pattern Language* but added new layers such as key players, gender, rate of repetition and importance rank. A guide was prepared by the invisible choreographer to provide experts and architecture students with step-by-step guidance on how to complete the pattern template. It is worth pointing out that the pattern template required a certain level of expertise from participants and demanded further research.

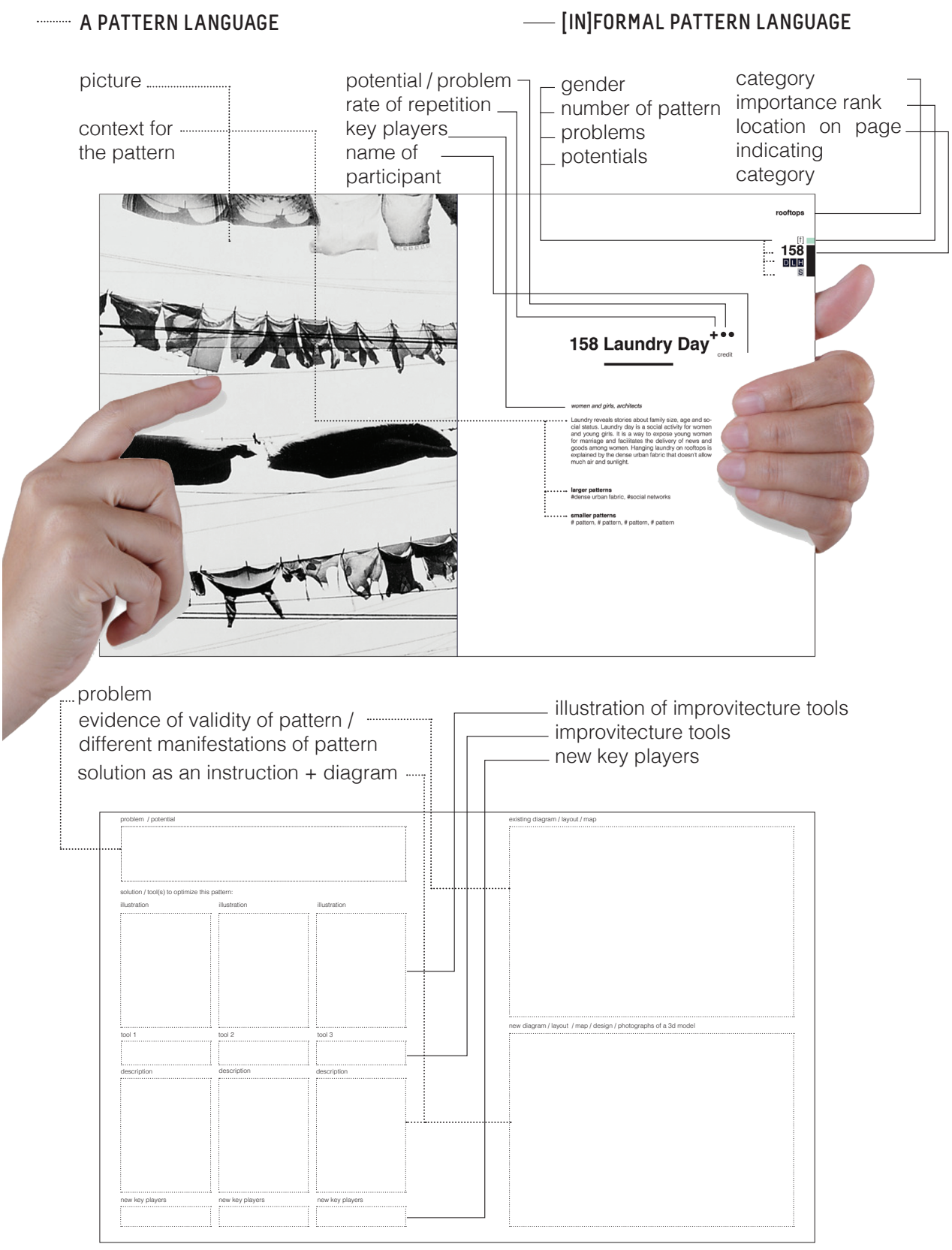


Figure 2.10 Format of the Pattern Template

PATTERN TEMPLATE - GUIDE

1 Select a **pattern.**

2 Indicate whether the pattern is a potential or a problem.
Mark potentials with a [**+**] sign and problems with a [**-**] sign.
Don't forget to write your name(s)

Selecting a pattern
According to Christopher Alexander, a pattern is "a morphological law which establishes a set of relationships in space".

Select a reoccurring / characteristic / consistent phenomenon, arrangement or element in Cairo's or Ard El Lewa's informality. This pattern should be linked to a spatial logic.

4 Who are the **key players** involved / mostly affected / mostly interested in this pattern ? Mark male dominated activities with [m] and female dominated activities with [f].

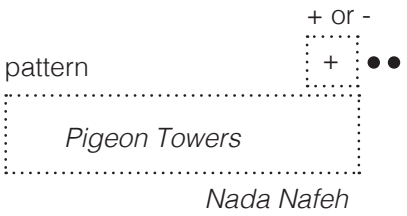
5 Provide a brief **description** / **context** of the pattern:
- empirical background of the pattern
- evidence of the pattern's validity
- variations and different manifestations of the pattern

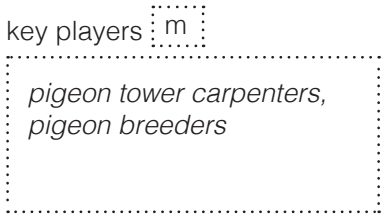
6 List other patterns that are connected to your pattern.
Divide your list into **larger patterns** and **smaller patterns.**

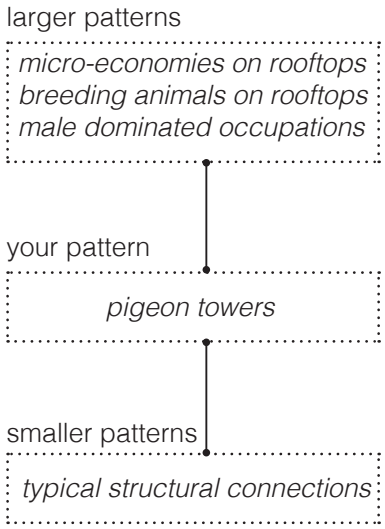
7 Give your pattern an **importance rank:**

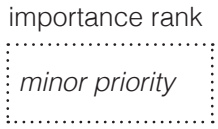
1. High priority: A pattern that is absolute, needs to be changed immediately or has major effects on the country / city.
2. Medium priority: A pattern that affects a certain community or has a moderate level of impact.
3. Minor priority: A pattern that seems to work, is relative or can wait. It still can be optimized through design.

Example









8 How **often** is your pattern repeated?

●● very often, every informal community

● often, Ard El Lewa specifically

9 Relate your pattern to **general problems:**

general problems

R

A	loss of scarce agricultural land
D	density, lack of open and green space
G	garbage accumulation
R	sanitary problem
T	traffic congestion
C	accessibility
O	overburdened services
I	adapting to social injustice
...	..... (formulate a new problem)

10 Relate your pattern to **general potentials:**

general potentials

N M S

N	homogeneous construction
M	micro-economies
F	self financing
E	low energy demands
P	close work home proximity
S	strong communal ties
....	..... (formulate a new potential)

11 Elaborate why your pattern is considered a **potential / problem**

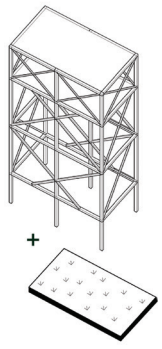
12 Sketch a diagram illustrating existing network / spatial configuration / spatial + temporal appropriation / types

13 Formulate your solution / tool(s) to optimize your pattern in the form of:
- an **illustration**
- a **statement:** How and what is needed to solve the pattern?
- **description of the tool**: summery of the solution
- **new key players** that are affected by your introduced tool if applicable

14 Sketch a diagram illustrating your design interventions, its assembly, components and materials / new network / proposed operation + maintenance / allowable spatial + temporal appropriation / new map / new layout.

How can your tool be embedded in the residents' daily life?
How can ordinary people build your design?
How does your tool accommodate current and future informality and needs?

illustration



tool 1

combine green roof system with pigeon tower

new key players

Schaduf (urban farming)

picture / sketch of the pattern

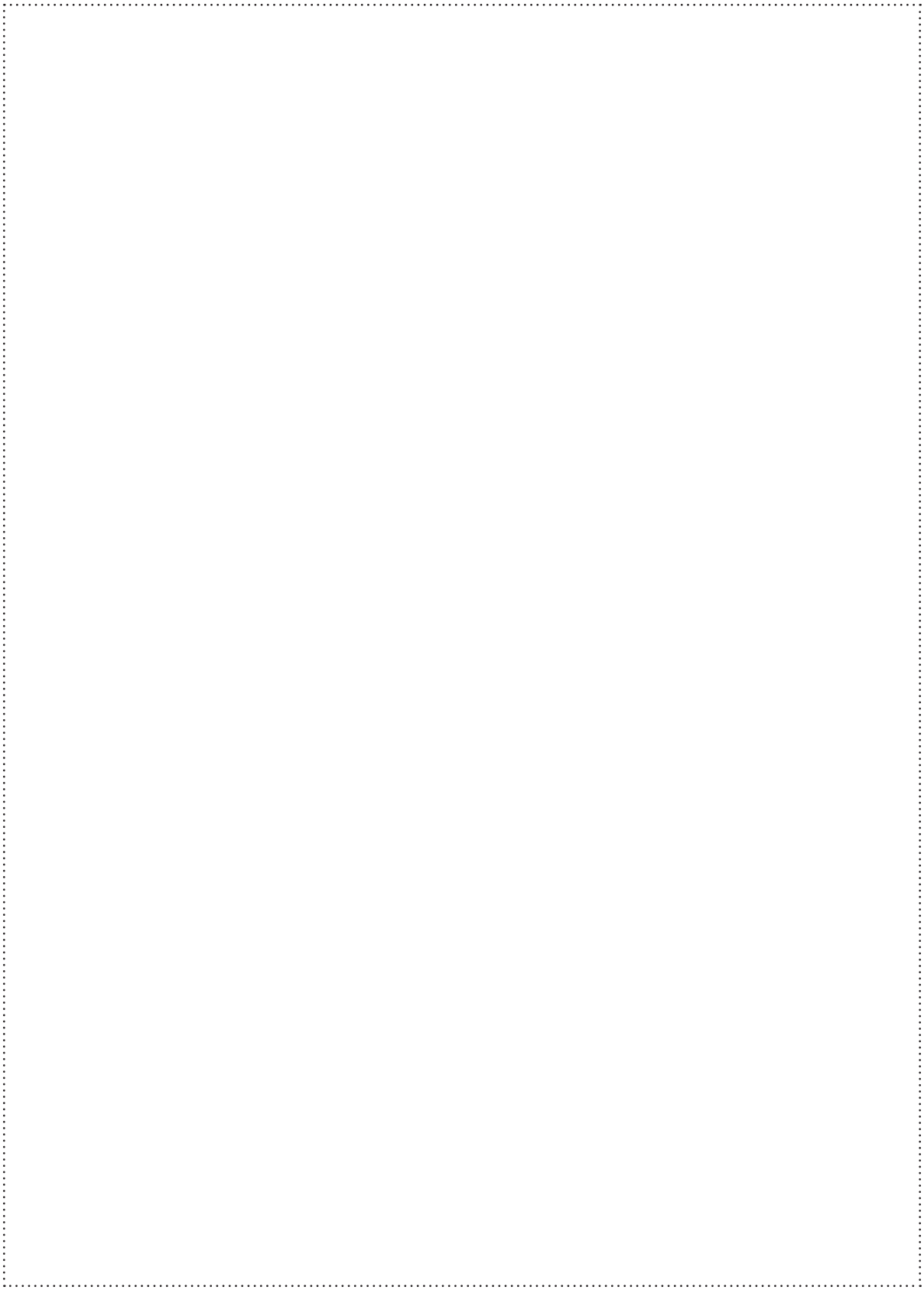


photo credit + source

+ or -

pattern

name

key players

importance rank

general problems

description / background

general potentials

larger patterns

smaller patterns

problem / potential

solution / tool(s) to optimize this pattern:

illustration	illustration	illustration
tool 1	tool 2	tool 3
description	description	description
new key players	new key players	new key players

existing diagram / layout / map

new diagram / layout / map / design / photographs of a 3d model

A GUIDE ON REPLICABLE TOOLS + THE TYPOLOGIES OF PARTICIPATION

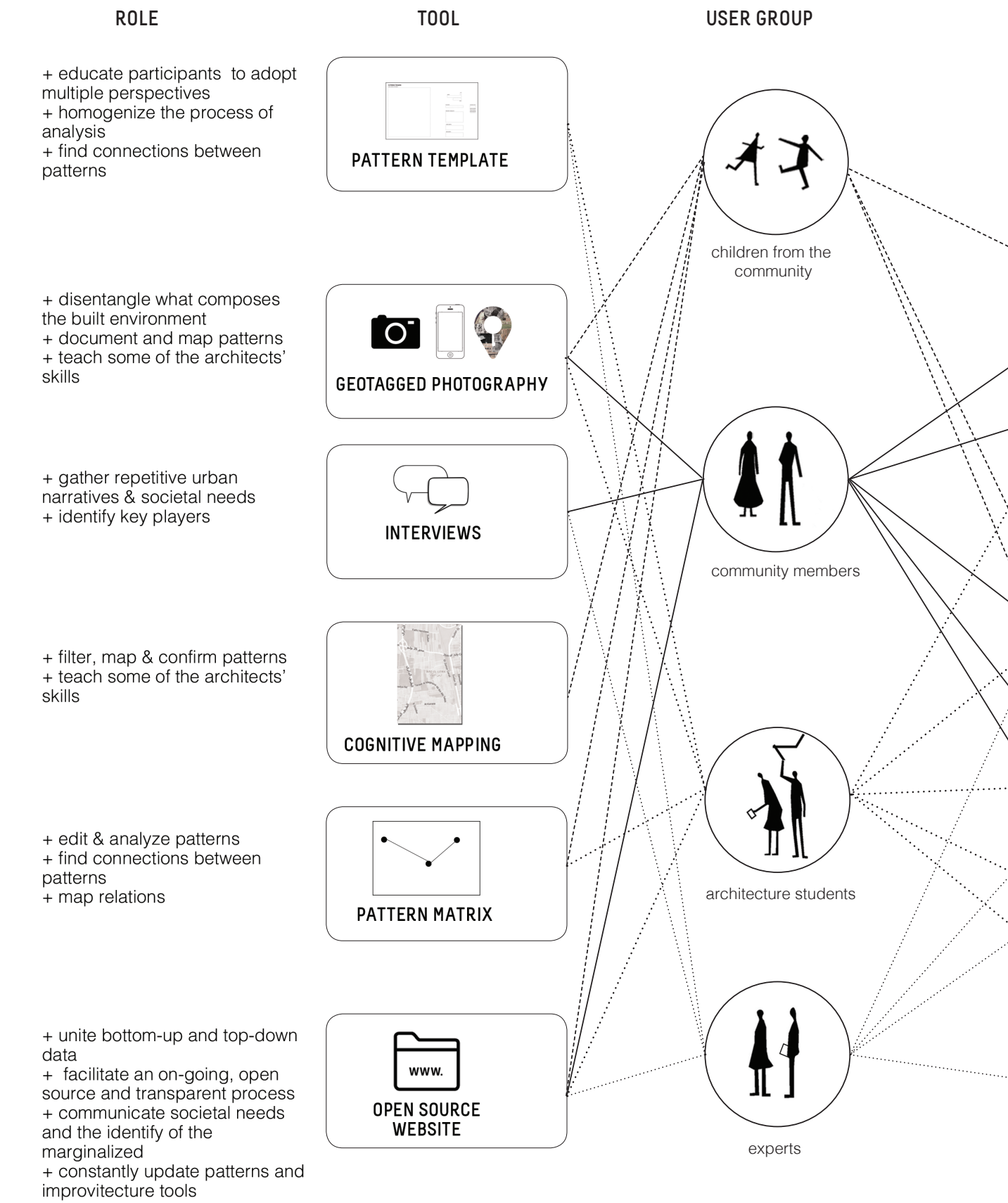


Figure 2.11 Replicable tools & the typologies of participation

Testing the Process

TYPOLOGY OF PARTICIPATION / EVENTS	ROLE
INTRODUCTORY SESSIONS	+ launch the initiative + distribute pattern templates + recruit workshop participants
MEETINGS WITH LOCAL PARTNERS	+ confirm events' logistics + facilitate access to community networks + recruit workshop participants
SITE VISITS	+ conduct a site analysis + gather urban narratives & patterns from the architect's perspective + test photography & mapping tours + test community members' skills & cooperation
WORKING SESSIONS	+ complete & test pattern templates + compile patterns from outsider's perspective
MEETINGS WITH EXPERTS	+ launch the initiative + create awareness + distribute pattern templates + include their expertise
TALKS	+ launch the website and the workshop + create awareness + put experts, architecture students and representatives from the community in a dialogue + provide a theoretical framework for the initiative
WORKSHOPS	+ compile & map local patterns + generate improvitecture tools + optimize patterns through design + create awareness + exchange knowledge between architects and community members
EXHIBITIONS / INSTALLATIONS	+ celebrate outcomes + communicate outcomes to the wider community + create awareness + gather more patterns

II. TESTING THE PROCESS

"We may then gradually improve these patterns which we share, by testing them against experience"

- Christopher Alexander,
The Timeless Way of Building, xii

This section is an application of the designed methodology. It narrates events as they occurred on site, with the intention to illustrate through hands-on experience how the designed tools could be implemented. Figure 2.13 illustrates how each step added a layer of analysis, and contributed to the creation of the [in]formal Pattern Language manual. Events overlap and provided information for refining the following steps and the process as a whole. The length of the rectangles in the diagram indicates the duration of the step, while their height designates a partnership between different user groups. The diagram also sums up the outcome of each event.

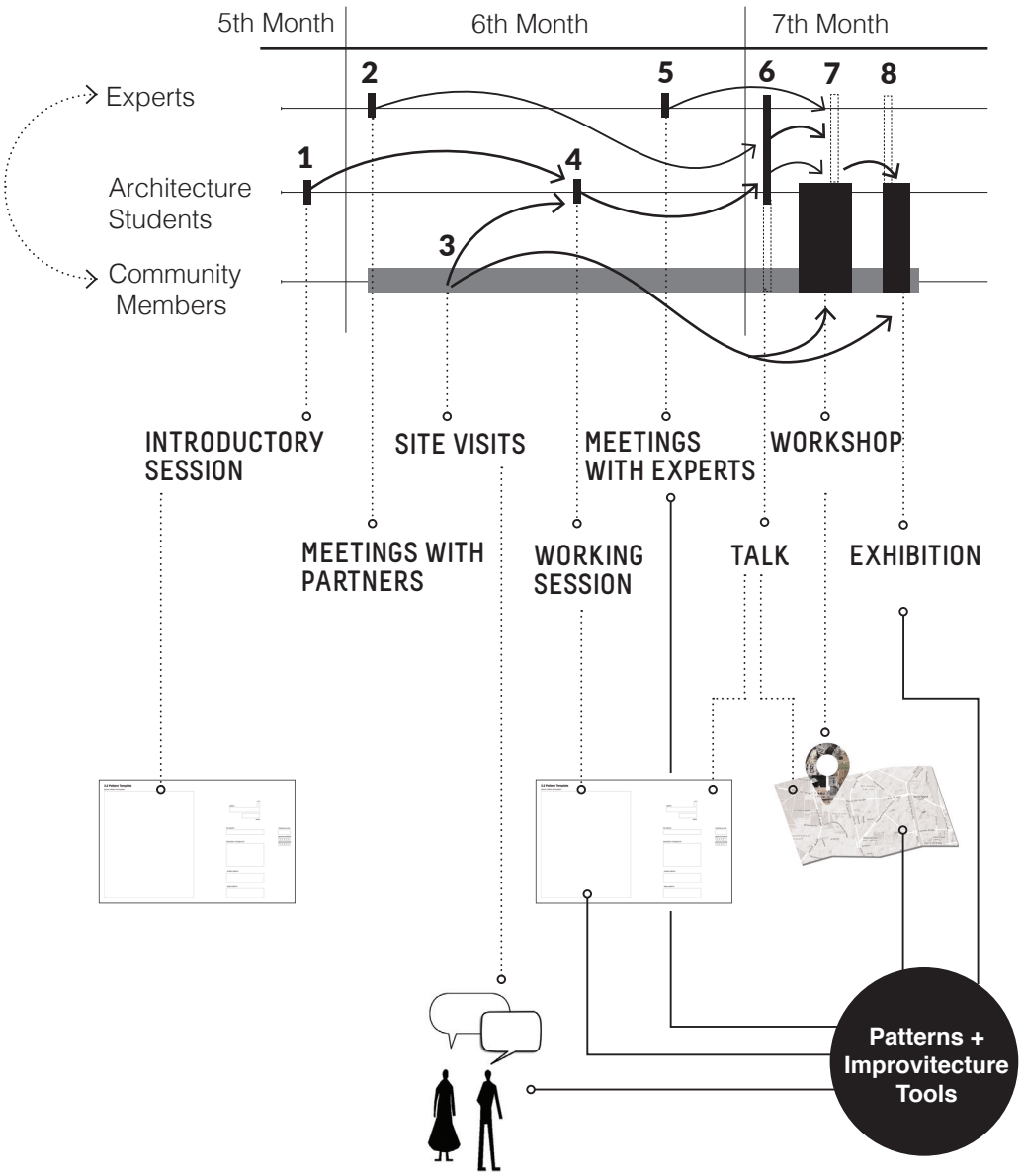


Figure 2.12 Testing the process

1. INTRODUCTORY SESSION

Duration: 1-2 hrs
The American University in Cairo
Architecture students

An introductory session was organized to inform architecture students about the [in]formal Pattern Language initiative. The students had been studying *A Pattern Language*, the work of Abdelhalim Ibrahim and other grass root movements during their studio research, which provided a strong theoretical framework to introduce the [in]formal Pattern Language initiative, and question the expanded role of the architect. The session included a brief on the initiative, the website, ways to participate, and a guidance on how to complete the pattern templates. The objectives of this session were mainly to start an awareness of the initiative, distribute pattern templates and recruit interested students for the workshop. Hidden goals included testing the students' response to the pattern template and their motivation to participate.

The session was followed by a discussion, which was a great opportunity to receive feedback on the pattern templates and refine the process. An interesting argument evolved around defining what hierarchy of patterns would best represent the connectivity of patterns, and the transition from urban to individual scale.

Overall, the students showed great motivation towards the initiative, and shared the need to change conventional top-down practices and the way [in]formal areas are perceived. The challenge was, however, how to sustain students' motivation for the upcoming workshop and the initiative as a whole.

2. MEETINGS WITH PARTNERS

Artellewa + Save the Children+ CLUSTER + Schaduf

Meetings with partners were conducted to facilitate access to community networks and finalize logistics for the talk and workshop. An additional partner on site, Save the Children Organization, represented by Raghda Momtaz, was added to the Agents of Change Committee. Since, it was founded in 2011 in Ard El Lewa, Save the Children operates as the centre for the marginalized within a marginalized society. The centre offers education, health, art and social programs to the children of Syrian and African refugees, who are not able to enrol in Egyptian schools. Increasing numbers of Ard El Lewa residents are also joining the centre to participate in extra-curricular activities, currently lacking in public schools and their community. Occupying the rooftop and the three floors on top of Artellewa workshop and exhibition, Save the Children presented itself as the ideal place to recruit children for the workshop.

3. SITE VISITS

Duration: 6 weeks
Ard El Lewa
Local partners + community members + children

Site visits were undertaken to conduct interviews with community members. They were also crucial in preparing for the upcoming workshop by testing mapping tours, and the children's interest and capabilities in social media, photography and mapping techniques. The following section documents observations and the adjustments made to the initial planning of the workshop after acquiring knowledge from the site.

Interviews took place informally, in the market and the street, where most of the community members are present, such as street vendors, housewives, deliverymen, toktok drivers, swing owners and children. Farmers, builders, parking lot owners and pigeon tower owners were interviewed as well. Once reassured that the architect was not affiliated with any media or governmental institution, community members became very cooperative.

Every aspect in the community is coordinated through personal relations and negotiations between stakeholders. The architect is an outsider, who has to win community members' trust first, in order for the process to start.

Figure 2.13 Micro-bus traffic organizers under the bridge
Figure 2.14 Pigeon breeder
Figure 2.15 Toktok driver having a rest under the bridge
Figure 2.16 Parking lot owner and service men
Figure 2.17 Soccer field owners
Figure 2.18 A boy in Palestine Street, Ard El Lewa
Figure 2.19 Concierge planting vegetables in El Karama school court
Figure 2.20 Toktok parking lot owner
Figure 2.21 'Feteera (Pie) Maker, street vendor at the market
Figure 2.22 Fruit vendors at the market
Figure 2.23 Abo Rahma, Toktok driver and retired employee
Figure 2.24 Toktok drivers waiting for passengers under the bridge
Figure 2.25 Sugarcane and carob juice mobile vendor
Figure 2.26 Community members in Ard El Lewa

Figure 2.13

Figure 2.14

Figure 2.15

Figure 2.16

Figure 2.17

Figure 2.18

Figure 2.19

Figure 2.20

Figure 2.21

Figure 2.22

Figure 2.23

Figure 2.24

Figure 2.25

Figure 2.26

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PEDESTRIAN ACCESS

01 Élysée bridge
02 Newly constructed bridge
03 Former access (now closed)

VEHICULAR ACCESS

04 Boulak bridge
09 Newly constructed bridge
Space below the bridge:
Toktok waiting area
Micro-bus stop
10 Main Street (Former Canal)
15 Main Street

05 Past: El Zomor Canal
Now: Appropriated Parking lots
06 Privately owned land
07 Urban void
08 Garbage dump

11 Schools
12 Parking lot (former garden)
13 Parking lot
14 Soccer field
16 Major commercial and transportation node:
Market
Micro-bus and Toktok waiting area
Small Amusement Park

TRANSPORTATION

09 Space below the bridge:
Toktok waiting area
Micro-bus stop
16 Micro-bus / Toktok waiting area
17 Taxi waiting area
18 Toktok waiting area

The site analysis of Ard El Lewa, conducted by the invisible choreographer, reveals how [in]formality triggers the art of improvising on space, to maximize use and economic gains. Community members aggregate the rigid urban fabric with great flexibility and little means. Substitute services are hybrid and adaptable.

[IN]FORMAL TRANSPORTATION

As taxis and public transport don't enter Ard El Lewa, because of narrow unpaved streets and traffic problems at access points, the area is equipped with [in]formal transit infrastructures in the form of toktoks, a 3-wheeled motorized vehicle, and micro-buses. Together with walking, they are the most common means of transportation for an Ard El Lewa resident. While toktoks connect the interfaces with the inner body of Ard El Lewa, micro-buses take passengers to other [in]formal areas or the formal city. Innovative variants of toktoks are emerging to facilitate delivery of goods. Toktok and Micro-bus transit occupy the space below bridges (No. 9 and 16).

ACCESSIBILITY

Heading to Ard El Lewa, public transport, micro-buses and taxis drop their passengers at one of the pedestrian bridges along El Sudan Street in Mohandessin. Daily commuters then take the stairs to cross over to Ard El Lewa using pedestrian bridges, the workplace of street vendors, beggars and young men distributing flyers or looking for jobs. The street vendors' location is ideal for housewives, employees and students to buy groceries on their way home. Toktoks await the passengers at the exit of the staircase along El Zomor Canal Street to take them to their homes. Exiting Ard El Lewa, residents take a toktok from home or walk to pedestrian bridges, where they find micro-buses and a row of taxis waiting at the border of the formal city in El Sudan Street.

Vehicles access Ard El Lewa through Boulak Bridge and the newly constructed bridge. Vehicular activity is mostly found on main streets, El Zomor Canal Street and El Magnouna Street, which were canals in the past.

Due to the close proximity to pedestrian bridges, the market, toktok and micro-bus waiting areas, vibrant pedestrian and vehicular activity can be observed in El Shohada Street and El Motamidia Street.

Accessibility continues to be a problem in Ard El Lewa. With the majority of the 300,000 inhabitants commuting daily through only two access points, major pedestrian and vehicular traffic congestion is caused. It is amplified by undefined driving directions and waiting micro-buses and toktoks. Moreover, narrow and unpaved streets make it difficult for ambulances and fire trucks to fully access the site.

Figure 2.27 Site analysis (left)

WATER + ELECTRICITY + SANITATION + GARBAGE COLLECTION

Water, electricity, natural gas and sewage are connected to the homes in Ard El Lewa. The area suffers, however, from regular water and electricity cuts. This is explained, on the one hand, by the energy crisis overshadowing all of Egypt. On the other hand, power and water cuts are a result of illegal connections, cutting expenses and overloading the system with more built environment than tolerated. There is therefore a strong need for expanding on the existing infrastructure, by developing alternative low-cost and sustainable sources of energy, water and waste management. Garbage is collected once a week by individuals who have taken the initiative or [in]formal garbage collectors. Spaces below bridges, water canals, unappropriated urban voids and deteriorated agricultural land are potential sites for dumping garbage. For optimizing patterns, local recycling programs need to be developed, along with changing the mentality of the people by using micro-economies as a tool for achieving social responsibility.

Figure 2.28 Pedestrian bridge and former canal

Figure 2.29 Community-owned market

OWNERSHIP

Security of tenure is known to be the key precursor to development programs, as described in “Informal Settlement Upgrading in Sub-Saharan Africa.” Residents need assurance that their investments will be recognized by the state, and will not be demolished in order to mobilize more resources and skills in upgrading their neighbourhood with services and taking care of it. Ownership is, therefore, considered as one of the main forces influencing patterns and the proposed process. Areas with an unclear state of ownership, like spaces below the bridge, former canals and unappropriated urban voids as mentioned above, are incubators of negative patterns. As ownership and security of tenure are a controversial and sensitive topic, they require more research beyond the information provided by community members in interviews. Moreover, it is not unlikely that community members refuse to reveal such information. From the conducted interviews, rent was identified as the most common type of ownership in Ard El Lewa. The high demand for housing in Ard El Lewa, due to its ideal location and rapid population growth, makes land and building owners perceive their properties as a great investment. They therefore choose not to sell their properties, in order to maximize their value and keep them within the family. A 180 m^2 plot of land at the intersection of two main streets is worth 5 million EGP (625,000 US Dollar) in Ard EL Lewa. Residents also prefer to rent since it is a more affordable and safer option. It is not uncommon that the same property is sold to more than one individual with quasi-legal contracts. It is worth mentioning that buildings have addresses, an indication that they are registered. In some cases, however, addresses are repetitive and differentiated by a sign stating the name of the owners’ family. Although buildings are constructed on privately owned land, they are still considered [in]formal because they don’t have a building permit and don’t adhere to codes. Urban voids are rented and transformed into soccer fields, toktok and car parking lots and small amusement parks. The formal [in]formal interface combines, as illustrated in Figure 2.34, the following types of ownership:

Figure 2.30 Urban void rented as an amusement park, privately-owned

Figure 2.31 Urban void: unclear ownership

Figure 2.32 Urban void appropriated as a parking lot, unclear ownership

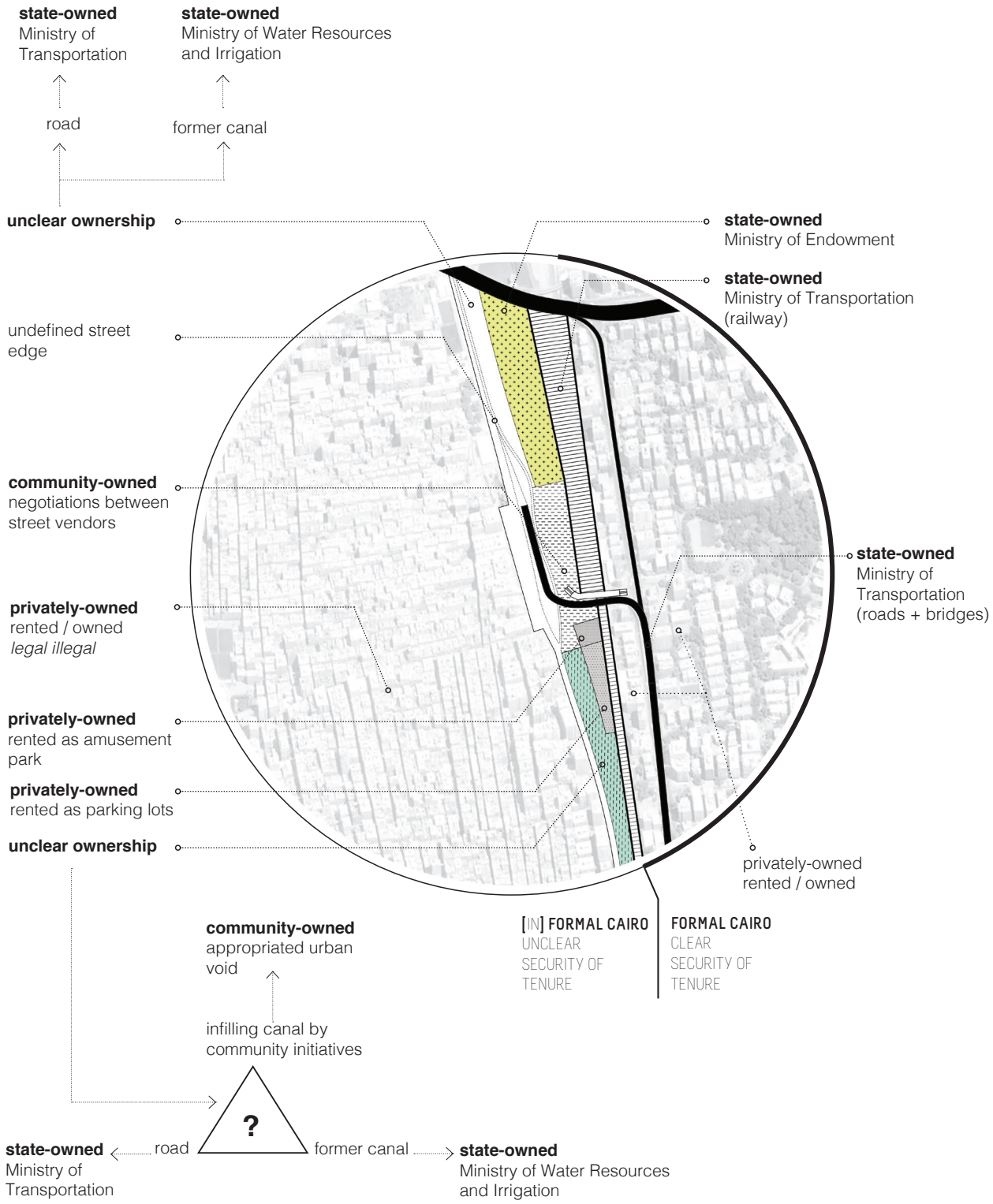


Figure 2.33 Types of ownership along the formal [in]formal border

CHILDREN

As a result of a lack of open space, children are found all over the streets in Ard El Lewa, appropriating dead-ends and narrow streets as their playgrounds.

This provided a great opportunity to test the children's mapping skills and interest in participating in the workshop. Testing the children's mapping ability required examining both their cognitive mapping, and map reading abilities, as described by S.J. Catling.[62] While cognitive mapping abilities were developed during the workshop through photography and mind maps, the children's map-reading skills were tested during site visits. They were given a camera and a map of their neighbourhood. Spending most of their time on the street made the children very informed about their neighbourhood. They were very excited about taking pictures and pinpointing their houses, schools, favourite play areas, friends' houses and parents' workshops on the map. This proved that children in Ard El Lewa were capable of undertaking the projected mapping exercises, and recalling important patterns of their environment. Their local knowledge pushed the site analysis forward and introduced new community members to be interviewed.

THE SITE IS NEVER THE SAME

A striking aspect about Ard El Lewa, and [in]formal areas in general, is their rapid development, changeability and adaptability to new circumstances.

Different times of the day reveal different uses of space, programs and new stakeholders. Urban voids appear in the morning as no man's land, but during the night they are transformed into street cafes. Street vendors are not present on pedestrian bridges before 10:00am, and are replaced with other types of street vendors at night.

The site experiences rapid horizontal and vertical development. The majority of buildings are able to expand vertically. This is observed in the spread of incomplete walls and columns on roofs. Horizontal expansion occurs on agricultural land. Some of the green land visible on Google Maps in 2015 has already been transformed into urban voids, or are being prepared for construction. The pictures on the left portray some changes experienced in Ard El Lewa during three weeks of fieldwork, confirming that patterns should be constantly updated through an on-going process.

Figure 2.34

Figure 2.35

Figure 2.36

Figure 2.37

Figure 2.38

Figure 2.39

Figure 2.34 Children locating their homes and communal hubs on the map
Figure 2.35 A boy documenting toktok as a pattern
Figure 2.36 Children revealing their urban narratives
Figure 2.37 A boy registering his father's and uncle's workshop
Figure 2.38 Remaining agricultural land, ©GIS, 2010
Figure 2.39 Construction infill and loss of agricultural land, ©Google, 2015

site during site analysis

site during the workshop (2 - 3 weeks later)

Figure 2.40 [in]formal construction dynamics, before and after

Figure 2.41 Market condition before and after closing the railway crossing

Figure 2.42 Site condition before and after re-opening the pedestrian bridge

After reopening the pedestrian bridge and closing the railway crossing, street vendors immediately changed their location in order to maximize exposure to pedestrians. A new layout for the market was negotiated among vendors. The former site of the market became a new, still unclaimed, urban void.

Figure 2.43 Improvised shed in Ard El Lewa

Figure 2.44 Improvised structure in Ard El Lewa

Figure 2.45 Compiling patterns

Figure 2.46 Adding pictures

Figure 2.47 Discussing connections

Figure 2.48 Drawing connections

Figure 2.49 Completing pattern templates

4. WORKING SESSION

Duration: 1-2 hrs
The American University in Cairo
Architecture students

The session was organized to test the process of compiling patterns through pattern templates and the pattern matrix. Results were then compared to patterns gathered from site. The idea was to identify common trends perceived as patterns, from both the insider's and the outsider's perspective. Moreover, the goal of the session was to guide architecture students while completing their pattern templates, with knowledge acquired from the site.

The session started with brainstorming patterns by pinning them under the most relevant category on the wall. The students were then asked to link, using thread, the patterns they believe are connected. Guided by the generated matrix and our discussion, the students worked on their pattern templates, individually and in groups.

MATRIX

infrastructure	(+)	+ but need to be optimized	(-)
urban voids			
street			
building cluster			
building			
roof			
networks			

The working session confirmed what was presumed about the pattern templates. Designed for architects, they required prior knowledge about [in]formal areas and global trends in Egypt and, in many cases, triggered additional research. The students lead discussions while completing the pattern templates, which pushed their analytical abilities to consider many layers, stakeholders and perspectives. The matrix was very helpful for the students to analyze their pattern in context with larger and smaller patterns. Most of the data was categorized as patterns that work, but still need to be optimized. A solid remark, mentioned by one of the students, brought up the necessity to develop a sequence for generating Improvitecture tools. According to Mariam Gazzaz, in order to optimize patterns and ensure a sustainable development, Improvitecture tools should address the following domains: legalization, design and, finally, maintenance. A selection of the generated pattern templates is presented in Chapter 3.

5. PRESENTING THE PROCESS TO ABDELHALIM IBRAHIM / MEETINGS WITH EXPERTS

Duration: 1 hr
Abdelhalim Ibrahim's Office - Community Design Collaborative (CDC)

A meeting with Abdelhalim Ibrahim was arranged to get feedback on the process, from his experience working with Christopher Alexander and community members. His feedback contributed to refining the process.

In general, Abdelhalim Ibrahim was pleased with the [in]formal Pattern Language initiative, and that fact that community members are documenting their own patterns. He pointed out that the step of not entering into the community until acquiring legitimacy is missing in the proposed process. The cycle doesn't run smoothly. It contains traps, miss-findings and loops until legitimacy is obtained. Furthermore, Abdelhalim advised to account for unplanned events and the fact that community members won't collaborate right away.

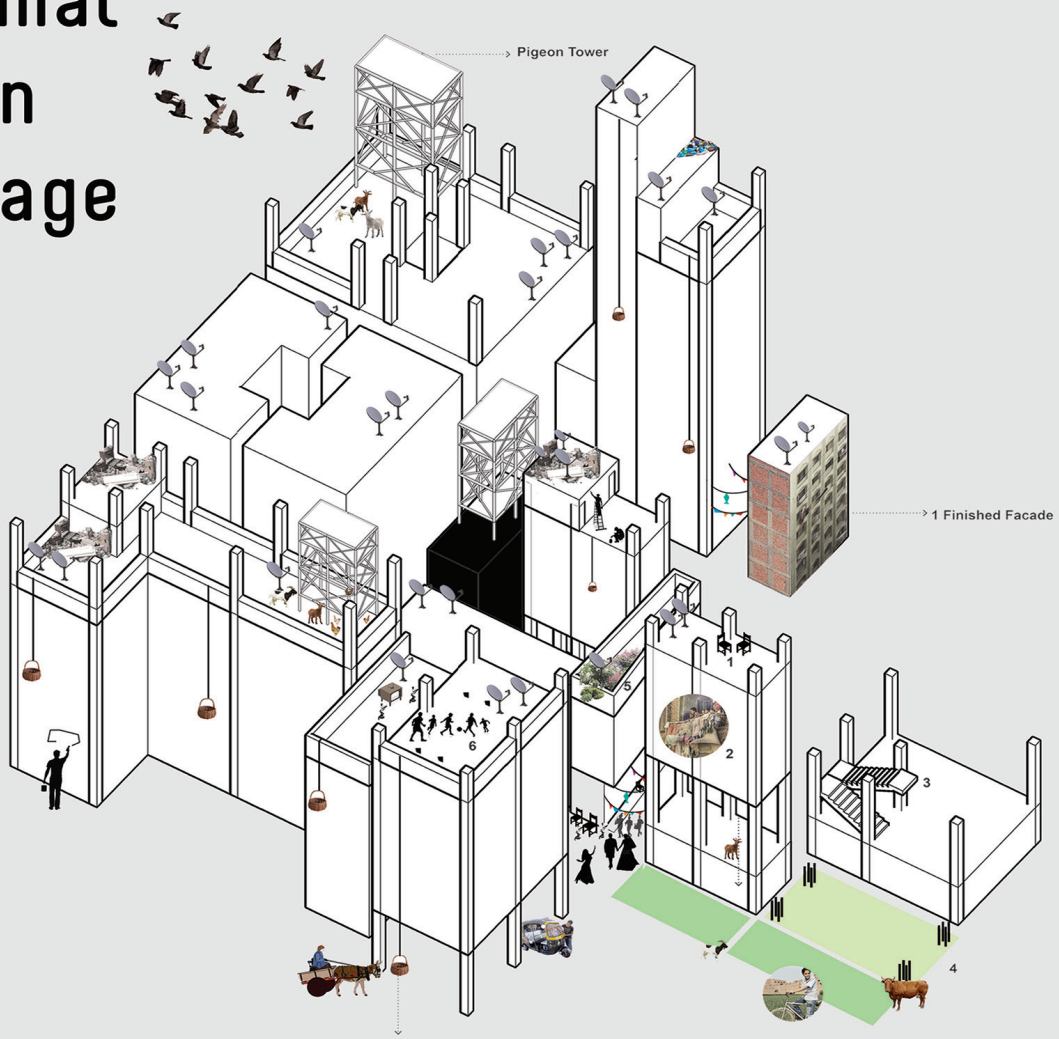
At the end of the discussion, Abdelhalim proposed the following questions to reflect on:

What makes architects think they have legitimacy in self-organized communities?
What are the most influential and formative patterns that generate other patterns?
What is the generative aspect about a pattern?
In the case of pigeon towers, is there a symbolic meaning behind the pattern?

Figure 2.50 Abdelhalim Ibrahim

Figure 2.51 Poster of the Talk: Towards an [in]formal Pattern Language *(right)*

Towards an [in]formal Pattern Language



JUNE 03

6:00 PM

MARGO VEILLON GALLERY
THE AMERICAN UNIVERSITY IN CAIRO
TAHRIR CAMPUS

PANEL 1: [IN]FORMAL PATTERN LANGUAGE
NADA NAFEH
UNIVERSITY OF WATERLOO

PANEL 2: MAPPING INFORMALITY
OMAR NAGATI
BETH STRYKER
HANAA GAD
CLUSTER

MODERATOR
MAGDA MOSTAFA
THE AMERICAN UNIVERSITY IN CAIRO

CONTACT
informalpatternlanguage.com
nnafeh@uwaterloo.ca

ORGANIZERS
UNIVERSITY OF WATERLOO
THE AMERICAN UNIVERSITY IN CAIRO
الجامعة الأمريكية بالقاهرة

LOCAL PARTNERS
CLUSTER
artellswa

SPONSORS
ARCHITECTURE ASSOCIATION
SCHADUF URBAN MICRO FARMS

6. TALK -TOWARDS AN [IN]FORMAL PATTERN LANGUAGE

Duration: 2-3 hrs
The American University in Cairo - Tahrir Campus
Experts + community representative + architecture students

'Towards an [in]formal Pattern Language,' co-organized by University of Waterloo and the American University in Cairo, was held in Margo Veillon Gallery at AUC Tahrir Campus. The event was planned to launch the [in]formal Pattern Language initiative and the website. The objective of the talk was also to provide a theoretical framework for the initiative. The talk hosted two panels, followed by a discussion and an exhibition, displaying the thesis work, the students' completed pattern templates, and urban narratives collected from site.

The talk was moderated by Magda Mostafa, who introduced informality as an alternative mode of practice, and the necessity to generate a pedagogical and research shift in Architecture. Mostafa contextualized that "[in]formality is the vernacular of the city, the new man-made architecture that is now being produced. We look at vernacular from a positive lens and, perhaps, if we look at [in]formality also from a positive lens it will be included into the mainstream practice."

The talk started with a presentation of Improvitecture and the [in]formal Pattern Language initiative. Local partners: Omar Nagati, Beth Stryker and Hanaa Gad from CLUSTER, proceeded in the second panel with shedding light on bottom-up mapping and communal initiatives, as well as alternative ways of practise that aim to engage the city in different ways. Nagati and Stryker spoke about the importance of negotiating bottom-up and top-down practices, followed by a presentation of two projects; Archiving the City in Flux and Cairo Urban Initiatives Platform (CUIP). Gad presented Hawamish, a grass-roots project she has been working on for her Masters of Architecture degree. The project maps services, crafts and facilities available in Ard El Lewa, with the objective of communicating the identity of [in]formal areas and their potentials.

http://www.cuipcairo.org
http://www.hawamish.com

By bringing experts, architecture students and a representative from Ard El Lewa into dialogue, the talk provided a platform to collaboratively respond to the proposed thesis questions. The recognition, shared among attendees, of how formal and organized [in]formal practices actually are, consolidated the importance of the [in]formal Pattern Language initiative and the need to decode those practices. The talk fulfilled part of the responsibilities of becoming a mediator the thesis is advocating for, in the hopes of generating a sustainable critical discourse for the future, and an interdisciplinary approach of looking at our cities.

Figure 2.52 Panel 1

[in]formal Pattern Language
Nada Nafeh
University of Waterloo

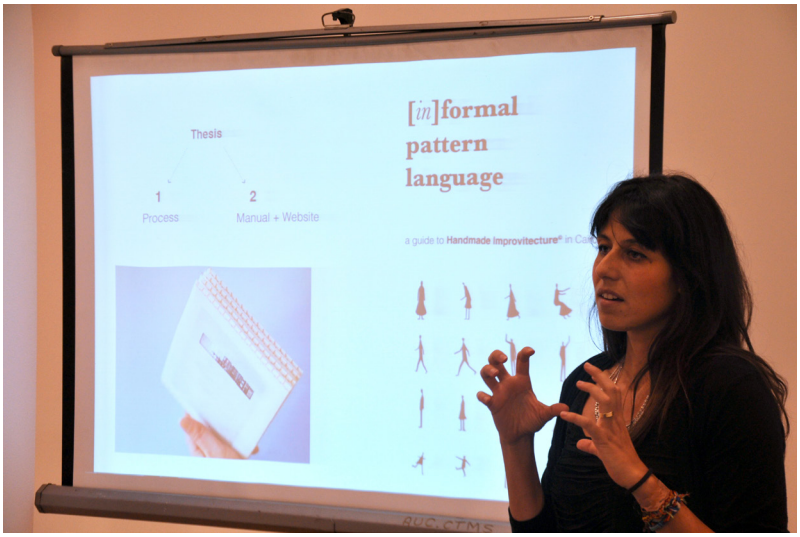


Figure 2.53 Panel 2

Mapping Informality
Omar Nagati, *CLUSTER*
Beth Stryker, *CLUSTER*
Hanaa Gad, *CLUSTER* &
Public Coalition Ard El Lewa

Figure 2.54 Moderation

Magda Mostafa
The American University in Cairo

Figure 2.55 Registration station for taking Pattern Templates and viewing the website

Figure 2.56 Thesis work

Figure 2.57 Exhibition in Margo Veillon Gallery, AUC

Figure 2.58 Urban narratives

Figure 2.59 Attendees: Experts & Students

Figure 2.60 Fruit boxes as display

Figure 2.61 Discussion

Figure 2.62 Architecture students contemplating urban narratives

7. WORKSHOP

Duration: 5 days (9:00 am - 4:00 pm)
Artellewa + Save the Children rooftop
Architecture students + children

OBJECTIVES

The main objective of the workshop was to compile and document local patterns for the [in]formal Pattern Language manual. Workshop participants, composed of Ard El Lewa children, local partners, urban farming experts, architect and architecture students, acted like a mock-up for the Agents of Change Committee. Moreover, the goal of the workshop was also to create a setting to practise the re-framed roles of the architect as a facilitator, and an invisible choreographer. The workshop fostered an exchange of knowledge and skills between community members and architects.

Since 2011, UNICEF has been encouraging children to use mobile technology and open data to map environmental and health issues near their homes.[63] Technology, however, isn't available to everyone. The workshop addressed this by providing an opportunity for children from Ard El Lewa to create maps for their community, and document their patterns, needs and environmental issues using geotagged photography. The photographic documentation and mapping of three urban conditions in Ard El Lewa was a preliminary step towards creating publicly accessible maps for [in] formal areas, and combining bottom-up and top-down data.

The following section narrates events as they were conducted during the workshop, after modifications had been made. Changes to the original plan were necessary, in order to conform to participants' skills and level of engagement. Despite pre-planning of the workshop and all materials, every day required reflecting on the outcome, workflow and participants' feedback, and updating exercises for the next day accordingly. Most importantly, on-the-spot improvisation was essential in maintaining the flow of the workshop during experienced power cuts, errors in ordered materials, shortage in resources and unplanned events.

Figure 2.63 Working efficiently during power cuts

"Instead of the original plan disappearing from my sight, it continued to evolve in front of me ... Certainly the performance of this festival, added something to the plan that rational designing could not have conceived. The action of the community added a sense of wholeness that would otherwise not have been there."
- Abdelhalim Ibrahim, A Ceremonial Approach to Community Building, 147.

DESCRIPTION

The 5-day workshop engaged 6 architecture students and 10 children from the community in producing local patterns and maps for their community, while registering their stories and needs by using geo-tagged photography and cognitive mapping.

The workshop was co-organized by the University of Waterloo and the American University in Cairo, in collaboration with Artellewa, CLUSTER, Save the Children and Schaduf.

Three urban conditions in Ard El Lewa were studied: urban x urban, formal [in]formal border, and endangered edge. Specifically, workshop participants documented building and rooftop typologies and mapped urban voids, incomplete structures, [in]formal transportation, spatial and temporal appropriations, and [in]formal vendors. Exploring possible futures for Ard El Lewa, workshop participants came up with strategies and in-situ design solutions to optimize their patterns with their own hands. To visualize the strategies, participants optimized the Save the Children rooftop with the few available resources. On the last day of the workshop, a micro urban farm, donated by Schaduf, was installed by the children on Save the Children rooftop and handed over to the community.

The workshop ended with a 3-day exhibition in Artellewa showcasing community-produced patterns, maps and photographs. The exhibition spontaneously became part of the urban tour organized by EUF, the Egyptian Urban Forum. Sponsored by University of Waterloo and the Architecture Association (AA) at the American University in Cairo, the exhibition also displayed all pattern templates generated by architecture students.

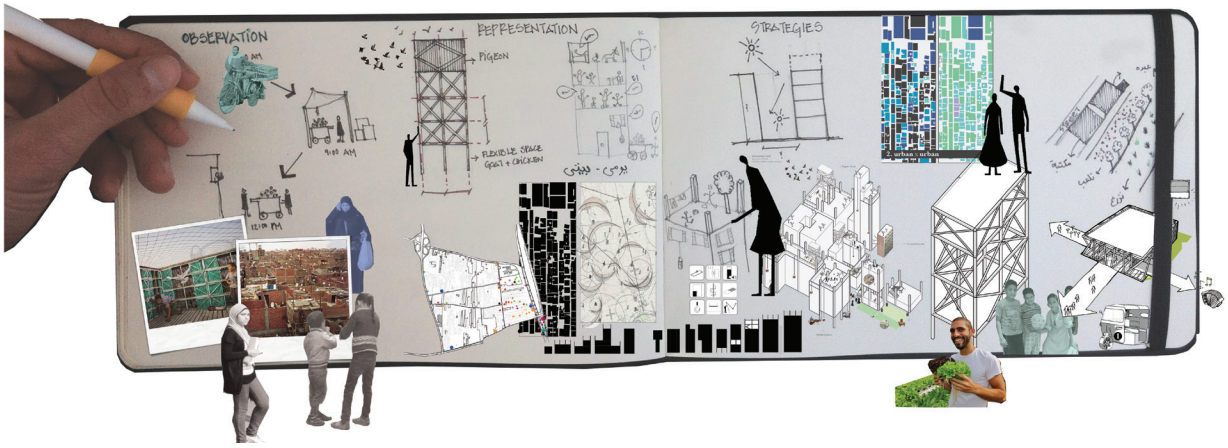


Figure 2.64 Workshop stages

THE TEAM

Mirette Khorshid
MCP Candidate
MIT
reuse + recycling

Mounir Youssef
Architecture, Undergraduate
AUC
space below the bridge

Ahmed Leithi
Community Member
Ard El Lewa

Nada
Community Member
Ard El Lewa
balcony drapes

Mohamed
Community Member
Ard El Lewa

Ehsan Aboushadi
Teaching Assistant
AUC
cantilevered street facade

Nada Nafeh
M.Arch Candidate
University of Waterloo
pigeon towers

Mariam
Community Member
Ard El Lewa
water pots on the street

Karim
Community Member
Ard El Lewa
soccer field

El Tayeb
Community Member
Ard El Lewa
parking lots

Heba El Sawy
Architecture, Undergraduate
AUC
territoriality

Renat
Community Member
Ard El Lewa
amusement parks

Belal Mohamed
Community Member
Ard El Lewa
street vendors

Mohamed
Community Member
Ard El Lewa
facades with no paint

Mai Mahmoud
M.Arch Canditate
Cairo University
urban voids as parking lot

Mohamed
Community Member
Ard El Lewa

Hammad
Community Member
Ard El Lewa
basket

Hussein
Community Member
Ard El Lewa
people

Nancy
Community Member
Ard El Lewa
agricultural land

Bakar
Community Member
Ard El Lewa

Mohamed
Community Member
Ard El Lewa
car wash

Nadia Abotaleb
Architecture, Undergraduate
AUC
construction on agricultural land

Hawazen
Community Member
Ard El Lewa
satelite dish

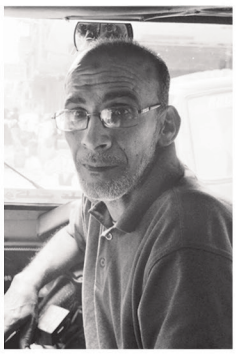
Azima
Community Member
Ard El Lewa
the laundry theory

Mona
Community Member
Ard El Lewa
garbage dumps

Dina
Community Member
Ard El Lewa
railway crossing

Hossam
Community Member
Ard El Lewa
junk on the roof

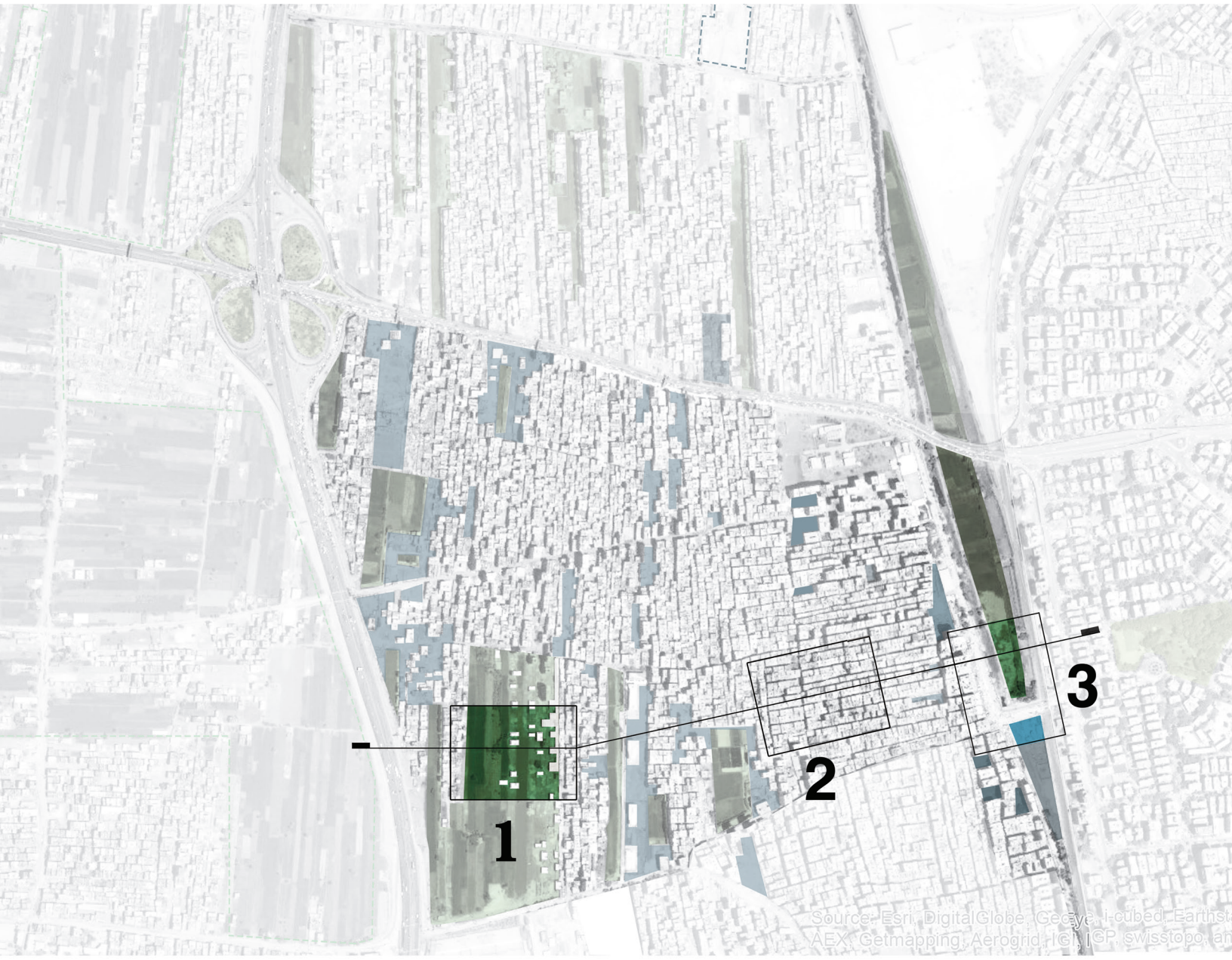
Wessam
Community Member
Ard El Lewa
toktok



Abo Rahma
Toktok Driver
Ard El Lewa

Youssef + **Youssef** + **Ahmed**
Community Members
Ard El Lewa

Figure 2.65 Workshop participants



URBAN CONDITIONS

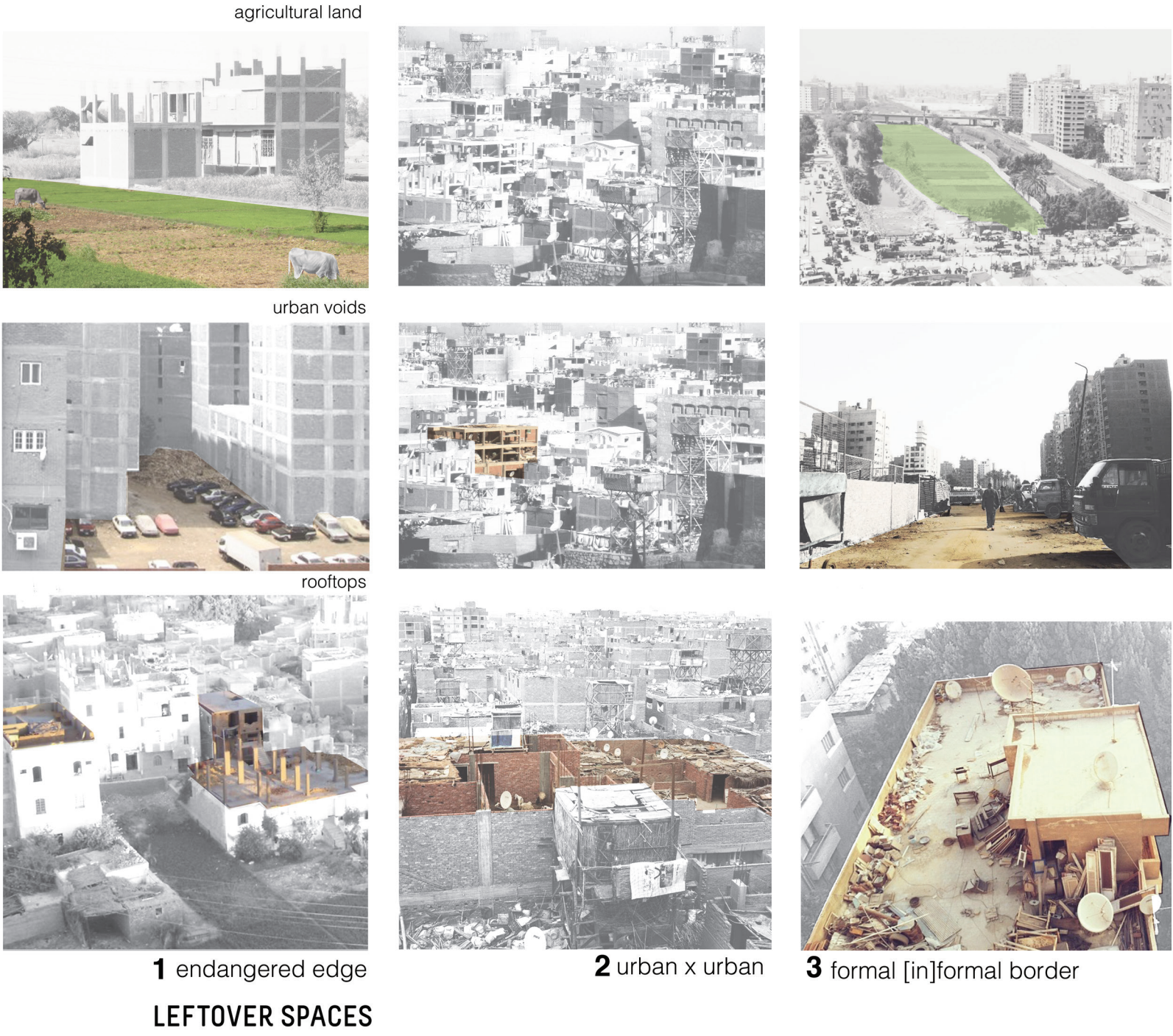


Figure 2.66 Mapping 3 urban conditions in Ard El Lewa

The following exercises were undertaken in the workshop to transfer participants from reality to a higher level of abstraction and analysis. Each layer confirmed patterns for the manual and took participation from partnership to delegated power.

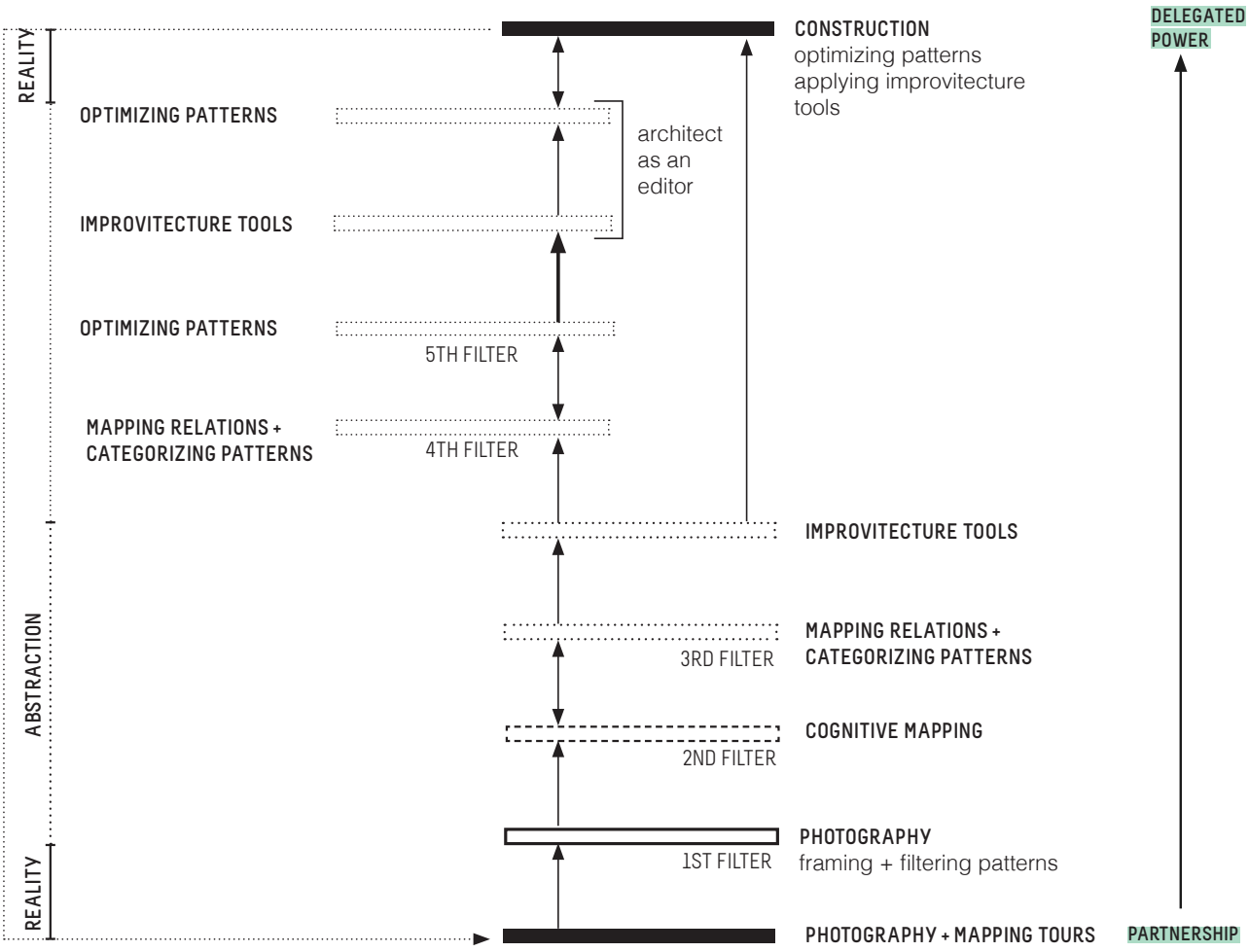


Figure 2.67 Workshop exercises and layers of representation
Figure 2.68 Workshop participants departing for photography and mapping tours (top left)
Figure 2.69 Workshop participant placing his pattern in context (bottom left)

Figure 2.70 Mapping urban voids

7.1 PHOTOGRAPHY + MAPPING TOURS
DOCUMENTING PATTERNS

TOOLS

GROUP 1 GROUP 2 GROUP 3

Figure 2.71 Urban condition 1: urban x urban

GROUP 1 GROUP 2

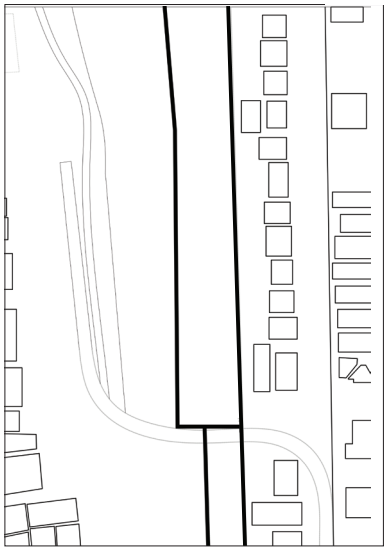


Figure 2.72 Urban condition 2: formal [in]formal border

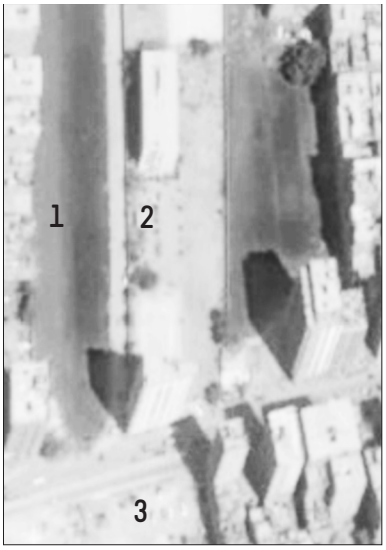


Figure 2.73 Urban condition 3: endangered edge, ©Google, 2015

Figure 2.74 El Esseiry Street

Figure 2.75 Below the bridge

Figure 2.76 Agricultural land (1)

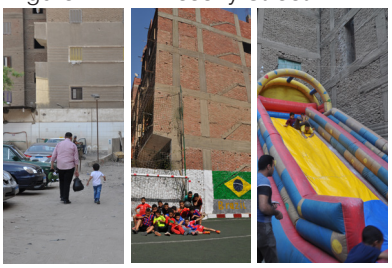


Figure 2.77 Urban voids

Figure 2.78 Street vendors

Figure 2.79 A small farm in a school (2)

Figure 2.80 Palestine Street

Figure 2.81 Pedestrian bridge

Figure 2.82 Former agricultural land (3)

"In order to define this quality in buildings and in towns, we must begin by understanding that every place is given its character by certain patterns of events that keep on happening there"
- Christopher Alexander, The Timeless Way of Building, x

The first exercise was photography and mapping tours, thus a direct interaction with the built environment through observation and in-situ mapping. Photography offered a tool for children to frame their opinion about their neighbourhood and identify patterns.

Figure 2.83 Geotagged Photography

For the photography and mapping tours, each participant received a toolkit composed of the following: a tote bag imprinted with some patterns for guidance, a sketchbook, maps, and a table to register building typologies, incomplete structures, available services, commercial and street activity, and patterns that define the built environment. Participants were asked to take geotagged images of building façades and elements in the built environment. With the help of architecture students, the children observed and documented existing configurations, and marked on the map where geotagged images were taken. These tools and mapping tasks were necessary to teach the children some of the architect's skills in reading the built environment, and representing it in a more abstract way by practising mapping on-site first.

Figure 2.84 Framing Patterns

Groups for the photography and mapping tours were composed of two architecture students, three to four children and escorted by one young adult from the community.

Before departing, an introductory session was given to the participants on the workshop as a whole, photography and framing tips, and how to use the given tools. Each group was to decide how roles were assigned, and then reshuffled to give the opportunity to all members to practise a variety of tasks.

The children and architecture students also interviewed some community members during tours. This helped participants include more perspectives into their analysis and exchange local knowledge with community members. Among the interviewed community members, was a broker-builder who spoke about the rationale behind the cantilevered street facade, the 'inverted L-Building typology,' and light-wells as an alternative to setbacks and openings in the facade in such a dense urban environment.

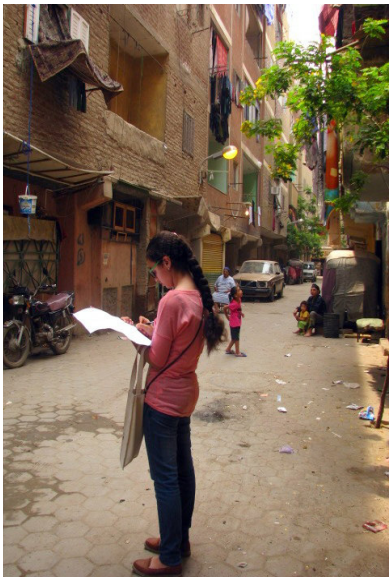


Figure 2.85 Documenting building typologies

During one of the tours, a construction drawing for an apartment in Ard El Lewa was found on the street. The drawing was prepared by an office in Mohandessin and was included in the workshop findings not only as a proof for how 'formal' the construction process in [in]formal areas is, but also to study [in]formal standards related to light-wells, stairs and room dimensions.

Figure 2.86 Drawing existing layout of an urban void

Figure 2.87 Negotiating ownership of the found pigeon

Figure 2.88 Interviewing a local builder

Figure 2.89 Interviewing local construction workers

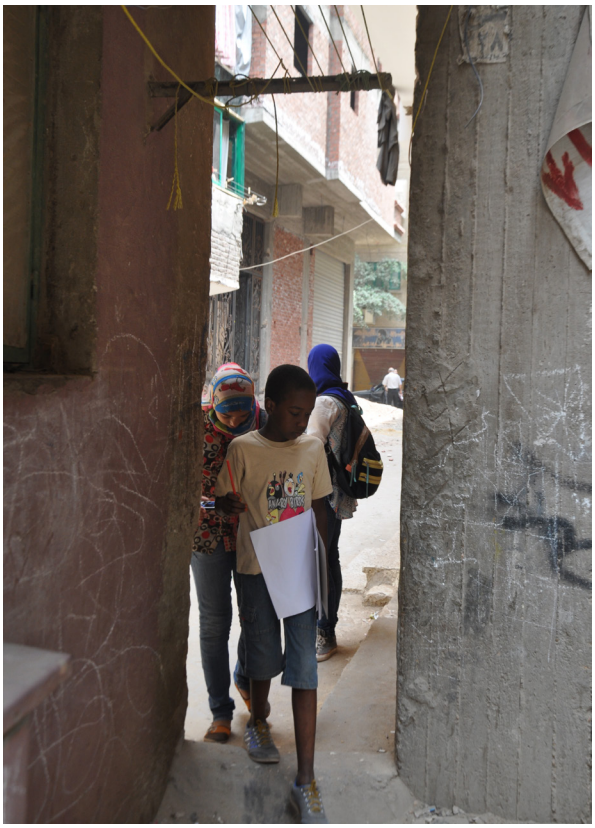


Figure 2.90 Urban x urban photography tour

Figure 2.91 Finding a floor plan of an apartment

Figure 2.92 Local construction workers in Ard El Lewa

MESSI
10

7.2 DISCUSSION + MAPPING RELATIONS
ANALYSING + CATEGORIZING PATTERNS (1st ROUND)

TOOLS

"Once we have understood how to discover individual patterns which are alive, we may then make a language for ourselves for any building task we face, The structure of the language is created by the network of connections among individual patterns: and the language lives, or not, as a totality, to the degree these patterns form a whole."
- Christopher Alexander, The Timeless Way of Building, xii

Each photography and mapping tour was followed by a group discussion. Participants were asked to present five to ten photographs that best describe the character of the observed urban condition. This was considered the initial filtering process for identifying patterns. Moving to a higher level of abstraction, participants mapped relations through the pattern matrix. With the compiled set of pictures, participants created a pattern matrix by categorizing patterns and drawing connections with thread. This step was done in parallel to cognitive mapping due to shortage in time.

Figure 2.94

Figure 2.95

Figure 2.96

Figure 2.97

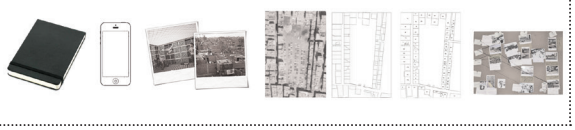
Figure 2.98

Figure 2.93 Creating pattern matrices (left)
Figure 2.94 Discussing framed patterns
Figure 2.95 Filtering patterns
Figure 2.96 Group discussions
Figure 2.97 Finding connections between patterns
Figure 2.98 Discussing connections

7.3 COGNITIVE MAPPING + DRAWING NARRATIVES

MAPPING + CONFIRMING PATTERNS

TOOLS

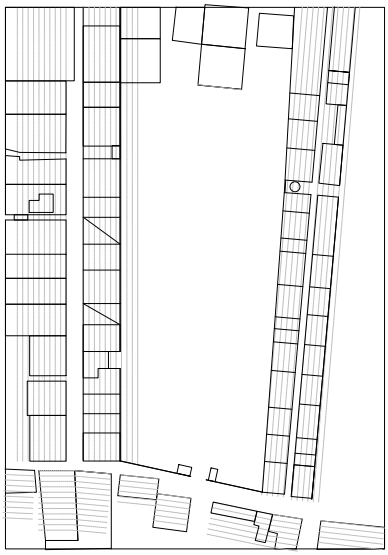


LAYER 1

Figure 2.99 Layer 1: Google map, ©Google, 2015

LAYER 2

Figure 2.100 Layer 2: Building footprints with numbers



LAYER 3

Figure 2.105 Reference lines for building height

"The sequence of patterns is also the 'base map' from which you can make a language for your own project by choosing the patterns, which are most useful to you."
- Christopher Alexander, A Pattern Language

If there was anything to prove from this step, it was the need to challenge the view that map work with younger children is either unnecessary or beyond their capability, as S. J. Catling argues *in* "Maps and Cognitive Maps: The Young Child's Perception."[64] The process of recalling important features of the environment and deciding what to include in the map, taught the children how to filter and document patterns.

The following maps were overlaid to guide the children during the mapping process: Google Maps, building footprints, and reference lines for various heights. Drawing each building required collaboration among group members, in terms of checking its height and adjacent activities from the tables, cross-referencing data with geo-tagged images, and extracting characteristic patterns from photographs.

Figure 2.101 Cross referencing with geo-tagged images
Figure 2.102 Drawing building typologies
Figure 2.103 Collaborating on drawing the map
Figure 2.104 Cognitive mapping of patterns (right)

Figure 2.101

Figure 2.102

Figure 2.103

7.4 IMPROVITECTURE TOOLS
OPTIMIZING PATTERNS

After completing the stages related to documenting patterns, the next step, as proposed by the process, involved the generation of Improvitecture tools to optimize patterns. Based on daily experience, acquired skills during the workshop and the students' guidance, the children evaluated their framed patterns and wrote what needed to be changed. When putting all three generated maps together, the children started recalling more features of their environment and added them to the maps. They were able to draw inferences from maps, which helped them in formulating tools

Figure 2.106 Updating the maps with more features

TOOLS

Figure 2.107 Adding information

Figure 2.108 Generating Improvitecture tools

7.5 MAPPING RELATIONS
ANALYSING + CATEGORIZING PATTERNS (2nd ROUND)
Architecture students

Architecture students proceeded with further mapping relations and categorizing patterns. Equipped with the generated maps and matrices, the challenge was how to the edit available data and represent it in a more generic way that does justice to the interconnectivity of the patterns. This required developing a hierarchy that covers all patterns and, at the same time, allows for the addition of new ones. The students proposed to include 'forces' as additional evaluation criteria for patterns. By quantifying forces that contribute to the creation of each pattern, the most formative patterns should be identified

TOOLS

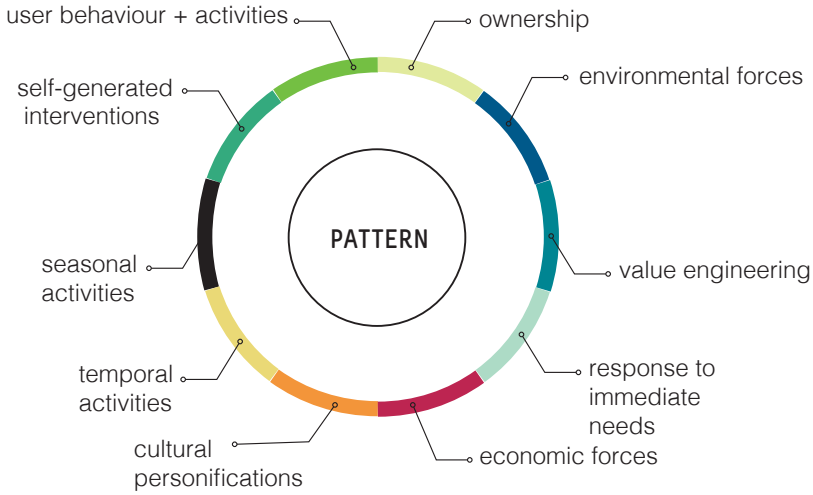
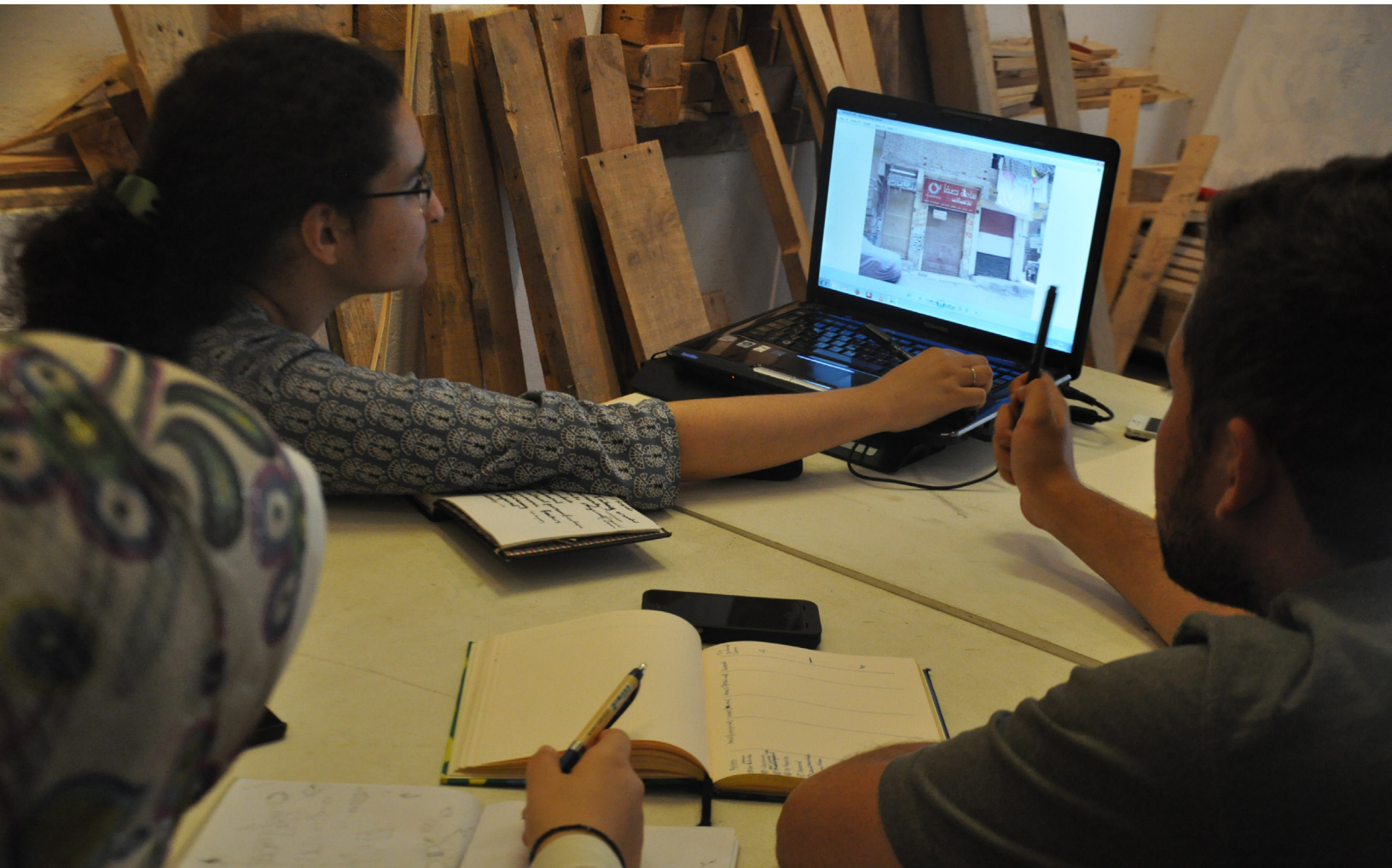


Figure 2.109 The 10 driving forces proposed by architecture students
Figure 2.110 Participants visualizing green roofs (top right)
Figure 2.111 Architecture students creating the pattern matrix (bottom right)



7.6 CONSTRUCTION

OPTIMIZING PATTERNS
Children

The rooftop of Save the Children was selected as the pattern for optimization. The following three steps were undertaken during the construction process:

STEP 1: Analysing existing conditions and needs

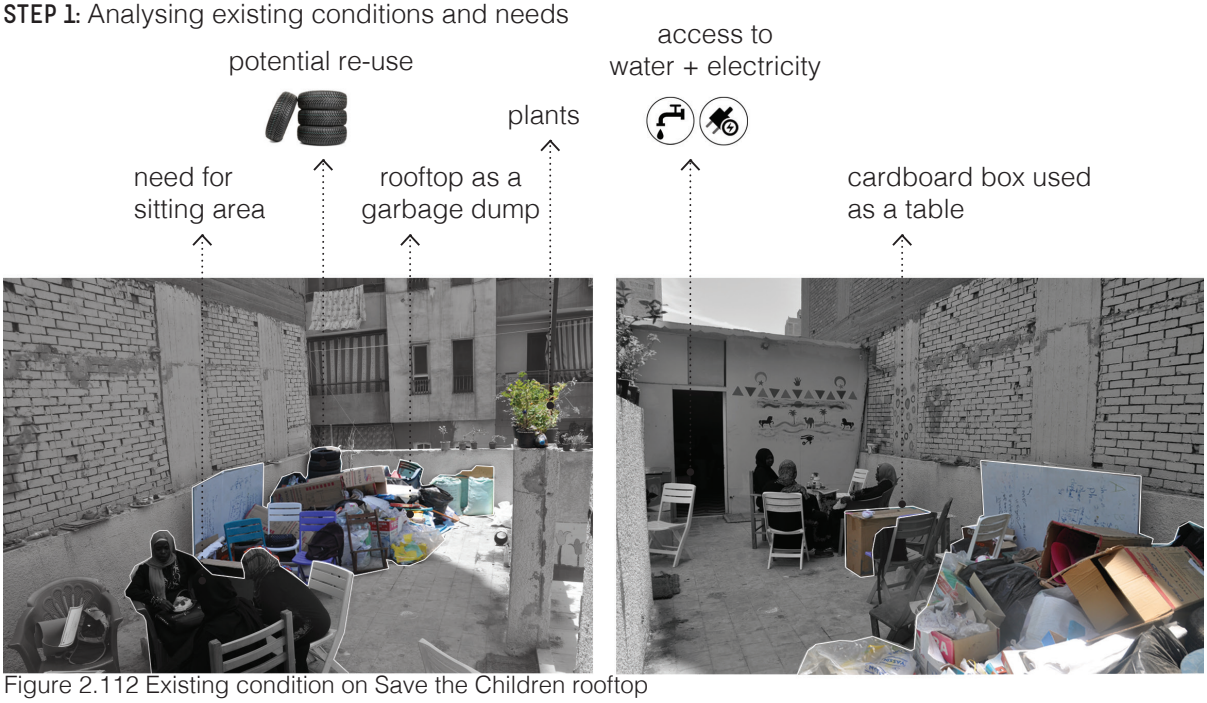


Figure 2.112 Existing condition on Save the Children rooftop

STEP 2: Selection of tools from the generated Improvitecture toolkit

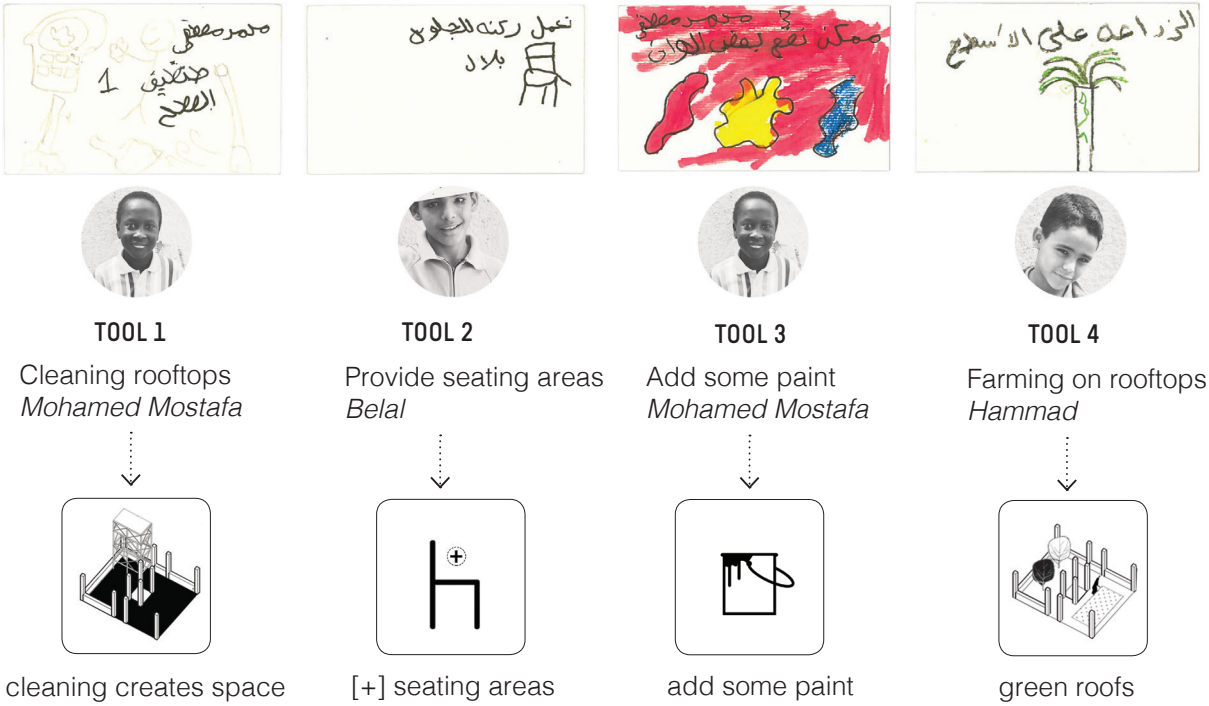
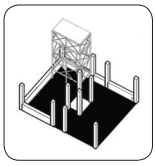


Figure 2.113 Selected Improvitecture tools generated by workshop participants

STEP 3: Applying Improvitecture tools
The Building Ceremony

After forming improvitecture tools for optimizing and maintaining their roof, it was time for the children to depart from abstract ideas, to actual implementation of both their generated solutions and the Building Ceremony concept with few available resources. This step was crucial for the children to take ownership and delegated power of generated interventions, boost their creative energies and visualize their strategies. It was observed that residents of [in]formal areas seem to need to experience a quick handmade implementation of their needs, in order to further cooperate. Applying the generated tools showed the children how to transform a space in a short period of time, with a few local resources and their own set of skills, in the hope of replicating this process on other rooftops in the neighbourhood.



TOOL 1
cleaning creates space

As part of a game, the children quickly cleaned their rooftop and set aside waste that can be reused, such as tires, fruit boxes and cardboard.

Figure 2.114 Cleaning games

Figure 2.115 Cleaning creates space

Figure 2.116 Organizing tires

Figure 2.117 Cleaning tires for reuse

TOOL 2
[+] seating areas

DESIGN ELEMENTS

14 x recycled wood palettes 30.LE / each

tires

fruit baskets 5. LE / each or found on street

rented drill 20 L.E / day

rope

Applying Tool 2, the idea was to create an L-shaped seating area for children and teachers to use during lunch hour, breaks and outdoor learning activities. As the space could not be occupied with a permanent arrangement that prevents alternative uses of the rooftop, nor freestanding chairs that would trigger garbage accumulation once more, a semi-permanent seating area was created using recycled wood palettes. The palettes (80 x 90 cm) were bought from a local carpenter called Yassin.

When assembling the seating area, a problem was encountered; not all palettes were the same size, as ordered. Improvisation followed: the height of the sitting corner was reduced and, with the remaining palettes, shelving units were created that should operate as a small library and lockers. The library, at that time lacking in the centre, transformed the seating area into a more positive learning environment, encouraging children to read while waiting for their classes. Tires were used to accommodate a more flexible sitting arrangement around the shelves for relaxing, socializing and reading. Shelves were made from fruit boxes found on the street and bought from street vendors in the market. Workshop participants experimented with several configurations that provide shelves with maximum flexibility.

Figure 2.118

Figure 2.119

Figure 2.120

Figure 2.121

Figure 2.118 Testing the assembled seating area
Figure 2.119 Building the library shelves from wooden palettes
Figure 2.120 Attaching the shelves with rope
Figure 2.121 Testing different configurations
Figure 2.122 Building a positive seating corner (right)

TOOL 3
Add some paint

Unfinished facades are cost-effective for building owners and appealing to some designers. Children, however, miss colours in their built environment. In response to this need, and the tool generated by one of the participants, the workshop included painting the recycled tires and the constructed library shelves. The children customized their library with dates, assigned numbers for shelves and mixed paint to create more colours. Other children and women from the neighbourhood got interested and participated in the activity.

Figure 2.123 Completed library shelves and painted tires
Figure 2.124 Mothers joining the building ceremony
Figure 2.125 Mixing colours to create more colouts
Figure 2.126 Painting the tires
Figure 2.127 Completed seats from reused tires and rope
Figure 2.128 Painting assembled library shelves
Figure 2.129 Painting assembled library shelves (top right)
Figure 2.130 Curious children from the neighbourhood joining the workshop (bottom right)

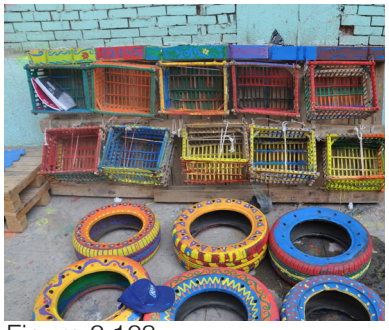


Figure 2.123

Figure 2.124

Figure 2.126

Figure 2.127

Figure 2.125

Figure 2.128

TOOL 4
green roofs

DESIGN ELEMENTS

timber joists
2x 2.0 m
2x 1.5 m

waterproof membrane

drill

nails

nylon thread

filter fabric

hose

STEP 1
Clear the site of obstructions. Arrange 4 timbers in an outline of the planned bed, butting each timber's end against the next timber's side. Using the drill nail the timber joists to one another. Check the frame for level and square as you proceed.

STEP 2
Add waterproof membrane and nail it to the timber joists from the top.

STEP 3
Create a grid by wrapping the nylon thread around the nails. The grid serves as a substructure for the filter fabric.

STEP 4
Cut holes in the filter fabric. Overlay the filter fabric on top of the grid.

STEP 5
Pass the hose through one of the holes. Nail the filter fabric to the timber joists.

STEP 6
Fill the planter bed with water.

Figure 2.131 A guide on installing the urban farm prototype

DESIGN ELEMENTS

growing media with nutrients

wicks

planting cups

seeds

STEP 7
Pass the wick fabric through the planting cup. The wick is composed of the same material as the filter fabric and supplies water to the plant using capillary action.

STEP 8
Fill planting cups with growing media containing nutrients. Make sure the wick is extended all the way through the planting cup to ensure supply of water.

STEP 9
Compact the growing media. Fill planting cups with more growing media and seeds.

STEP 10
Store planting cups in a safe place until assembly of the planter bed is completed.

STEP 11
Place planting cups in the holes of the filter fabric.

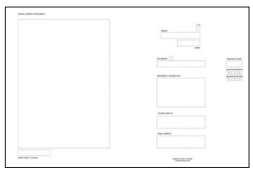
Schaduf offers training sessions on the benefits of urban farming by setting up a roof top farm and weekly markets for low-income families.

7.7 OPTIMIZING 3 PATTERNS

Architecture students

When children were optimizing their rooftop, architecture students were involved in the same process, yet in a more abstract way using pattern templates. Tracing identified forces, how patterns are interconnected, and the impact each pattern produces when optimized, the students selected the following 3 patterns: *waiting agricultural land*, *space below the bridge* and *urban voids as a parking lot.*

TOOLS



Pattern Template

Pattern Matrix

waiting agri-cultural land

space below the bridge

urban voids as a parking lot

Figure 2.132 Selected patterns during the workshop

7.8 DISCUSSING RESULTS + MUGSHOTS

CONFIRMING PATTERNS

To wrap up the workshop, three events were organized. During the time the children were building the urban farm prototype, architecture students presented the workshop outcomes. The event was conceived as an informal pin-up, displaying generated maps and pattern matrices. The objective was, on the one hand, to receive feedback on the pattern matrix and generated pattern templates; on the other hand, it was necessary to test what the students took from the workshop in order to update the process accordingly.

The second event involved taking mug shots of each participant, with what s/he believes to be the most important pattern that gives Ard El Lewa its character. The objective was to confirm patterns for the manual.

The third event was a group discussion about the workshop and the process as a whole. The discussion was held on the rooftop surrounded by our newly constructed interventions and urban farm. Important issues were raised regarding who will take ownership of the library and the urban farm, and how can the children benefit from managing them. It was arranged that participants' mothers make pillows for the sitting corner and books should be donated to the library. As pioneers of the initiative, the children were encouraged to take the workshop forward by showing their families and other community members how to improve their rooftops and by organizing other mapping workshops.

Figure 2.133 Architecture students presenting pattern matrix and optimized patterns
Figure 2.134 Discussing Results

8. EXHIBITION

Duration: 3 days
Artellewa + Save the Children rooftop
Architecture students + children + community members + experts

Designed as an interactive street exhibition, each component was displayed to gather new patterns, opinions and narratives. Viewers became contributors to the exhibition and part of the process. Workshop participants flourished, as experts in representing their community and the curators of the exhibition. The main objectives of the exhibition were to engage the wider community in Ard El Lewa, create awareness for the [in]formal pattern language initiative, continue The Building Ceremony and celebrate the work produced during the workshop. The exhibition was held all day long during the last 3 days before Ramadan, which was a great time to celebrate. Streets were filled with decoration and, lanterns, and a festive spirit was shared among community members.

The exhibition combined all user groups and tools. It featured generated pattern matrices, maps, pattern templates and photographs of the process and participants. A banner containing empty speech bubbles was displayed to engage viewers in filling it with their urban narratives and needs.

The children got very excited when a group of local and international scholars, practitioners, and students from the informed urban community, visited the exhibition as part of an urban tour passing through Ard El Lewa, organized by the Egyptian Urban Forum (EUF). Proud of their accomplishment, and representing Ard El Lewa, the children walked the visitors through the exhibition and explained what they did during the workshop.

Figure 2.136 Open street exhibition

Figure 2.137 Exhibition at night

Figure 2.138 Participants welcoming visiting experts

Figure 2.139 Wall displaying maps & process

Figure 2.135 Exhibition in Ard El Lewa

Figure 2.140 Display

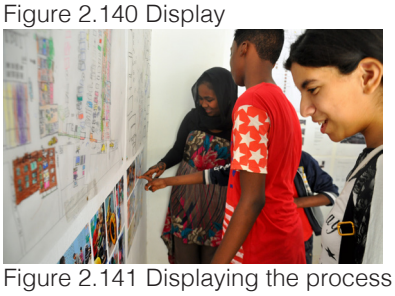


Figure 2.141 Displaying the process

Figure 2.142 Participants writing their [illegible] cross referencing patterns

Most exhibition visitors were curious children and youths, the most active contributors to the displayed work. Some of them traced their homes on the map by recognizing familiar features and landmarks, which was itself a confirmation for some patterns. Others fed the maps and matrices with more information, such as new strategies, street names, trees, workshops and facilities. One of the visitors was an architect living in Ard El Lewa, who currently works as a draftsman in Downtown Cairo. Women's attendance was limited to a few mothers of workshop participants.

The exhibition was not an end to the fieldwork, but rather an important part of the process and an additional opportunity to gather patterns.

Figure 2.145 Local architect
Figure 2.146 Geotagging the exhibition
Figure 2.147 A boy tracing his home
Figure 2.148 Children viewing Pattern Templates
Figure 2.149 Boys writing their friends' names

Figure 2.145

Figure 2.146

Figure 2.143 Children updating maps with new informaltion

Figure 2.147

Figure 2.148

Figure 2.144 Children updating matrices with new patterns

Figure 2.149

01
farmers
“I wish that agricultural land doesn’t get sold for construction”

02
students
“I wish for a better education”

03
children
“we need green spaces”

04
university graduate
“I hope to find a job that suits my field of education”

05
unemployed
“health services”

06
housewives
“better transportation”

07
“I wish Ard EL Lewa was clean and not defined as an informal area”

08
delivery man / vendor
“wants to own a shop to sell chicken”

09
breadwinner
“I hope that people clean the streets”

10
girl
“ I wish I could walk freely without being harassed”

11
toktok driver
“I wish there was no traffic congestion”

Figure 2.150 Compiled Urban Narratives

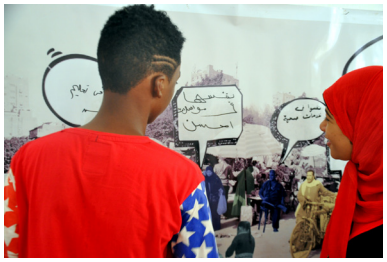


Figure 2.151 Participants and attendees filling speech bubbles with urban narratives and needs

Figure 3.1 Exhibition in Ard El Lewa

03

PART 3

RESULTS

WORKSHOP OUTCOMES

This chapter presents unedited outcomes of the workshop and exhibition, along with a selection of student-generated pattern templates. As seen in Figure 3.2, the outcomes demonstrate different layers of representation that were designed to transfer participants from reality to a higher level of abstraction. The first layer was a direct interaction with the built environment through observation and an in situ site analysis. The second layer was framing the built environment through photography. Moving to a more abstract form of representation, the third layer was mapping the built environment, followed by mapping relations through the pattern matrix. Each layer served as a filter to confirm patterns for the manual, which are illustrated in final matrix, the 101 [in]complete Pattern Matrix.

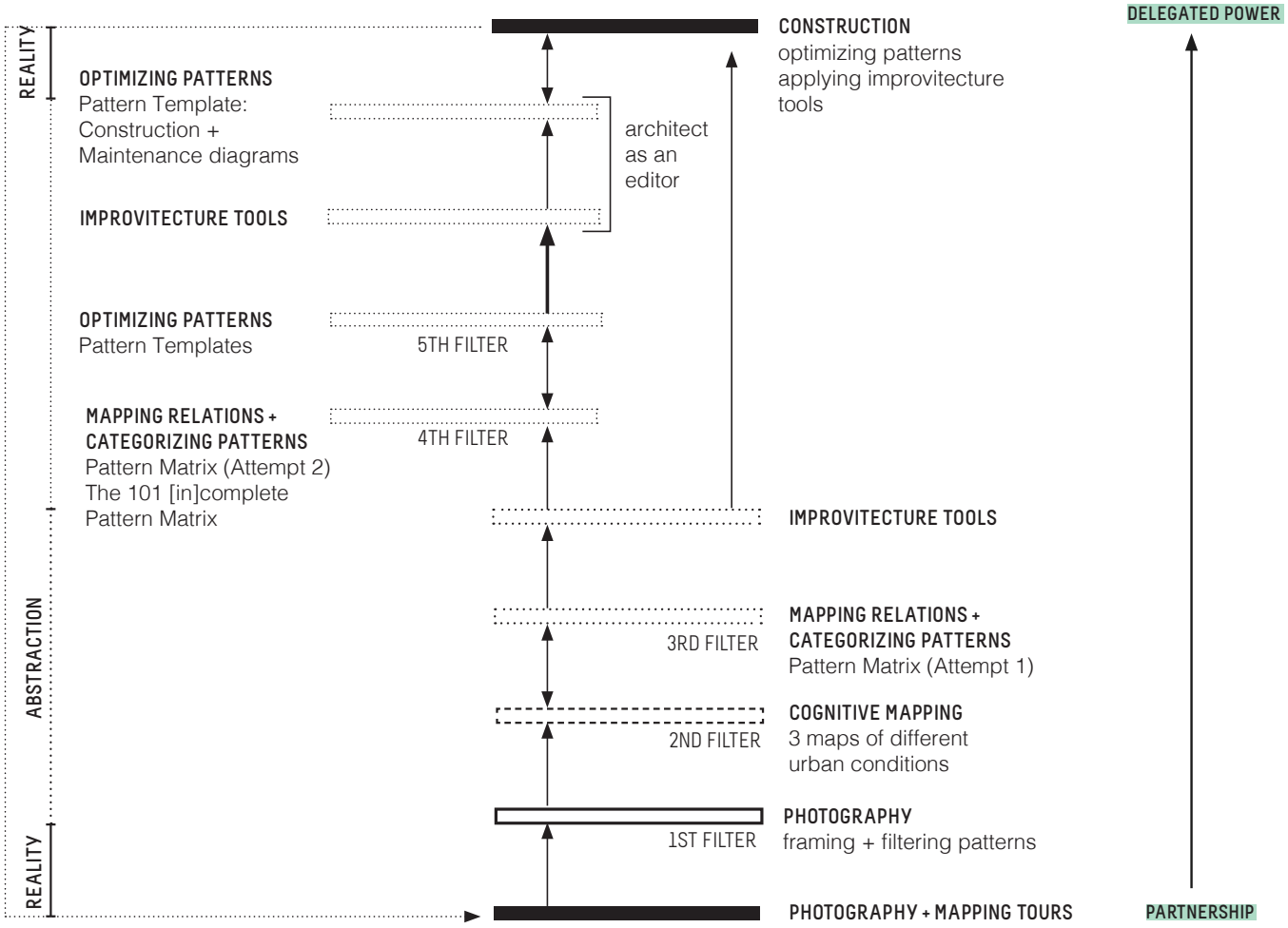


Figure 3.2 Layers of representation in relation to workshop outcomes

PHOTOGRAPHY

incomplete buildings

junk on the rooftop

repetitive addresses

Figure 3.3 A selection of framed patterns

COGNITIVE MAPPING

Figure 3.4 urban x urban, ©Google, 2015

Figure 3.5 formal [in]formal border, ©Google, 2015

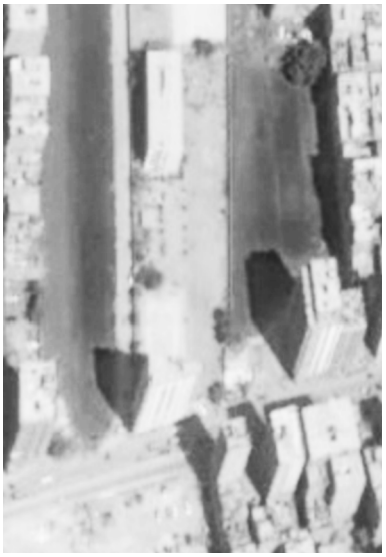


Figure 3.6 endangered edge, ©Google, 2015

Figure 3.7 Map 1: urban x urban

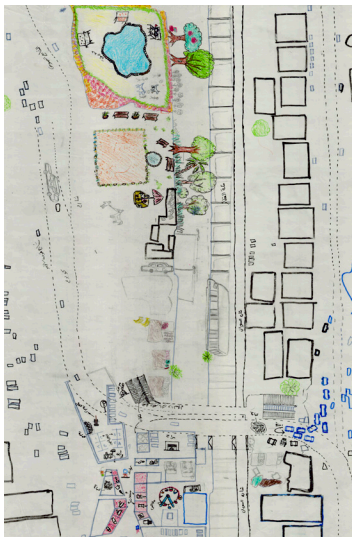


Figure 3.8 Map 2: formal [in]formal border

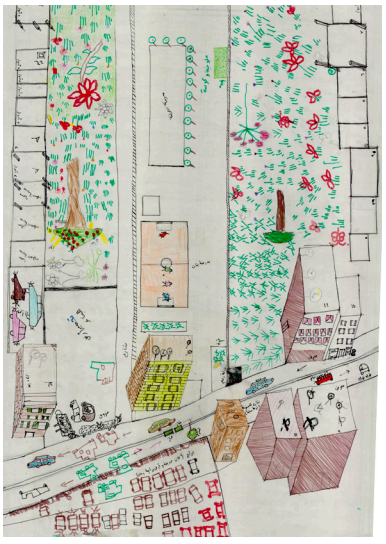


Figure 3.9 Map 3: endangered edge

MAPPING RELATIONS + CATEGORIZING PATTERNS
CHILDREN + ARCHITECTURE STUDENTS
(Pattern Matrix: Attempt 1)

"Then finally, from separate languages for different building tasks, we can create a larger structure still, a structure of structures, evolving constantly, which is the common language for a town."
- Christopher Alexander, The Timeless Way of Building, xiii

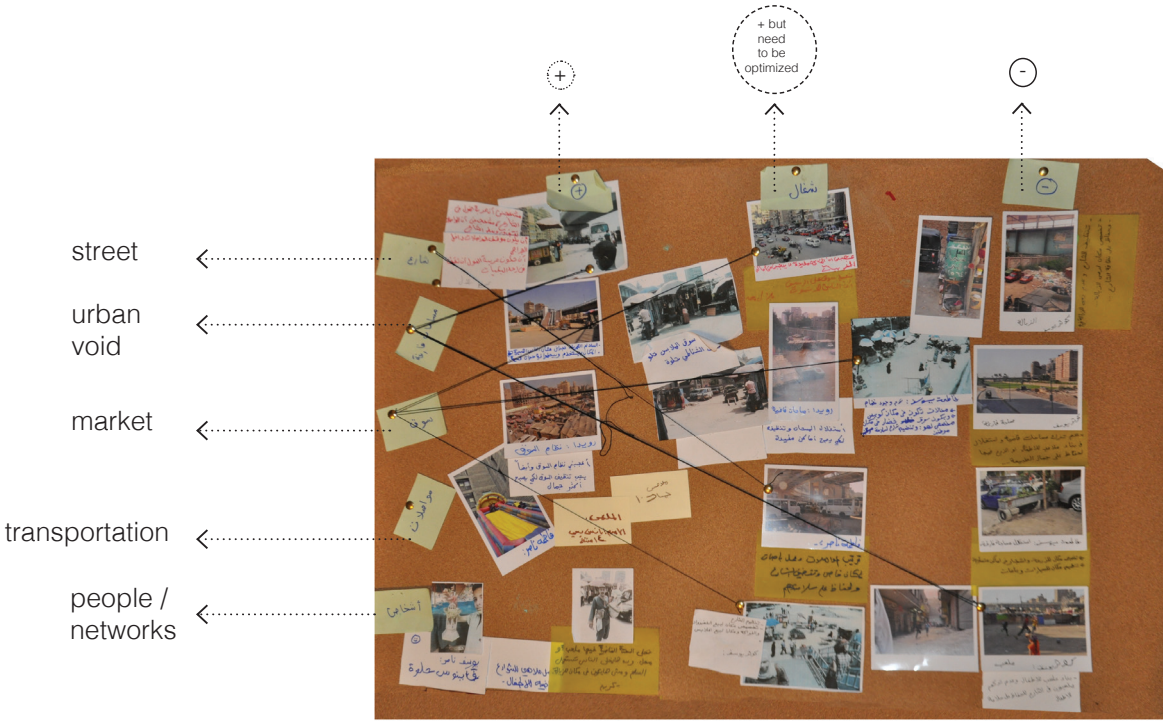
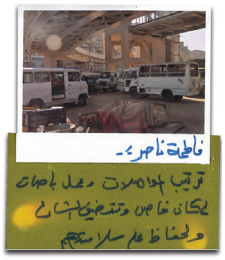


Figure 3.10 Pattern matrix attempt 1 by group1

Figure 3.11 Pattern matrix attempt 1 by group 2

IMPROVITECTURE TOOLS



Fatma Nasser

IMPROVITECTURE TOOLS

1 organize transportation
2 provide a separate space for buses
3 clean streets
4 keep streets safe

Kawsar Youssef

PATTERN
urban voids

IMPROVITECTURE TOOLS

1 don't leave urban voids unused
2 transform urban voids into playgrounds or "plants" (green spaces) to protect the environment

Fatma Youssef

PATTERN
urban voids

IMPROVITECTURE TOOLS

1 create equally dispersed spaces for agriculture and trees
2 organize spaces for cars and buses

Figure 3.12 A selection of Improvitecture tools

MAPPING RELATIONS + CATEGORIZING PATTERNS
ARCHITECTURE STUDENTS
(Pattern Matrix: Attempt 2)

This matrix was an initial step towards forming a more generic representation of the patterns. It was also a preliminary step towards setting a logical hierarchy for the patterns. The developed format covers all patterns and, at the same time, allows for the addition of new ones. The matrix, however, did not show how patterns are interconnected. With this in mind, the matrix has been updated to include connections and forces that generate each pattern.

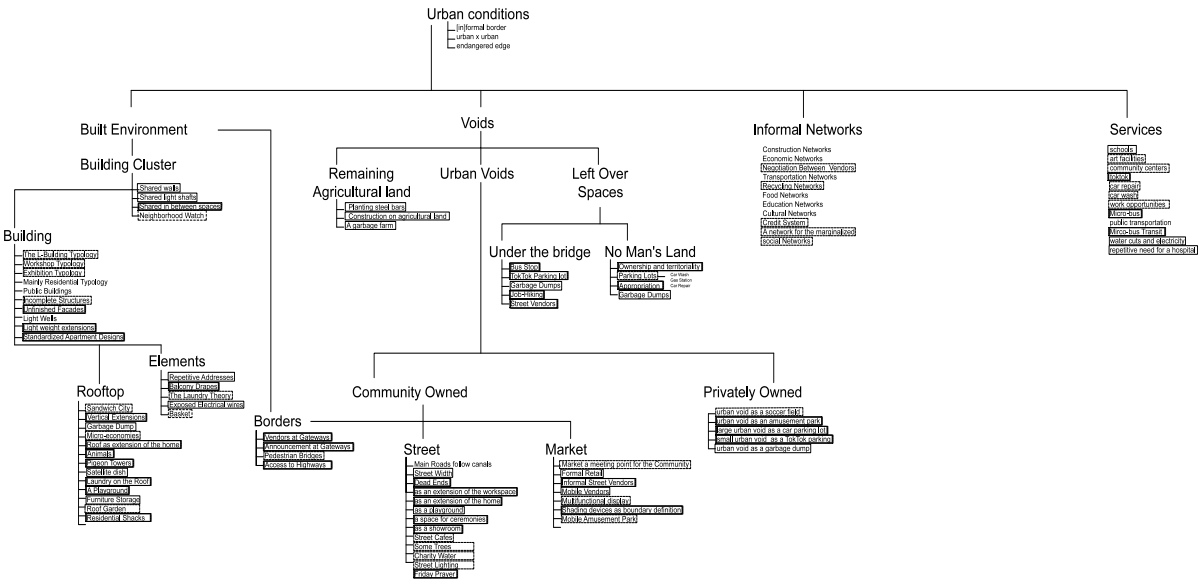


Figure 3.13 Pattern matrix attempt 2

THE 101 [IN]COMPLETE PATTERN MATRIX
ARCHITECTURE STUDENTS + INVISIBLE CHOREOGRAPHER
(Pattern Matrix: Attempt 3)

The 101 [in]complete Pattern Matrix was compiled after layering all data from the workshop, pattern templates and interviews. It acts as the index of the [in]formal pattern language manual.

The matrix frames 101 documented local patterns ranging from the community scale to the individual scale. It also associates the documented local patterns to global patterns, which operate on the city and country scales. Connecting the physical built environment to the socio-cultural realm, local patterns are divided into 4 main overarching categories: the built environment, voids, [in]formal networks and services. Patterns are then ordered, more or less, cascading from the largest elements to the smaller ones.

As seen in the matrix, patterns are not only vertically connected to larger and smaller patterns, but also transversely to patterns from other categories. The matrix thus portrays a composition for [in]formal areas, allowing its users to generate infinite combinations for optimizing patterns. To optimize a pattern, one needs to perceive it in context with other patterns and other key players. As framed by Alexander, “no pattern is an isolated entity. Each pattern can exist in the world only to the extent that is supported by other patterns.”[65]

The developed format covers all patterns and, at the same time, allows for the addition of new ones. It portrays patterns in relation to their driving forces, and identifies potentials and problems. It was named as [in]complete to highlight that it is not a fixed end result, but an invitation to be filled with new patterns.

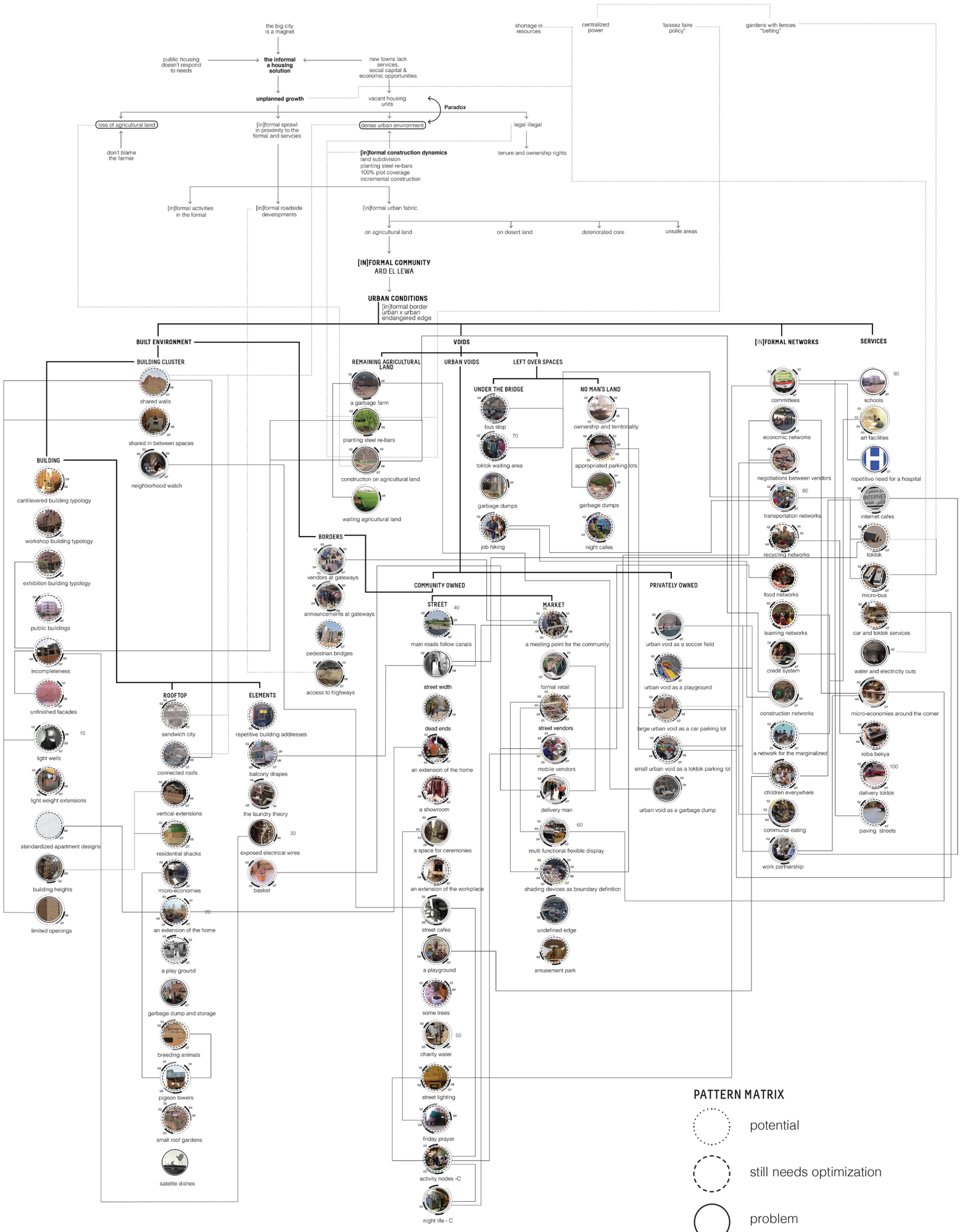


Figure 3.15 The 101 [in]complete Pattern Matrix

OPTIMIZING PATTERNS

Pattern Templates

picture / sketch of the pattern

Taken by Nadia Abotaleb
on June 7, 2015

+ or -

-

pattern

Building on agricultural land

Nadia Abotaleb

name

key players m

Builders

importance rank

Major

description / background

Ard El Lewa used to be an agricultural land, but due to neccessity, green soil was replaced by buildings. Some green lands survived, but are in the process of being replaced.

smaller patterns

Traditional building process

larger patterns

Loss of agricultural lands due to urbanization

problem

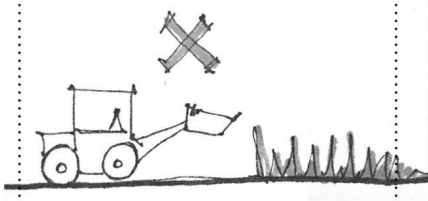
Loss of agricultural lands

potential

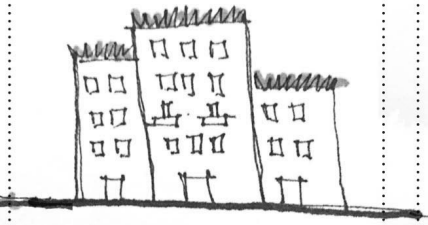
Enhancing micro-economy
Using wasted spaces

solution / tool(s) to optimize this pattern:

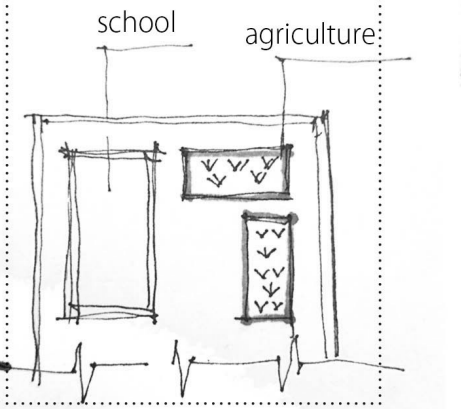
illustration



illustration



illustration



tool 1

Preserve existing agricultural land

tool 2

A law that states each constructed building has to have a green roof

tool 3

Utilize existing wasted spaces in public areas (for example: schools)

description

Perseve and efficiently cultivate existing agricultural land

description

Lost agricultural land can be compensated either vertically or efficiently using the wasted roof scape

description

Agriultural activities can take place at large wasted spaces in public areas like schools or parking lots.

new key players

Government

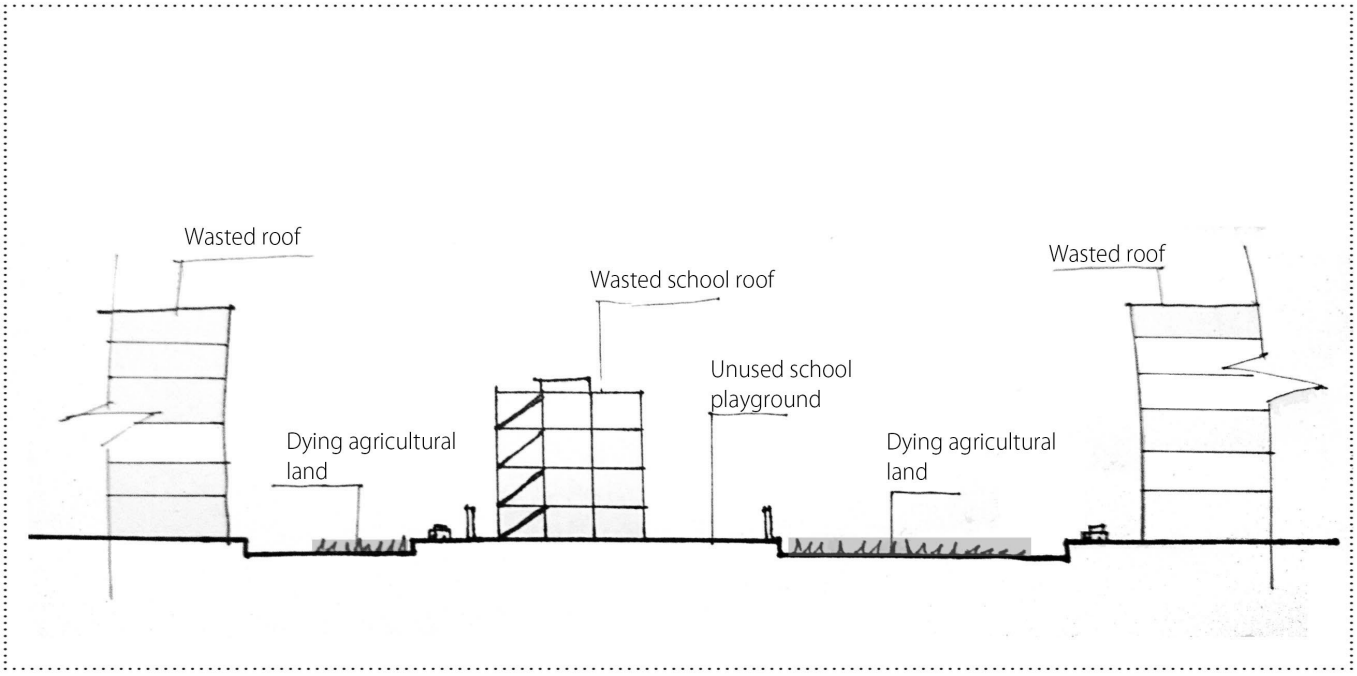
new key players

Government

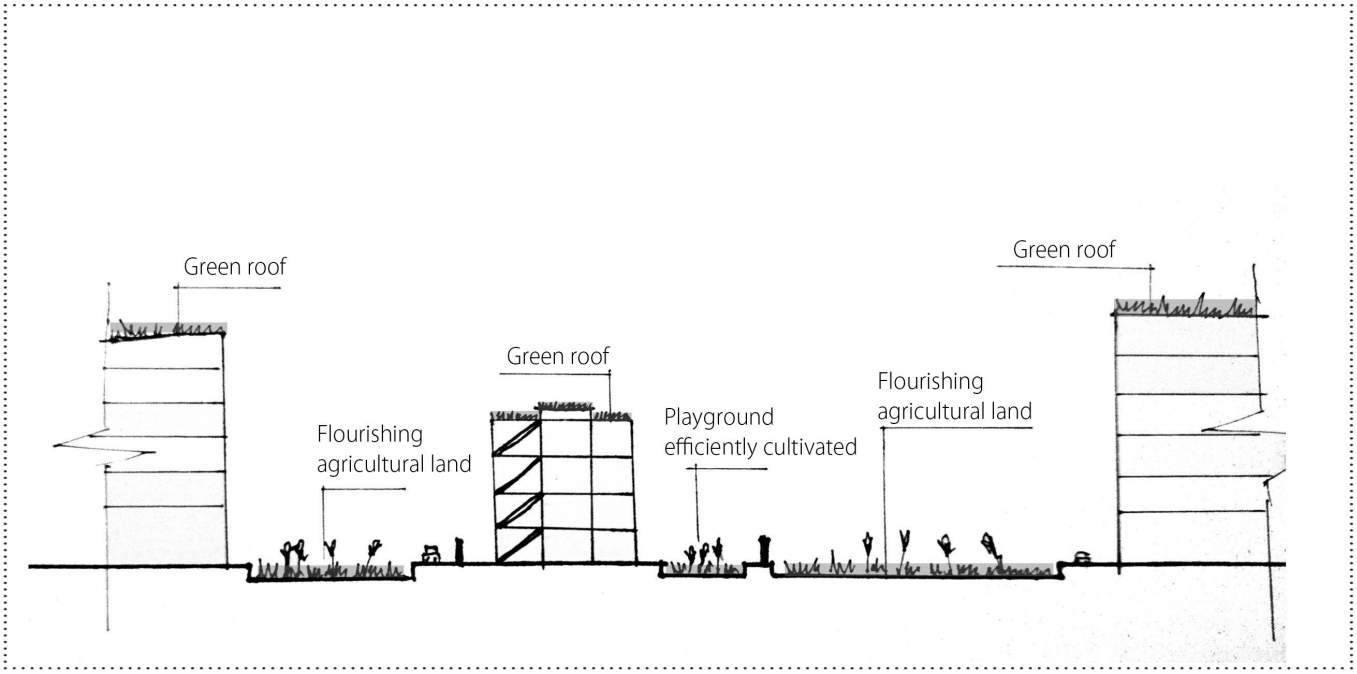
new key players

Public space users: students, teachers. ...etc.

existing diagram / layout / map



new diagram / layout / map / design / photographs of a 3d model



picture / sketch of the pattern

HAMMAD

photo credit + source

+ or -

+ ●●

pattern

PARKING URBAN VOID

EHSAN ABUSHADI
MAI MAHMOUD

name

key players **m**

vehcial owners, parking servicemen,
land owners

importance rank

minor priority

general problems

A G

general potentials

B T M F

description / background

Empty plots in dense areas used as parking areas to serve a need. This is a low dense activity in a very dense area which is not very efficient. Some unused areas of the parking have spontaneous vegetation growth.

smaller patterns

modular division

larger patterns

renting spaces for micro-economies,
temporal use of vacant land,
services

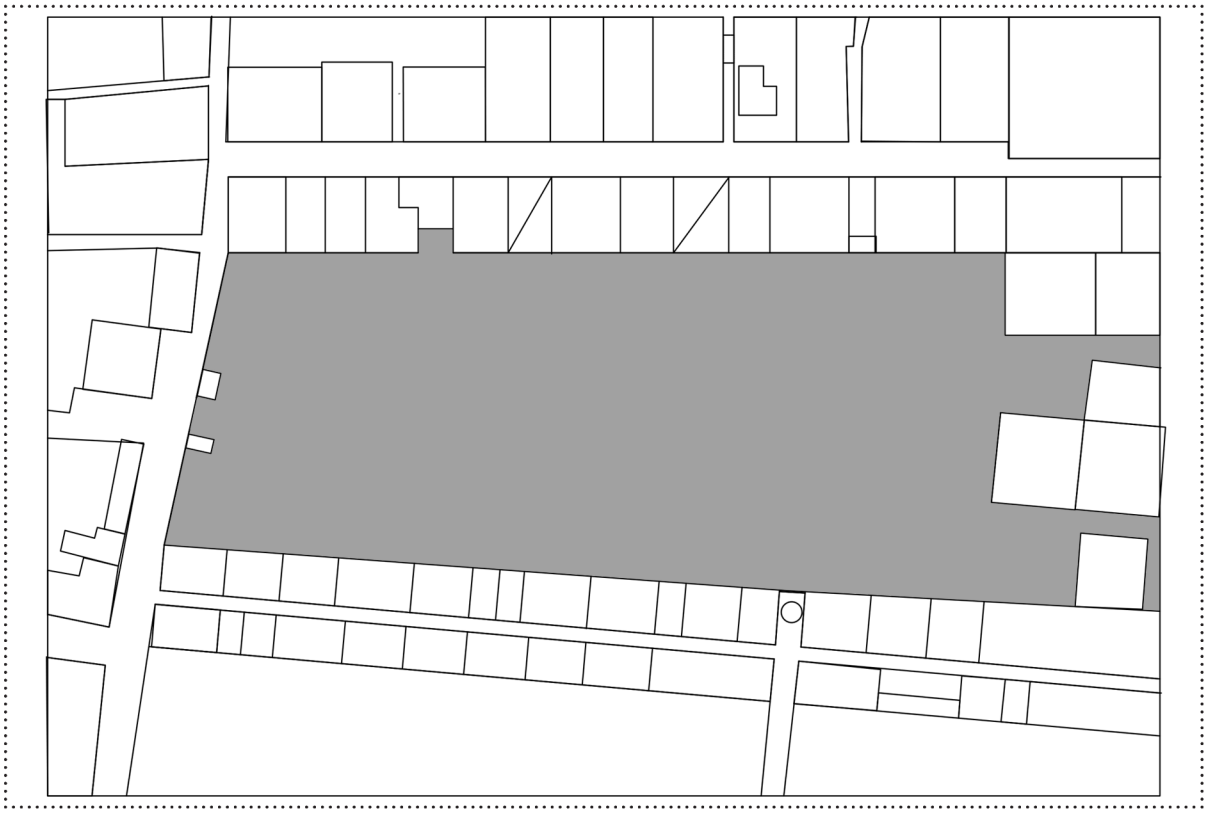
problem / potential

creating vertical activities that service the community on top of the garage increasing density while maintaining open green space through the use of green roof which shade the parking plots below

solution / tool(s) to optimize this pattern:

illustration	illustration	illustration
tool 1	**tool 2**	**tool 3**
Green roofs	Vertical distribution of activities	Communal public spaces
description	description	description
Provide urban voids with greenery which contributes to the microeconomics of the community as well as creating a green pocket amongst the brick architecture. Encourages the opening of more windows in the surrounding buildings as the land is given a permanent function that is not residential.	Increases the efficiency of the use of urban voids whilst maintaining their crucial function of parking space. The activities would be public services such as clinics or office spaces, retail, art and recreational areas.	This would fill in for the lack of public spaces that the community can use, particularly in the day to day routine which excludes the amusement parks. Children in particular are have few spaces for play, sports , arts and learning,
new key players	new key players	new key players
Schaduf, local farmers	Business owners, residents, entrepreneurs	Children and residents

existing diagram / layout / map



new diagram / layout / map / design / photographs of a 3d model

picture / sketch of the pattern
picture / sketch of the pattern

photo credit + source

+ or -

+ ●●

pattern

under the bridge

EHSAN ABUSHADI
MAI MAHMOUD

name

key players

micro-bus drivers, toktok drivers,street vendors, commuters

importance rank

high priority

general problems

G R T C O

general potentials

E M F

description / background

space under the bridge used as micro-bus station, a transite between transportation methods ,mobile and stationary street vendors appear in the crowded area which is one of the entrances to Ard el Lewa and also they located all over pedestrian paths ,flow of citizen
Usually these are located at the edges, as the bridges cross over the belting walls.

smaller patterns

human scale space with structure
shaded space

larger patterns

informal economy

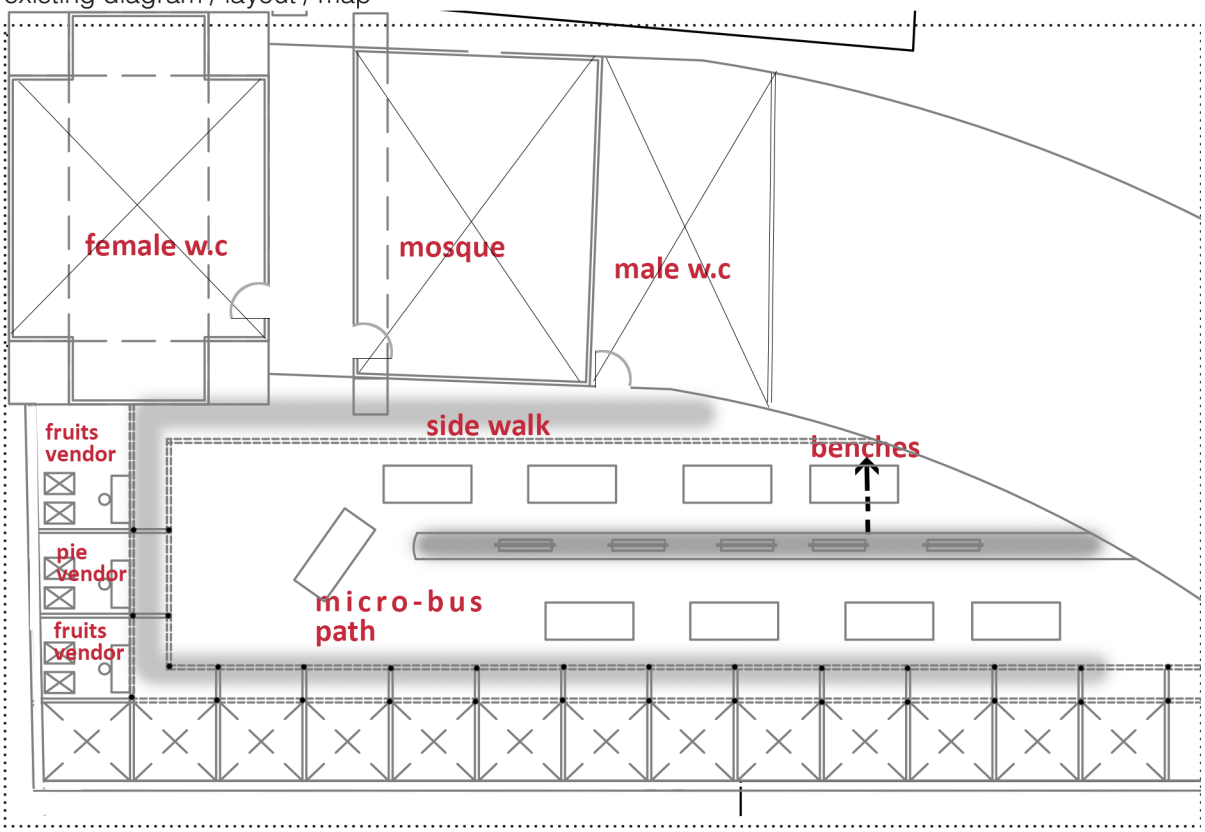
problem / potential

creating services like w.c , place for people to pray like small mosque ,seats and water distenser to help people to wait at micro-bus station

solution / tool(s) to optimize this pattern:

illustration	illustration	illustration
tool 1	**tool 2**	**tool 3**
seats ,water distenser	small mosque	W.c
description	**description**	**description**
Provide waiting seating area to make space under the bridge more comfort and water distenser to Satisfied people needs	people spent all their times at street and waiting micro-bus so we can provide small area for them to pray and this mosque was requested	space under the bridge one of crowded space and waiting one so people need some facilities like w.c
new key players	**new key players**	**new key players**
citizen, residents	passangers ,micro-bus users, micro-bus drivers	passangers ,micro-bus users, micro-bus drivers

existing diagram / layout / map



new diagram / layout / map / design / photographs of a 3d model

picture / sketch of the pattern

Ehsan Abushadi

photo credit + source

+ or -

±

pattern

Cantilevered street facade

Ehsan Abushadi

name

key players

street users, contractors

importance rank

minor priority

general problems

D

general potentials

N S

description / background

Majority of buildings in ard el lewa have a recessed ground floor to allow for a wider street while not reducing floor area of storey above. This also allows for shading of the building entrance. However, no balance between shading and natural lighting.

smaller patterns

shading, natural lighting, pedestrianism

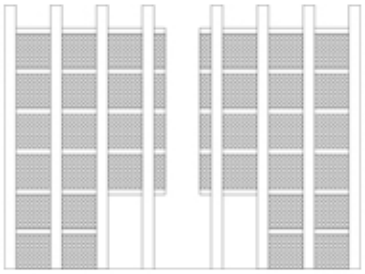
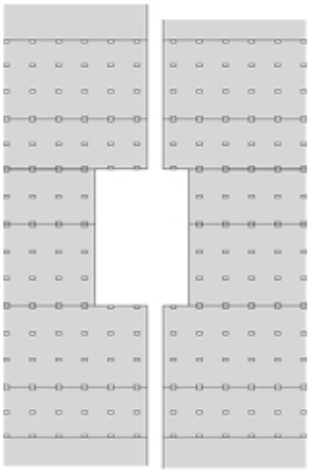
larger patterns

real estate, apartment size, macro-economics

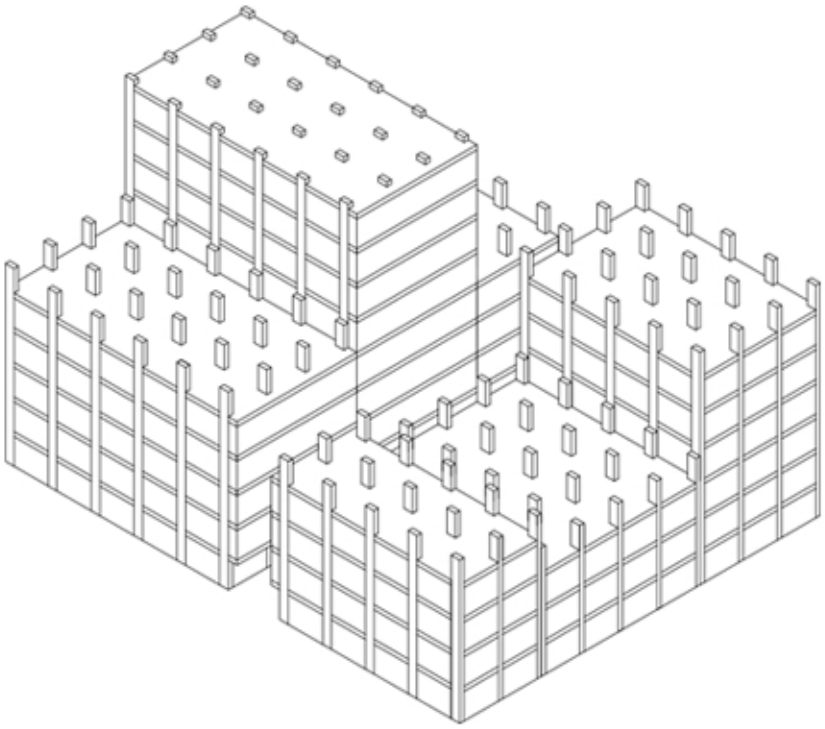
problem / potential

It is a potential make streets even wider, however, it is a problem as it greatly reduces the space between buildings and given their heights, can lead to poor urban ventilation and a lack of sunlight which is essential to those that do not leave their neighbourhoods

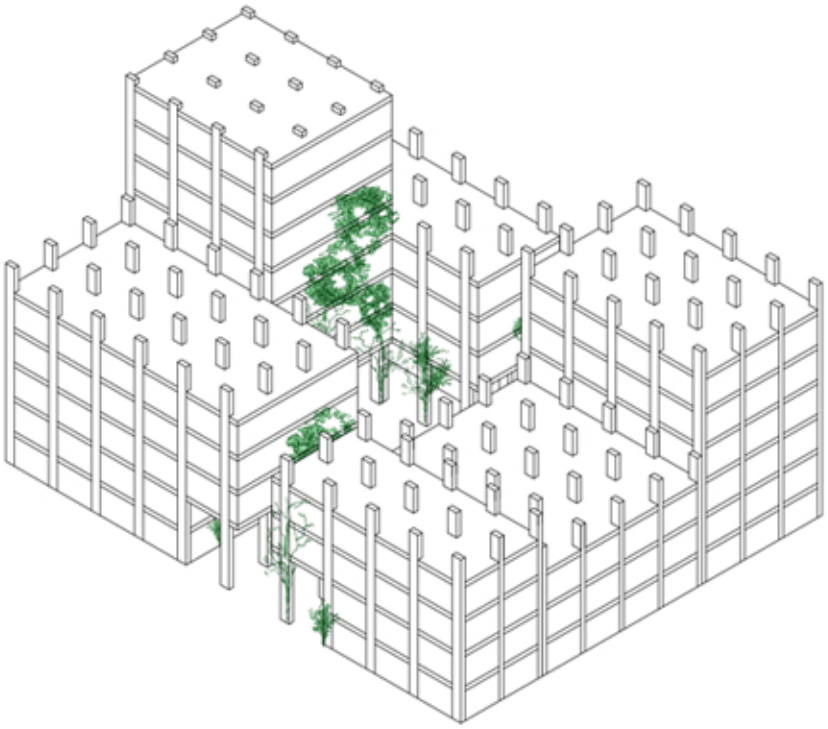
solution / tool(s) to optimize this pattern:

illustration	illustration	illustration
		
tool 1	tool 2	tool 3
enlarge recess	create urban pockets	Planting climbing plants
description	description	description
Recess building an additional module and give recess double height. This allows for more activities and/or less cogestion, and improves ventilation due to a larger volume of air.	Every couple of buildings buildings should make way for an urban pocket or courtyard which aids in ventilation as well as creating public spaces reminiscent of the Islamic urban pattern.	Despite green roofs aleviating the absence of vegetation, these 'jungles of concrete and brick', need greenery at street level for environmental, pyschological, and aesthetic, purposes .
new key players	new key players	new key players
Citizens, developers	Citizens, developers	Urban farmers

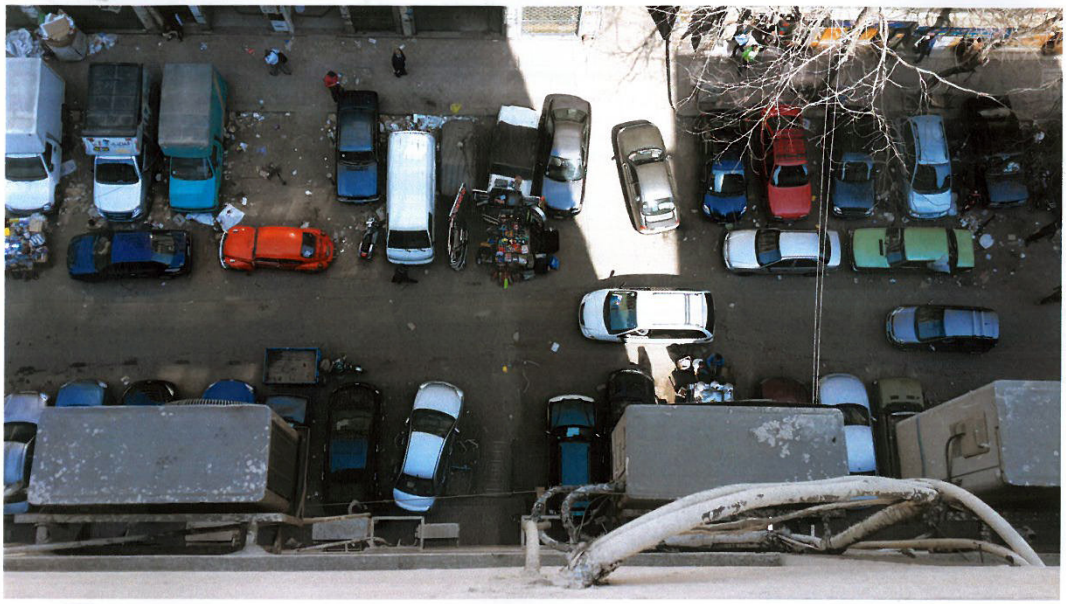
existing diagram / layout / map



new diagram / layout / map / design / photographs of a 3d model



picture / sketch of the pattern



ME

photo credit + source

+ or -

+

pattern

Legal Car Part Shops
Economic Booster

MARYAM
GAZZAZ

name

key players M

MEN - shop owners (powerful)
- vendormen (powerless)

importance rank

1

general problems

TW

general potentials

FEN

description / background

ALTHOUGH SHOP OWNERS ARE DOING GOOD BUSINESS, THEY'RE OVER-SHADOWING THE VENDORMEN WHO WISH TO ESTABLISH THEMSELVES ECONOMICALLY IN EL TAWFIKEYYA. THEY SET UP ON THE SIDEWALKS IN FRONT OF THE SHOPS & BECOME AN OBSTRUCTION TO THE PEOPLE WHILE IN THE MEANTIME COMPLAIN ABOUT PEOPLE INVADING THEIR PERSONAL SPACE. THEREFORE, THEY NEED A STRONG SENSE OF OWNERSHIP.

smaller patterns

--> PARKING OF DIFFERENT TYPES OF VEHICLES:
. SERVICE TRUCKS (LEGAL)
. VENDORMENS' MOTORCYCLE

larger patterns

--> AN ATTRACTION POINT IN DOWNTOWN CAIRO, FOR ANYONE & EVERYONE WHO WANTS TO BUY SPARE CAR PARTS, EQUIPMENT & ACCESSORIES, ETC.

problem / potential

THE PROBLEM EXPLAINED IN THE DESCRIPTION IS ALSO A POTENTIAL. IT IS A PERFECT POTENTIAL TO BE FIXED AND ENHANCED BY AN ARCHITECTURAL SOLUTION. IT IS BETTER TO FIX IT THAN TO ABOLISH THESE CENDORMEN, BECAUSE TAWFIKEYYA HAS A BOOMING ECONOMIC ATMOSPHERE & NEEDS ANYONE WHO HAS THE PASSION TO KEEP IT AND ENHANCE IT.

solution / tool(s) to optimize this pattern:

illustration

tool 1

LEGALIZE.

description

ARCHITECTS + VENDORMEN VISIT THE LEGALIZING BUSINESS OFFICE TO FINISH PROPOSE & EXECUTE DOCUMENTS TO "OWN" THE PORTION OF THE STREET THEY NEED IN ORDER TO SET UP THEIR VENDOR.

new key players

- ARCHITECT +
- GOV' T OFFICIAL +
- VENDORMAN

illustration

tool 2

DESIGN.

description

1 METER WIDE SPACED 90 CM HIGH POSTS AS STRUCTURAL ELEMENTS ON SIDE WALK, USING SIMILAR LANGUAGE AS OTHER AREAS IN DOWNTOWN CAIRO. AFTER SUCCESSFUL WORK, THIS COULD TURN INTO A LONG STRIP OF SHEDS.

new key players

- VENDORMEN +
- PEDESTRIANS

illustration

tool 3

PAY & MAINTAIN.

description

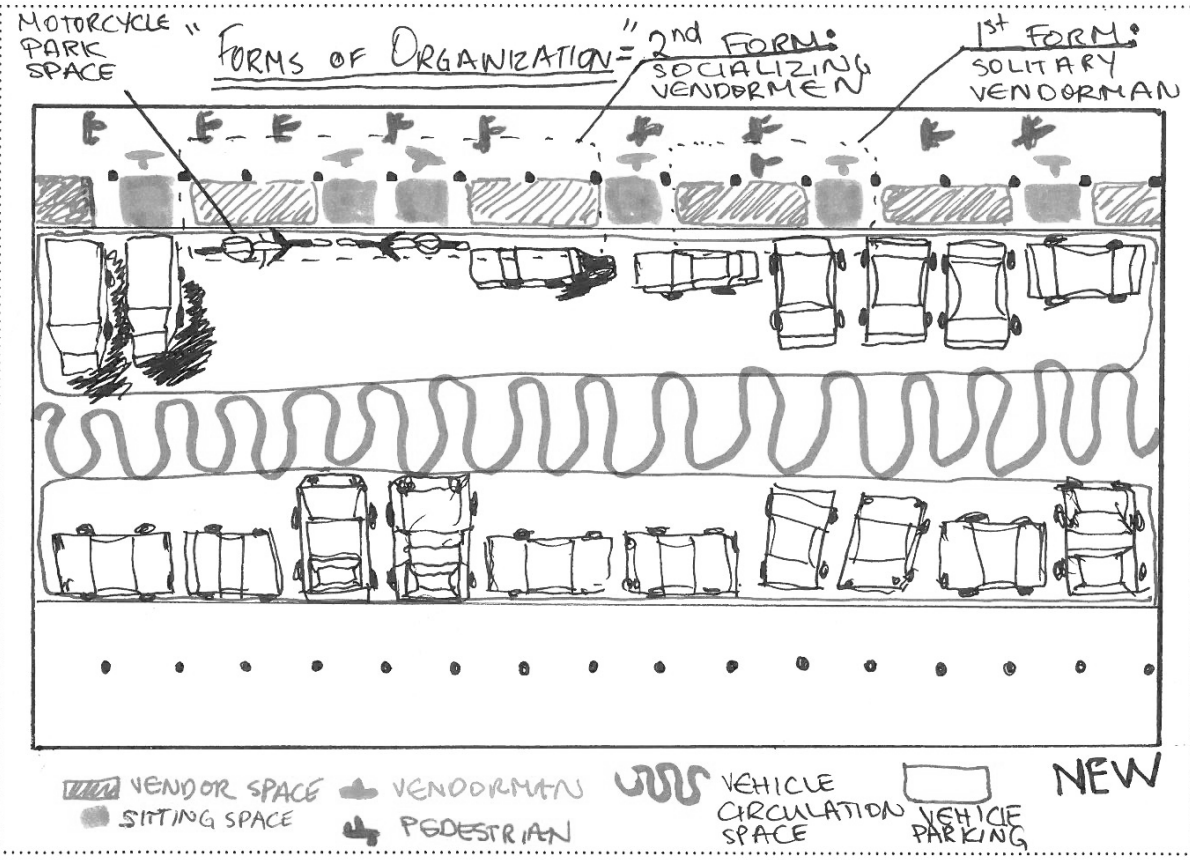
THE VENDORMEN MUST PAY A SMALL FEE TO BOTH KEEP THEIR PLACE FOR THEMSELVES, WORK IN IT & MAINTAIN IT. ARCHITECTS WILL PAY VISITS TO STUDY FUTURE PATTERNS & GOV' T OFFICIALS WILL ENSURE EVERYTHING IS UNDER CONTROL.

new key players

- ARCHITECT +
- GOV' T OFFICIAL

existing diagram / layout / map

new diagram / layout / map / design / photographs of a 3d model



picture / sketch of the pattern

Taken by Nadia Abotaleb,
on May 29, 2015

photo credit + source

+ or -

-

pattern

Undefined market edge

Nadia Abotaleb

name

key players m

Market sellers and users, passers-by, vehicles' drivers

importance rank

Medium

description / background

El Moneera Market is a two-lane street in Embaba. Each lane has sellers on both sides, allowing only one car to pass. "Formal" vehicular realm boundaries are pushed inwards causing traffic jams, while the pedestrian realm is left undefined.

general problems

1 - Vehicular traffic jam
2 - Undefined pedestrian realm
3 - Unshaded pathways

smaller patterns

Market organization

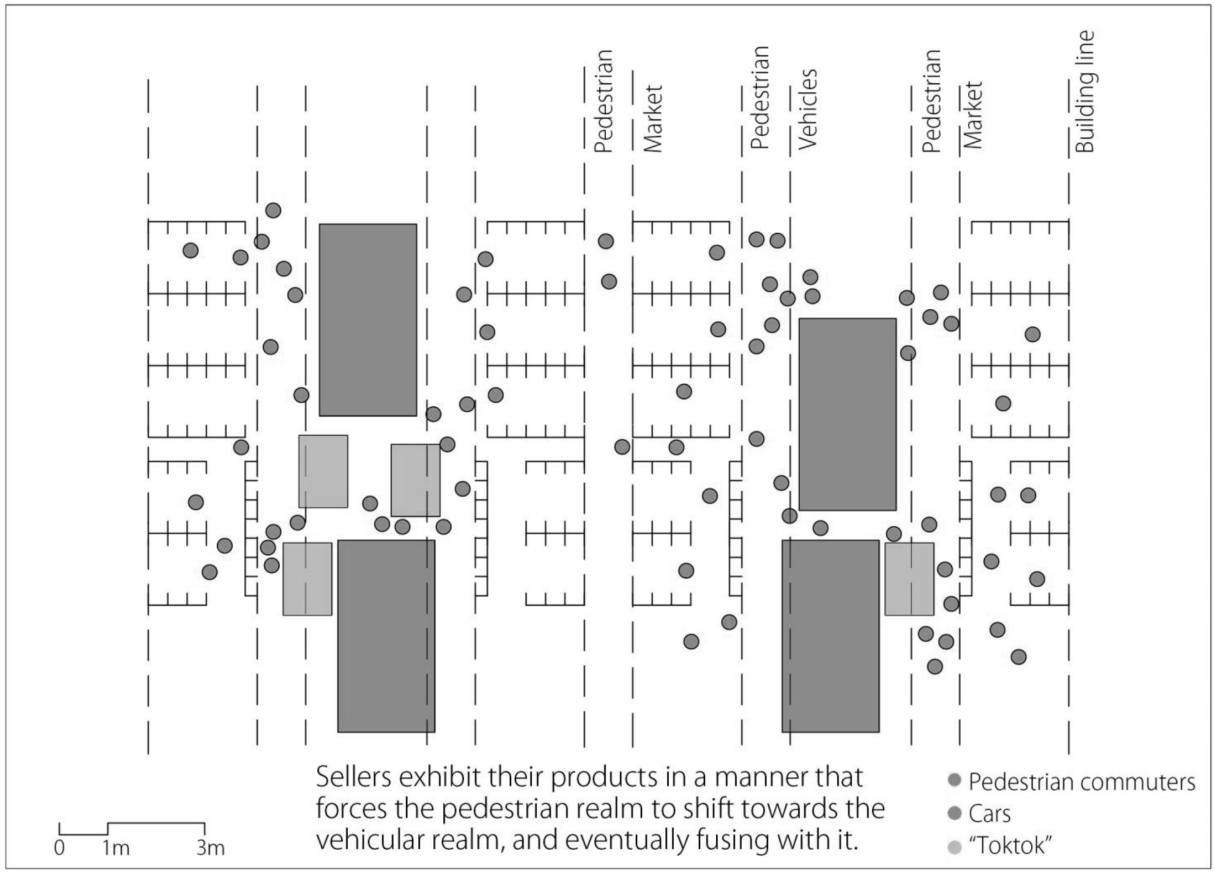
general potentials

1 - Enhancing micro-economy

larger patterns

Micro-economy of el Moneera Market. Vehicular and pedestrian circulation of El Moneera street.

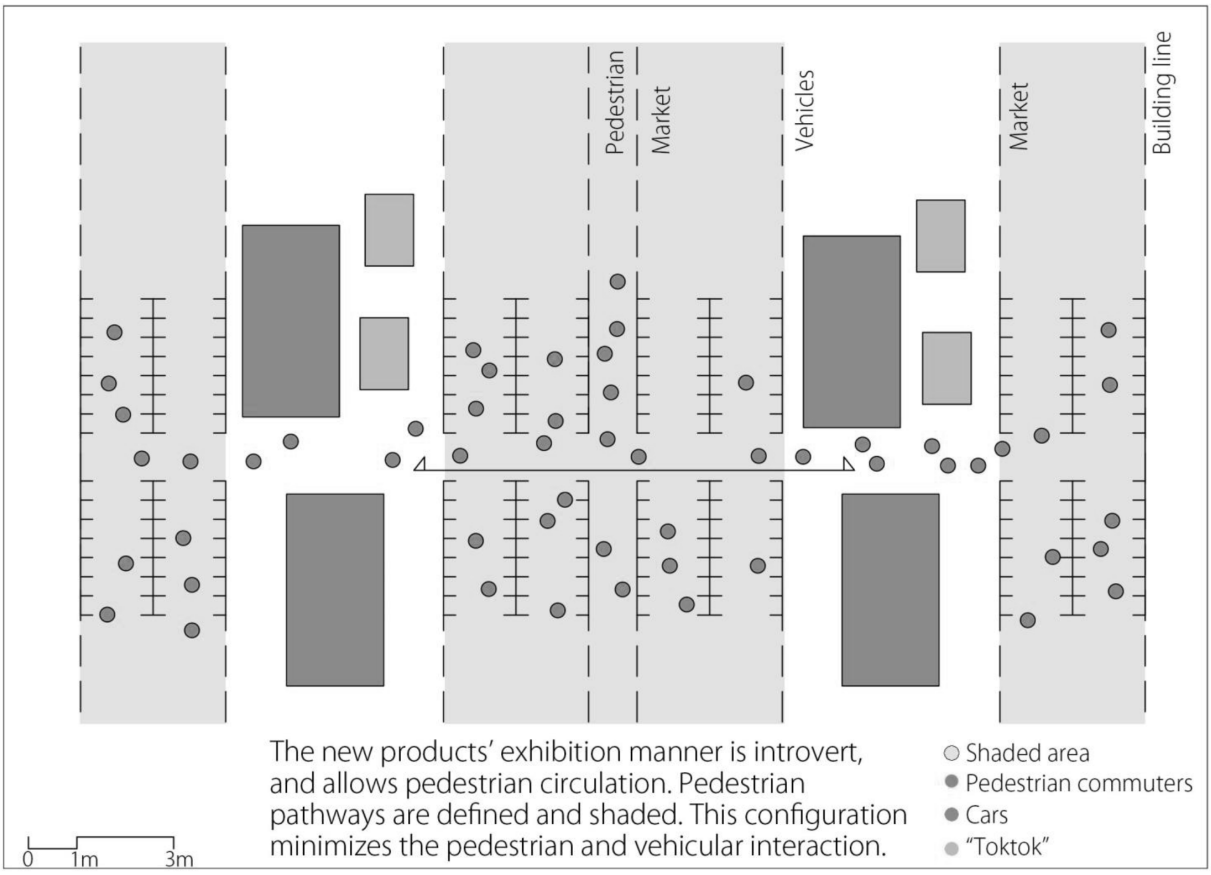
existing diagram / layout / map



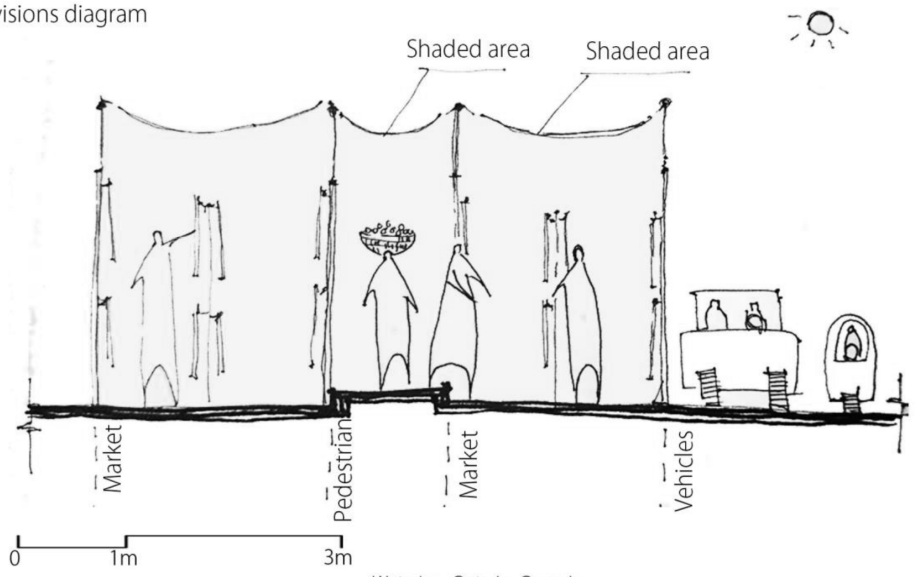
existing realms division

Vehicular realm
Pedestrian realm
Market

new diagram / layout / map / design / photographs of a 3d model



suggested divisions diagram



picture / sketch of the pattern

1.

2.

3.

4.

5.

Heba El-Sawy

photo credit + source

+ or -

+

pattern

Territoriality

Heba El-Sawy

name

key players [m]>[f &ch]

Permanent and Temporary Street Vendors, TocToc Drivers, Microbus Drivers, Informal Transporation Mangers

importance rank

High

general problems

D G S T C I

general potentials

N M F E P S

description / background

-Informal businesses require boundaries to mark their territory to establish themselves and gain economic and social stability
1. Temporary street Vendors mark their territory on the pavement
2. Semi-permanent street vendors mark shop boundaries using concrete cobbles, cane cages, and umbrellas
3 and 5. Toc Toc and microbusses parking marked using traffic cones and vehicles themselves
4.. Kiosks mark their boundaries using their own merchandise
5. Macro: usage of gateways (train crossing and mazla'an), vertical transporation (underneath bridges and stairs), nodes, and intersections that act as a hub that hosts informal bussiness; this hub itself on a macro scale marks a boundary

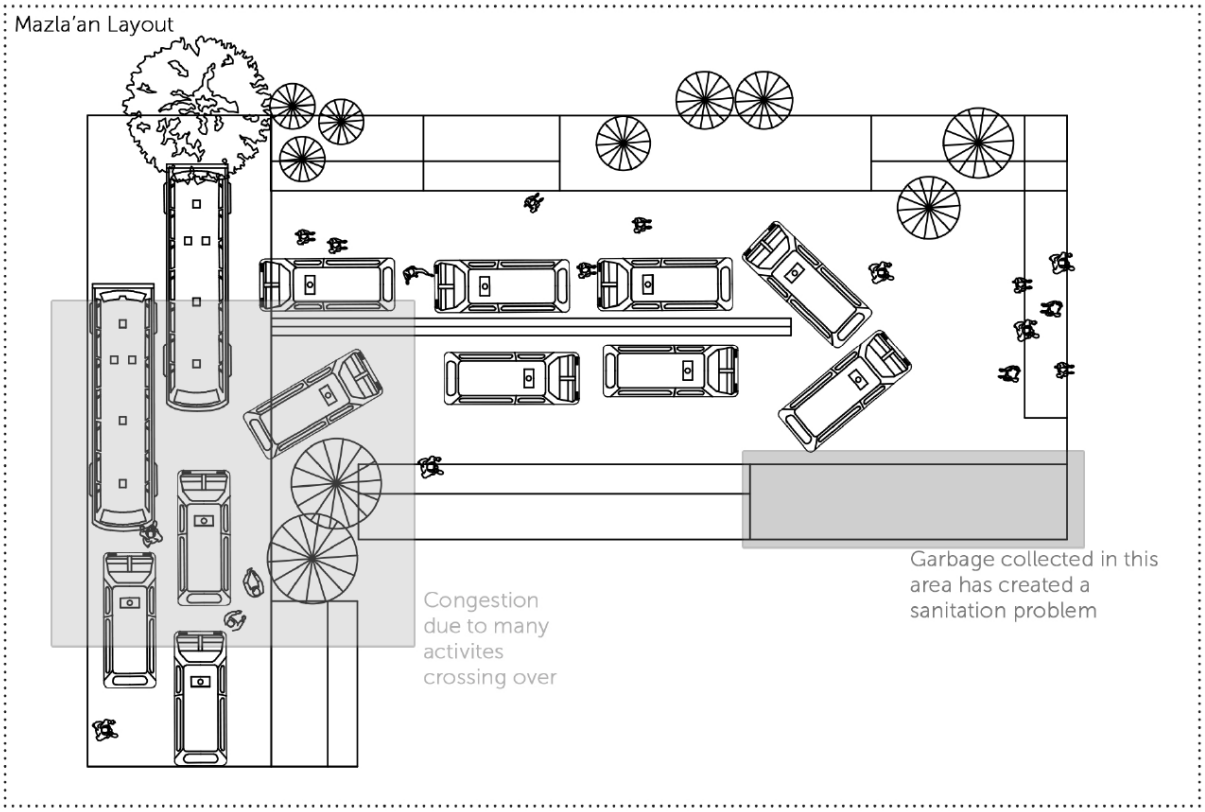
smaller patterns

#cobblesandcagesboundaries #umbrellamarketing
#markingsonthepavement #vendorspillovers
#definingboundaries #merchandisewalls
#informalparkinglots #toctocparking
#microbusmanagment

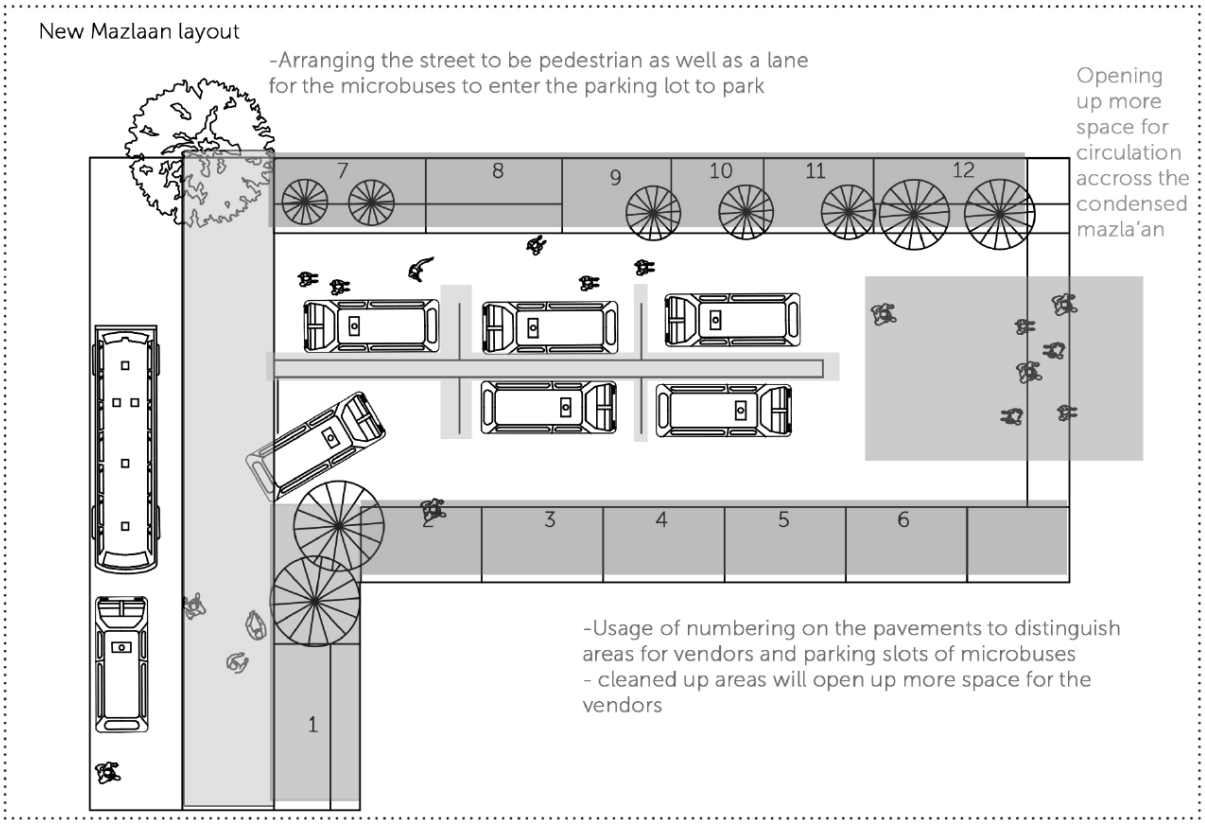
larger patterns

#mazla'anmagnet #hubunderthebridge
#marketcommunity

existing diagram / layout / map



new diagram / layout / map / design / photographs of a 3d model



problem / potential

illustration

-hazardous and misplaced vendor boundaries

illustration

Congestion due to cross over of:
-street vendors
-microbus parking entrance
-vehicular road
-pedestrian paths

illustration

Sanitation Problem

solution / tool(s) to optimize this pattern:

description

The solution involves marking terriorty for all the vendors, so that misplaced materials that could potentially cause harm are not used.

description

Reorganizing the area as illustrated in the illustraion on the left hand side of the page.

description

The solution to the problem is clean up, cleaning up the area will create a more hospitable environment for the businesses that are run here, and open up more space for vendors

picture / sketch of the pattern

Grigorios Dimitriadis

photo credit + source

Waterloo, Ontario, Canada, 2015
© Nada Nafeh 2015

+ or -

-

pattern

limited facade openings

Maya Kazamel

name

key players: m

building owners, contractors

importance rank

high priority

general problems

H- Health D H

general potentials

N

description / background

Many buildings in Ard el-Liwa are built without openings in the facades which are seen as an invasion of privacy and a waste of precious wall space, resulting in buildings with entire solid walls and only occasional openings

smaller patterns

windows and openings

larger patterns

informal building practices
macro-economics of land ownership and construction
health in informal areas

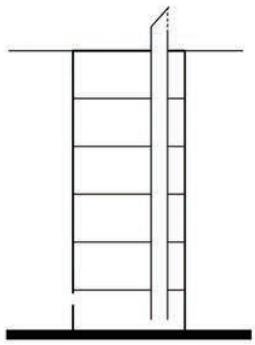
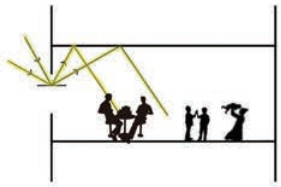
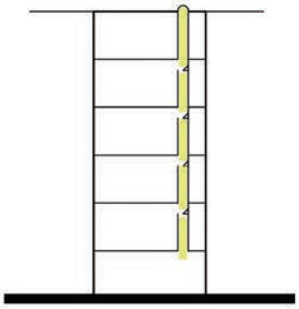
Waterloo, Ontario, Canada, 2015

© Nada Nafeh 2015

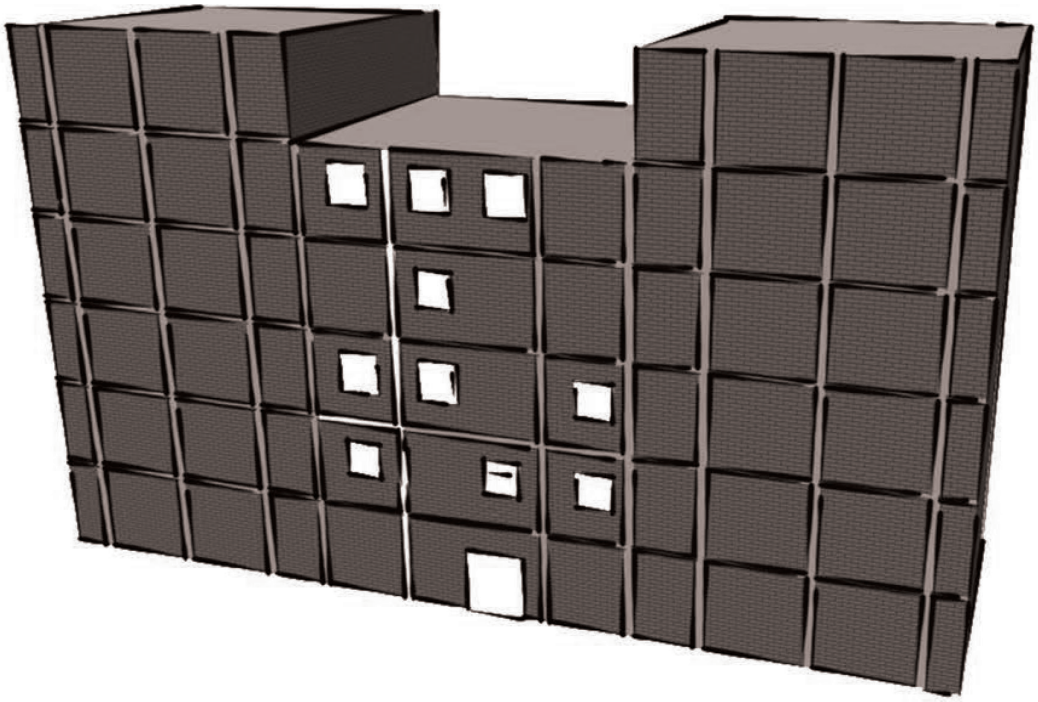
problem / potential

Building apartment buildings with limited windows is a widespread practise in informal areas. While the main facade often has windows and balconies, the side facades generally have none and may be stuck to other buildings. This maximises the available interior wall space but also prevents the entry of fresh air and sunlight. The practise of building on entire land plots without setbacks to maximise floor area and profits further exacerbates this problem. Light wells are generally very small and used for ducts as well, limiting their ability to allow in light or air. Therefore there is a need for an intervention to allow light and air inside buildings while maintaining privacy.

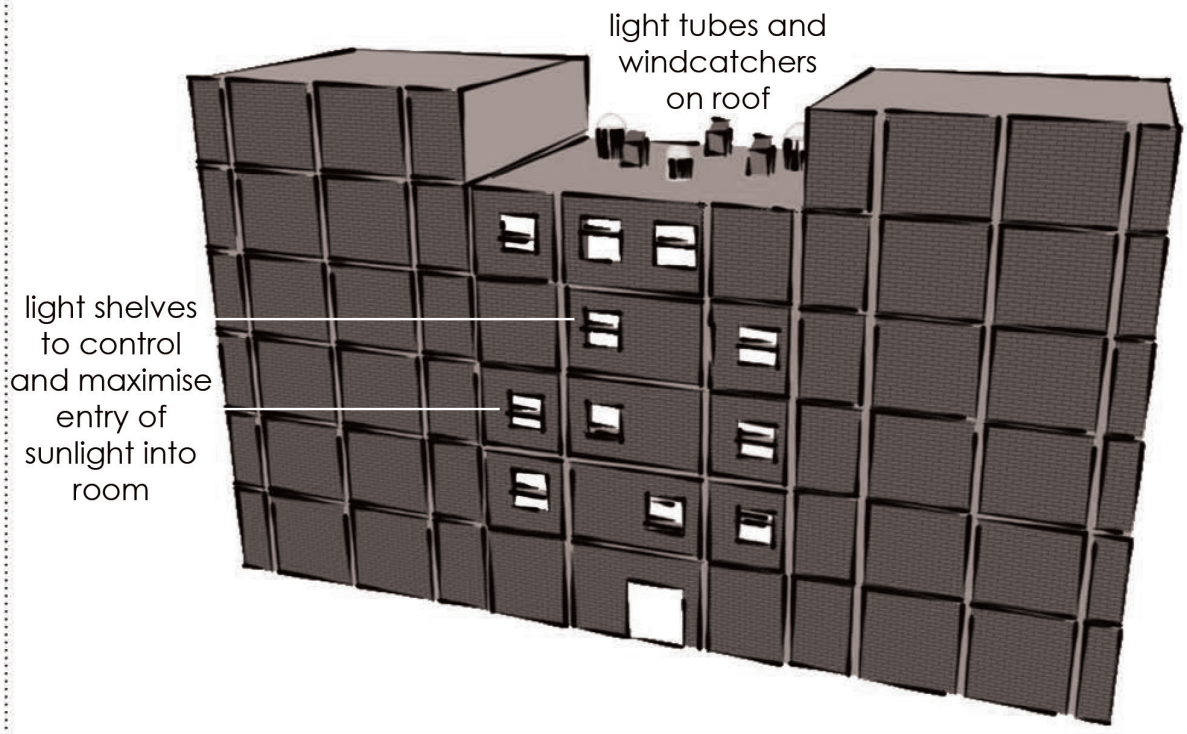
solution / tool(s) to optimize this pattern:

illustration	illustration	illustration
		
tool 1	tool 2	tool 3
windcatchers	light shelves	light tubes
description	description	description
Inserting ventilation shafts that can also act as light-tubes. Similar to the Islamic windcatcher, this can be optimized to open/ close on different floors individually operated by residents	Maximising upon existing windows, light shelves can allow light deeper into spaces by using reflective materials. This is easy technology and can be used by residents to control the amount of light entering based on the time of day	Similar to the windcatchers, light tubes can introduce light into the building without changing the facade.
new key players	new key players	new key players
Residents Workers, Craftsmen	Residents Craftsmen	Residents

existing diagram / layout / map



new diagram / layout / map / design / photographs of a 3d model



04 [in]formal pattern language

a guide to **Handmade Improvitecture©** in Cairo

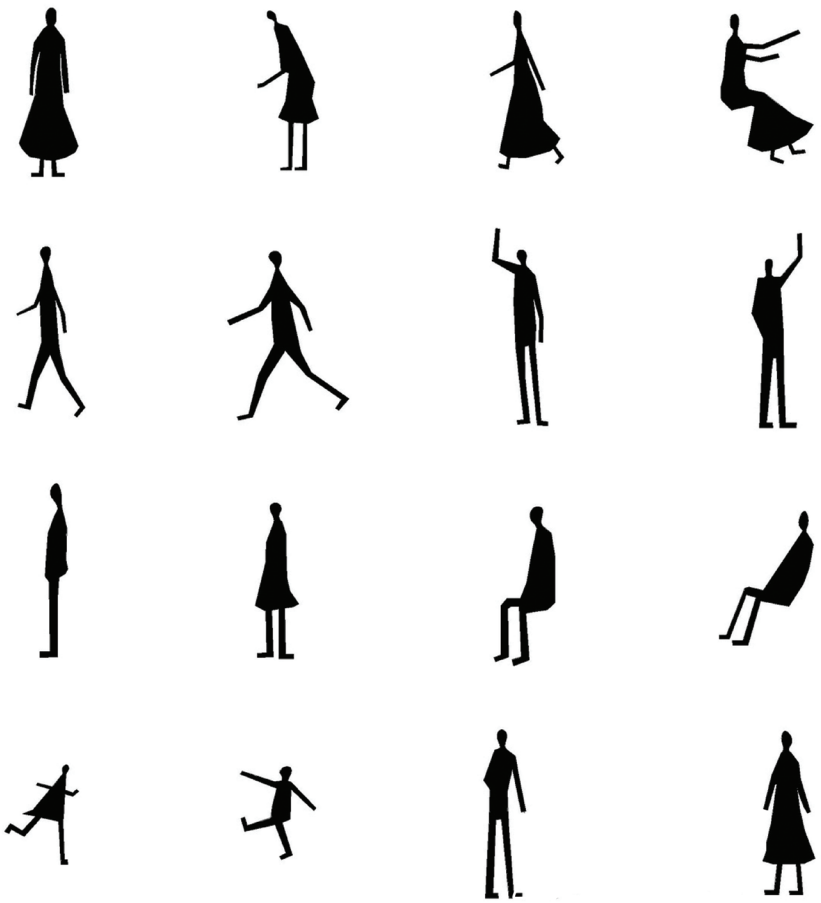


Figure 4.1 SANAA human figures

[in]formal Pattern Language starts by zooming in on the 101 documented local patterns during the workshop, followed by a step-by-step guide on how to optimize a pattern. The manual then, presents an analysis of forces and an overview of Improvitecture tools.

For the purpose of this thesis, the three most influential patterns were selected by the thesis author to demonstrate how the manual should document, analyze and optimize patterns. Patterns were chosen to represent different scales and categories.

The proposed designs intentionally address more than one pattern, because patterns are interlocked and co-exist. The designs are an embodiment of the Improvitecture tools and forces extracted from pattern templates and the workshop. The urban farm installed on Save the Children rooftop during the workshop serves as a prototype for optimization. Similar to the workshop, designs are conceived to be built with few available resources and local skills. They are not only developed to contain existing activities and patterns, mapped from the workshop, but also activate patterns from other categories on the matrix, accommodate future informality and serve as frameworks for directed improvisation.

BUILT ENVIRONMENT

BUILDING CLUSTER

shared walls

shared in between spaces

neighborhood watch

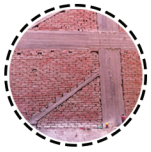
BUILDING

cantilevered building typology

incompleteness

standardized apartment designs

workshop building typology



unfinished facades

building heights

exhibition building typology

light wells

limited openings

public buildings

light weight extensions

ROOFTOPS

sandwich city

breeding animals

connected roofs

pigeon towers

vertical extensions

small roof gardens

residential shacks

satelite dishes

micro-economies

an extension of the home

a play ground

garbage dump and storage

ELEMENTS

repetitive building addresses

balcony drapes

the laundry theory

exposed electrical wires

basket

VOIDS

REMAINING AGRICULTURAL LAND

waiting agricultural land

a garbage farm

planting steel re-bars

construction on agricultural land

URBAN VOIDS

COMMUNITY OWNED

BORDERS

vendors at gateways

announcements at gateways

pedestrian bridges

access to highways

STREET

main roads follow canals

street width

dead ends

an extension of the home

a showroom

a space for ceremonies

an extension of the workplace

PRIVATELY OWNED

MARKET

street cafes

a meeting point for the community

urban void as a soccer field

a playground

formal retail

urban void as an amusement park

some trees

street vendors

large urban void as a car parking lot

charity water

mobile vendors

small urban void as a toktok parking lot

street lighting

delivery man

urban void as a garbage dump

friday prayer

multi functional flexible display

activity nodes -C

shading devices as boundary definition

night life - C

undefined edge

amusement park

VOIDS

LEFT OVER SPACES

UNDER THE BRIDGE

bus stop

toktok waiting area

garbage dumps

job hiking

NO MAN'S LAND

ownership and territoriality

appropriated parking lots

garbage dumps

night cafes

[IN]FORMAL NETWORKS

committees

economic networks

negotiations between vendors

transportation networks

recycling networks

food networks

learning networks

credit system

construction networks

SERVICES

a network for the marginalized

schools

roba bekya

children everywhere

art facilities

delivery toktok

communal eating

repetitive need for a hospital

paving streets

work partnership

internet cafes

toktok

micro-bus

car and toktok services

water and electricity cuts

micro-economies around the corner

AN ANALYSIS OF FORCES

Based on the fieldwork conducted during the workshop, the following diagrams were prepared to quantify driving forces behind the 101 documented local patterns. The objective was to identify and communicate the most influential forces, which then should be given priority while optimizing patterns. Percentages were calculated by comparing the occurrence of a force in relation to the total forces.

The analysis revealed that the presence of forces is mostly recognized in the market, followed by the street, [in]formal networks, rooftops and building elements (Figure 4.2).

As seen in Figure 4.3, patterns are mostly created as a response to immediate needs and are self-generated interventions. Ownership and economic forces are the second most influential forces on patterns. Environmental forces have a little effect on patterns, which means that they are not important, not recognized or neglected by community members. While the first statement is likely wrong, the second case requires more fieldwork and creating awareness for environmental issues. The third case complies with the typical characteristics of informality in pursuing immediate needs and neglecting the consequences of such actions on the environment.

Alexander proposes, “the more living patterns there are in a place, a room, a building, or a town - the more it comes to life as an entirety, the more it glows, the more it has self-maintaining fire.”[66] Overlaying this statement with the findings, one should, therefore seek to combine and introduce the most influential forces in a design intervention for the generation of more patterns. Design objectives should therefore nurture the most influential forces, and address missing needs, generate economic opportunities and new partnerships, and strengthen the residents’ sense of ownership. They should also compensate for the missing link between environment and patterns by fostering green sustainable values.

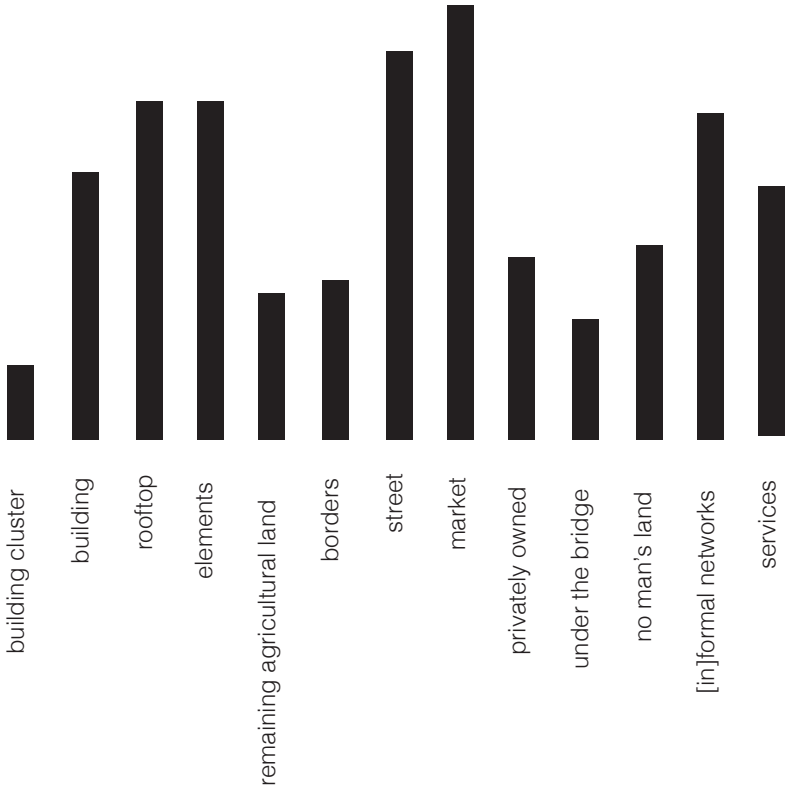


Figure 4.2 Presence of forces in each category

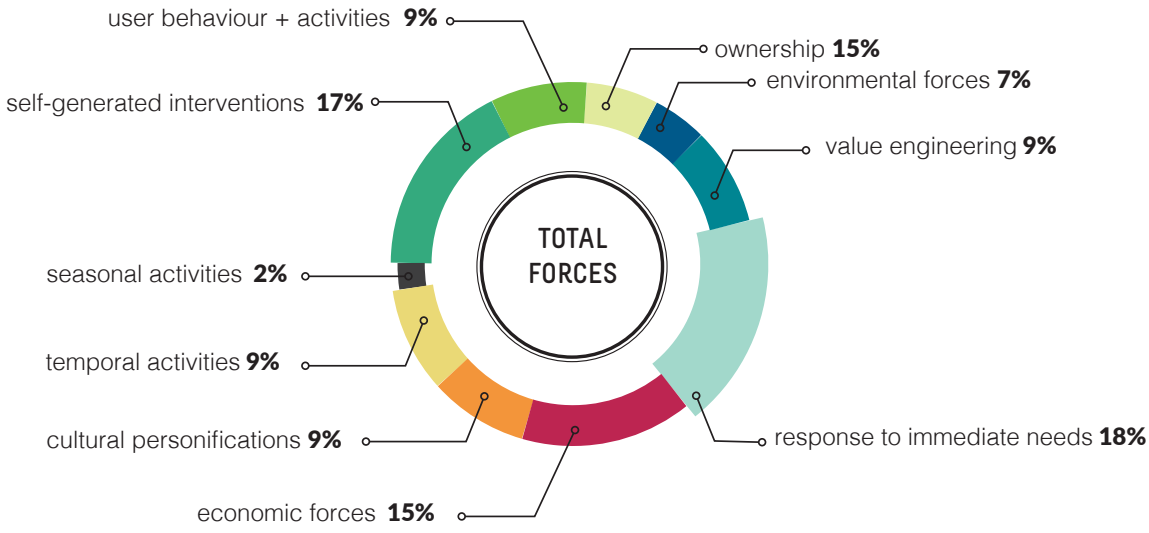


Figure 4.3 Quantifying the influence of forces

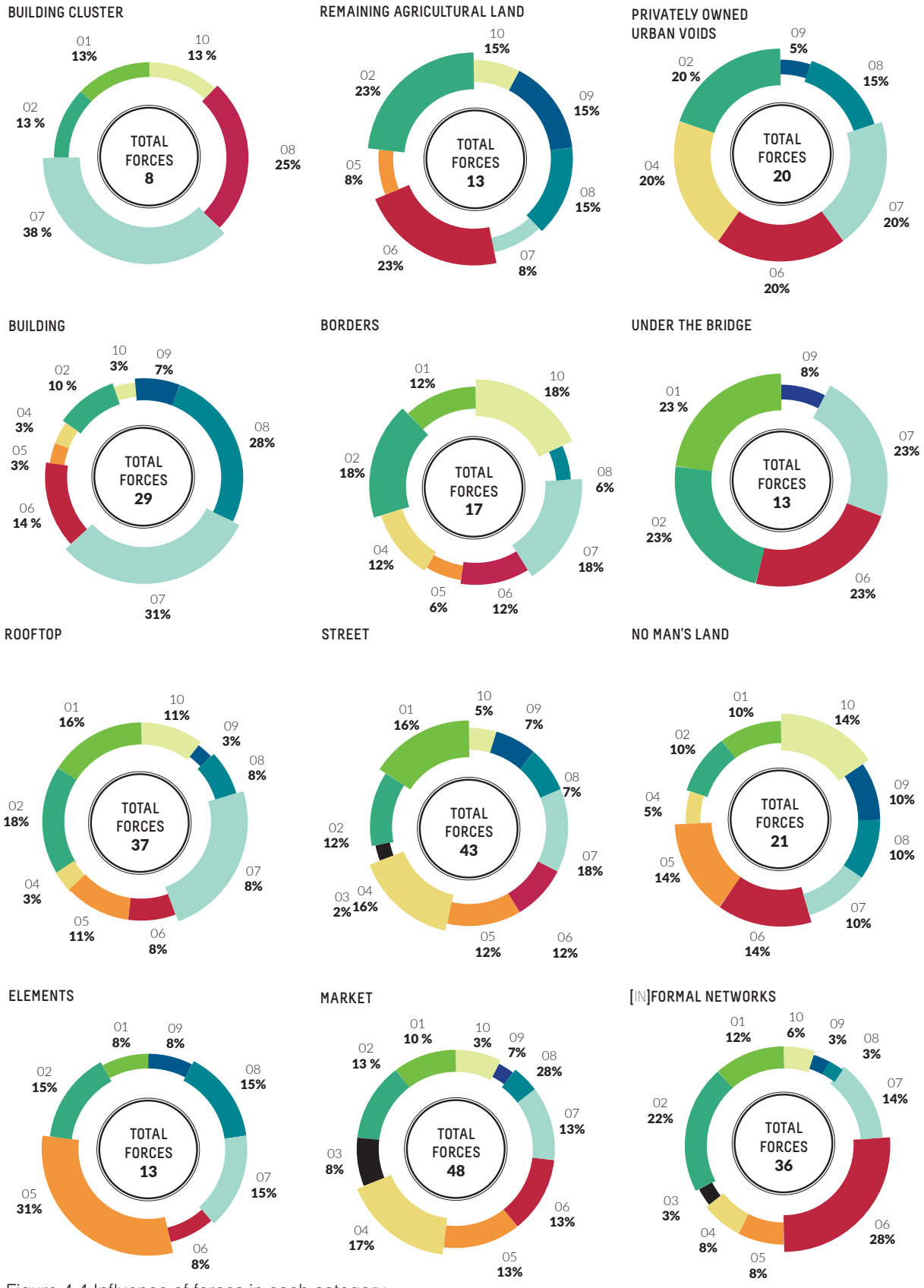


Figure 4.4 Influence of forces in each category

HOW TO OPTIMIZE A PATTERN?

As proposed optimization needs to promote the continuity of existing patterns, yet in a more sustainable way, it is crucial that design objectives reinvigorate the forces that created the patterns.

For this reason, the following section was developed to illustrate how design decisions should be made. The Pattern-Forces-Design Objectives Chart (Figure 4.4) guides community members and designers in tracing design objectives from forces and existing patterns. Once this step is done, Improvitecture tools should be selected from the compiled toolkit to realise the design objectives and complete the optimization process.

When utilizing the Pattern-Forces-Design Objectives chart, move from the inner circle to the outer circle (Figure 4.2). The inner circle is the pattern, the second circle the forces and the outer circle the design objectives.

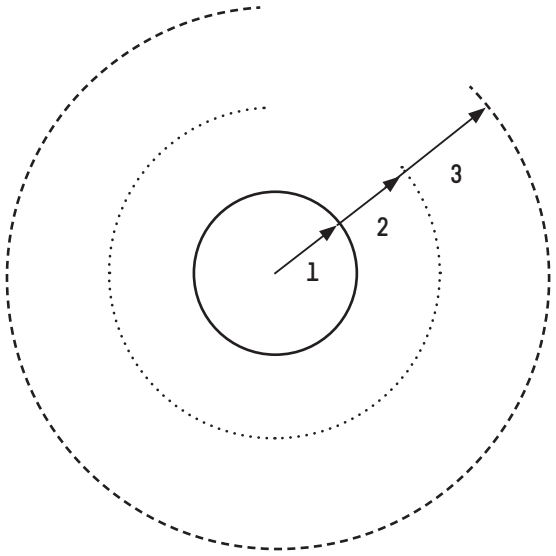


Figure 4.5 Reading the Pattern-Forces-Design Objectives Chart

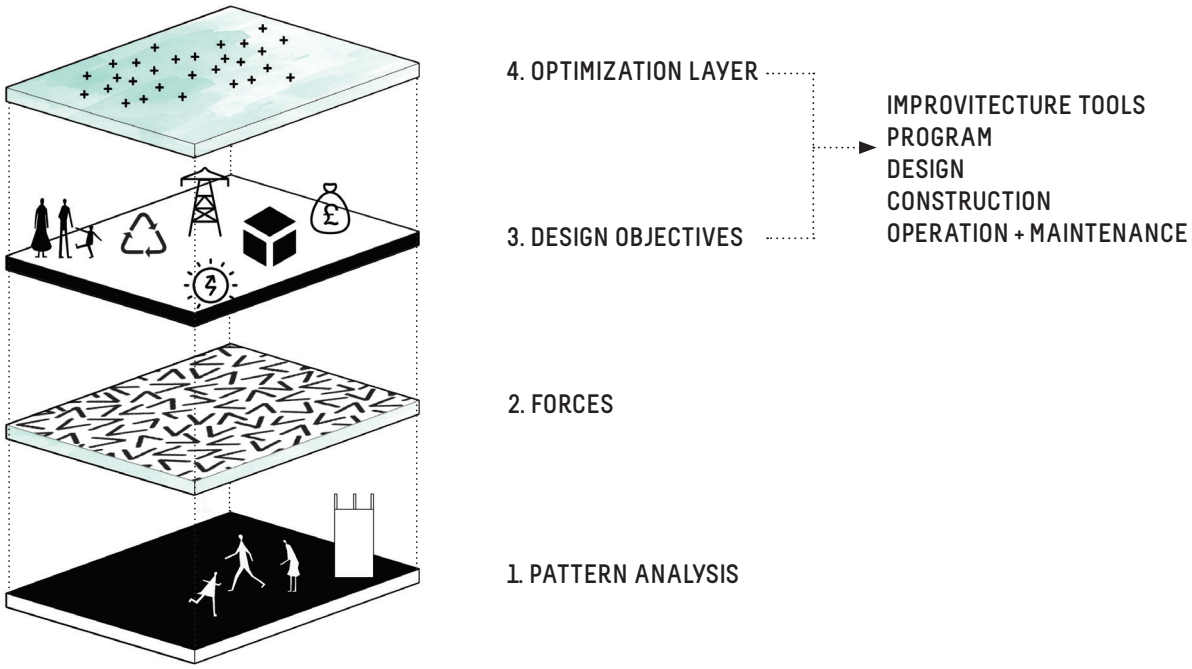


Figure 4.6 How to optimize a pattern?

STEP 1: PATTERN ANALYSIS
Undergo a pattern analysis using the pattern template and identify key players, related patterns, etc.

STEP 2: FORCES
Determine the forces that contribute to the creation of the pattern.

STEP 3: DESIGN OBJECTIVES
Using the chart on the right, compile design objectives that correspond to the forces determined in Step 2.

STEP 4: OPTIMIZATION LAYER
To optimize your pattern, add the missing physical and social infrastructure as well as sustainable values to the compiled list of design objectives and existing program to create hybridized systems.

..... Forces
------- Design Objectives

SELECT + GENERATE IMPROVITECTURE TOOLS
Select tools from the improvitecture toolkit and/or self-generate new tools that realize your design objectives assembled from Step 4 and 5. Translate design objectives into program. Think about construction, operation and maintenance. Flexible, hybrid and adaptive systems need to be designed to comply with the complex urban context. Improvitecture tools need to address social, cultural, legislative and environmental dimensions, local skills, and individual and collective needs.

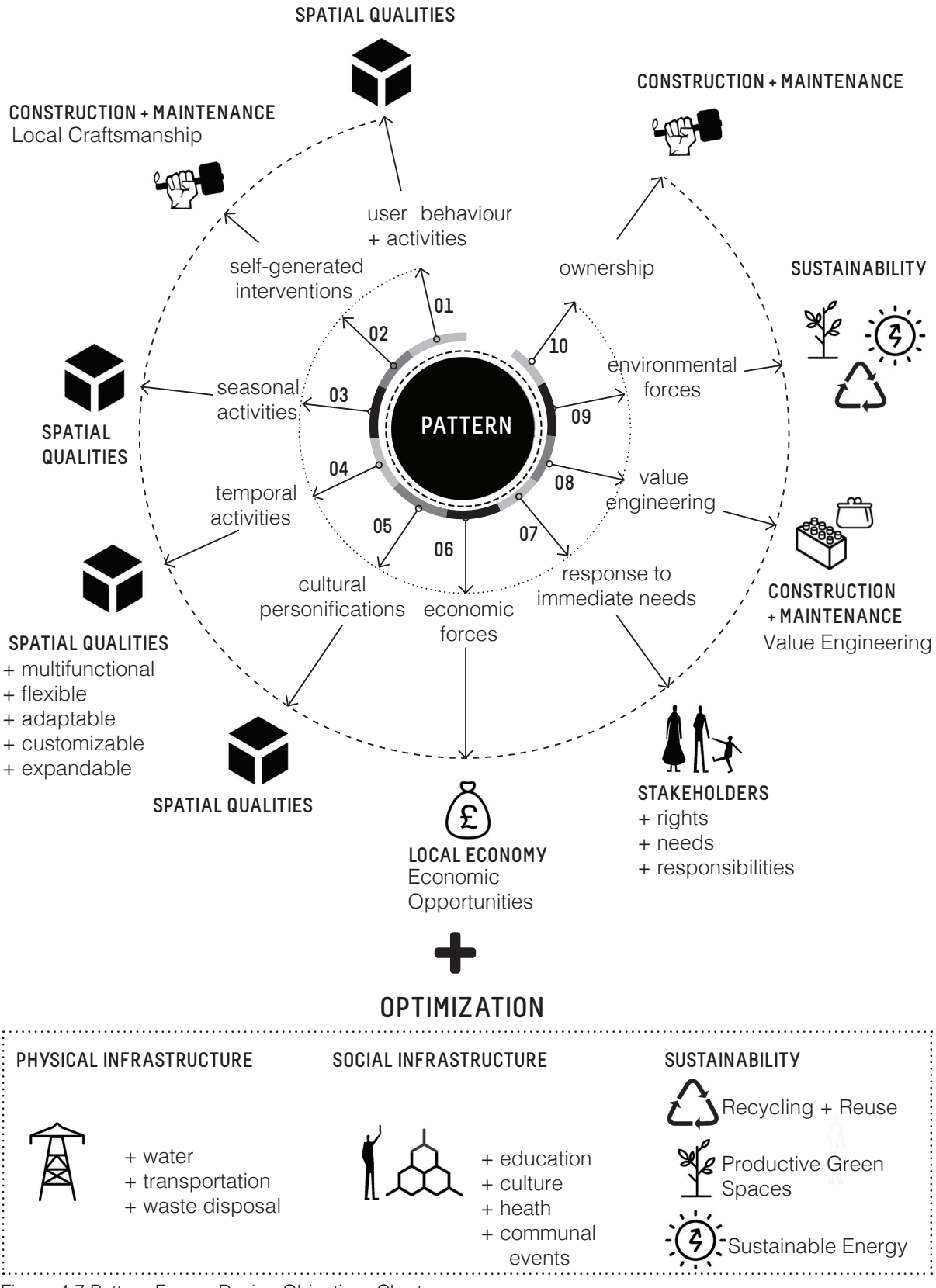


Figure 4.7 Pattern-Forces-Design Objectives Chart

Figure 4.8 Swing ride in Ard El Lewa

THE IMPROVITECTURE TOOLKIT

Improvitecture tools are actions to realize the compiled design objectives. They are proposed tools to optimize current and future [in]formal practices, while empowering communities and celebrating their improvisation. Optimization occurs in the sense of rearranging and making the most effective use of existing patterns, while providing general regulations that make patterns more sustainable. The tools address global interventions, in respect to legislation and securing remaining agricultural land, but are more focused on providing small-scale design interventions that can be implemented by individuals. This is due to the locality of the conducted fieldwork. In general, Improvitecture tools propose hybridized systems that combine physical and social infrastructure, and a more efficient use of urban space, such as vacant incomplete structures and urban voids.

Similar to compiled patterns, Improvitecture tools need to be constantly updated, and are ordered under four main categories: legalize and secure, cultivate, [re]appropriate and [re]use, celebrate and maintain. These categories are designed to guide community members, designers and authorities throughout the process, from preparing for a participatory intervention, to design and operation.

One of the most important aspects of the Improvitecture toolkit, is the fact that it was self-generated, mainly by community members and architecture students. Tools were extracted and compiled from the established theoretical framework, interviews with community members, pattern templates and the workshop. As seen in the following pages, tools follow the same format for clarity. Every tool is inscribed with the name of its creator, and has a number, an instruction, an illustration and, finally, a short a description.

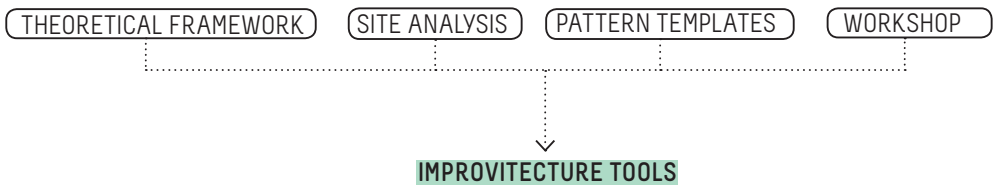


Figure 4.9 Extracting Improvitecture tools

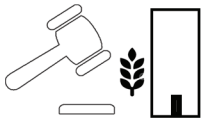
IMPROVITECTURE TOOLS

LEGALIZE + SECURE

1.1 *Yahia Shawkat*

change land and housing laws

"Laws governing land and housing tenure must be changed, economic and built-environment policy must be rewritten"
- Learning from Cairo

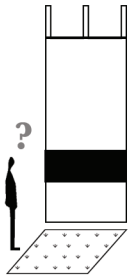


Change rigid agricultural laws and taxation imposed on farmers that makes them sell their land for construction.

1.2

negotiate ownership + tenure rights

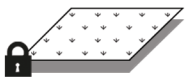
Negotiate ownership and tenure rights than secure them by law.



1.3 *Nadia Abotaleb*

preserve existing vacant land

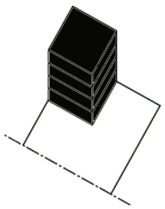
Preserve existing agricultural land and urban voids by law that forbids construction.



1.4

secure an open space ratio

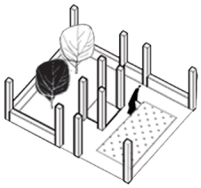
Secure an open space ratio for future construction and compliance with building codes in order to expedite the process towards formalization.



1.5 *Nadia Abotaleb + Hammad*

green roofs by law

Pass a law that requires each building constructed on agricultural land to have a green roof. Lost agricultural land can be compensated either vertically or efficiently using the wasted roof scape.



1.6 *Mariam Gazzaz*

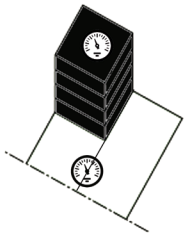
rent portions of the street

Architects should design spaces along the street for street vendors to rent without disturbing vehicular and pedestrian activity. In return street vendors should pay a monthly fee which equals to a negotiated percentage of their profit to the government.

1.7 *Mariam Tawfik*

shared but separate electric meters

Urban void renters often connect illegaly to the electrify of adjacent buildings, which overburdens the system and residents with a higher bill. Add a separate electric meter in urban voids, rented as a parking lot for cars and toktoks, soccer field or amusement park. Electricity bills have to be shared among urban void renters and residents or workshop owners.



CULTIVATE

1.8

formalize the [in]formal

Formalize improvised [in]formal transportation services by providing toktok and micro-bus transits, a numbering system and licenses for toktoks to operate within [in]formal areas.

2.1

cultivate curiosity in the young first

Before starting any development project cultivate curiosity of the residents first, especially children and youths. Events like workshops, exhibitions and small installations are important to test the residents' skills, cooperation and available resources.

2.2

reclaim vacant spaces with neighbours' needs

Negotiate stakeholders' rights, needs and responsibilities before appropriating vacant spaces such as urban voids, remaining agricultural land and incomplete structures with the missing needs and infrastructure.

2.3

cultivate partnerships first

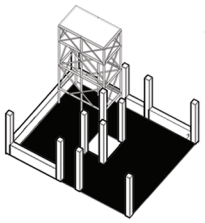
Before starting any development project, cultivate partnerships to meet mutual goals. If a new constructed community hub is being provided, collaborate first with community members who offer the targeted service in order not to create competition and reduce their revenues. If they do not wish to collaborate, cultivate new partnership.

[RE]APPROPRIATE + [RE]USE

3.1 *Heba El Sawy + Mohamed Mostafa*

cleaning creates space

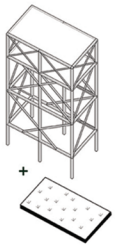
Collaborate with your neighbours and clean up your rooftop from garbage and unused material to create space for micro-economies, social activities and urban farming.



3.2

combine pigeon towers with urban farming

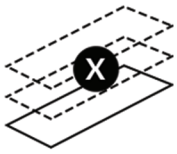
Use the structure of the pigeon tower to create hybridized green towers that include the following program: pigeon breeding + hydroponic system + planter beds + seating areas.



3.3

multiply land-use

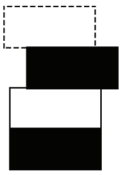
Think of ways to multi-play land-use of your plot by combining different income generating and social activities.
Example: green roofs, vending kiosks, classrooms, nurseries, health centers, workshops, solar energy and waste management facilities.



3.4 *Ehsan Aboushadi + Mai Mahmoud*

vertical distribution of activities

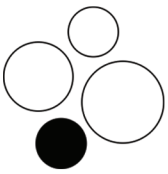
In response to the dense urban environment, vertical distribution of activities increases efficiency while maintaing existing functions.



3.5

[re]shuffling program helps

Sometimes it's all about reshuffling program. Group similar activities that produce a lot of waste like animal breeding together and separate them from others. Create separate zones that respond to different needs.



3.6

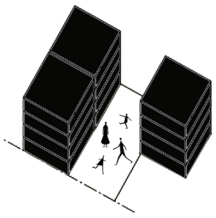
swap properties for public interest

Swap properties to combine adjacent vacant land in order to create larger communal hubs.

3.7 *Kawsar Youssef + Ehsan Aboushadi + Mai Mahmoud*

transform urban voids into communal hubs

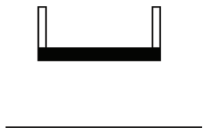
Urban voids currently used as parking lots, amusement parks and soccer fields are ideal to fill the lack of public spaces. Transfer urban voids into communal hubs that offer educational, health, social, urban farming and economic facilities. This should increase revenues for land owners and prevent future residential construction.
Urban farming promotes micro-economies and creates a green pocket amongst the brick architecture. Encourage residents to open more windows in surrounding buildings to maximise exposure.



3.8 *Mai Mahmoud*

occupy space below the bridge

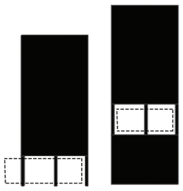
Space below the bridge should not be a neglected and full of garbage. Using light weight structures create enclosures for the missing infrastructure such as washrooms, pray areas, kiosks, storage and waiting areas for buses.



3.9

borrowing space - legal sprawl

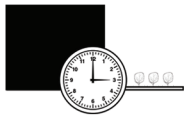
Incomplete structures can be optimized as a plug-in system for temporary classrooms, micro-economies,showrooms and exhibitions. Like urban voids, they should be rented to generate income for both building owners and renters.



3.10 *Nadia Abotaleb + Nada Nafeh*

urban time share

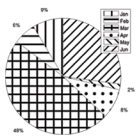
Transform public buildings like schools after operating hours into vocational and community centres. The rooftop and the school court during summer time provide space for urban farming. Urban farms should be maintained by the students and school concierge.



3.11

respect existing multi-functionality

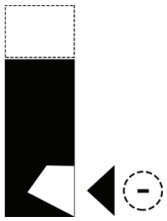
When [re]appropriating a space respect existing program, informality and other stakeholders. Negotiate needs, rights and responsibilities.



3.12

carve but offset

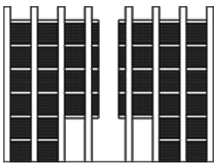
For public interest, transform lower floors of residential buildings into open and flexible spaces that accommodate communal activities and micro-economies. Add removed floors atop the same or adjacent buildings.



3.13 *Ehsan Aboushadi*

enlarge recess

Push the recess to the back and give it double height. This allows for more activities. a space for informal micro-economies and less congestion, and improves ventilation due to a larger volume of air.



3.14

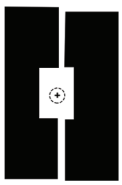
negotiate air rights

The owners of 1-3 storey buildings can sell or rent the space above their buildings to adjacent buildings allowing them to expand in its place. This offers expanded buildings a larger rooftop area, that can be optimized through urban farming and solar energy harvesting.

3.15 *Ehsan Aboushadi*

create [+] urban pockets

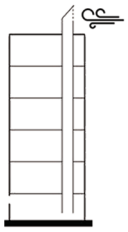
Every couple of buildings should make way for an urban pocket or courtyard which aids in ventilation as well as creating positive semi-public spaces.



3.16 *Maya Kazamel*

windcatchers

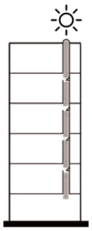
Add windcatchers to existing shafts to increase ventilation. Windcatchers direct airflow inwards if they are facing prevailing wind. They can also operate differently by directing airflow upwards using a wind-assisted or solar-assisted temperature gradient.



3.17 *Maya Kazamel*

light tubes

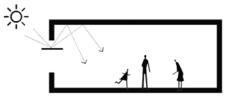
Light tubes introduce more light into the building while maintaing privacy and without changing the facade.



3.18 *Maya Kazamel*

light shelves

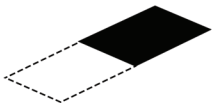
Optimizing existing windows, light shelves direct light deeper into spaces by using reflective materials. Flexible light shelves offer residents a low-cost way to control desired amount of light entering their apartments based on the time of day. Lightshelves can also be used to direct light downward into narrow dark streets.



3.19

connect + share rooftops

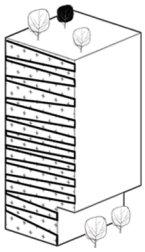
Connect rooftops using portable platform. Connected rooftops provide residents with a larger shared area for urban farming and other activities.



3.20 *Ehsan Aboushadi*

green walls + green roofs + green streets

In addition to green roofs and planting trees in streets, unfinished facades with few openings should be utilized for installing hydroponic systems or planting climbing trees. Our 'Concrete jungles' need edible greenery for self-sufficiency, environmental and aesthetic purposes.



3.21

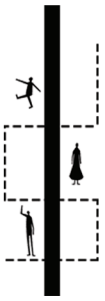
satellite dishes on the edge

Group satellite dishes and install them on roof fences to save space for micro-economies and urban farming.

3.22 *Abdelhalim Ibrahim*

boundaries are community walls

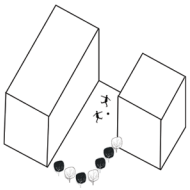
instead of having rigid fences, transform boundaries of your plot into permeable community walls that contain enclosures for rent for micro-economies, learning and socio-cultural activities. Community walls will generate more income for plot owners, allow street vendors to have a permanent shelter and storage space, and provide residents with the missing facilities. Community walls can be constructed between the following boundary conditions:
urban void - street,
agricultural land - street
agricultural land - urban void
under the bridge - street



3.23 *Mariam Tawfik*

green edible fences

Transform rigid and dull brick fences of urban voids used as soccer fields and/or amusement parks into green edible fences that give the space a more pleasant feel, encourage children to participate in urban farming and maintain connection with the street without sacrificing the children's safety



3.24 *Mohamed Mostafa*

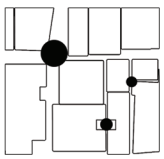
add some paint

It is cost effective for builders and landowners to keep facades unfinished. As designers we appreciate the unfinished brick facade, but children miss colours in their neighbourhood.
A colour-coded scheme should be implemented to make different communal hubs more visible within the 'concrete and brick jungle'.

3.25 *Fatma Youssef*

equal distribution of nodes

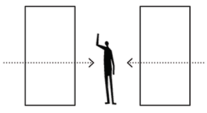
Distribute activity nodes equally to create a network of connected urban voids and agricultural land that offer farming, learning, economic and communal services



3.26 *Nadia Abotaleb*

introverted markets

Introverted markets minimize pedestrian and vehicular interaction, thus reduce congestion, garbage dumping and provide are safer environment for pedestrians



3.27 *Belal + Mai Mahmoud*

[+] waiting areas

Provide positive, interactive and customizable seating areas, which offer pedestrians information about environmental issues, educational and job opportunities. These areas should be allocated in urban pockets and/ or waiting areas for buses and toktoks, which currently lack seating for the elderly.

3.28 *Youssef Foad + Salwa Afifi*

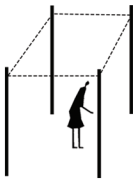
reduce, reuse, recycle

Waste is a potential resource, not a problem. Reduce waste by reusing and recycling it. Reduce unclaimed spaces subjected to garbage dumps such as urban voids, spaces below the bridge and the sides of the street. Reuse tires, fruit baskets and recycled wood palettes to built seating areas, roof gardens and animal shelters on the roof, as well as selling kiosks and playgrounds.

3.29 *Nadia Abotaleb + Mariam Gazzaz*

it's all about shading

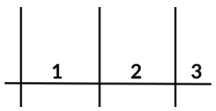
Shading on posts defines the market edge and separates vehicular and pedestrian activity without interfering with the flexible setup of street vendors and existing informality.



3.30 *Heba El Sawy*

reclaim your territory by numbers

Mark territories by usage of numbering to distinguish areas for vendors and parking lots for micro-buses. This is a better solution than putting misplaced objects that could potentially cause harm.



3.31

eco farms on rooftops

Install solar panels on rooftops of residential and public buildings to generate energy and solve constant power cuts. Government funding should be allocated in sponsoring eco farms rather than paving streets and relocating residents to new cities.

3.32

toktok for waste collection

New developed toktoks should collect waste from buildings, workshops, markets and communal hub during arranged times each day. In return for their service, toktok drivers should receive a fee from waste management centers.

CELEBRATE + MAINTAIN

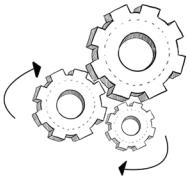
4.1 *Anna Heringer + Abdelhalim Ibrahim*

handmade increases ownership + collaboration

Residents should develop their neighborhood with their own hands. To increase ownership residents have to be in charge of the design up to construction, maintenance and operation. Design and construction have to be adjusted according to the residents' skills and available resources.

4.2 *Abdelhalim Ibrahim*

building ceremony



Regenerative events increase ownership and encourages residents to combine their skills, resources and creative energies to develop their neighborhood and maintain it. Events strengthen social capital which is the true asset of [in]formal communities. Organize markets, farming festivals, communal dinning, street cultural activities, etc.

4.3 *Youssef Foad + Salwa Afifi*

own to protect

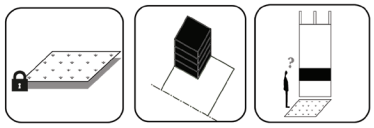
Reclaimed spaces are better protected than no man's land. The generated sense of ownership is a great motivation residents to allocate their resources and skills in protecting the space and constantly developing it. No one would protect his/her place better than its owner.

4.4

micro-economies as tools for social responsibility

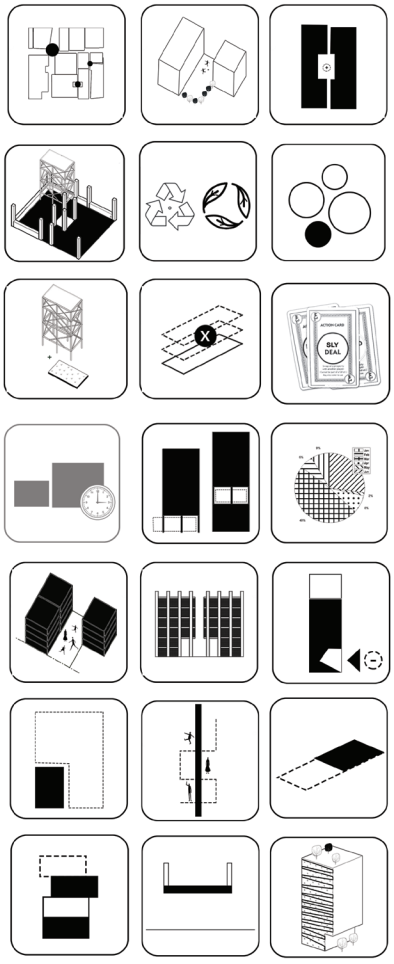
In order to develop social-responsibility and maintain it, it has to be linked to economic gains and creating job opportunities for community members. A new type of community service and co-op program has to be introduced on students from architecture, planning and agriculture universities in order to become temporary members in the agents of change committee and and raise awareness for social responsibility.

LEGALIZE + SECURE

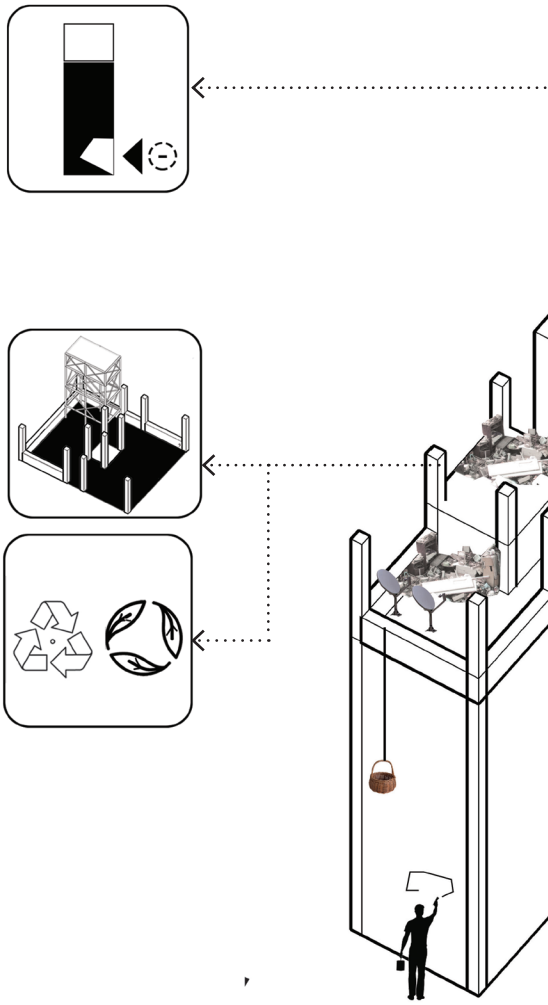


CULTIVATE

[RE]APPROPRIATE + [RE]USE



CELEBRATE + MAINTAIN



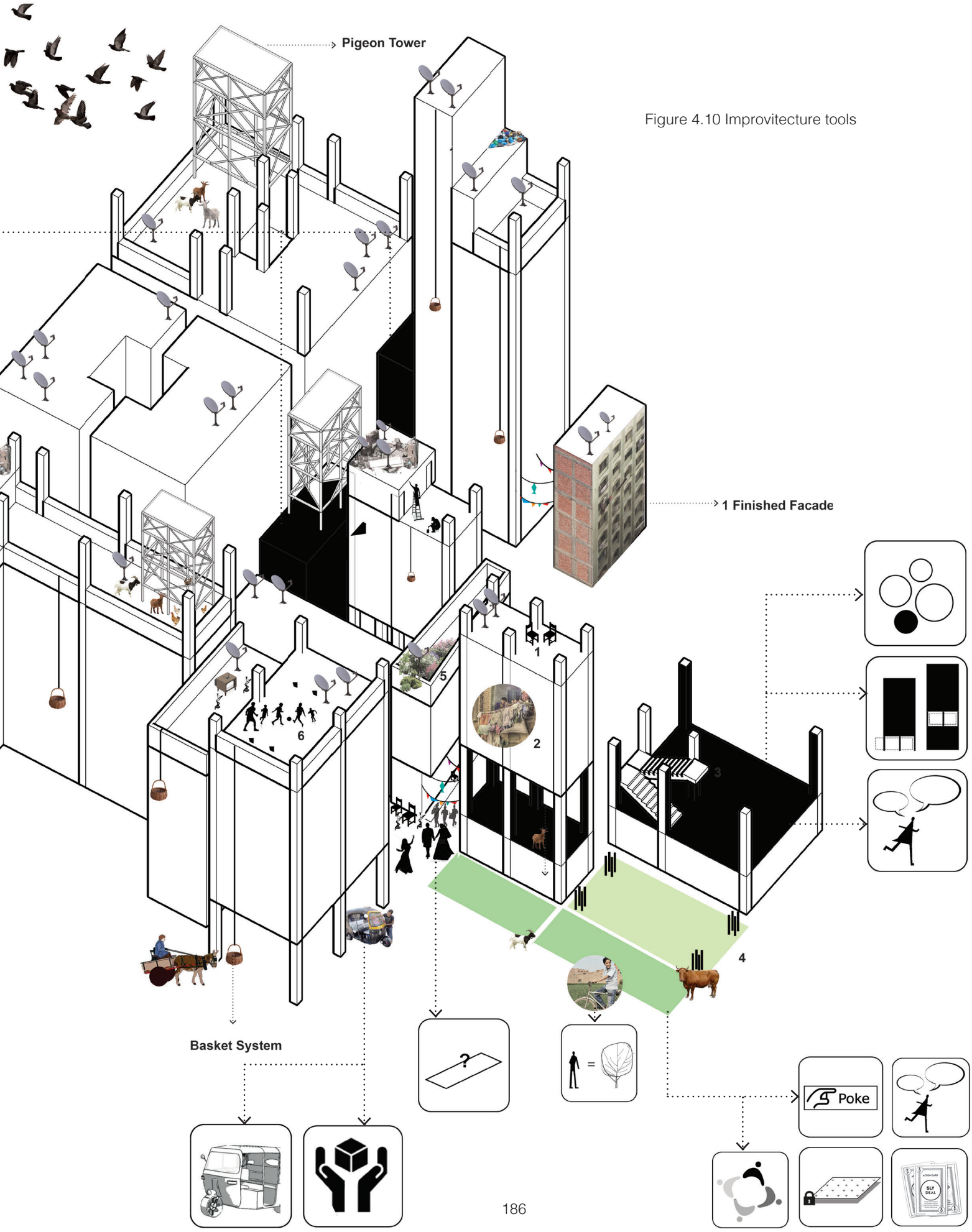


Figure 4.10 Improvitecture tools

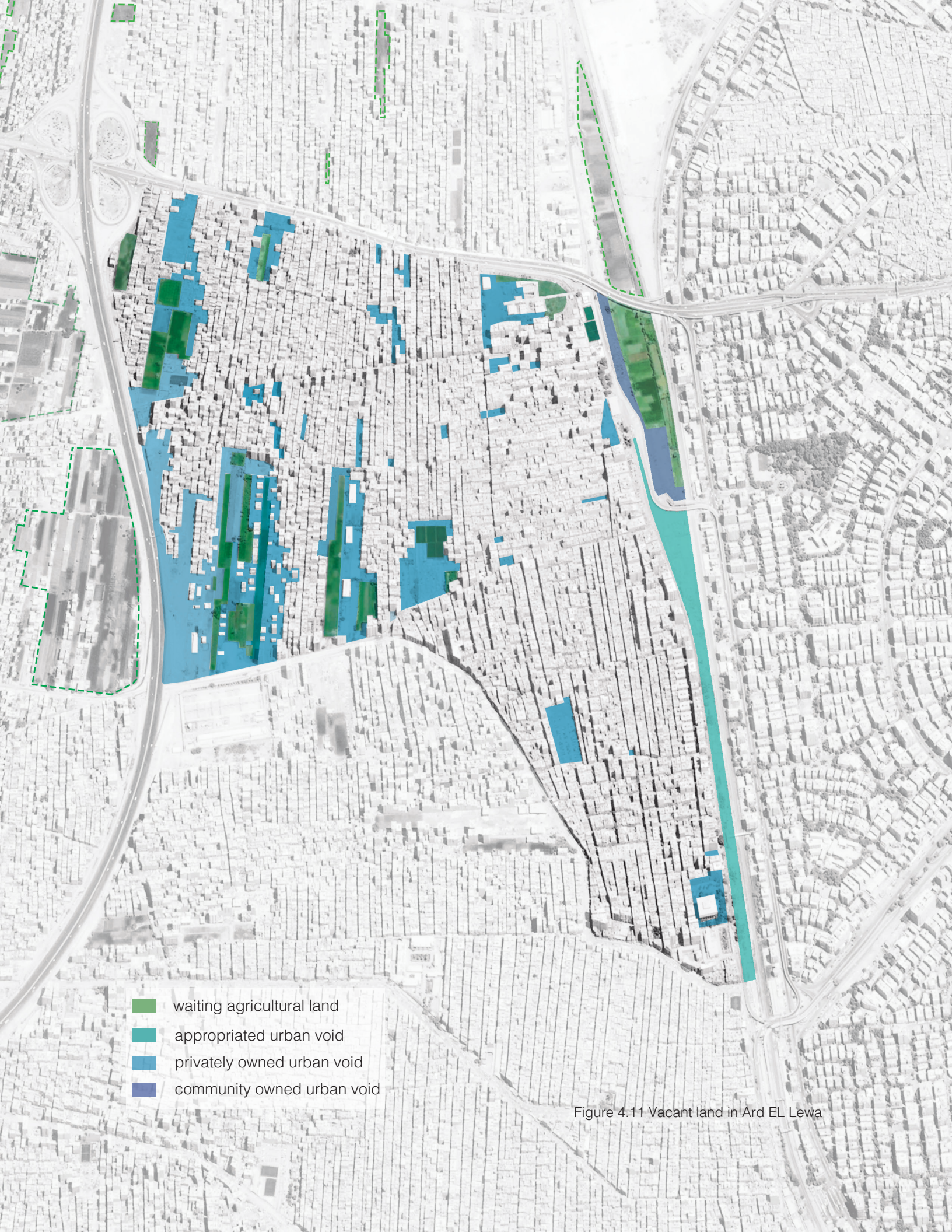


Figure 4.11 Vacant land in Ard EL Lewa

97,292 m²
WAITING AGRICULTURAL LAND

306,475 m²
URBAN VOIDS

1, 370,000 m²
ROOFTOPS

Figure 4.12 Occurrence of selected patterns

SELECTION PROCESS

The thesis unlocked 101 [in]formal patterns and chose the 3 most influential patterns to optimize. The selection process was built on layering all the data compiled from pattern templates, urban narratives and the workshop, as well as applying the architect's expertise in recognizing potentials. Selection was based on the following criteria:

- Level of Influence
- Repetition Rate
- Speed of Implementation
- Likelihood that community members will optimize the pattern
- Potential for Economic Gain

Waiting agricultural land, *large urban void as car parking lot*, *incompleteness* and *sandwich city* were found to be the most influential patterns to start with. The first two patterns, as well as the third and forth pattern, are combined in one pattern template, respectively, due to interconnectivity and close proximity.

The selected patterns are the most occurring and offer the largest spaces for optimization. The 3 patterns are more or less contained in all three analyzed urban conditions, as seen in the maps, generated during the workshop, (Figure 4.12, Figure 14 - Figure 16). Every building in the dense urban fabric of Ard El Lewa has a rooftop, thus providing approximately 1,370,000 m² for optimization. There is circa 97,292 m² remaining agricultural land and 306,475 m² urban voids excluding incomplete structures and spaces below the bridge in Ard El Lewa. Selected patterns also represent different scales and categories, thus open up the possibility to create a network of connected optimized patterns and a plug-in system for missing infrastructure and needs.

While there is a little likelihood that landowners and builders are persuaded to stop construction on agricultural land, this pattern, needs to be addressed as a priority to put an end to current and future urban sprawl on agricultural land and to connect to the national loss of agricultural land problem. Moreover, it is crucial to prevent future problems from occurring in [in]formal.

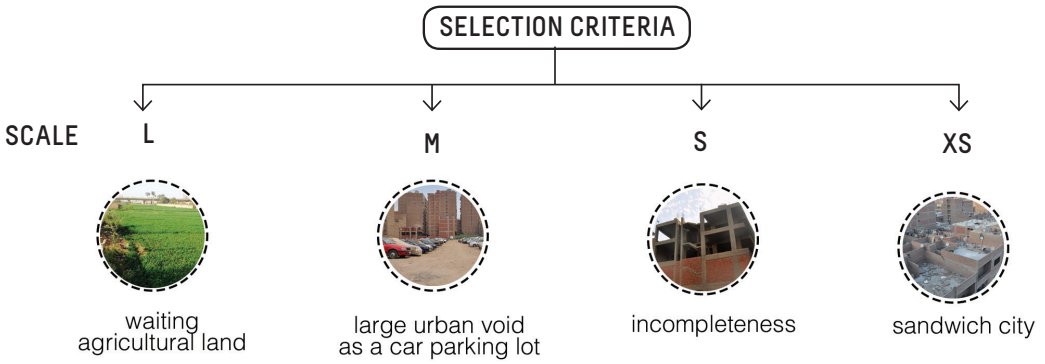


Figure 4.13 Selected patterns

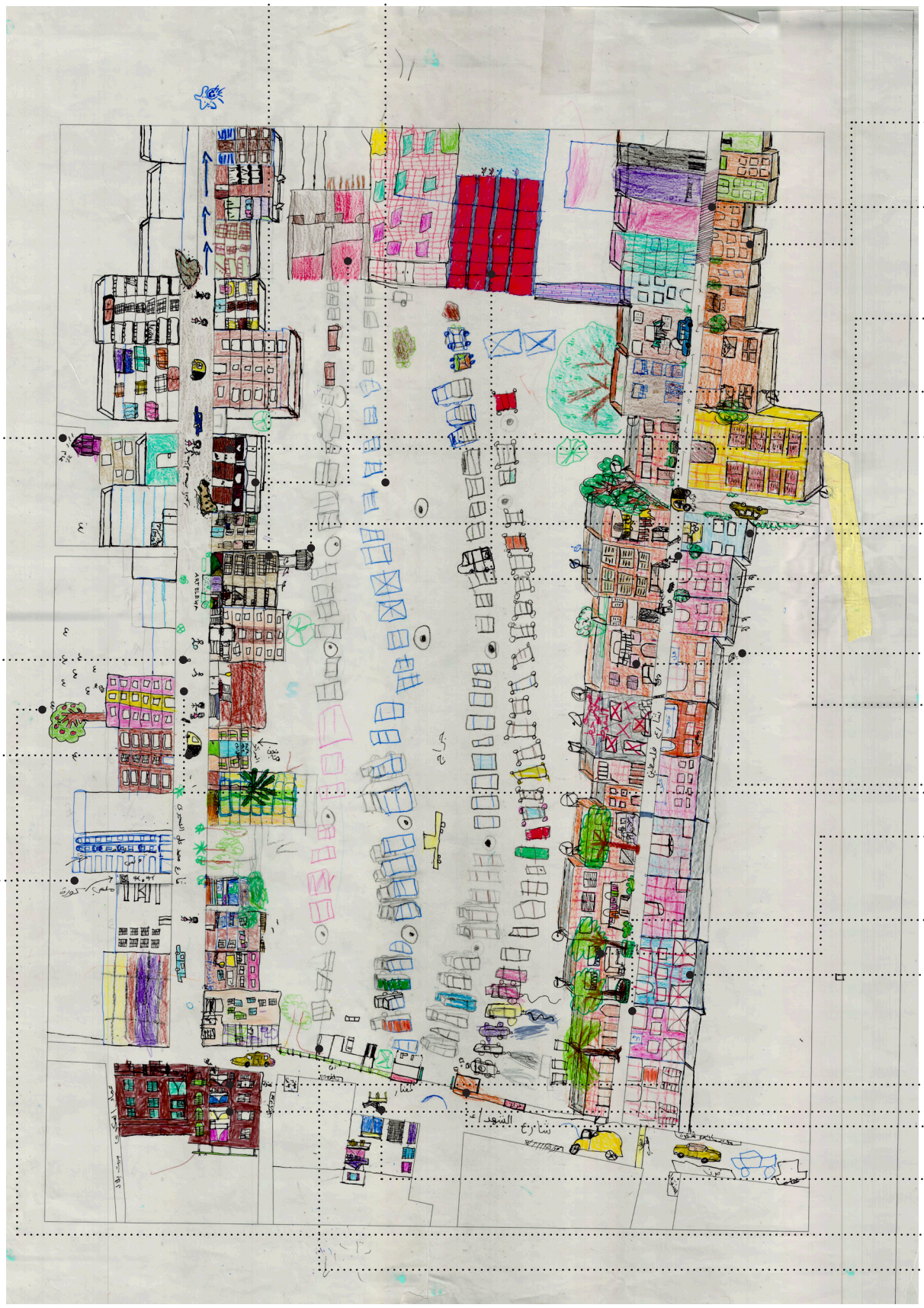


Figure 4.14 Extracting patterns from map 1: urban x urban

M

BUILDING CLUSTER

shared walls

URBAN VOIDS

large urban void as a car parking lot

[IN]FORMAL NETWORKS

children everywhere

BUILDING

workshop building typology

incompleteness

S

unfinished facades

limited openings

light weight extensions

building heights

ROOFTOP

pigeon towers

vertical extensions

connected roofs

S

satelite dishes

small roof gardens

MARKET

mobile vendors

ELEMENTS

the laundry theory

basket

balcony drapes

STREET

dead ends

a playground

some trees

an extension of the workplace

SERVICES

art facilities

toktok

car and toktok services

micro-economies around the corner

paving streets

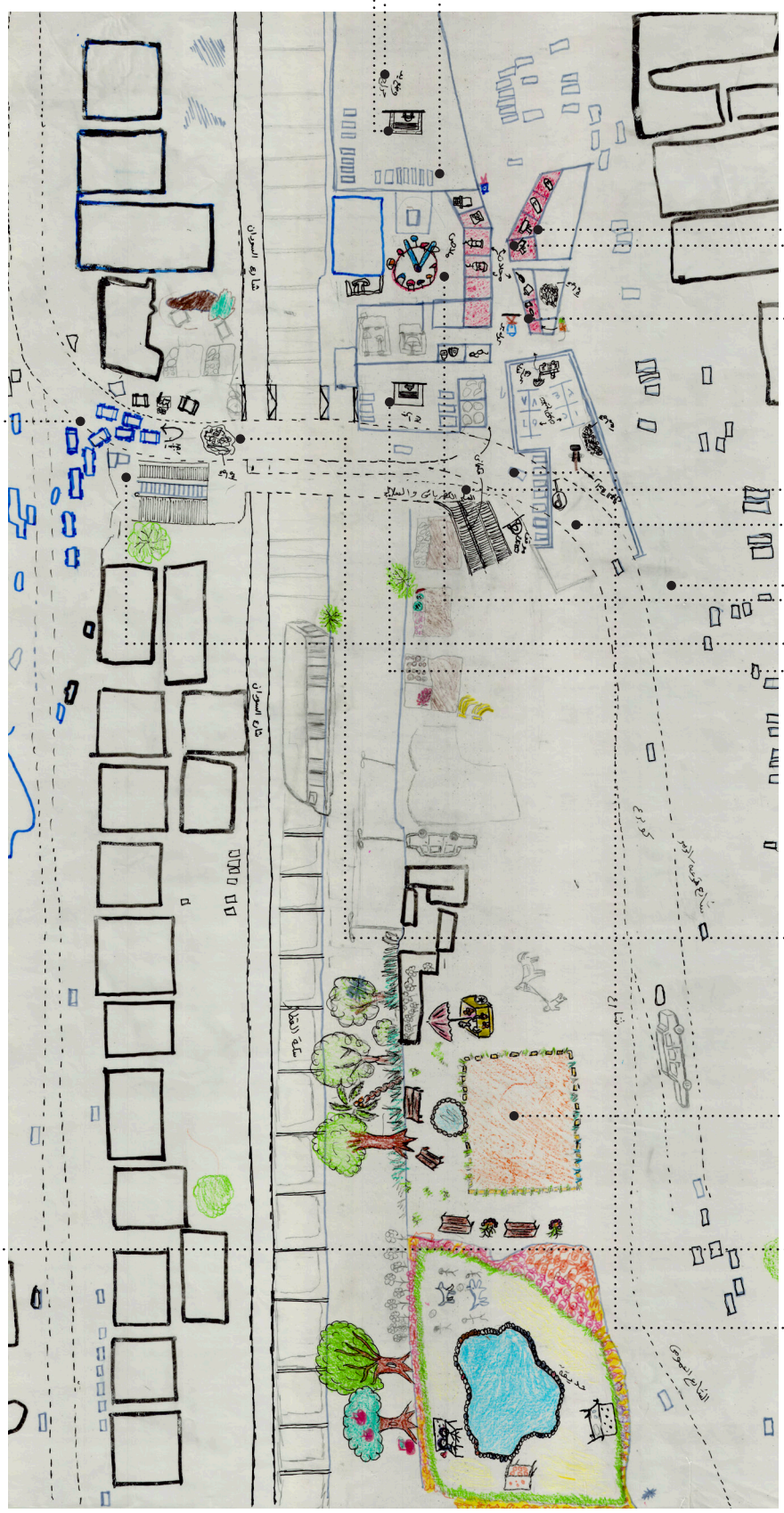


Figure 4.15 Extracting patterns from map 2: formal [in]formal border

MARKET

street vendors

mobile vendors

undefined edge

amusement park

NO MAN'S LAND

appropriated parking lots

garbage dumps

L

SERVICES

car and toktok services

toktok

micro-bus

BORDERS

vendors at gateways

pedestrian bridges

UNDER THE BRIDGE

bus stop

toktok waiting area

garbage dumps

STREET

charity water

REMAINING AGRICULTURAL LAND

L

waiting agricultural land

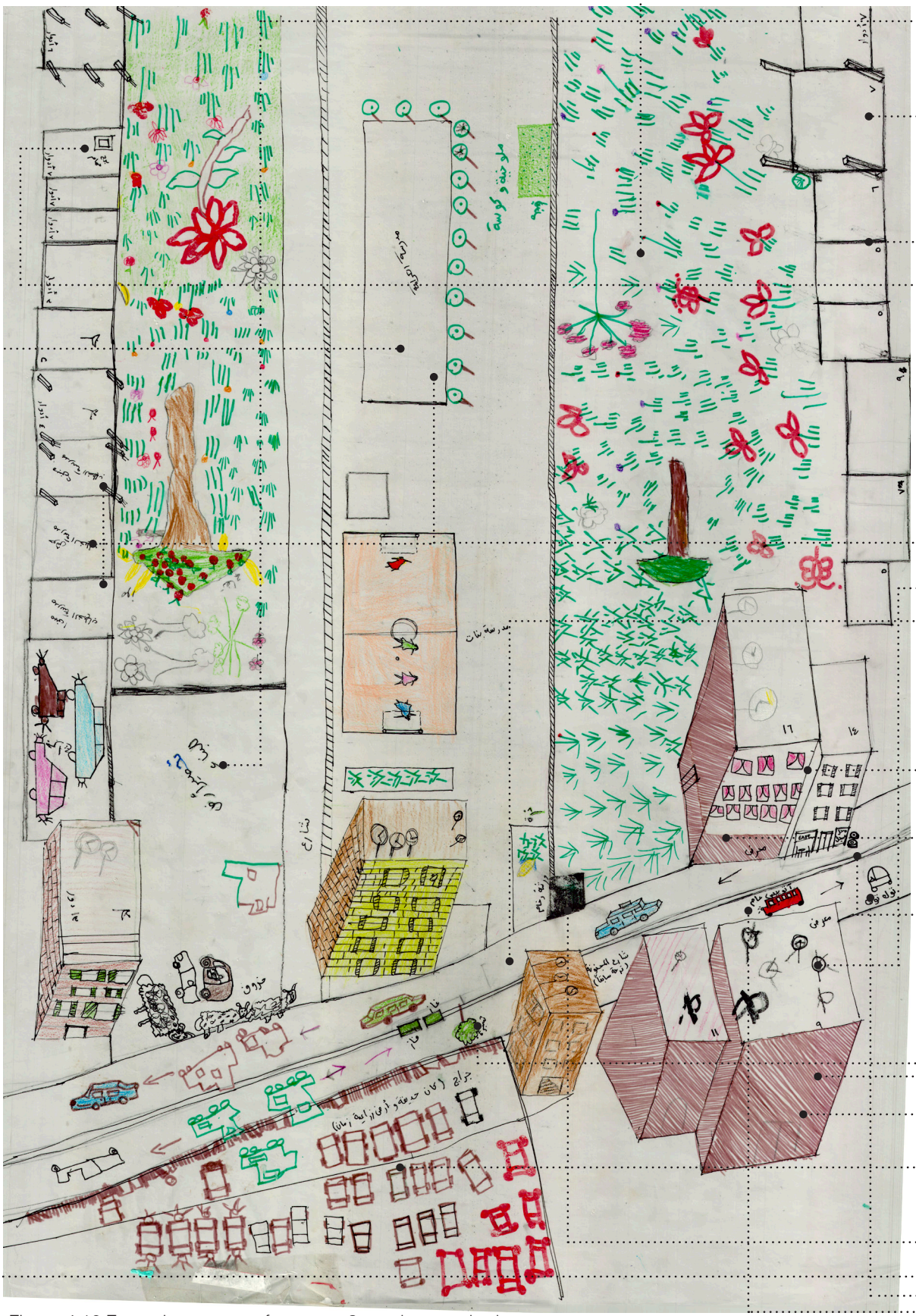


Figure 4.16 Extracting patterns from map 3: endangered edge

L

XS

REMAINING AGRICULTURAL LAND

BUILDING CLUSTER

ROOFTOP

GLOBAL PATTERNS

shared walls

connected roofs

construction on agricultural land

- dense urban environment
  100 % plot coverage
  land subdivision
- loss of agricultutal land
- legal illegal
- laissez fair policy

BUILDING

pigeon towers

waiting agri-cultural land

exhibition building typology

- incremental construction

satelite dishes

STREET

public buildings

main roads follow canals

ELEMENTS

SERVICES

S

incompleteness

balcony drapes

a showroom

schools

unfinished facades

some trees

toktok

limited openings

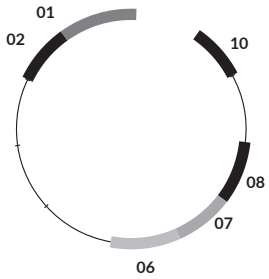
URBAN VOIDS

M

micro-bus

large urban void as a car parking lot

micro-economies a round the corner



+ - ●●

15 SANDWICH CITY

[m + f]
building residents, landlords, pigeon tower owners

As a result of the dense urban environment and confined apartments, residents have created a parallel world to the street on their rooftops to accommodate their needs. Incomplete structures, light-weight extensions, pigeon towers and satellite dishes are the typical infrastructure found on rooftops, and dominate the skyline of [in]formal areas. Activities on rooftops range from micro-economies and animal breeding, to dwelling and storing unused items. During the day, rooftops are programmed by women hanging laundry, feeding animals, socializing or making bread. Children use rooftops as 'free-of-charge' playgrounds, and as an escape from densely populated streets. Men occupy rooftops in the evening to train their pigeons, and during the night for socializing.

larger patterns
building heights, shared walls

smaller patterns
connected rooftops, vertical extensions, residential shacks, micro-economies on rooftops, rooftop as an extension of the home,rooftop as a playground, rooftop as a garbage dump and storage, breeding animals on rooftops, pigeon towers, small roof gardens, satellite dishes, laundry theory.

01 user behavior and activities
02 self-generated interventions
06 economic forces
07 response to immediate needs
08 value engineering
10 ownership

Figure 4.17 Sandwich City, ©Jesse Sharratt

POTENTIAL / PROBLEM

Every building has a rooftop. Adding all the rooftop space within a community offers unlimited opportunities for improvement. Optimizing rooftops can therefore become an alternative option to ground-up development. Attached buildings open up the possibility to connect rooftops and multiply shared areas while dividing costs. Unclaimed areas on rooftops are subjected to dumping of garbage, leftover construction material and old furniture, which is an enormous waste of space in such a dense built environment. Not separating animals from spaces for laundry and micro-economies causes poor hygiene.

Therefore:

Optimize rooftops by creating hybridized systems merging existing program with urban farming.

EXISTING DIAGRAM / MAP / LAYOUT

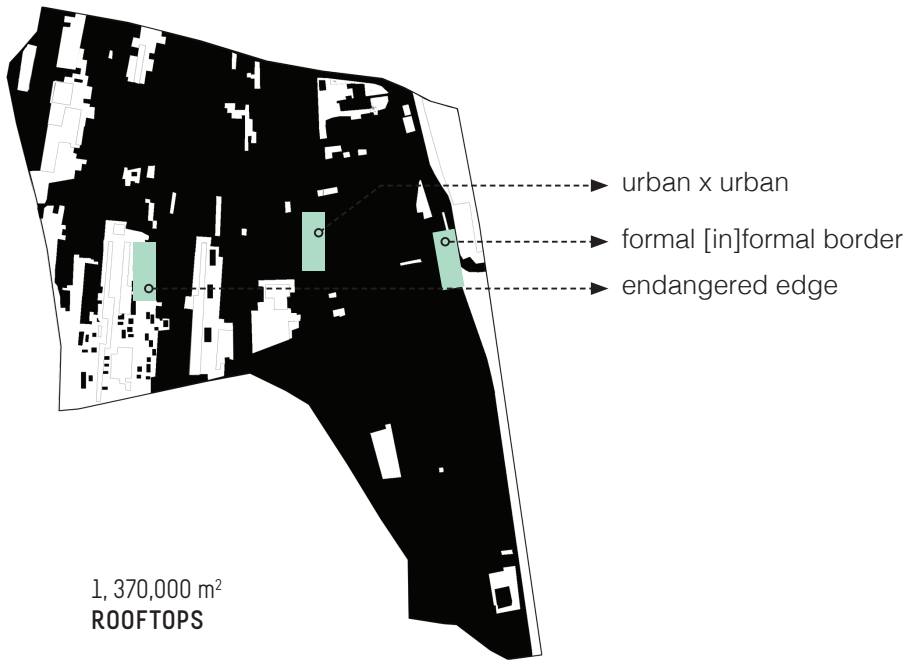


Figure 4.18 Occurrence of rooftops in Ard El Lewa

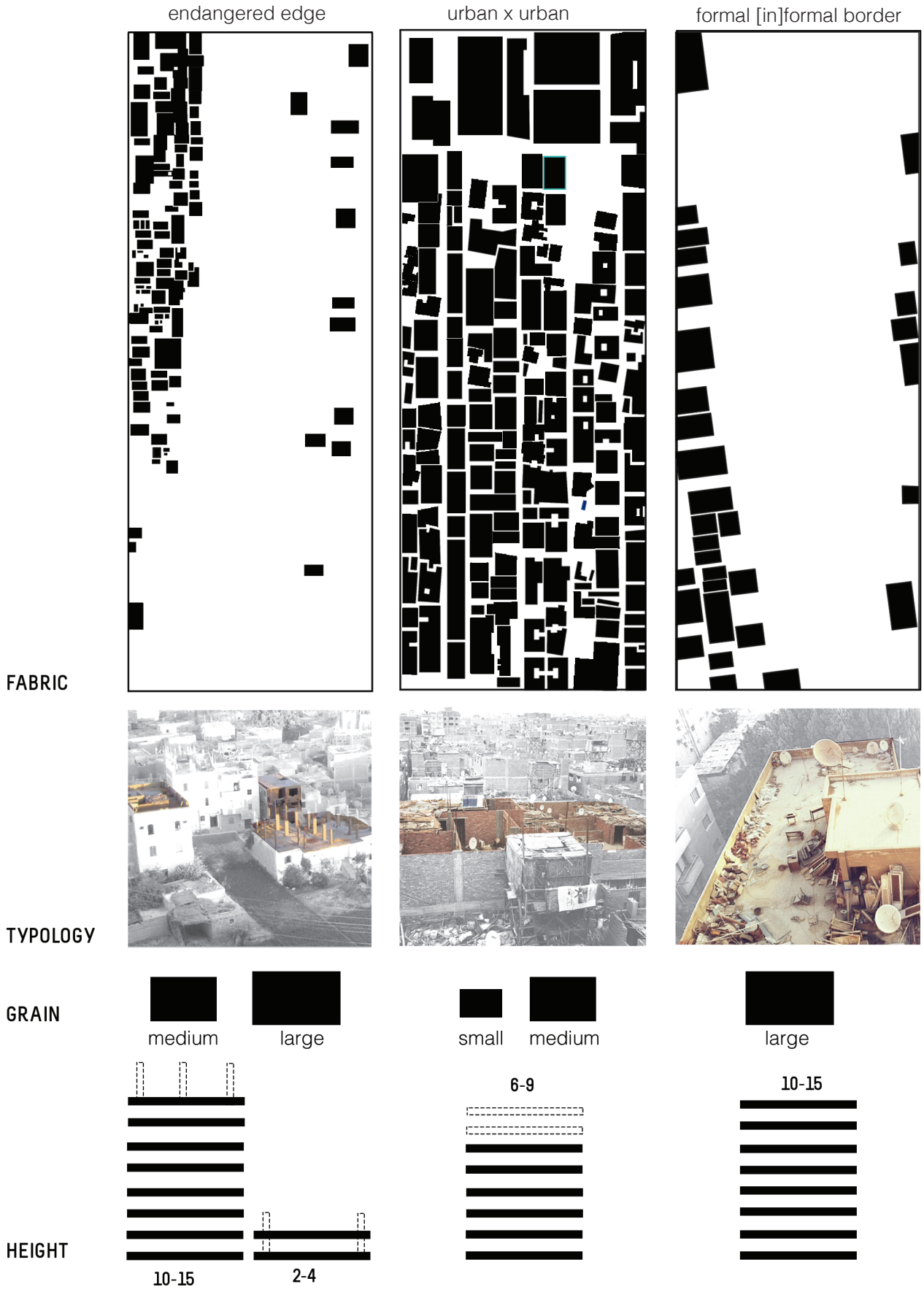


Figure 4.19 Analysis of rooftop typology in relation to urban condition

DESIGN OBJECTIVES + OPTIMIZATION LAYER

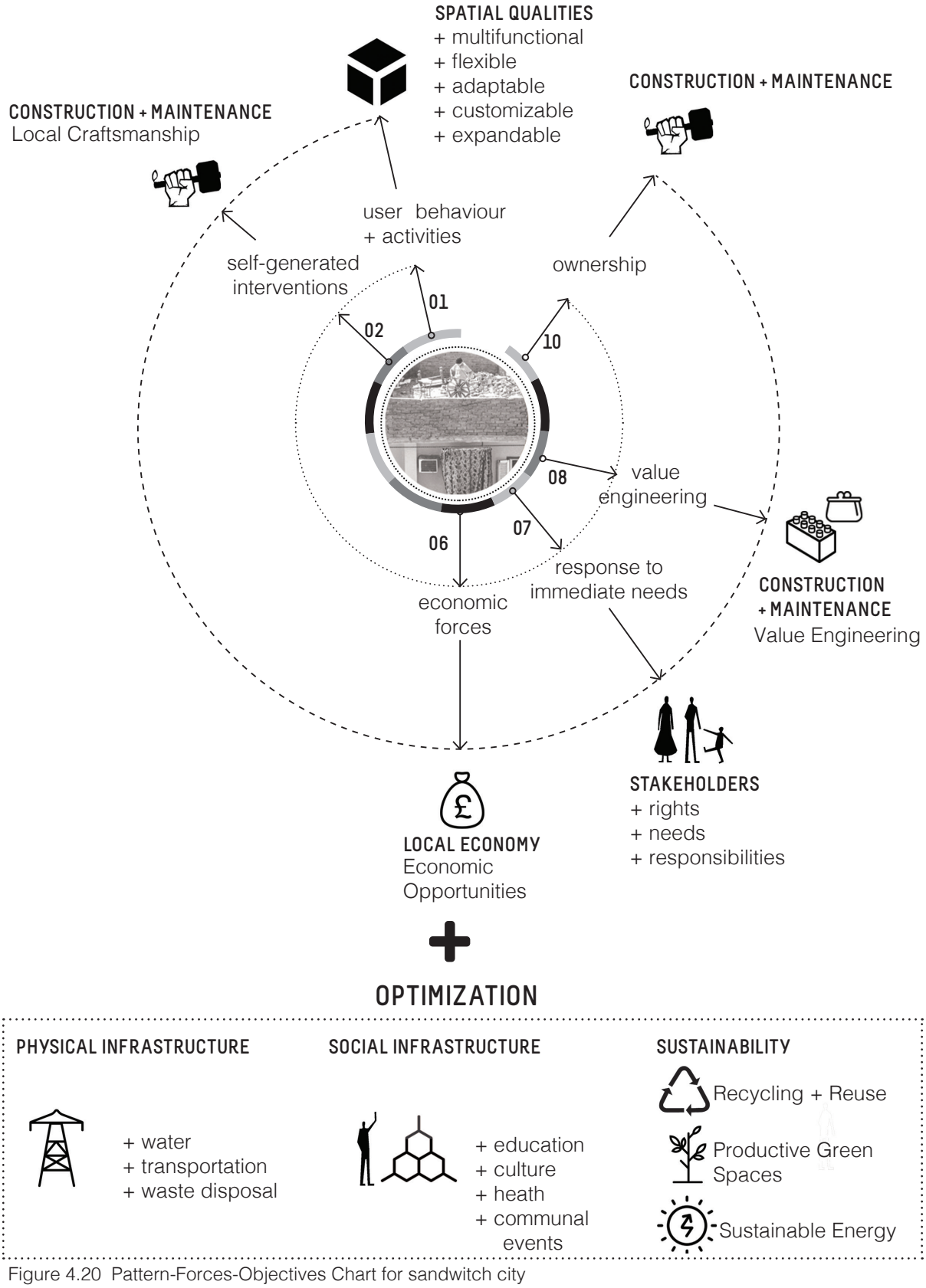


Figure 4.20 Pattern-Forces-Objectives Chart for sandwitch city

Figure 4.21 Sitting corner in a pigeon tower

Figure 4.22 Pigeon tower

Figure 4.23 Rooftops in Ard El Lewa

Figure 4.24 Installing a satellite dish

Figure 4.25 Garbage dumps

Figure 4.26 Lightweight structures

Figure 4.27 An extension of the home

Figure 4.28 A small roof garden

Figure 4.29 Breadmaking on rooftops

Figure 4.30 A rooftop garden, ©Hanaa Gad

PROPOSED OPTIMIZATION / NEW DESIGN

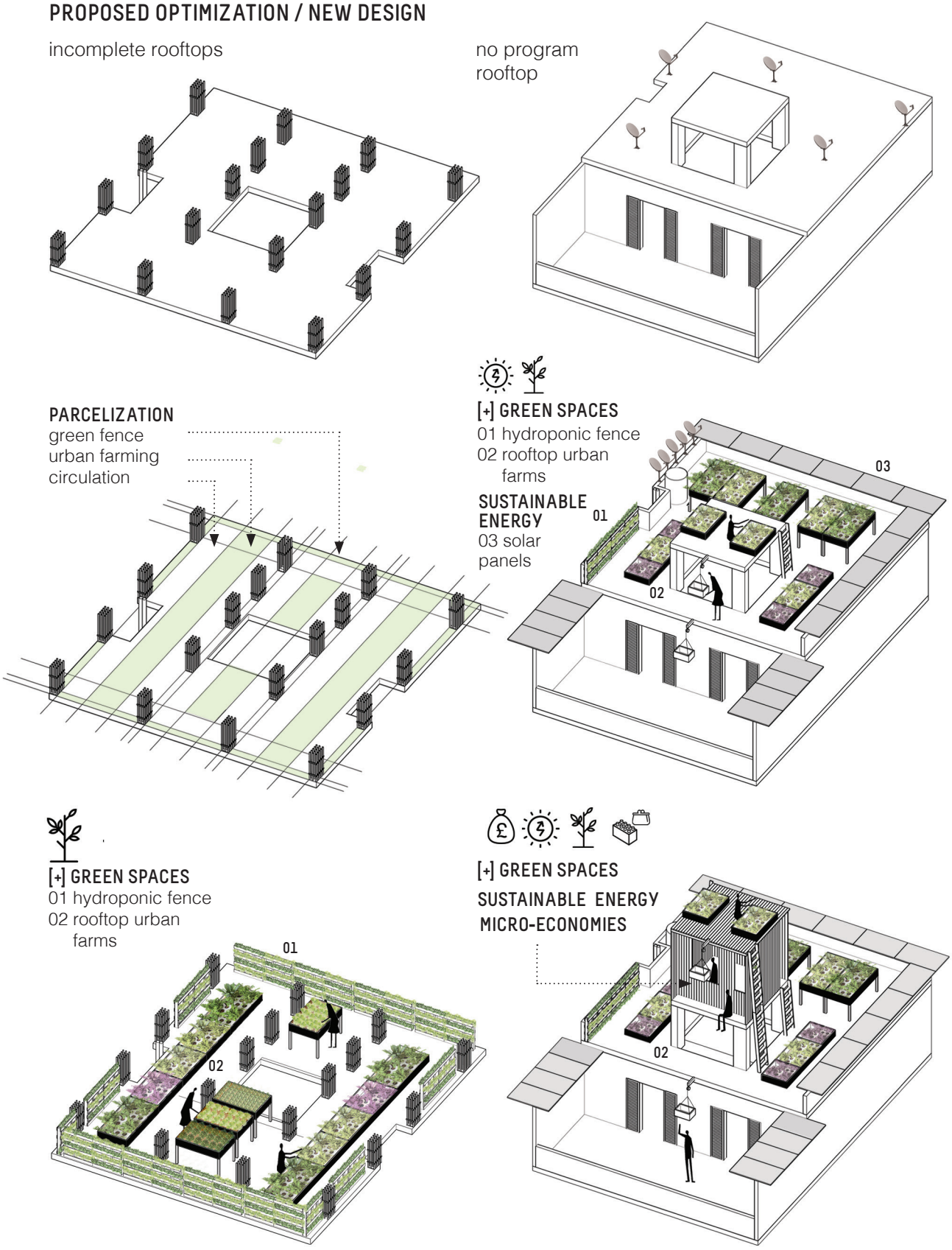
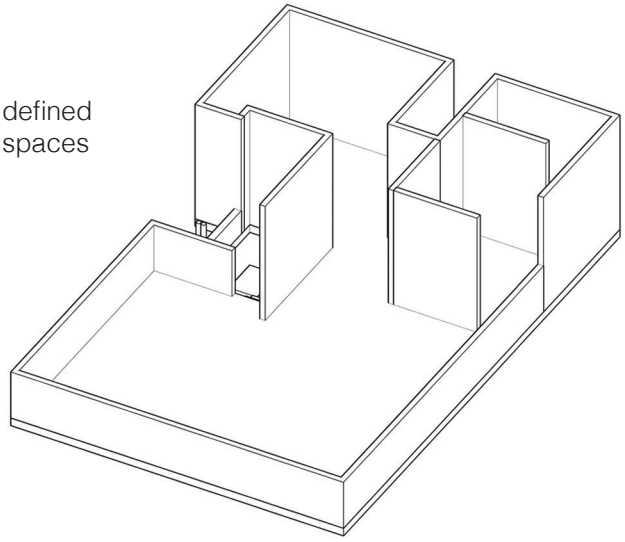
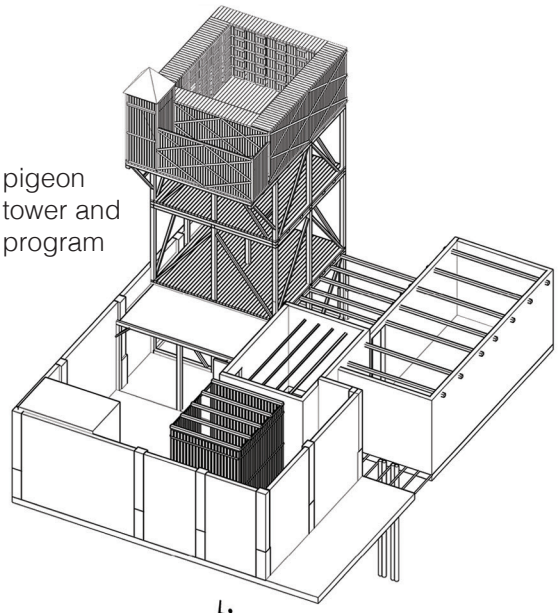
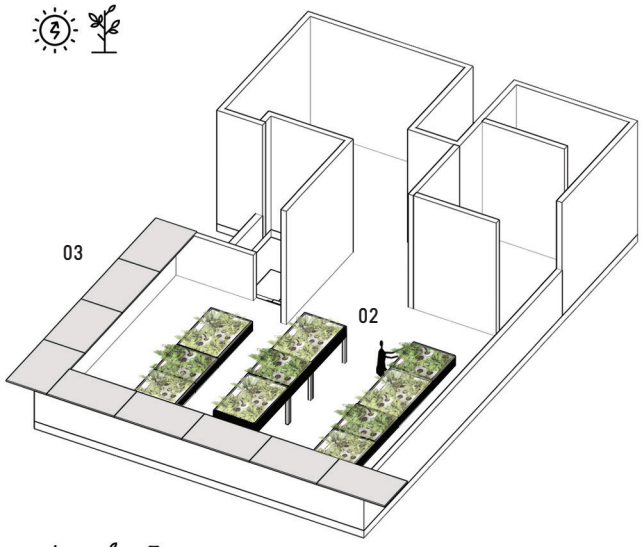
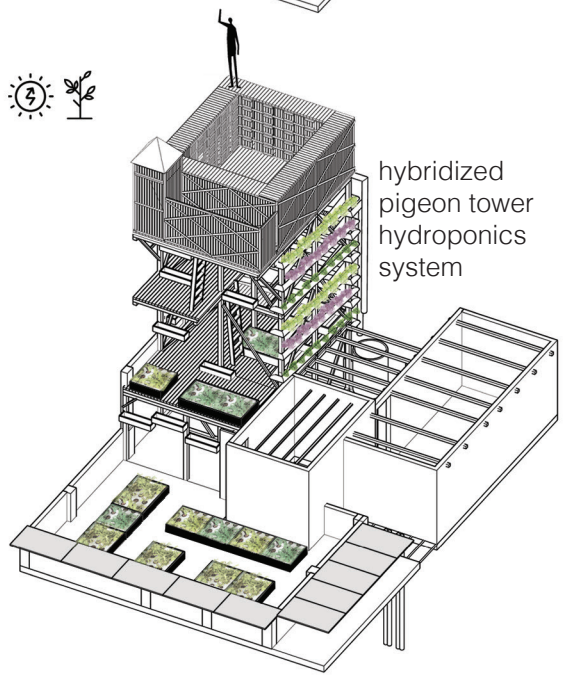


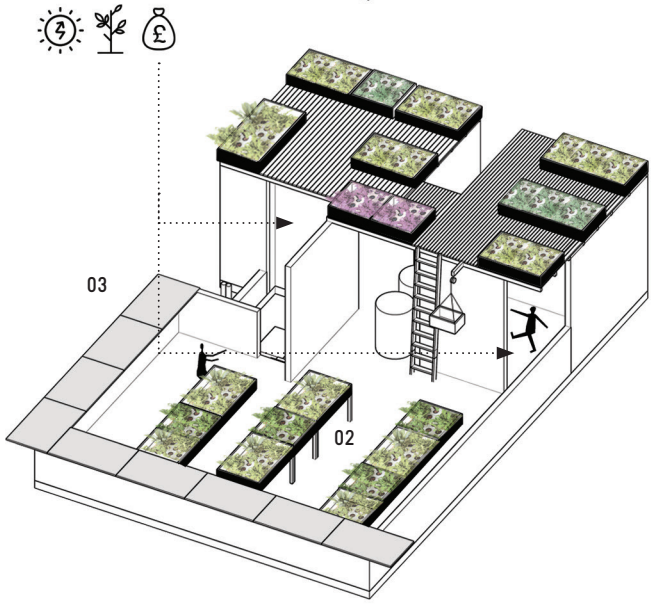
Figure 4.31 Proposed optimization in relation to rooftop typology


defined
spaces


pigeon
tower and
program


03
02


hybridized
pigeon tower
hydroponics
system


03
02

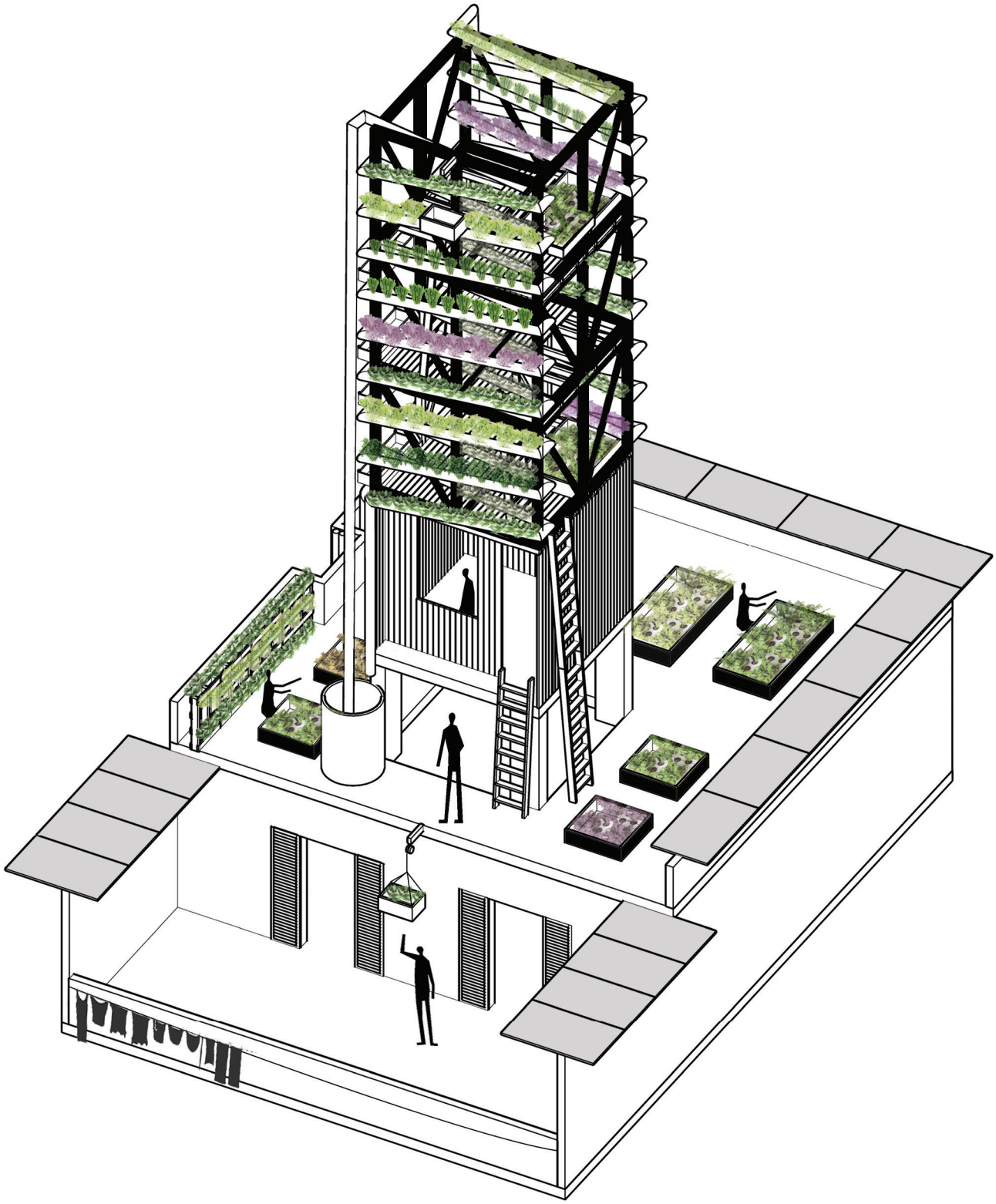


Figure 4.32 Proposed hybrid system combining micro-economies and urban farming

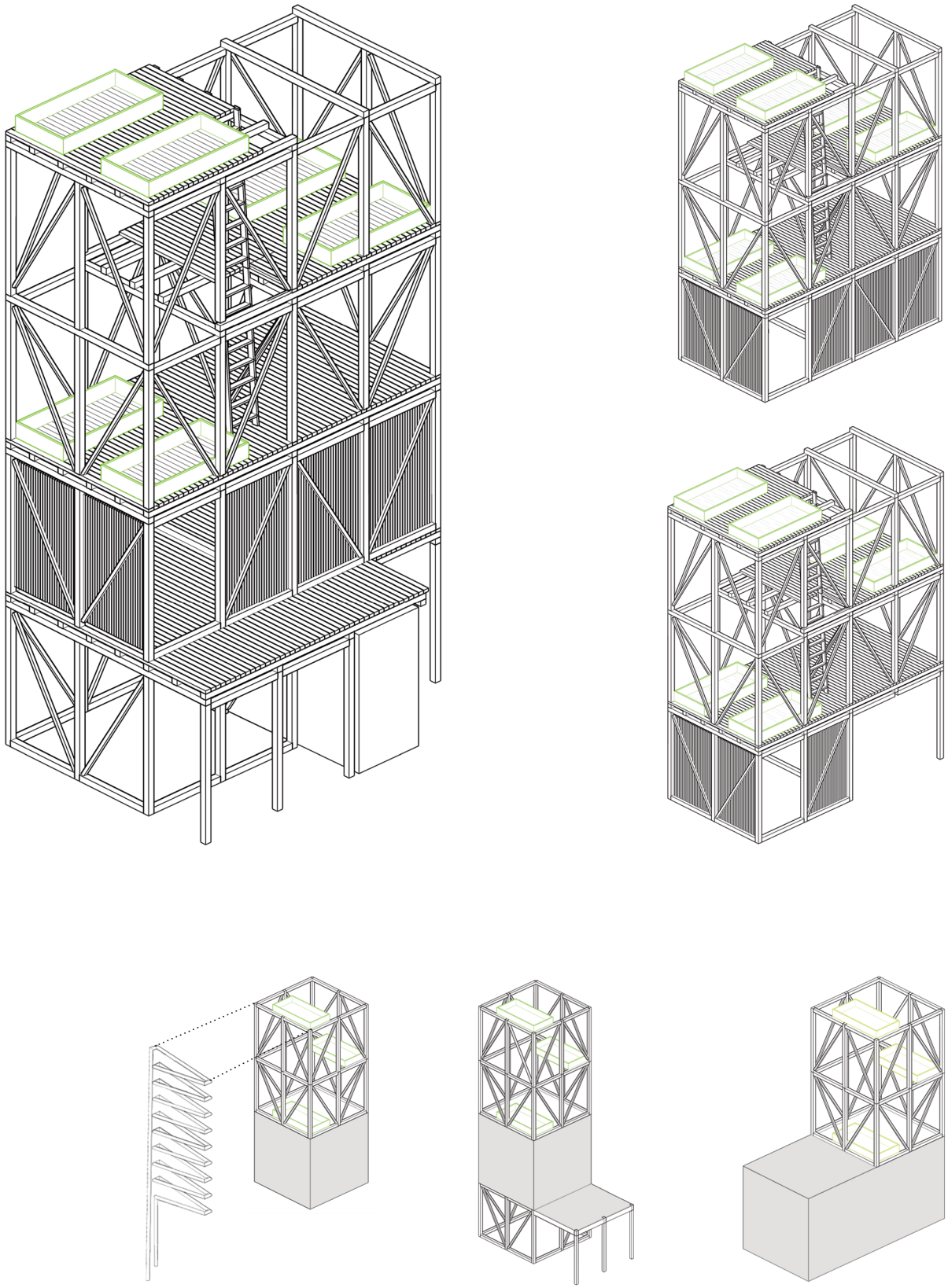


Figure 4.33 Optimized Prototypes

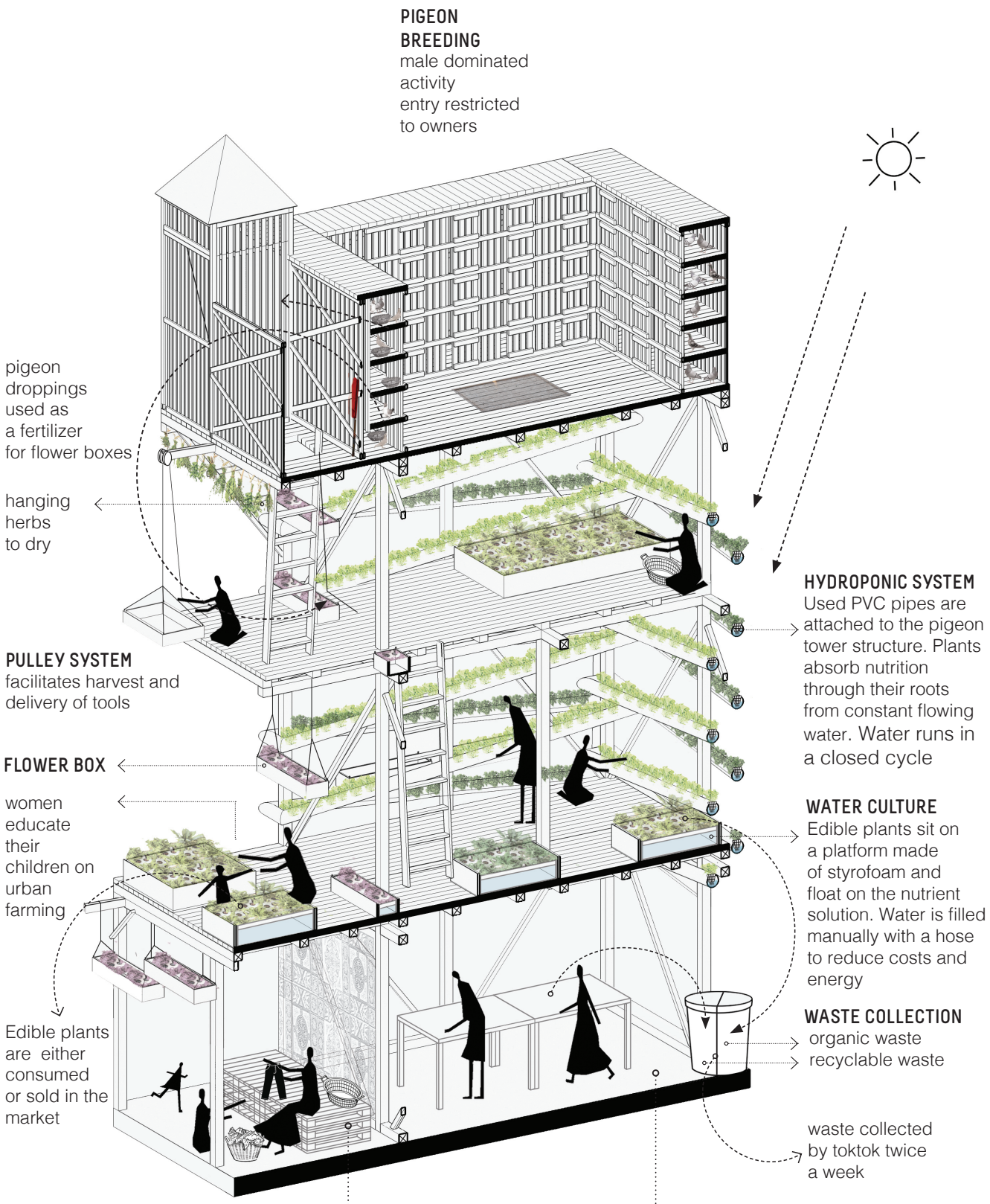


Figure 4.34 Operation of optimized pigeon tower during daytime

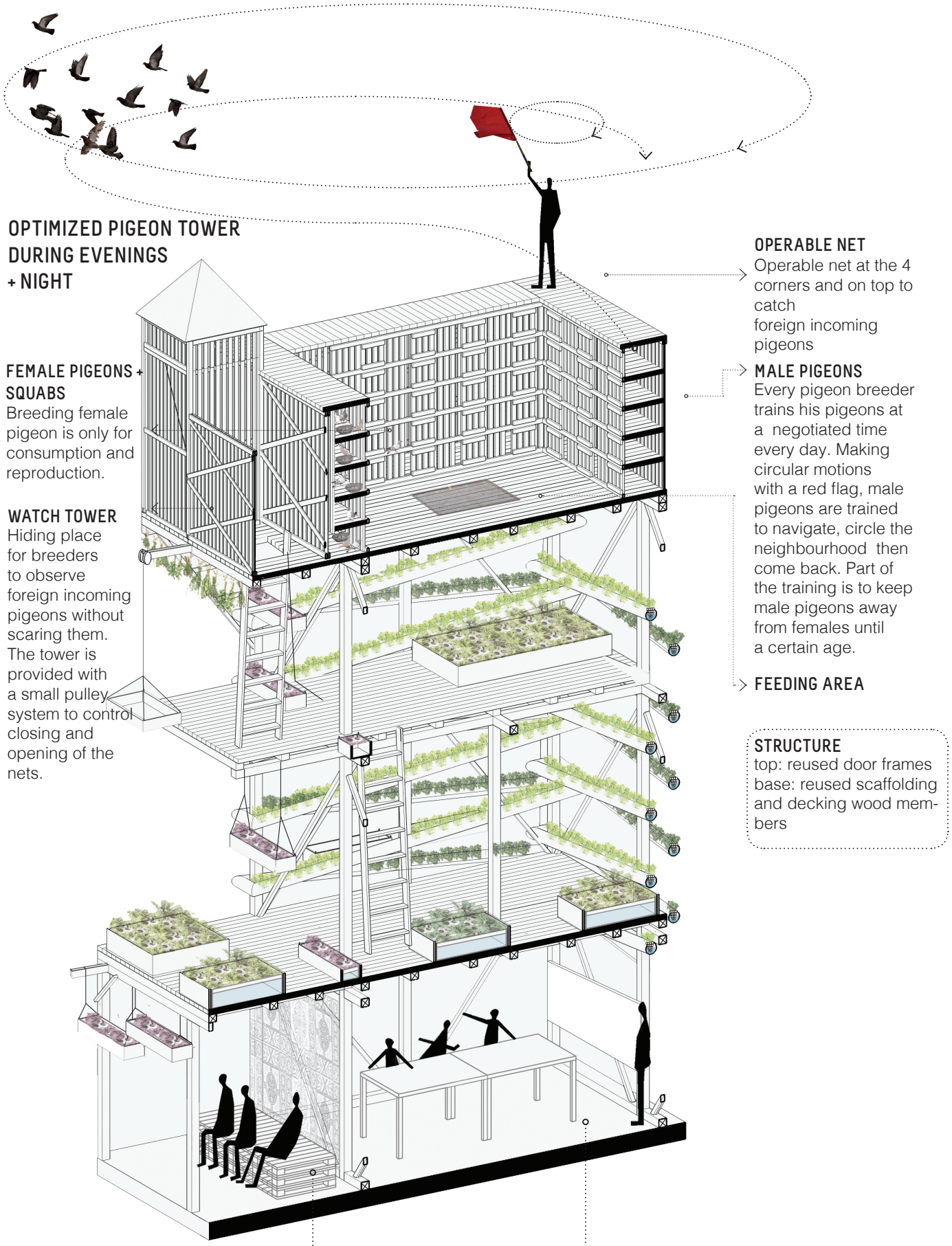
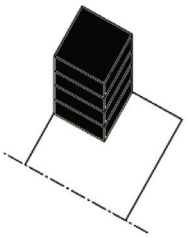


Figure 4.35 Operation of optimized pigeon tower during evenings & night time

Figure 4.36 Pigeon breeder in Ard EL Lewa

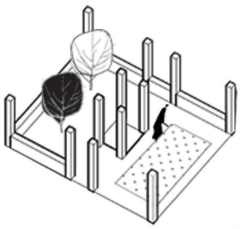
IMPROVITECTURE TOOLS

LEGALIZE + SECURE



1.4
secure an open space ratio

building residents
agents of change committee
designers



1.5
green roofs by law

officials
landowners + building owners
agents of change committee

CULTIVATE

2.1
cultivate curiosity in the young first

designers
agents of change committee
young adults + children

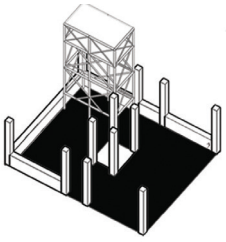
2.2
reclaim vacant spaces with neighbours' needs

designers
building owners
building residents

2.3
cultivate partnerships first

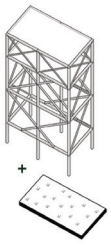
designers
building owners
building residents
agents of change committee

[RE]APPROPRIATE + [RE]USE



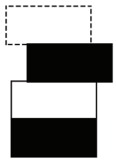
3.1
cleaning creates space

building residents
building owner



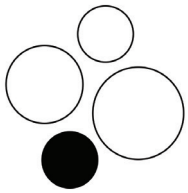
3.2
combine pigeon towers with urban farming

designers
pigeon breeders
agents of change committee



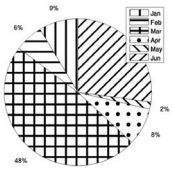
3.4
vertical distribution of activities

building residents
building owner
agents of change committee
designers



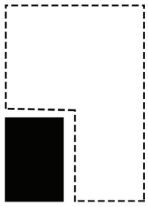
3.5
reshuffeling program helps

building residents
building owners
designers
agents of change committee



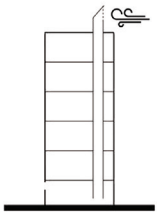
3.11
respect existing
multi-functionality

designers
agents of change committee



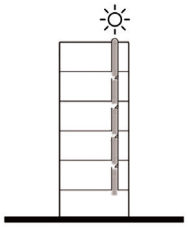
3.14
negotiate air rights

building owners
land owners
agents of change committee
designers



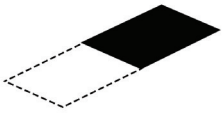
3.15
windcatchers

designers
builders
building owners
agents of change committee



3.16
light tubes

designers
builders
building owners
agents of change committee

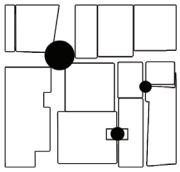


3.19
share + connect rooftops

designers
landowners
building owners
agents of change committee

3.21
satellite dishes on the edge

building owners
residents
satellite dish technicians



3.25
equal distribution of nodes

designers
agents of change committee

3.27
[+] waiting areas

landowners
designers
residents

3.28
reduce, reuse, recycle

building residents
agents of change committee
toktok drivers
waste management

3.31
eco farms on rooftops

building owners
agents of change committee
government officials
funding agencies
designers

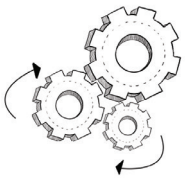
3.32
toktok for waste collection

building residents
agents of change committee
toktok drivers
waste management

CELEBRATE + MAINTAIN

4.1
handmade increases ownership + collaboration

designers
agents of change committee
building residents
building owners



4.2
building ceremony

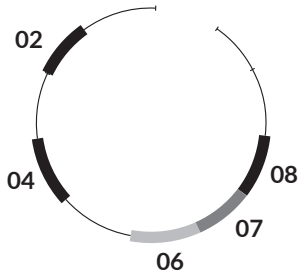
agents of change committee
designers
building residents
vendors

4.4
micro-economies as a tool for social responsibility

building residents
agents of change committee

Figure 4.37 Urban void as a car parking lot, by Hammad

Figure 4.38 Urban void as a car parking lot



+ ●●

66 LARGE URBAN VOID AS A CAR PARKING LOT

[m]
land owners, parking lot owners, servicemen, vehicle owners

Urban voids are yesterday's agricultural land and tomorrow's buildings.

When disputes on land ownership and/or a shortage in resources delay construction, plot owners temporally transform their waiting vacant land into parking lots for cars, either self-managed or rented to others, to maximize their monthly profits. Perceiving their land as an investment for the future, other owners choose not to proceed with construction until the value of their land increases. Urban voids as a parking lot are usually equipped with repair and car wash services, and offer their parking services to car, truck, micro-bus and cab owners. Parking fees are EG£ 5/day and EG£150/month, excluding extra services. Servicemen live in small rooms located at the entrance of urban voids to protect the vehicles during the night and operate the facility during the day. Some unused areas of the urban voids still have spontaneous vegetation growth.

larger patterns
renting spaces for micro-economies, temporal use of vacant land

smaller patterns
car wash and services, micro-economies around the corner

FORCES

02 self-generated interventions
04 temporal activities
06 economic forces
07 response to immediate needs
08 value engineering

POTENTIAL / PROBLEM

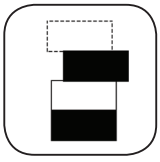
Urban voids contain few activities in extremely dense residential areas, which is not an efficient use of space. They have the potential to be used as a flexible plug-in system for the missing infrastructure in the community, creating a network of communal hubs and micro-economies, as well as maximizing landowners' monthly profits.

Therefore:

Learning from the example, located in the intersection of El Zomor Canal and Hossam El Din Serag Street, strive for a vertical distribution of economic, socio-cultural, urban farming and educational activities on top of existing program. Vertical distribution increases efficiency and profit, while maintaining open space.

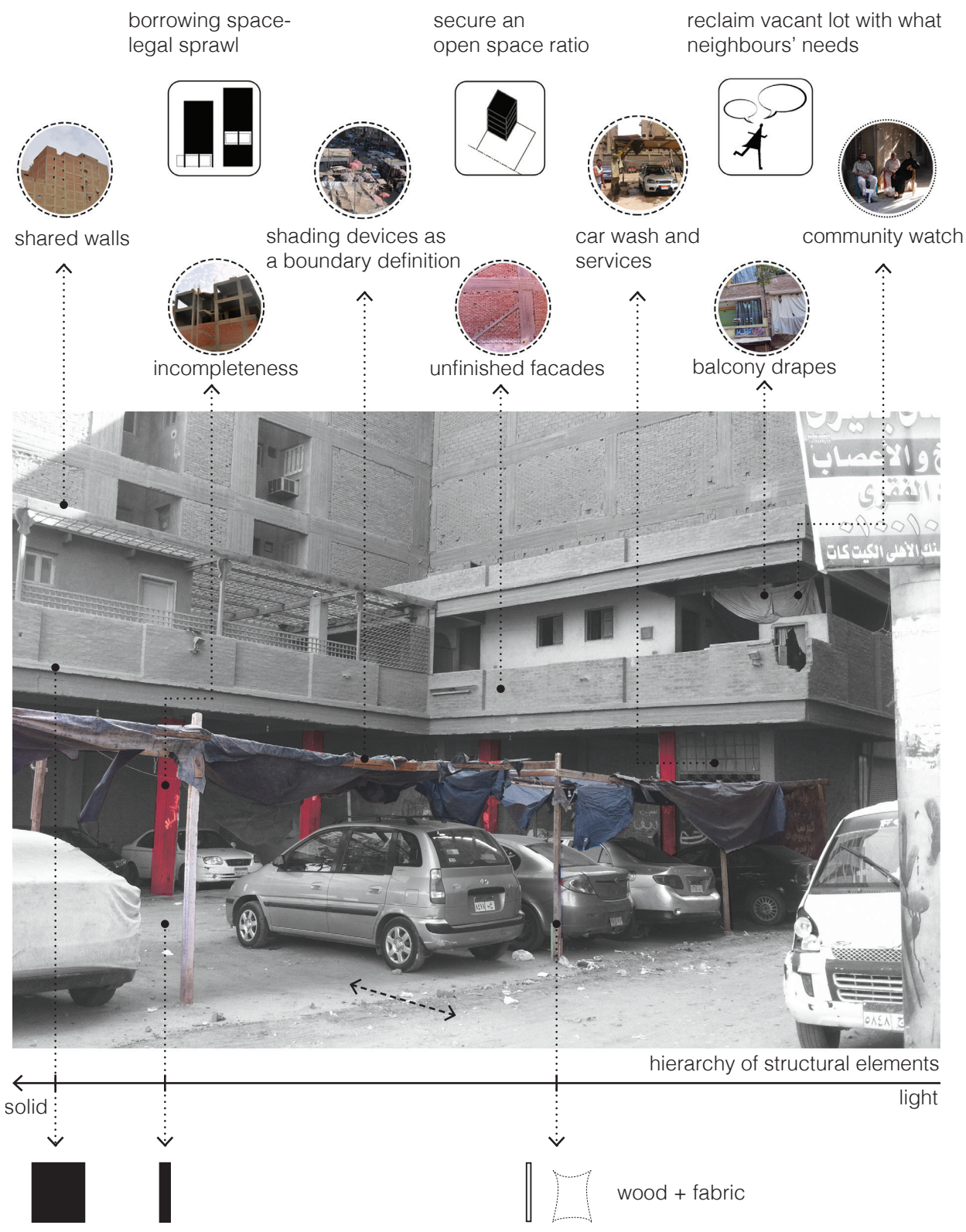
Figure 4.39 Location of case study

Activities:	residential	parking lot + car services	street
Ownership:	privately owned / rented	privately owned / rented	community owned



vertical assembly

Figure 4.40 Case study of an urban void in Ard El Lewa
Figure 4.41 Extracting patterns and tools from the case study (right)


borrowing space-
legal sprawl
secure an
open space ratio
reclaim vacant lot with what
neighbours' needs
shared walls
shading devices as
a boundary definition
car wash and
services
community watch
incompleteness
unfinished facades
balcony drapes
hierarchy of structural elements
solid
light
wood + fabric
masonary
construction
concrete columns
light weight construction materials define territori-
ality and maintain visibility to the street.

EXISTING DIAGRAM / MAP / LAYOUT

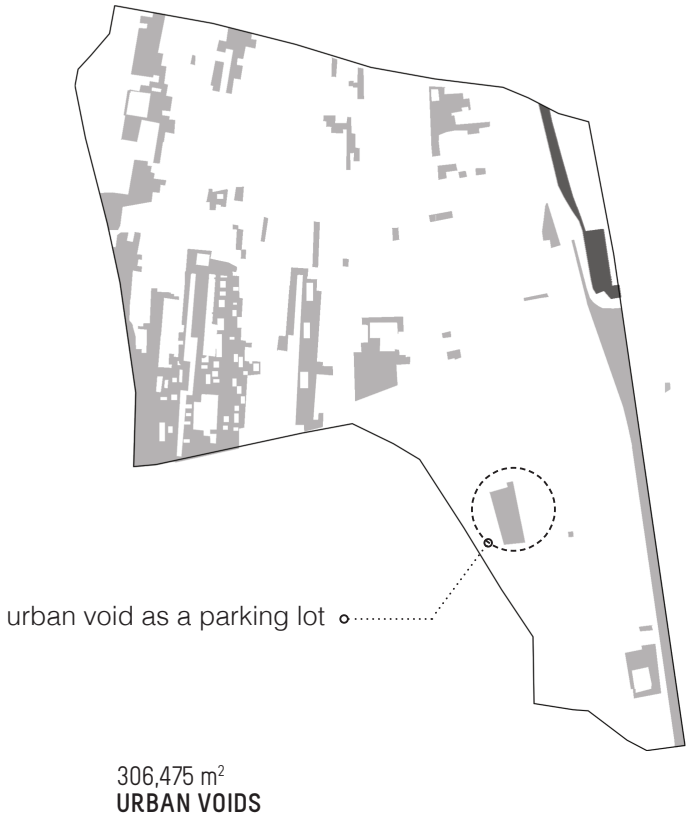


Figure 4.42 Occurrence of urban voids in Ard El Lewa

DESIGN OBJECTIVES + OPTIMIZATION LAYER

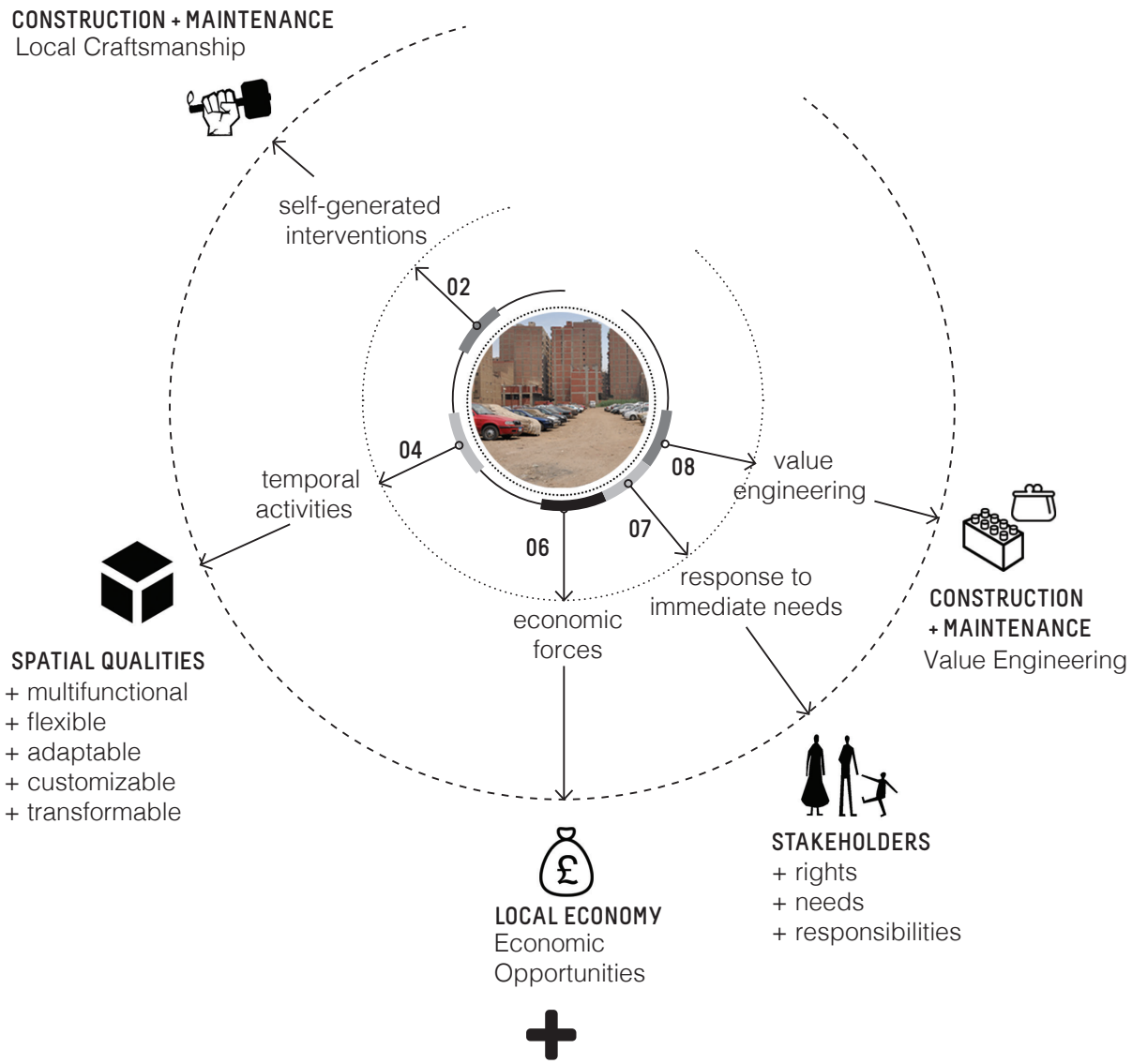


Figure 4.43 Pattern-Forces-Design Objectives Chart for urban void as a parking lot

EXISTING DIAGRAM / MAP / LAYOUT

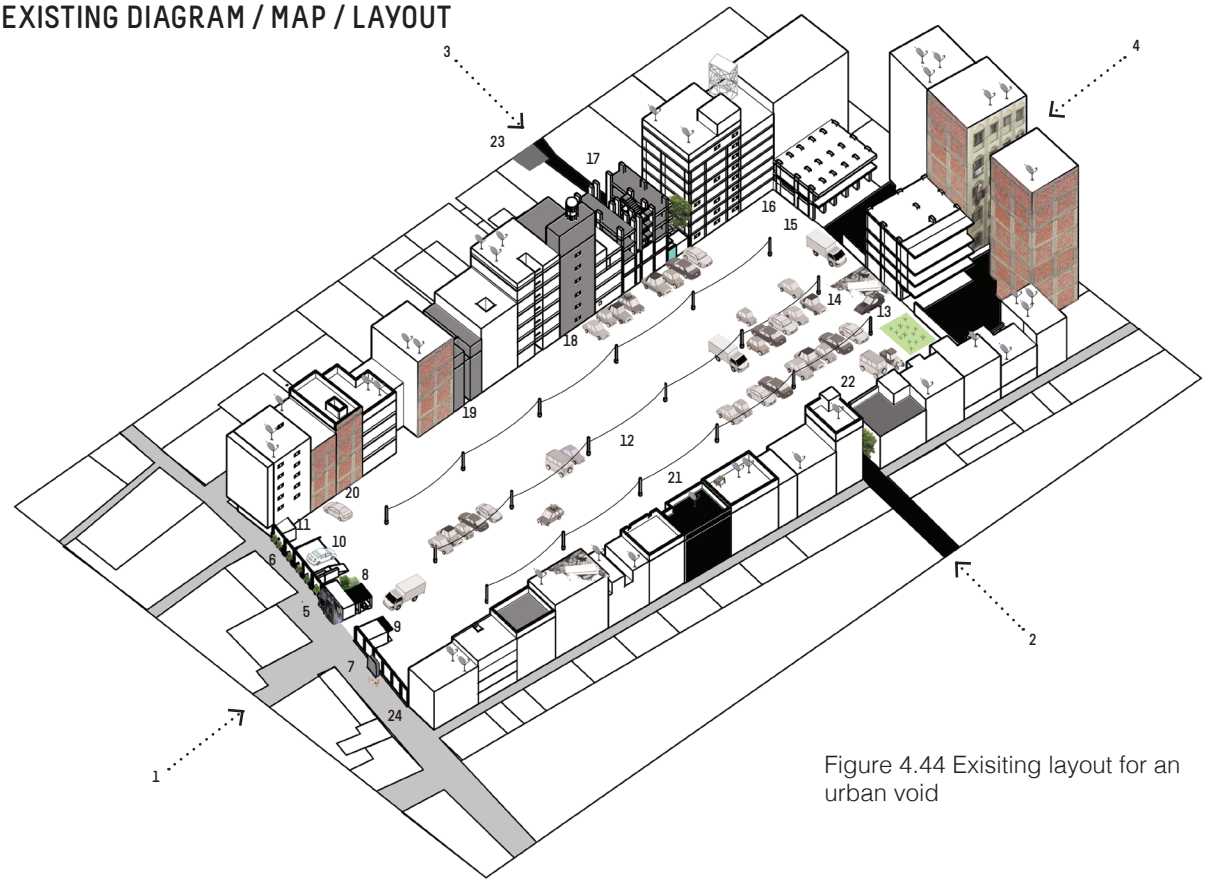


Figure 4.44 Exisiting layout for an urban void

01 Main entrance to parking lot
02 Dead-end + tree
03 Dead-end
04 Streets leading to the parking lot
05 Morning: Vegetable vendor [f] / Night: Watermelon vendor [m]
06 Plants protected by a steel mesh
07 Morning: Chicken vendor [f]
08 Guard room 1 + shaded sitting area
09 Guard room 2
10 Car wash + services
11 Washroom
12 Parking lot: cars + cabs + trucks + toktok
13 Wild plants
14 Dump of old carts + racing cars + wheels
15 Truck loading bricks for construction
16 Building under construction
17 Incomplete structure
18 Artellewa gallery + library + artists residence + studio
19 Save the Children Center + Artellewa workshop + gallery
20 Unfinished facades with no openings
21 Building in danger of falling
22 Rooftop of a low rise building
23 Artspace founded by Shadi El Noshokaty
24 Main Street: El Shoda Str.

Figure 4.45 Main entrance to parking lot
Figure 4.46 Dead end and community members
Figure 4.47 Dead end
Figure 4.48 Building under construction and street
Figure 4.49 Vegetable vendor around the corner
Figure 4.50 Guard's room and sitting area
Figure 4.51 Car wash services
Figure 4.52 Wild plants
Figure 4.53 Dump of old carts
Figure 4.54 Building under construction
Figure 4.55 Incomplete structure
Figure 4.56 Rooftop of a low rise building

Figure 4.45

Figure 4.46

Figure 4.47

Figure 4.48

Figure 4.49

Figure 4.50

Figure 4.51

Figure 4.52

Figure 4.53

ESIGN

SUSTAINABLE ENERGY
12 solar panels - Eco farms

PHYSICAL + SOCIAL INFRASTRUCTURE (COMMUNITY WALL)

05 waste collection

structure 1: ground floor
01 micro-economies for existing + new keyplayers
02 communal kitchen
03 communal dinning
04 washrooms
05 multipurpose hall for ceremonies + cultural events + movies
06 space for mobile vendors + urban farmers + future informality
07 communal stairs
08 guards rooms
09 performance space

structure 1: first floor
10 cultural cafe
11 performance space
12 exhibition space
13 space for mobile vendors + urban farmers + future informality
14 soccer field
01 micro-economies for existing + new key players

structure 2: first floor
12 exhibition space
15 classroom / studio
16 outdoor classrooms
17 kindergarten

incomplete structure
11 performance space
12 exhibition space
13 classroom / studio

[+] GREEN SPACES
18 rooftop urban farms + hydroponic fences
19 green sitting areas

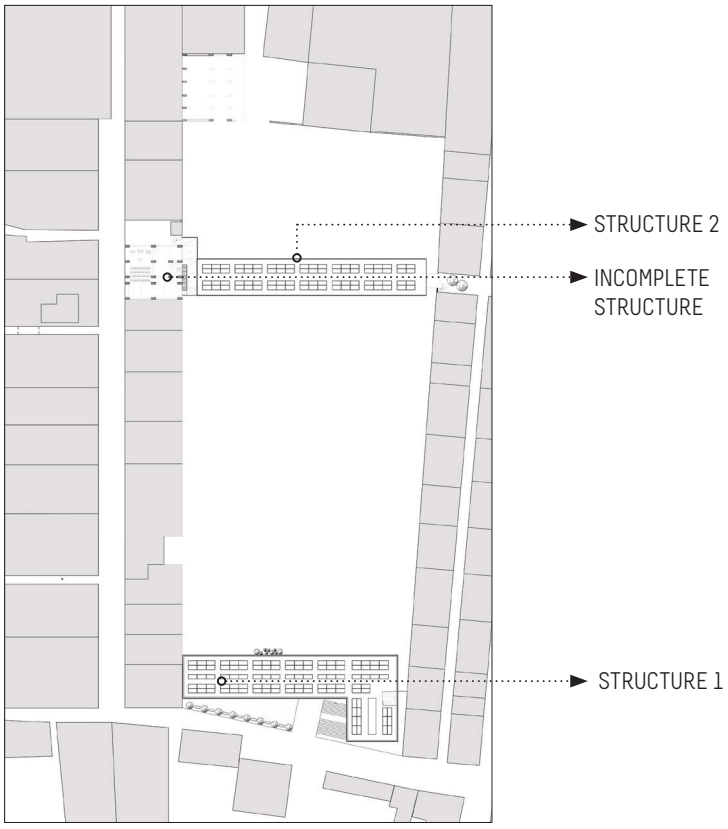


Figure 4.57 Proposed layout

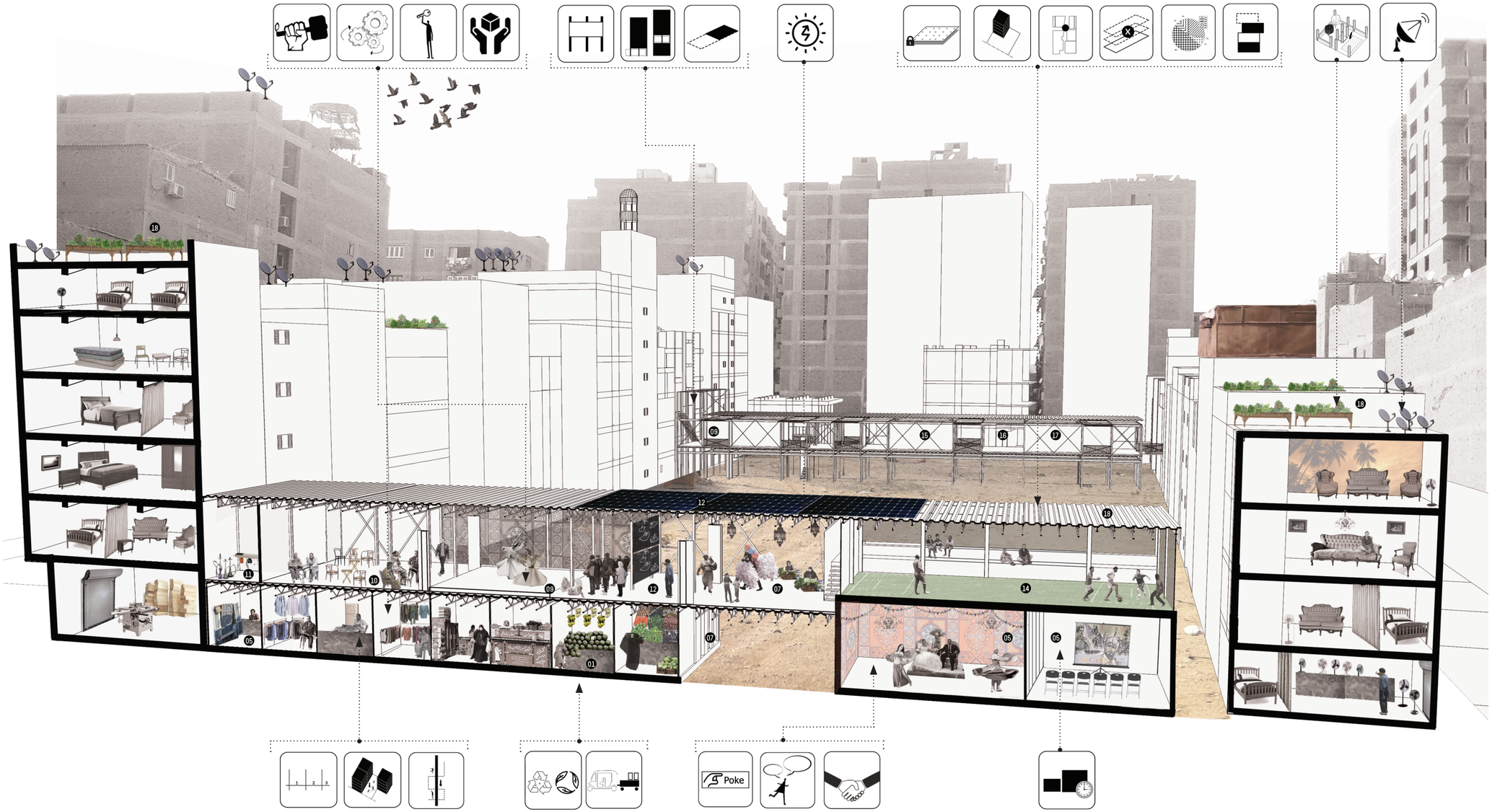


Figure 4.75 Improvitecture tools and optimization of urban void as a parking lot

Figure 4.59 Optimized plan with new patterns:
Structure 1: Ground Floor

Figure 4.60 Optimized plan with new patterns:
Structure 1: First Floor

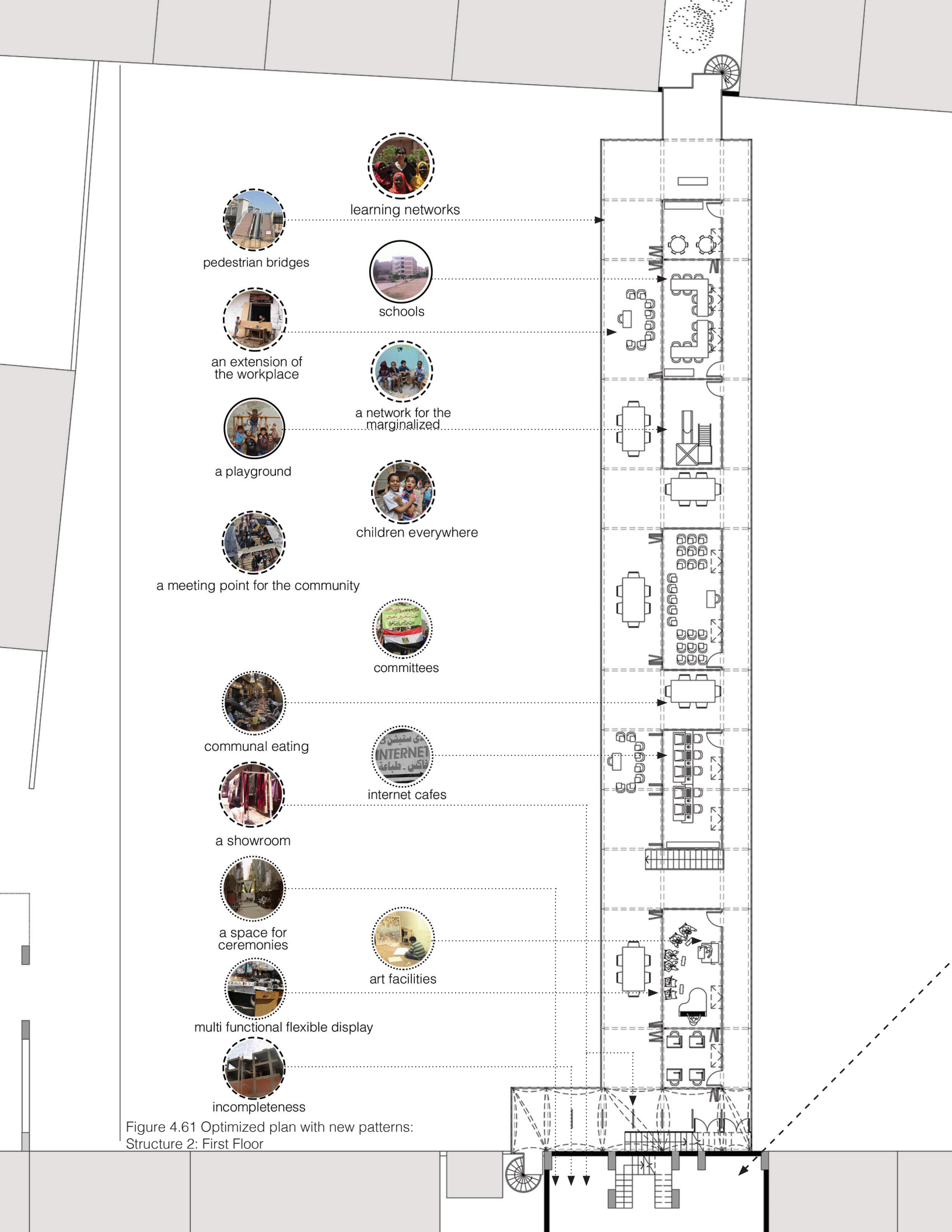


Figure 4.61 Optimized plan with new patterns: Structure 2: First Floor

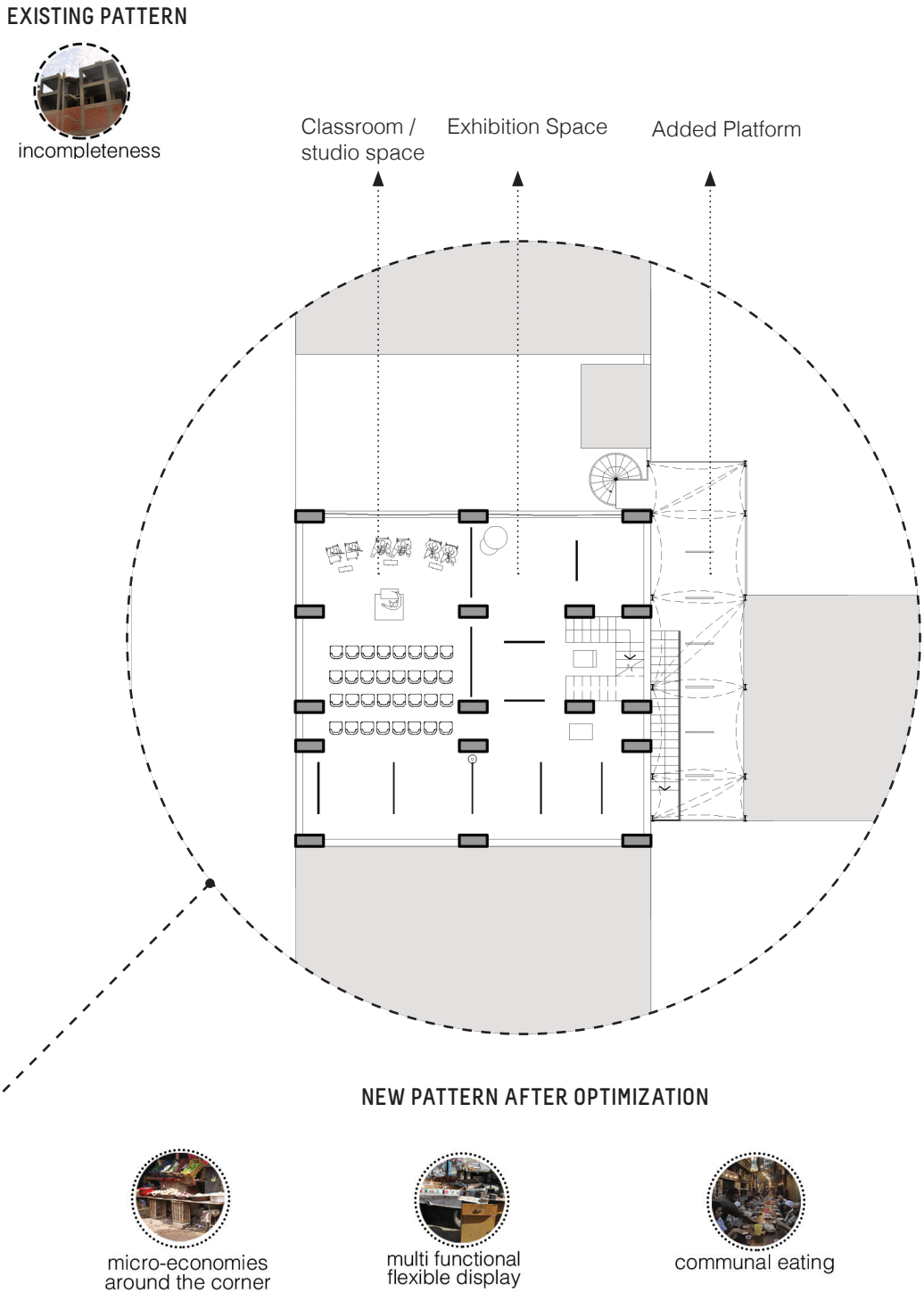
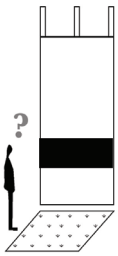


Figure 4.62 Optimized incomplete structure with patterns

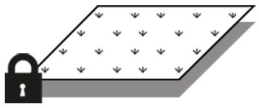
IMPROVITECTURE TOOLS

LEGALIZE + SECURE



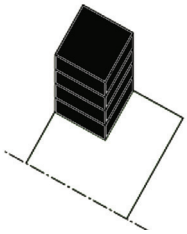
1.2
negotiate ownership + tenure right

landowners
agents of change committee
government officials



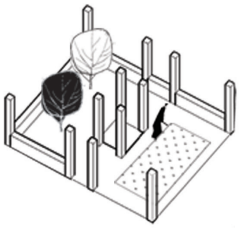
1.3
preserve existing vacant land

government officials
agents of change committee
landowners



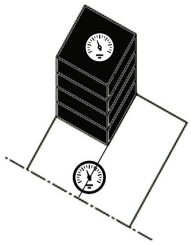
1.4
secure an open space ratio

builders
landowners
agents of change committee



1.5
green roofs by law

government officials
landowners
agents of change committee



1.7
shared but separate electric meter

government officials
landowners
agents of change committee
tenants: vendors, etc.

CULTIVATE

2.1
cultivate curiosity in the young first

designers
agents of change committee
young adults + children

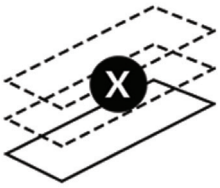
2.2
reclaim vacant spaces with neighbours' needs

designers
landowners
residents
tenants: vendors, etc.
agents of change committee

2.3
cultivate partnerships first

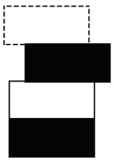
designers
landowners
agents of change committee
tenants: vendors, etc.

[RE]APPROPRIATE + [RE]USE



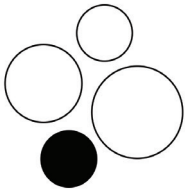
3.3
multiply land-use

landowners



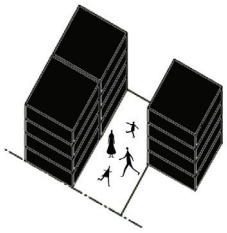
3.4
vertical distribution of activities

builders
landowners
designers



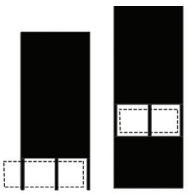
3.5
reshuffeling program helps

landowners
designers
agents of change committee



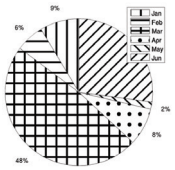
3.7
transform urban voids into communal hubs

designers
landowners
agents of change committee



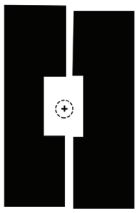
3.9
borrowing space - legal sprawl

designers
agents of change committee
landowners
building owners
tenants: vendors, artists, teachers,



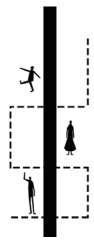
3.11
respect existing multi-functionality

designers
landowners
agents of change committee



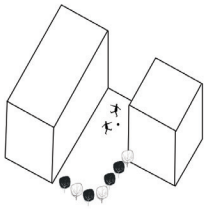
3.15
create [+] urban pockets

designers
landowners
agents of change committee



3.22
boundaries are community walls

designers
landowners
small business owners
vendors

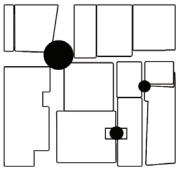


3.23
green edible fences

designers
landowners
agents of change committee

3.24
add some paint

designers
landowners
agents of change committee
children + youth



3.25
equal distribution of nodes

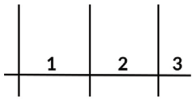
designers
agents of change committee

3.27
[+] waiting areas

landowners
designers
residents
agents of change committee

3.28
reduce, reuse, recycle

landowners
agents of change committee
waste management
residents
tenants
toktok drivers
designers



3.30
reclaim your territory by numbers

landowners
tenants: vendors etc.
mobile vendors
designers

3.31
eco farms on rooftops

landowners
agents of change committee
government officials
funding agencies
designers

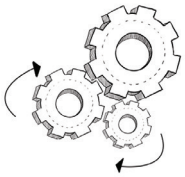
3.32
toktok for waste collection

landowners
tenants: vendors, etc.
agents of change committee
toktok drivers
waste management

CELEBRATE + MAINTAIN

4.1
handmade increases ownership + collaboration

designers
agents of change committee
landowners
local ctaftsmen
tenants: vendors, etc.
residents



4.2
building ceremony

agents of change committee
designers
land owners
tenants: vendors, etc.
residents
artists
funding agencies

4.3
own to protect

landowners
tenants: vendors, etc.

4.4
micro-economies as a tool for social responsibility

landowenrs
agents of change committee
unemployed residents
toktok drivers

CONSTRUCTION

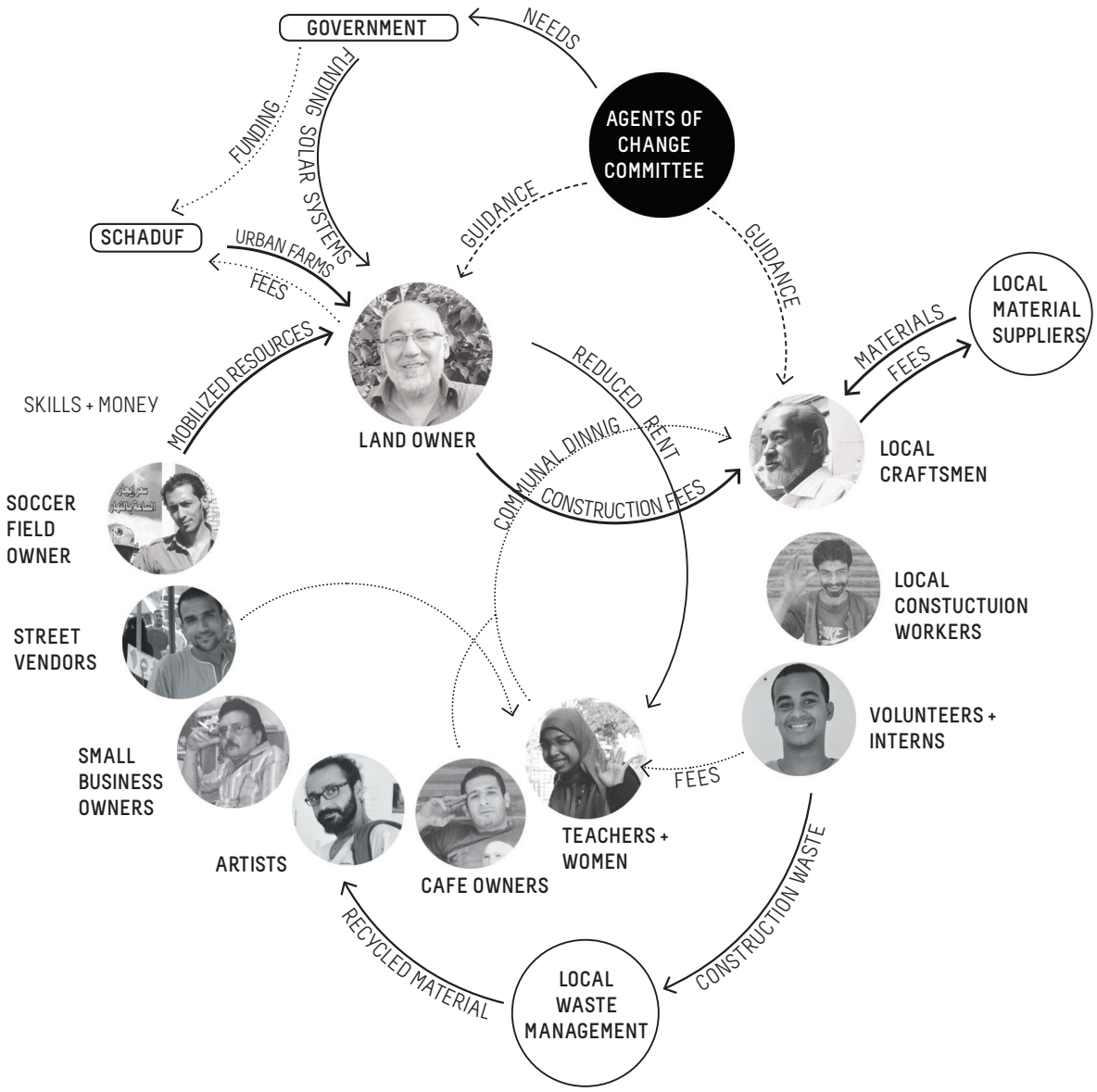


Figure 4.63 Proposed construction diagram for an urban void as a parking lot applying the Building Ceremony concept

OPERATION + MAINTENANCE

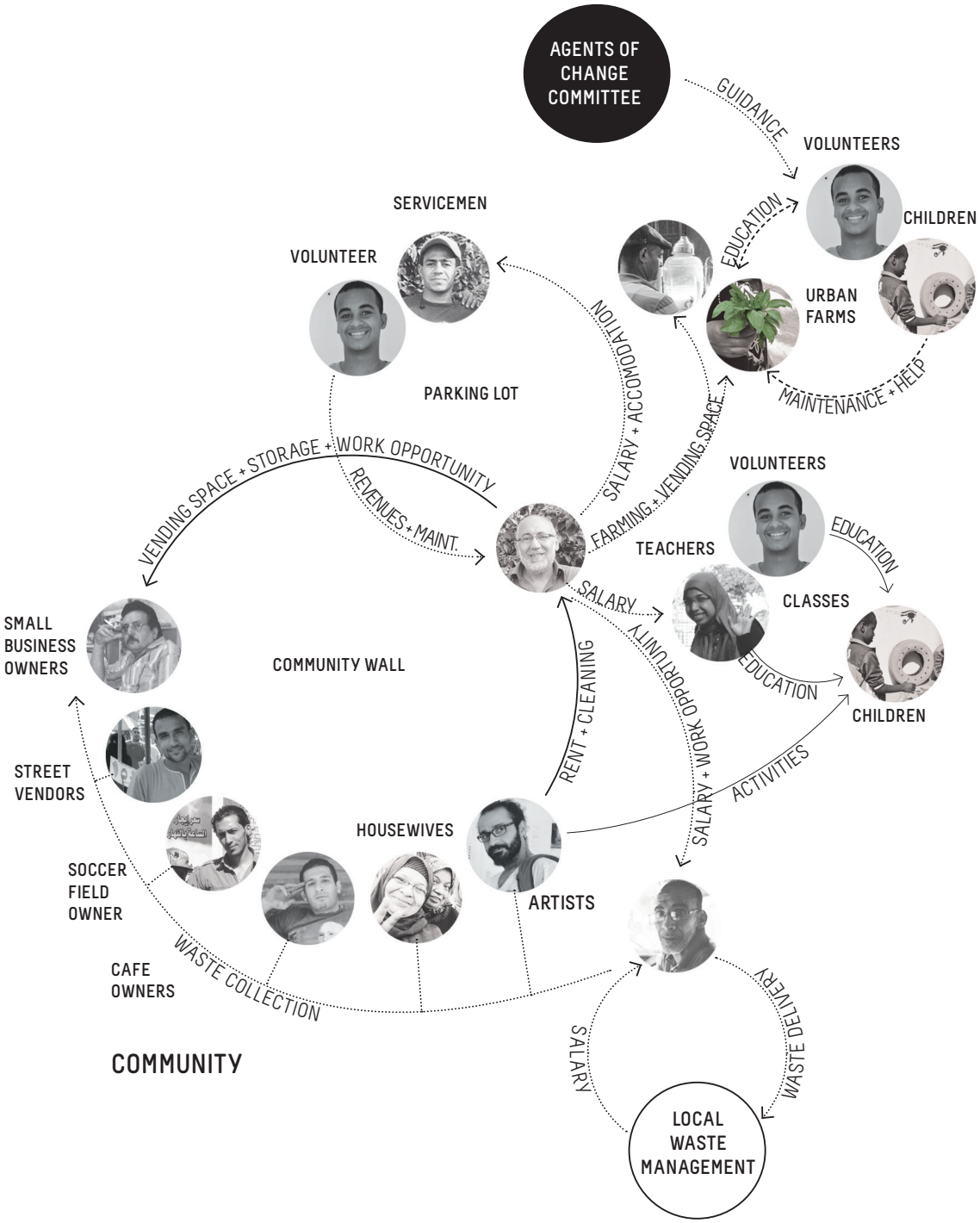
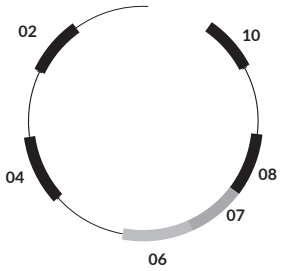


Figure 4.64 Proposed operation diagram for an urban void as a parking lot applying the Building Ceremony concept

Figure 4.65 Waiting agricultural land



+ - ●●

32 WAITING AGRICULTURAL LAND

[m + f]
landowners, farmers, builders, government employees

Lack of infrastructure and rigid taxation hinders farmers from cultivating their land. Remaining agricultural land is therefore waiting land, in the process of being prepared for construction or left until ownership problems are resolved and the means become available to the owners. Owners intentionally transform their waiting agricultural land into urban voids by the means of destroying the soil and using the land as a garbage dump in order to tweak the law and be able to proceed with construction. Waiting agricultural land is often surrounded by urban voids, which were former agricultural land that did not survive.

larger patterns
the big city is a magnet, shortage in resources, laissez faire policy, loss of agricultural land, don't blame the farmer.

smaller patterns
agricultural land as a garbage farm, planting steel re-bars, construction on agricultural land, shared walls, cantilevered building typology, incompleteness, streets follow irrigation grid, street width, constuction networks.

FORCES

02 self-generated interventions
04 temporal activities
06 economic forces
07 response to immediate needs
08 value engineering
10 ownership

POTENTIAL / PROBLEM

"A particular class of rituals and ceremonies has arisen around certain buildings and productive operations in which the technical act of building or production is integrated with the symbolic and social dimension of the culture. It is this class of ritual which appears to link and address acts of building and landscaping to the social and cultural life of the community" [677] *- Abdelhalim I. Abdelhalim*

Therefore:

Transform passive waiting land into a communal hub that provides the residents with economic, socio-cultural, farming, energy-generating and educational activities. Re-build a farming community that serves as catalyst and prototype for other waiting plots. This is an alternative income-generating use of land for the owner that should substitute residential construction.

97,292 m^2

MAP: WAITING AGRICULTURAL LAND

Figure 4.66 Occurrence of waiting agricultural land in Ard El Lewa

Figure 4.67 Waiting agricultural land at the formal [in]formal border

Figure 4.68 Preparing waiting agricultural land for construction

Figure 4.69 Land subdivision

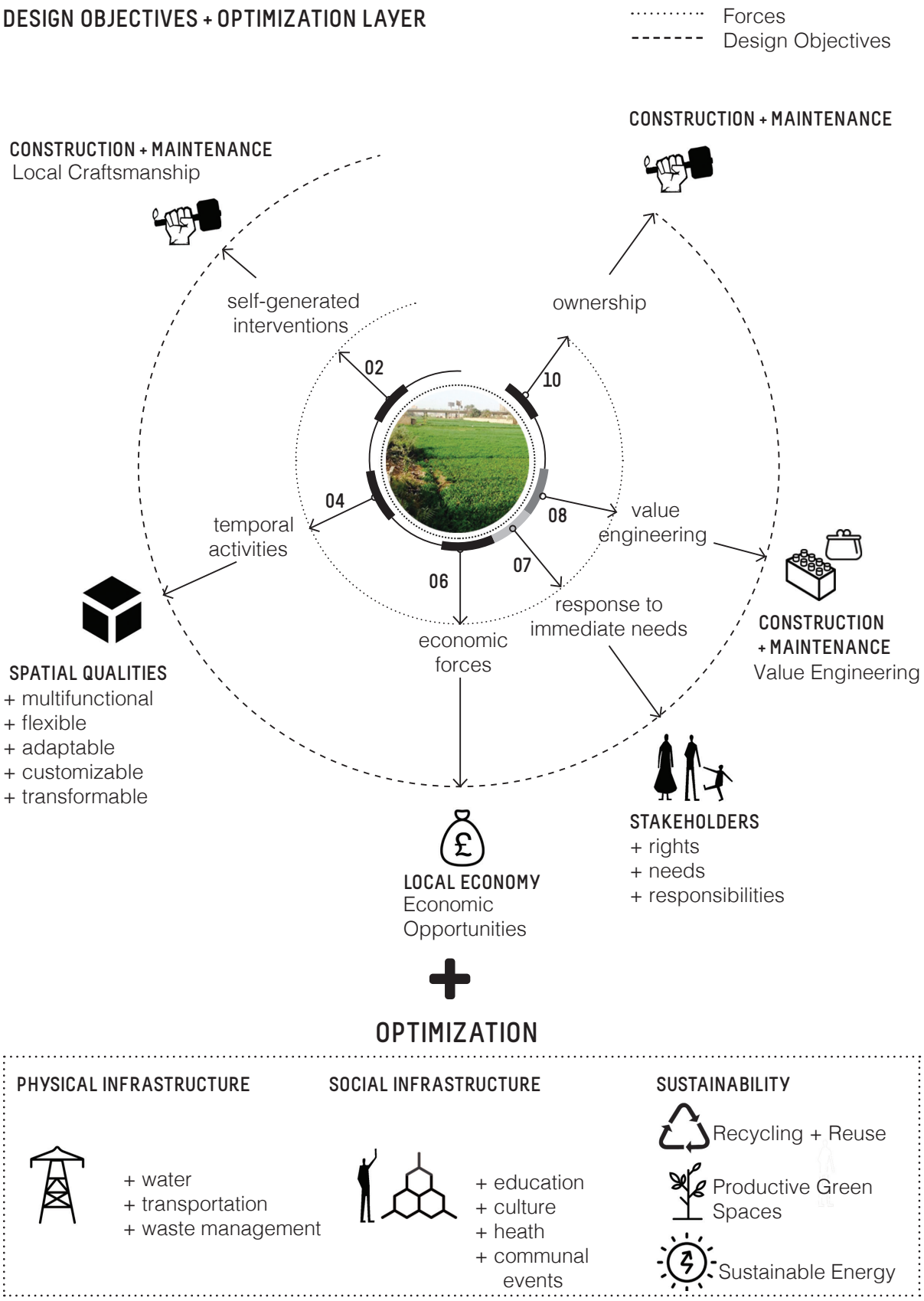


Figure 4.70 Pattern-Forces-Design Objectives Chart for waiting agricultural land

PROPOSED OPTIMIZATION / NEW DESIGN

SUSTAINABLE ENERGY
12 solar panels - Eco farms

PHYSICAL + SOCIAL INFRASTRUCTURE (COMMUNITY WALL)

05 waste management

06 classrooms
kindergarten
07 communal dinning
cultural cafe
08 micro-economies

STRUCTURE
04 frame structure +
operable partitions
09 open web steel joist
10 corrugated sheets
11 light-weight concrete
slab + tensile shading

[+] GREEN SPACES
01 community farming
02 communal park +
flower garden
03 green walkways
13 rooftop urban farms +
hydroponic fences
14 pulley system

PARCELIZATION
01 [+] green spaces
03 green walkway
15 gathering space
16 pedestrian
walkway
17 vending space
18 toktok lane for waste
delivery + future
informal sprawl

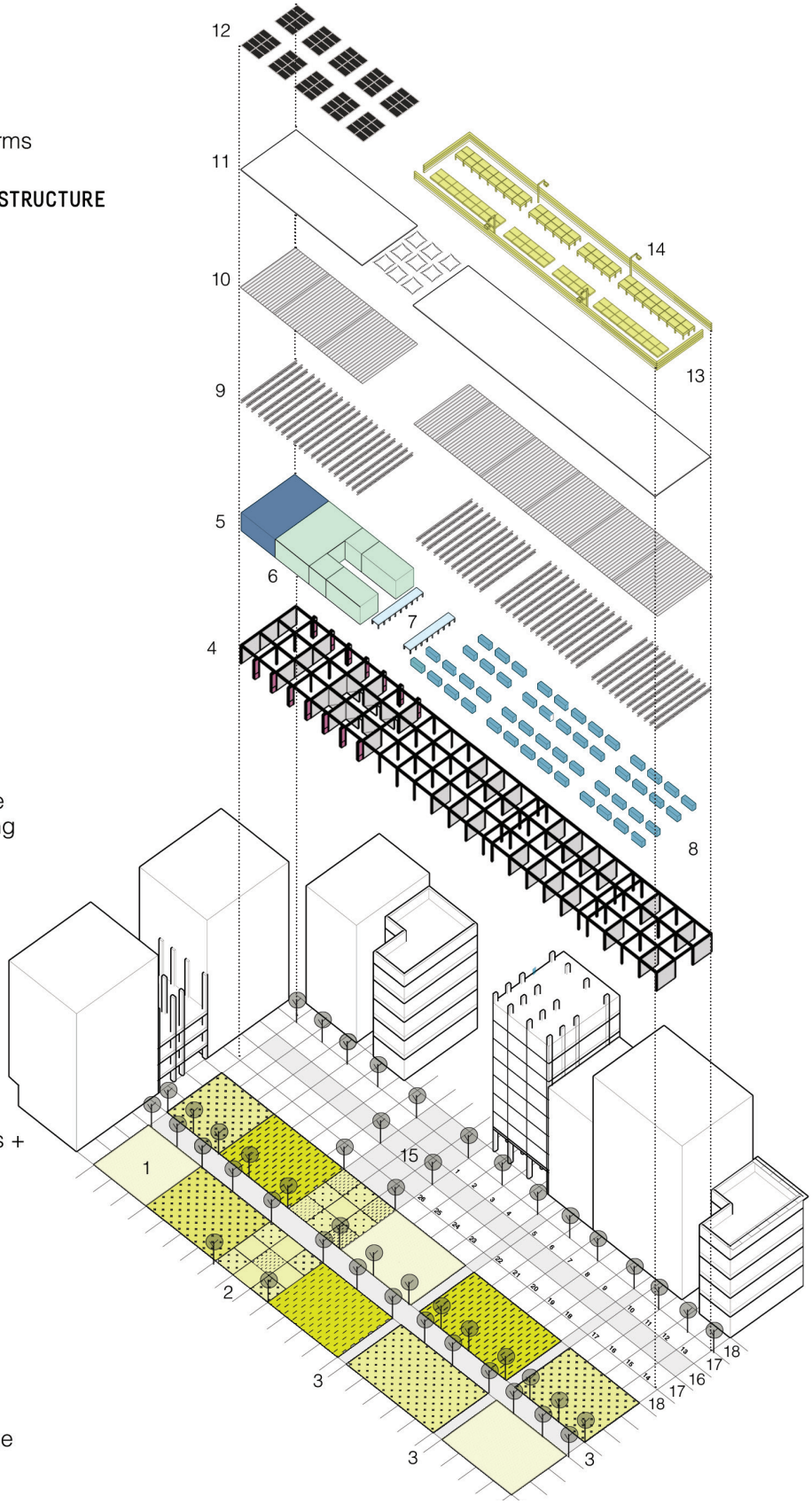


Figure 4.71 Optimized waiting agricultural land

[RE]APPROPRIATE + [RE]USE

SUSTAINABLE ENERGY
Solar panels provide energy for waste management plant, classrooms and kindergarten

GREYWATER REUSE
Greywater is collected from households, recyled on site and reused for irrigation of the community park. Water is infiltrated into the ground to avoid contact with the plants,

CLASSROOMS
co-op students and volunteers educate community members on farming, help children with school work and teach adults skills.

COMMUNAL DINNING
Day: Communal Dinning
Operated by women and provides dinning and socializing opportunities for vendors, elderly and neighbourhood residents

Night: Cultural cafe
Operated by men (street cafe owners) and acts as a gathering space for local artists and neighborhood residents.

CELEBRATE + MAINTAIN

CULTIVATE

PARCELIZATION
Module 3.2 x 3.2 m

COMMUNITY FARMING
Parcels and rooftop urban farms are rented by neighborhood residents (mainly women) as an additional source of income. Products are sold in the market or to the communal dinning cafe.

LEGALIZE + SECURE

[RE]APPROPRIATE + [RE]USE

WASTE MANAGEMENT
organic waste
recyclable waste
Toktoks collect waste from vendors and buildings and bring it to the waste management plant on site

Figure 4.76 Improvitecture tools and operation of optimized waiting agricultural land

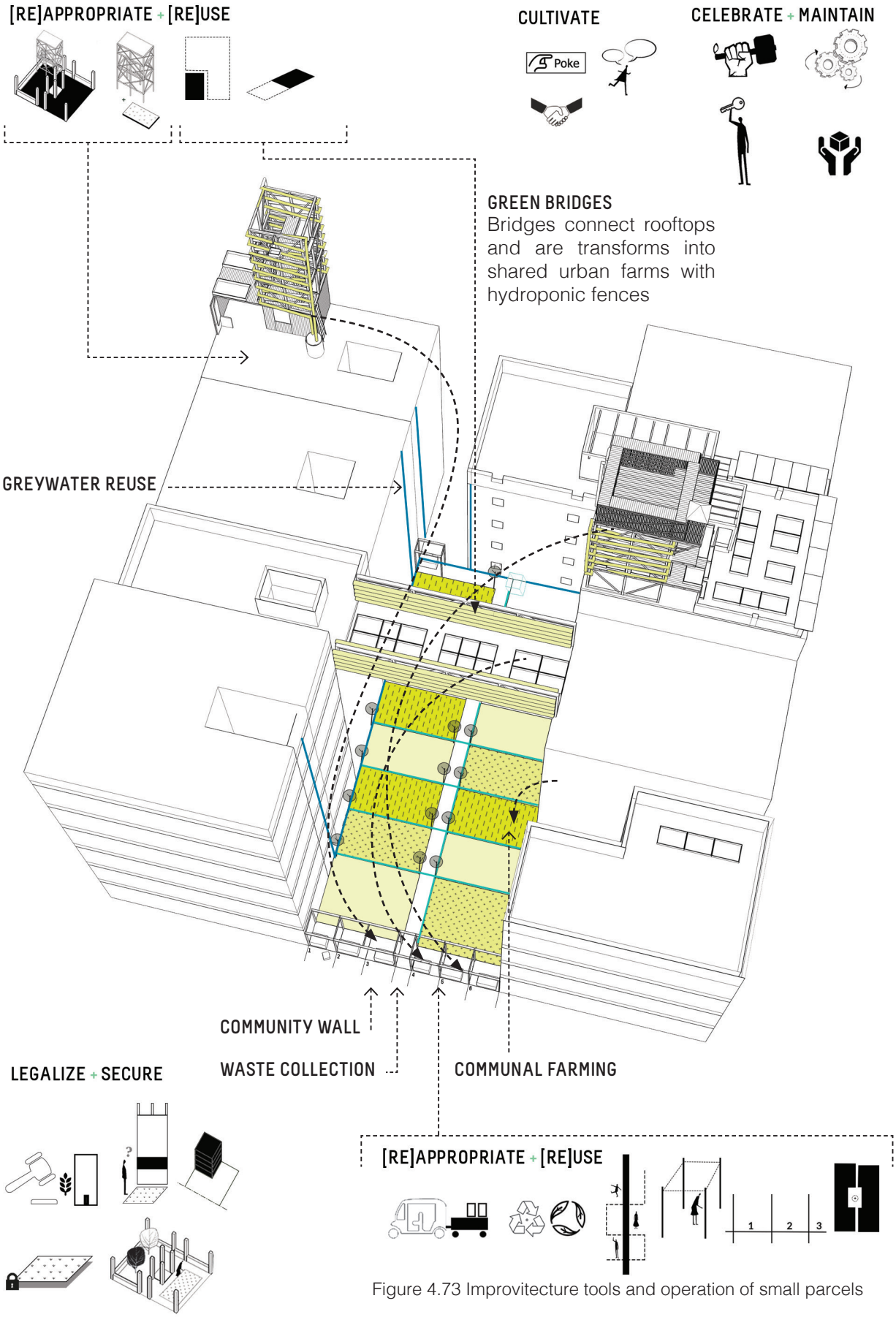
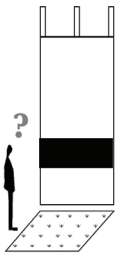


Figure 4.73 Improvitecture tools and operation of small parcels

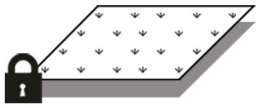
IMPROVITECTURE TOOLS

LEGALIZE + SECURE



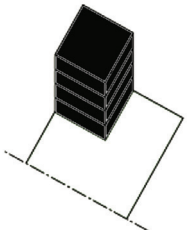
1.2
negotiate ownership + tenure right

landowners
agents of change committee
government officials
farmers



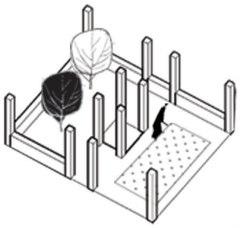
1.3
preserve existing vacant land

government officials
agents of change committee
landowners



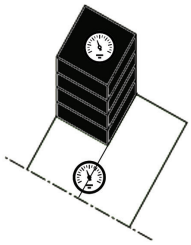
1.4
secure an open space ratio

builders
landowners
agents of change committee



1.5
green roofs by law

government officials
landowners
agents of change committee
building residents



1.7
shared but separate electric meter

government officials
landowners
agents of change committee
tenants: vendors, etc.

CULTIVATE

2.1
cultivate curiosity in the young first

designers
agents of change committee
young adults + children

2.2
reclaim vacant spaces with neighbours' needs

designers
landowners
residents
tenants: vendors, etc.
agents of change committee

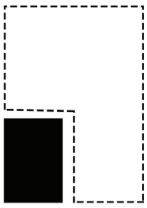
2.3
cultivate partnerships first

designers
landowners
agents of change committee
tenants: vendors, etc.

[RE]APPROPRIATE + [RE]USE

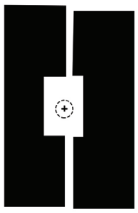
3.6
swap properties for public interest

government officials
agents of change committee
landowners



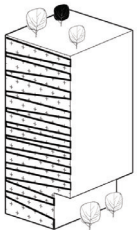
3.14
negotiate air rights

building owners
land owners
agents of change committee
designers



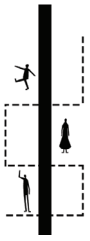
3.15
create [+] urban pockets

designers
landowners
agents of change committee



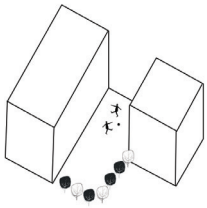
3.20
green walls + green roof + green streets

designers
landowners
building owners
housewives
residents
builders



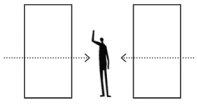
3.22
boundaries are community walls

designers
landowners
farmers
vendors
street cafe owners
housewives



3.23
green edible fences

designers
landowners
agents of change committee
farmers

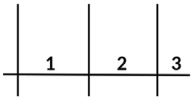


3.26
introverted market

designers
landowners
agents of change committee

3.28
reduce, reuse, recycle

landowners
agents of change committee
waste management
residents
tenants: vendors + farmers
toktok drivers
designers



3.30
reclaim your territory by numbers

landowners
tenants: vendors + farmers
mobile vendors
designers

3.31
eco farms on rooftops

landowners
agents of change committee
government officials
funding agencies
designers

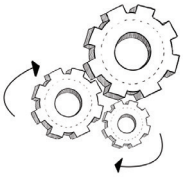
3.32
toktok for waste collection

landowners
tenants: vendors, etc.
agents of change committee
toktok drivers
waste management

CELEBRATE + MAINTAIN

4.1
handmade increases owner-ship + collaboration

designers
agents of change committee
landowners
local ctaftsmen
tenants: vendors, etc.
residents



4.2
building ceremony

agents of change committee
designers
land owners
tenants: vendors, street cafe owners, etc.
residents
farmers
artists
funding agencies

4.3
own to protect

landowners
tenants: vendors, etc.
farmers

4.4
micro-economies as a tool for social responsibility

landowenrs
farmers
agents of change committee
unemployed residents
toktok drivers

Goat & Chicken
eat from garbage dumps + live on the roof

animals

Nadia / 47
buys food each day from the market at the railway crossing + earns money from knitting

housewives

Saber / 40
needs storage space and a prayer area

street vendor

Zenhom / 50
recently lost his job and has 3 kids. He needs health facilities

unemployed

H'ag Eid / 73
can't afford to keep his plot of land due to taxation

farmers

Manar / 20
commutes to university + faces accessibility issues everyday

university student

Mido & Salma / 5,8
play on the street + need a community park

children

A'am Gomaa / 52
delivers anything anywhere especially to shop owners + housewives

delivery man+ vendor

PROBLEMS

- loss of scarce agricultural land
- density, lack of open and green space
- traffic congestion
- accessibility
- garbage accumulation
- sanitary concerns
- overburdened services
- adapting to social injustice

Salah / 43
works as a government employee during the day and a toktok driver at night

employee (low-ranking)

Figure 4.74 Urban naratives gathered by the invisible choreographer

Visitor

Micheal / 30
the government refuses to accredit his efforts and expences in cleaning the urban void

parking lot owner

Abu Rahma / 20
retired worker + shares the toktok with his friend

toktok driver

Ahmed / 25
sits everyday under the bridge to wait for a job

breadwinner

A'am Sayed / 64
the cantilevered building typology is the solution in such density

contractor + landowner

Figure 5.1 In the coops of Cairo, ©Rania Matar

05

REFLECTION

TOWARDS AN [IN]FORMAL PATTERN LANGUAGE INITIATIVE

An abundance of architecture theses display diverse directions in which architecture of the future will extend. By introducing the [in] formal Pattern Language initiative, the thesis chose to respond to the other 90% worldwide [8], and the 60-70% in Cairo [9], living in [in] formal areas, whose needs are currently neglected by contemporary architects. In a city where [in]formality has become the mainstream, yet still neglected and mistreated, and where conventional modes of practise no longer seem to work, the thesis set out to explore a process and new tools in dealing with informality while redefining it. The thesis also focused on revisioning the role of architects as mediators and choreographers of forces in self-organized communities, with the objective of fostering a pedagogical and research shift, and a mediation between bottom-up and top-down practices, as discussed in the conducted talk.

Architecture connects reality to theories. It has the power to constantly renew our reality and define space, even through small changes in the repetition of the ordinary. With this in mind, Improvitecture was introduced as a new typology in architecture, and redefined the [in]formal as improvised. The [in]formal Pattern Language manual, and the proposed process, were conceived as a guide on operating within the new typology and empowering citizens. All stages conducted in the thesis to test the process, that range from observing reality, research, interviewing community members and analysing local patterns to the slightest encounters during the workshop, such as finding the floor plan, prove how formal and organized the practices we call [in]formal actually are.

The [in]formal Pattern Language initiative not only transformed community members into active agents, but also transformed the architect into a facilitator, mediator, curator and invisible choreographer of forces. The thesis does not advocate for architecture without architects, but rather implies that architects should, in addition to the traditional professional profile, be designers of the process and inventors of opportunities. As seen from the designed tools in this thesis, which include an open-source website, pattern templates, workshop exercises and the manual, the expertise of the architect lies in designing a process and replicable tools that allow people to participate and improve their environment when the architect leaves the site. Architectural thinking should no longer solely be confined to crafting objects, but should give priority to designing components and processes. Design in self-organized communities and unpredictable environments should change its typology to allow agency and new forms of representation. Stan Allen proposes, “doubt and indeterminacy may have to be accepted as the everyday working material of the architect. Accepting the impossibility of a diaphanous communication between architect and public, a turn to the somewhat crude instrumentality of notation may in face be reasonable.”[70]

For the purpose of formalizing and communicating compiled data to authorities, planners and other community members, the architect needs to operate as an editor at the end of the process. As an editor, the architect should find connections between data generated by multiple users, organize extracted tools, patterns and needs with a higher level of professionalism and identify the most influential patterns, in the hope that the [in]formal Pattern Language manual becomes a building code, specifically tailored for 'improvised settlements.' As proposed in the process, the architect should also conceive construction and operation diagrams that allow community members to proceed with the implementation of the optimization. This step is necessary to give community members delegated power to construct the proposed optimization.

The [in]formal Pattern Language manual gives community members the tools to quickly optimize their lives, instead of waiting for the government to respond to their needs and resolve urban and environmental issues, a process that takes many years or might never happen. One of the most important aspects about this thesis is the fact that the Improvitecture tool-kit was not imposed on the community, but rather self-generated. As such, the [in]-formal Pattern Language initiative was designed as a cycle and an on-going, open-source and replicable process. The thesis also communicates societal needs to authorities and the need to change laws related to ownership, taxation and agriculture.

Furthermore, [in]formal Pattern Language provides a way for architects to insert themselves as agents, and participants in, self-organized communities and an approaching future where most of the built environment is designed without architects. What we currently consider as a marginal form of practice will be the mainstream of the future.

The workshop was the most essential component in the process for unlocking the 101 local patterns. Mapping accomplished an understanding of how patterns are related, and identified the most reoccurring elements of the built environment. It was also necessary to move from reality to a higher level of abstraction that non-architects are still able to comprehend. The workshop proved that community members have the ability to document their patterns, creatively transform spaces, and make the best out of existing skills and resources. Contemplating the outcomes of the 5-day workshop, one cannot stop thinking of the enormous effect that co-op students from architecture and agriculture universities would cause if they joined the agents of change committees and started replicating, together with other community members, the process in other neighbourhoods.

Designs presented in the manual, in their form and tectonic, celebrate both the utilitarian role of infrastructure in providing missing services, and the socio-cultural development it creates. Design interventions were created with the concept of incompleteness in

mind. They combine defined spaces with open buffer zones for mobile vendors, beggars, street vendors and future extensions. Proposed designs operate as a framework for current and future [in]formality, and should be seen as a directed form of improvisation. They serve as an incubator for existing patterns found on site and at the same time integrate new patterns to make the site more alive.

The thesis was deeply rooted in testing the proposed process on site, and including multiple voices. As a direct consequence of 'doing architecture' on site, the thesis encountered a few limitations, which need to be discussed.

The generated pattern templates and design interventions might not be the best and aesthetically pleasing operations. Working in [in]formal areas, one has to accept that no universal and definite solutions can be reached but, rather, an optimization of existing conditions: Key players' rights, needs and responsibilities, environmental concerns and inadequate resources. The outcome of the thesis is therefore not a completed guide, but an example of the endless possibilities available to create a more robust environment.

Even though a long-term transformation on the Save the Children rooftop was not achieved, the workshop gave the children the tools to analyze their built environment, transform a space with their needs, take ownership, and negotiate how they can benefit from maintaining it. Moreover, it managed to create awareness among participating children, encountered community members, architecture students and engaged experts. Pattern Templates, and the workshop, provoked participants to explore different mediums of design such as photography, mapping and illustrations, explore societal needs, employ critical judgement, think about value and design, and adopt multiple perspectives.

It is worth mentioning that the process strongly depends on its participants. Although the tools were designed in a replicable and generic way, and the format of the pattern templates was homogenized, one has to be aware that different user groups might document different patterns. To overcome this shortcoming, it is therefore, the responsibility of the architect to replicate the process with a variety of user groups that include women, men and youths from different backgrounds.

Although the [in]formal Pattern Language initiative reached its aims in unveiling a capsule of Improvitecture tools, and in-situ interventions to compensate for the loss of agricultural land within a community through hybridized green roofs by law, a more sustainable use of leftover spaces and community-farm parks, it touched the surface of solving regional [in]formal sprawl on agricultural land. On the one hand, this is justified by the nature and locality of the conducted fieldwork. On the other hand, it could be an indication that, in order to optimize global patterns, one has

to zoom out after working with the community and operate back on the global level using the acquired local knowledge. With the compiled local patterns, planners can establish a language to redirect [in]formal urban fabric away from agricultural land to the desert, and link it to the existing formal fabric without repeating the problems of new desert cities.

The most valuable lesson to take from working with a self-organized community is, as framed by Abdelhalim Ibrahim, "designing in such a community must strive a balance between analysis, abstraction and rationality, on the one hand, and faith and submission to the community's ideas about order, on the other."[71] The architect has to accept the role of an outsider. It takes time and effort to win a community's trust. With this acquired knowledge, the process should be updated to include a few loops until legitimacy in the community is attained. Collaborating with local key players should expedite this stage of the process. Being an outsider should not be seen as a devaluation of the architect. Outsiders are equipped with global knowledge and look at the built environment from a different view than insiders.

It was the intent of the thesis to fill the gap and connect bottom-up and top-down-generated findings, redefine relations to the [in]-formal and take participation to a higher level in Cairo, but at the same time act as a catalyst for future research, collaboration and practice.

Moving forward, the thesis seeks to inspire community members and architecture students to adopt the [in]formal Pattern Language initiative and start acting upon their built environment. It is the responsibility of the architect as the choreographer of forces to guide this process and to direct the discovery of new patterns. This can be achieved by generating Building Ceremonies, in the form of periodically organizing workshops, events and installations as prototypes for interventions. Moreover, the choreographer of forces should bring sources of funding and organize places to donate material. Participation from the inside and outside should be encouraged by developing crossover networks between community members and activists, artists, students and specialists from different disciplines. The choreographer of forces should also train community members, fellow designers and architecture students to think differently, and develop more guides and prototypes for construction, operation and continuity.

Although strongly based on a small-scale and local intervention, the [in]formal Pattern Language initiative has great potential to be scaled up. It appeals to emerging initiatives that aspire to look at our city through different layers, other participatory models and bottom-up mapping initiatives. In succeeding to map global trends to individual patterns, the [in]formal Pattern Language can be further implemented in other disciplines, for example, addressing ownership, legislation, taxation and economics.

As the [in]formal Pattern Language provides a guide on the efficient use of space, by negotiating air rights and occupying urban voids, rooftops and incomplete structures, the same process can be replicated on 'formal' housing to make it more efficient and solve the existing housing paradox. While construction and urban sprawl continue on agricultural land, 30-40% of housing units in Cairo lie unoccupied. As framed by Yahia Shawkat, there are 750,000 vacant housing units in the new cities, more than a million empty units in greater Cairo, and around seven million vacant units in Egypt.[72] The [in]formal Pattern Language can therefore offer insights on alternative uses of these vacant units, and develop a language that relinks people to the abandoned built environment.

With the UN's estimate that every third person will be a resident of [in]formal areas within 30 years, the case of the [in]formal Pattern Language is emphasized as a tool for long-term empowerment, and communicating the voices of the vulnerable.[73] With this in mind, one is compelled to replicate the initiative in other [in]formal communities around the globe, to investigate common patterns towards forming a universal [in]formal Pattern Language manual.

Students and children today are leaders of tomorrow. Today's urban voids and remaining agricultural land are tomorrow's unsustainable buildings. It's time to act. The thesis is only a snapshot of what's to come.

Figure 5.2 The architect, a choreographer of forces

ENDNOTES

INTRODUCTION

1. United Nations Human Settlements Programme (UN Habitat), *State of the World's Cities*, Routledge Press, 2013. http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3387

2. Ibid.

3. "Informal Urbanism" (paper presented at the Habitat Universities Thematic Hub, University of Hannover, 2014).

4. Steven Bingler and Martin Pederson, "How to Rebuild Architecture," *The New York Times*, December 16, 2014, A29.

5. Cynthia E. Smith, *Design with the other 90% Cities* (New York: Cooper-Hewitt, National Design Museum Smithsonian institution, 2011).

6. United Nations Human Settlements Programme, "State of the World's Cities," UN Habitat, Routledge, 2013. http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3387

7. Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 125.

8. Iman Salama, "User-driven housing construction: Lessons from Cairo," *Cairobserver*, July 2015. http://cairobserver.com/post/122456125729/cairo-user-driven-housing-construction#.VgGTk0sqgpE

9. David Sims, *Understanding Cairo: The Logic of a City Out of Control* (Cairo: The American University in Cairo Press, 2011).

10. Ibid.

11. TADAMUN, "Coming Up Short: Egyptian Government Approaches to Informal Areas," Policy Alerts (September, 2014). http://www.tadamun.info/2014/09/16/coming-short-government-approaches-informal-areas/?lang=en#.Vggz-EsqgpE

12. David Sims, *Understanding Cairo: The Logic of a City Out of Control* (Cairo: The American University in Cairo Press, 2011)

13. Ibid.

14. Ibid.

15. Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 136.

16. Beth Stryker and Omar Nagati, *Archiving the City in Flux*, (Cairo: CLUSTER, 2013), 60.

17. Ibid.

18. Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 85.

19. Ibid., 91.

20. Hassan R. El-Ramady , Samia M. El-Marsafawy and Lowell N. Lewis, "Sustainable Agriculture and Climate Changes in Egypt," in *Sustainable Agriculture Reviews*, ed. Eric Lichtfouse (Springer Netherlands, 2013), 41.

21. David Sims, *Understanding Cairo: The Logic of a City Out of Control* (Cairo: The American University in Cairo Press, 2011)

22. Hassan R. El-Ramady, Samia M. El-Marsafawy and Lowell N. Lewis, "Sustainable Agriculture and Climate Changes in Egypt," in Sustainable Agriculture Reviews, ed. Eric Lichtfouse (Springer

Netherlands, 2013), 41.

23. David Sims, *Understanding Cairo: The Logic of a City Out of Control* (Cairo: The American University in Cairo Press, 2011).

24. David Sims, *Egypt's Desert Dreams: Development of Disaster*, (Cairo: The American University in Cairo Press, 2015).

25. David Sims, "What is secure tenure in urban Egypt?" in *Land, Rights and Innovation: Improving tenure security for the urban poor*, ed. G. Payne (London: ITDG Publishing, 2002), 79-99.

26. Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 92.

27. Ibid.

CHAPTER 00

28. TADAMUN, "Coming Up Short: Egyptian Government Approaches to Informal Areas," Policy Alerts (September, 2014). http://www.tadamun.info/2014/09/16/coming-short-government-approaches-informal-areas/?lang=en#.VgFO_ksqgpE.

29. Elena Piffero, "Struggeling for Participation: Experience of a 10-year Development Program, Boulaq el Dakrour, Egypt," *Participatory Development Programme in Urban Areas* (October, 2009).

30. Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 6.

31. Ibid., 134.

32. Government of Egypt, "Unofficial Translation: Constitution of the Arab Republic of Egypt 2014," Article 78 (Cairo,2014).

33. Ron Dembo, "Citizen Roles in Resilient Cities," *Global Urban Lecture Series* (lecture, UN Habitat and University Network Initiative, 2014. http://unhabitat.org/urban-knowledge/urban-lectures/

34. Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 135.

35. Ibid.,130.

36. Ibid., 130.

37. Ibid., 126.

38. Marcos L. Rosa, ed., Ute E. Weiland, ed., *Handmade Urbanism: From Community Initiatives to Participatory Models* (Berlin: Jovis Verlang Gmbh, 2013).

39. Mike Lydon and Anthony Garcia, *Tactical Urbanism: Short-term Action for Long-term Change,* (Washington: Island Press, 2015), 2.

40. "Informal Urbanism" (paper presented at the Habitat Universities Thematic Hub, University of Hannover, 2014).

41. Christopher Alexander, *The Timeless Way of Building,* (New York: Oxford University Press, 1979), 90.

42. Christopher Alexander, Sara Ishikawa, and Murray Silverstein, *A Pattern Language: Towns, Buildings, Construction*, (New York: Oxford University Press, 1977), xi.

43. Ibid.

44. Christopher Alexander, *The Timeless Way of Building* (New York: Oxford University Press, 1979).

45. Abdelhalim I. Abdelhalim, "A Ceremonial Approach to Community Building," *Theories and Principles of Design in the Architecture of Islamic Societies* (Cambridge, Massachusetts: Agha Khan Program for Islamic Architecture, 1988), 143.

46. Abdelhalim I. Abdelhalim, "Culture, Environment, and Sustainability: Theoretical Notes and Reflection on a Community Park Project in Cairo," Sustainable Landscape Design in Arid Climates (Geneva: Aga Khan Trust for Culture, 1996), 53.

47. Abdelhalim I. Abdelhalim, "A Ceremonial Approach to Community Building," *Theories and Principles of Design in the Architecture of Islamic Societies* (Cambridge, Massachusetts: Agha Khan Program for Islamic Architecture, 1988), 139.

48. Ibid.

49. Ibid., 140.

50. Christopher Alexander, *The Timeless Way of Building* (New York: Oxford University Press, 1979), 7.

CHAPTER 01

51. "Do improv comedians make the best design thinkers?", World Resonance, http://www.worldresonance.com/do-improv-comedians-make-the-best-design-thinkers.

52. Vitruvius Pollio, *Ten Books on Architecture*, trans. Morris H. Morgan (Cambridge: Harvard University Press, 1914), 5.

53. *Egyptian Urban Action*, directed by Omnia Khalil (Cairo: 2012). https://www.youtube.com/watch?v=F2i8HVnKtls

54. Christopher Alexander, Sara Ishikawa, and Murray Silverstein, *A Pattern Language: Towns, Buildings, Construction*, (New York: Oxford University Press, 1977), x.

55. Christopher Alexander, Sara Ishikawa, and Murray Silverstein, *A Pattern Language: Towns, Buildings, Construction*, (New York: Oxford University Press, 1977), xv.

CHAPTER 02

56. Sherry Arnstein, "A ladder of Citizen Participation," *Journal of The American Institute of Planners* (Boston: American Institute of Planners, Vol. 35, No. 4, 1969), 216-224.

57. Omar Nagati and Noheir Elgendy, "Ard Al Liwa Park Project: Towards a New Urban Order and Mode of Professional Practice", *Planum. The Journal of Urbanism*, no.6, vol. 1 (January 2013), 4.

58. Ibid.

59. Hanaa Gad, "The Role of Local initiatives in Urban Development," June 29, 2013, http://www.tadamun.info/?post_type=voice&p=1018&lang=en&lang=en#.VghIwksqgpE

60. Jamie Lundine, Primož Kovačič and Lisa Poggiali, "Youth and Digital Mapping in Urban Informal Settlements: Lessons Learned from Participatory Mapping Processes in Mathare in Nairobi, Kenya," *Children, Youth and Environments* Vol. 22, no. 2, Collected Papers (2012), 214.

61. Nadia Amoroso, *The Exposed City: Mapping the Urban Invisibles* (London and New York: Routledge Press, 2010), viii.

62. S. J. Catling, "Maps and Cognitive Maps: The Young Child's Perception," Geography Vol. 64, no. 4 (November 1979): 288, http://www.jstor.org/stable/40569984

63. "Digital mapping technology to reduce disaster risks," Unicefstories, last modified May 20, 2014,

http://www.unicefstories.org/2014/05/20/digital-mapping-technology-to-reduce-disaster-risks

64. S. J. Catling, “Maps and Cognitive Maps: The Young Child’s Perception,” Geography Vol. 64, no. 4 (November 1979): 288, http://www.jstor.org/stable/40569984

CHAPTER 03

65. Christopher Alexander, Sara Ishikawa, and Murray Silverstein, *A Pattern Language: Towns, Buildings, Construction*, (New York: Oxford University Press, 1977), xiii.

CHAPTER 04

66. Christopher Alexander, *The Timeless Way of Building* (New York: Oxford University Press, 1979), 7.

67. Abdelhalim I. Abdelhalim, “Culture, Environment, and Sustainability: Theoretical Notes and Reflection on a Community Park Project in Cairo,” *Sustainable Landscape Design in Arid Climates* (Geneva: Aga Khan Trust for Culture), 51.

CHAPTER 05

68. Cynthia E. Smith, *Design with the other 90% Cities* (New York: Cooper-Hewitt, National Design Museum Smithsonian institution, 2011)

69. Beth Stryker, Omar Nagati and Magda Mostafa, *Learning from Cairo: Global Perspectives and Future Visions*, (Cairo: CLUSTER and The American University in Cairo, 2013), 125.

70. Stan Allen, “Mapping the Unmappable: on Notations”, *Autographic vs. Allographic Practices* (1997)

71. Abdelhalim I. Abdelhalim, “A Ceremonial Approach to Community Building,” *Theories and Principles of Design in the Architecture of Islamic Societies* (Cambridge, Massachusetts: Agha Khan Program for Islamic Architecture, 1988), 143.

72. Yahia Shawkat, “Egypt’s new capital: A city for investments or for alleviating overpopulation?” interview by Mostafa Mohie. *Mada Masr*, March 22, 2015.
http://www.madamasr.com/sections/economy/egypts-new-capital-city-investments-or-alleviating-overpopulation

73. United Nations Human Settlements Programme, “State of the World’s Cities,” UN Habitat, Routledge, 2013. http://mirror.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3387

BIBLIOGRAPHY

Abdelhalim, Abdelhalim I. “A Ceremonial Approach to Community Building.” *Theories and Principles of Design in the Architecture of Islamic Societies.* Cambridge, Massachusetts: Agha Khan Program for Islamic Architecture, 1988.

Abdelhalim, Abdelhalim I.“Culture, Environment, and Sustainability: Theoretical Notes and Reflection on a Community Park Project in Cairo.” In *Sustainable Landscape Design in Arid Climates.* Geneva: Aga Khan Trust for Culture, 1996.

Alexander, Christopher.*The Timeless Way of Building*. New York: Oxford University Press, 1979.

Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. *A Pattern Language : Towns, Buildings, Construction*. New York: Oxford University Press, 1977.

Allen, Stan.“Mapping the Unmappable: on Notations.” *Autographic vs. Allographic Practices*.1997.

Amoroso, Nadia. *The Exposed City: Mapping the Urban Invisibles.* London and New York: Routledge Press, 2010.

Arnstein, Sherry. “A Ladder of Citizen Participation.” *Journal of the American Institute of Planners 35*, no. 4 (1969).

Borasi, Giovanna, ed., and Mirko Zardini,ed. *Actions : What You can do with the City.* Montréal: Canadian Centre for Architecture, 2008.

Bingler, Steven, Martin Pedersen. “How to Rebuild Architecture.” *The New York Times*, December 16, 2014.

Blundelll Jones, Peter, ed., Doina Petrescu, ed. and Jeremy Till, ed. *Architecture and Participation.* New York: Routledge Press, 2005.

Brillembourg, Alfredo, Kristin Feireiss and Hubert Klumpner. *Informal City: Caracas Case*. Munich, Berlin, London, New York: Prestel, 2005.

Catling, S. J. “Maps and Cognitive Maps: The Young Child’s Perception.” *Geography 64*, no. 4 (1979). http://www.jstor.org/stable/40569984

Dembo, Ron. “Citizen Roles in Resilient Cities.” *Global Urban Lecture Series.* UN Habitat and University Network Initiative, 2014. http://unhabitat.org/urban-knowledge/urban-lectures

“Digital mapping technology to reduce disaster risks.” Unicefstories. Last modified May 20, 2014. http://www.unicefstories.org/2014/05/20/digital-mapping-technology-to-reduce-disaster-risks

“Do improv comedians make the best design thinkers?” World Resonance.
http://www.worldresonance.com/do-improv-comedians-make-the-best-design-thinkers.

Egyptian Urban Action. Directed by Omnia Khalil. Cairo: 2012.
https://www.youtube.com/watch?v=F2i8HVnKtls.

El-Ramady, Hassan R., Samia M. El-Marsafawy, Lowell N. Lewis. “Sustainable Agriculture and Climate Changes in Egypt.” In S*ustainable Agriculture Reviews*, edited by Eric Lichtfouse. Springer Netherlands, 2013.

Gad, Hanna."The Role of Local initiatives in Urban Development." June 29, 2013 http://www.tadamun.info/?post_type=voice&p=1018&lang=en&lang=en#.VghIwksqgpE

Government of Egypt. "Unofficial Translation: Constitution of the Arab Republic of Egypt 2014." Article 78. Cairo, 2014.

Habitat Universities Thematic Hub. "Informal Urbanism." University of Hannover, 2014.

Hertzberger, Herman, Anna Herringer, and Jean-Philippe Vassal. *The Future of Architecture*. Rotterdam: nai010 publishers, 2013.

Jamie, Primož Kovačič and Lisa Poggiali. "Youth and Digital Mapping in Urban Informal Settlements: Lessons Learned from Participatory Mapping Processes in Mathare in Nairobi, Kenya." *Children, Youth and Environments 22*, no. 2 (2012).

Lydon, Mike, and Anthony Garcia. *Tactical Urbanism: Short-term Action for Long-term Change.* Washington: Island Press, 2015.

Nagati, Omar, Beth Stryker. *Archiving the City in Flux: Cairo's Shifting Urban Landscape since the January 25th Revolution.* Cairo: CLUSTER, 2013.

Nagati, Omar, and Noheir Elgendy."Ard Al Liwa Park Project: Towards a New Urban Order and Mode of Professional Practice."*Planum. The Journal of Urbanism 1*, no.6 (January 2013).

Pfeifer, Laura."The Planner's Guide to Tactical Urbanism." *Regina Urban Ecology,* October 2014. https://reginaurbanecology.files.wordpress.com/2013/10/tuguide1.pdf

Piffero, Elena. "Struggeling for Participation: Experience of a 10-year Development Program, Boulaq el Dakrour, Egypt." Participatory Development Programme in Urban Areas, October 2009.

Pollio, Vitruvius. *Ten Books on Architecture*. Translated by Morris H. Morgan. Cambridge: Harvard University Press, 1914.

Rosa, Marcos L., editor., Ute E. Weiland editor., and Ana Álvarez editor. *Handmade Urbanism : From Community Initiatives to Participatory Models*. Berlin: Jovis, 2013.

Salama, Iman. "User-Driven Housing Construction: Lessons from Cairo." *Cairobserver,* July 2015.

Shawkat, Yahia, "Egypt's new capital: A city for investments or for alleviating overpopulation?" Interview by Mostafa Mohie. *Mada Masr*, March 22, 2015. http://www.madamasr.com/sections/economy/egypts-new-capital-city-investments-or-alleviating-overpopulation

Shehayeb, Dina. *Maximising Use Value: Action Guide for Informal Areas.* Cairo: Participatory Development Programme in Urban Areas (PDP), 2011.

Sims, David. *Egypt's Desert Dreams: Development of Disaster*. Cairo: The American University in Cairo Press, 2015.

Sims, David. *Understanding Cairo : The Logic of a City Out of Contro*l. Cairo ; The American University in Cairo Press, 2011.

Sims, David. “What is secure tenure in urban Egypt?” In *Land, Rights and Innovation: Improving tenure security for the urban poor*, edited by G. Payne. London: ITDG Publishing, 2002.

Smith, Cynthia E. *Design with the Other 90% : Cities*. 1st ed. ed. New York: Cooper-Hewitt, National Design Museum, Smithsonian Institution, 2011.

Stryker,Beth, Omar Nagati, and Magda Mostafa. *Learning from Cairo: Global Perspectives and Future Visions*. Cairo: CLUSTER and the American University in Cairo, 2013.

TADAMUN, “Coming Up Short: Egyptian Government Approaches to Informal Areas.” September, 2014. http://www.tadamun.info/2014/09/16/coming-short-government-approaches-informal-areas.

United Nations Human Settlements Programme (UN-Habitat). *State of the World’s Cities*. New York: Routledge Press, 2013.

Vargas, Ana Cristina. “Tracing Public Space: A Participatory Approach to Transform Public Spaces in Low-Income Communities.” Master of Science in Architecture Studies, Massachusetts Institute of Technology, 2014.

White, Mason and Maya Przybylski. *On Farming*. Barcelona: Actar, 2010.