Housing Priorities in Informal Settlements

Design Guidelines for Housing Strategies Addressing the Informal Production of Housing in Sub-Saharan Africa

Housing Priorities in Informal Settlements

Design Guidelines for Housing Strategies Addressing the Informal Production of Housing in Sub-Saharan Africa

Frank Reitsma

studnr. 1503359

fereitsma@me.com

+31(0)651276557

submitted to

Delft University of Technology, Faculty of Architecture, Graduation Studio Explorelab

TUDelft Delft
University of
Technology

in partial fulfilment of the degree:

Master of Science in Architecture, Urbanism and Building Sciences

graduation committee

Prof. ir. Dick van Gameren

ir. Ype Cuperus

dr. ir. Nelson Mota

graduation studio coordinators

ir. Robert Nottrot

ir. Elise van Dooren

dr. John Heintz

July 2017

Abstract

Housing supply in Sub-Saharan Africa is dominated by self-help housing in informal settlements as a consequence of rapid urban population growth in the absence of sufficient formal housing supply, bringing forth sub-standard housing conditions. Government housing strategies have not been able to halt the informal production of housing, as according to UN-Habitat currently in Africa over half of the urban population (61.7%) lives in slums and by 2050, Africa's urban dwellers are projected to have increased from 400 million to 1.2 billion[1]. This thesis revisits the ideas of John F.C. Turner who in the 1960s argued that successful government housing strategies in this context, depend on the alignment of government action with the priorities and forces of popular settlement. To meaningfully address the insufficient housing quality and urban sprawl resulting from the informal production of housing, the main objective of this thesis is to produce design guidelines on the typology and housing strategy that best addresses the priorities of the main actors in informal settlements; the inhabitants and the government. Therefore the rationale behind the proliferation of the informal construction of housing is first introduced, clarifying the problematic. Then the theoretical background of existing housing strategies of the provider and enabler paradigm are discussed, while deducing from housing strategies the architectural typologies. To connect the strategies in a narrative, the priorities that form the criteria of a evaluation framework are presented. Evaluation of the strategies against this framework results in a decision making tool that schematically portrays the tradeoffs in priorities and the interconnected consequences of the housing strategies. Applying this tool, a case is made for the strategy of assisted informal multi-story housing; negotiating government priorities of reduced urban sprawl and increased housing quality, while allowing for the inhabitants priorities recognised in the informal production of housing. Case studies of prototypes of this housing strategy are undertaken with the aim to specify the benefits of the informal production of housing and identify solutions for an improved housing quality and urban density. Concluding on a set of generic guidelines on the design of a strategy of assisted informal multi-story housing, aligning government priorities on quality with a financial benefit (cost priority) for the inhabitant of the informal settlement.

keywords: *housing strategies, rapid urbanisation, urban poor, informal settlements, Sub-Saharan Africa, John F.C. Turner, housing priorities, architectural typology, design guidelines.*

---

1 UN-Habitat (2013). *State of the World's Cities 2012/2013, Prosperity of Cities.* New York, UN-Habitat.

Table of content

Preface

This master thesis is the result of a graduation project in the Explorelab studio at the Faculty of Architecture, Urbanism and the Build Environment of the Delft University of Technology. The thesis makes up the theoretical component of the graduation project and presents an argumentation for the strategy and architectural design that form the design component of the graduation project.

The Explorelab studio offers the possibility of graduating in architecture while pursuing a personal fascination in an individual graduation project. This project started with a fascination for incremental housing strategies: these strategies interpret housing not as a static product, but as a process of expanding and transforming as needs change and funds become available. In the course of the project this fascination translated into a quest to devise a housing strategy that adequately addresses the informal production of housing in Sub-Saharan Africa. This shift occurred during the field study of the proposed design location, Dar es Salaam in Tanzania, that presented a confrontation with the complex nature of the rapid growth of the informal settlements. Research and design have developed side by side during the course of the project, each informing and reflecting the other.

I would like to thank my mentors Prof. ir. Dick van Gameren, ir. Ype Cuperus and Dr. ir. Nelson Mota for their support for my graduation project, their patient guidance and the constructive criticism. For their guidance I would also like to thank Dr. Diego Sepulveda-Carmona of the Urbanism department and ir. Robert van Kats of the Dutch Alliance for Sustainable Urban Development in Africa.

Then I would like to express my appreciation for those who have been so kind and hospitable to me on my site visit to Dar es Salaam. Noldi Stals for welcoming me into her home for the entire duration of the site visit and Anoek de Smet for her insights and experience as a practicing architect in Dar es Salaam. Prof. Daniel Mbisso of the Architecture Department of Ardhi University, Martin Kimicha of the Vocational Education and Training Academy and Issack Peter of the National Housing Corporation. Finally, my thanks go to Omari, David, Cletus, and Mohammed and his family, for enthusiastically sharing their insights and personal experience with me, to provide me with a grounded understanding of the situation in the settlements of Dar es Salaam.

Delft, July 2017

1   Introduction

"Generally, African cities are characterised by low densities, peripheral sprawl, economies dominated by informal activities and widespread informal settlements with limited services. The proportion of urban residents living in informal settlements is higher in Africa as a region than any other part of the world." (UN-Habitat 2009)

This observation by UN-Habitat summarises the result of a transformation taking place in Africa. Developing countries in the entire 'Global South' have seen a rapid urban population growth in the past 50 years. This population growth in cities is linked with rural-urban migration, the shift from a rural to an urban society practicing the logic that in a globalised economy the city provides better economic perspectives than the countryside. More than half of the world's population now live in urban areas, and by 2050, that figure will have risen to 6.5 billion people: two-thirds of the world's population (UNDP, 2016). As Anna Kajumulo Tibaijuka, the Under-Secretary-General of the United Nations and Executive Director of the United Nations Human Settlements Programme stated: "Globalization is making the 21st century the century of the cities. The challenge is how to make cities a better place for the majority of the people." (UN-Habitat, 2001).

Especially in Africa the process of rapid urban population growth has not been accompanied by sufficient production of adequate housing. An apparent feature of urbanisation and globalisation trends in most countries in Africa is the spatial expression of socio-economic exclusion in the form of informal settlements. Informal settlements hold the majority of the housing stock in Africa, currently "over half of the urban population (61.7%) lives in informal settlements and by 2050, Africa's urban dwellers are projected to have increased from 400 million to 1.2 billion" (UN-Habitat 2013). The housing in these settlements is produced informally; it has been constructed or arranged by the inhabitants themselves, outside of formal frameworks.

Generally the informal production of housing occurs under conditions of poverty, leading to housing of inadequate quality and durability. The urban poor are largely limited to this form of housing, as formal land and housing markets are dominated by economic interests of the urban elite, poor urban dwellers and sometimes even the middle-classes do not have the means to participate in these markets. The reach of government planning in African cities has generally been confined to central business districts, high income residential areas and their associated facilities. (UN-Habitat 2009) Produced without government intervention, informal settlements are characterised by a lack of basic services, infrastructure and security of tenure.

The informal production of housing, specifically in Sub-Saharan Africa, has led to an urban fabric defined by low densities, peripheral sprawl, informal economies and informal settlements with limited services, bringing forth sub-standard housing conditions. There is a continuous struggle of a growing number of poor people for land, housing and livelihoods in an often challenging urban environment. Inhabitants of informal settlements suffer from socio-spatial exclusion in the form of the geographic marginalisation of individuals and groups because of where they live and who they are. It is characterised by their inability to access or effectively use a whole range of facilities and resources which improve well-being and position people to take advantage of available opportunities (Mitlin, D. & Satterthwaite, D. 2013).

The capacity of the inhabitants of informal settlements to move out of the sub-standard environments remains limited. For example, of the 10 million more people added to the urban population of Sub-Saharan Africa each year, two-thirds (7 million) live in informal settlements or slums and only 2 million can expect to move out from there (UN-Habitat 2011). The relevance of an alternative to unplanned urbanisation and the informal production of housing is apparent, as the living conditions in informal settlements fail to meet the basic human rights of the inhabitants. This thesis is informed by the understanding of an urgency to determine a relevant strategy to assure the right to adequate housing of a rapidly growing urban population in Sub Saharan Africa.

1.1   Problem Statement

The problem that is addressed in this thesis is bilateral, consisting of the different positions of the main actors in the informal settlements in Sub Saharan Africa: 1) Governments and NGOs problematise the sub-standard living conditions and urban sprawl resulting from the informal production of housing. 2) Inhabitants of informal settlements problematise the inadequate results of housing strategies attempting to provide an alternative to this informal production of housing. In order to address both positions, this thesis revisits the ideas of John Turner who in the 1960s argued that successful housing strategies in this context, depend on the alignment of government action with the priorities and forces of popular settlement.

Sub-standard living conditions in informal settlements and urban sprawl

To clarify the position of governments and NGOs on the situation, the sub-standard living conditions in informal settlements and the phenomenon of urban sprawl are elaborated.

The situation in informal settlements is not homogenous, there are many levels of quality to the informal production of housing. The quality of living conditions depends on what is lacking in a given household. Since 2003 the UN Member States have distinguished a set of 5 'deprivations' to indicate the measure in which a settlement can be identified as informal, or even as a 'slum'. Slums are the most deprived and excluded form of informal settlements, characterised by poverty and large agglomerations of dilapidated housing often located in the most hazardous urban land. The term slum holds negative connotations for the those living in the settlement, associated with "marginal activities including crime, 'vice' and drug abuse; and a likely source for many epidemics that ravaged urban areas – a place apart from all that was decent and wholesome." (UN-Habitat 2003a). In this thesis is opted for the more neutral term 'informal settlement', although the deprivations do qualify the described settlements in Sub Saharan Africa as slums.

The set of 'deprivations' that indicate the sub-standard conditions in an informal settlement, are defined by UN-Habitat as lack of 1) access to improved water, 2) access to improved sanitation facilities, 3) sufficient living area, no overcrowding, 4) structural quality or durability of dwellings, and   5) security of tenure (UN-Habitat 2003b). At the household level, the 'five deprivations' reflect the harsh living conditions for those living in informal settlements in Sub-Saharan Africa. For example, most inhabitants have no security of tenure and live under the constant threat of eviction (UN-Habitat 2011) while almost three quarters of the dwellings are considered highly precarious in Sub-Saharan Africa (Participatory Slum Upgrading Programme 2011). Sanitation is limited, like in Kenya's largest slum Kibera, in Nairobi, where open sewer lines empty effluent in front of people's houses and there are only 1,000 public toilets to serve the entire slum population of more than 180,000 people (Nairobi City Council 2013).

The insufficient provision of an adequate number of formal plots and houses has contributed to the dominance of unplanned urbanisation characterised by the informal production of housing leading to urban sprawl (UN-Habitat 2013). Urban sprawl is the physical expansion of the city's built environment, which usually uses up surrounding rural areas. It is generally characterised by low-density settlements that are car dependent and often lack access to public infrastructure and services. Intensifying the necessity for motorisation, it causes congestion and hazardous air pollution (UN-Habitat 2012).

The problem as it is identified by governments and NGOs as can be summarised as follows: the architectural and urban qualities of the informal construction of housing are inadequate, leading to sub-standard living conditions for the inhabitant and resulting in urban sprawl. This phenomenon is taking place as governments are lacking control over the location and construction of housing in their cities.

Inadequate results of housing strategies dealing with informal settlements

The position of the inhabitants of informal settlements does not contradict the problematic recognised by governments and NGOs. The inhabitants are faced daily with the reality of the deprivations in their living conditions and the problems of urban sprawl. However the informal production of housing is to them the only way to access the benefits of urban life. The problematic as it is recognised by the inhabitant is the

unavailability of an adequate alternative to the informal production of housing. To clarify this position a brief overview is given of the housing strategies dealing with informal settlements, these strategies are elaborated further in chapter 3 and 4 of the thesis.

It is over the last six decades that governments have started to assume responsibility for the production of housing for their citizens (Wakely 2014). As a consequence of the growth of informal settlements from the 1950s, governments throughout the world started to intervene directly in the urban housing market by establishing housing authorities, departments or ministries or extending the mandates of ministries of works to embrace the formulation and implementation of new policies and strategies for the production of dwellings. These initial housing strategies that address the informal production of housing are classified within the 'provider paradigm'. In strategies of this paradigm governments enter the housing market by constructing, maintaining and managing housing of an acceptable quality with security of tenure at affordable (subsidised) prices and costs, for the exclusive use of low-income households (Wakely 2014).

These housing strategies were not able to provide formal housing on a relevant scale in Sub-Saharan African countries, due to their strain on limited financial and managerial resources. Other sectors of the economy, such as import-substitution industrial development and national distribution networks, became higher political priorities for the investment of public resources than urban low-income housing (Wakely 2014). A paper by John F.C. Turner and Rolf Goetze that was delivered to the conference on Development Policies and Planning in Relation to Urbanisation at the University of Pittsburgh in 1966, introduced a solution to the limited financial resources, identifying the efficacy and productivity of informal housing processes of the urban poor as an existing resource that might be exploited to advantage by government housing authorities (Wakely 2014).

This idea was brought forth not only for financial benefit, Turner was critical of the approach that argued replacement of informally produced housing by government provided housing. In his book 'freedom to build' Turner identifies as a cause for the failure of the provider paradigm "mismatches between people's needs and the housing supplied by institutions" (Turner 1972). He concludes in 'Housing Priorities, Settlement Patterns, and Urban Development in Modernising Countries' that "successful urban planning and low-income housing policies in transitional contexts depend on the alignment of government action with the priorities and forces of popular settlement" (Turner 1968) and argues that a relevant housing strategy in this context is aligned with the priorities of the inhabitants of the informal settlements.

The ideas of Turner were brought to the attention of governments and the international aid donor community, notably by the World Bank and the United Nations Development Programme (UNDP), leading to a new paradigm in housing strategies. In the early 1970s housing strategies were implemented that engaged the inhabitants in the construction, maintenance and management of public housing, categorised under the enabler paradigm. These strategies share a characteristic 'self-help' component, that was derived from the ideas that Turner brought forth. The strategies were introduced in the housing policies of Sub-Saharan African countries alongside the provider housing strategies, that were rarely abandoned altogether by governments (Wakely 2014).

None of the existing housing strategies have however been successful in providing or enabling housing as an adequate alternative to the informal production of housing to the necessary scale, as according to UN-Habitat currently in Africa over half of the urban population (61.7%) lives in informal settlements and by 2050, Africa's urban dwellers are projected to have increased from 400 million to 1.2 billion (UN-Habitat 2013). The strategies have not been able to provide a meaningful contribution that addresses the scale of the problem within the limitations of the situation, leaving the inhabitants of informal settlements without an adequate alternative to the informal production of housing.

Hypothesis

This thesis argues that neither the housing strategies of the provider nor those of the enabler paradigm completely following the logic that Turner presented in his writings. Enabler strategies have not been able to align government action with the priorities and forces of popular settlement. The nature of the needs and priorities of the inhabitants and the government in informal settlements is interconnected and complex. The

proposition is that mismatches can still be identified between the needs of the inhabitants of informal settlements and the housing resulting from housing strategies.

Therefore this thesis proposes to evaluate the informal production of housing and the housing strategies of the provider and enabler paradigm against the priorities of the inhabitants and the government. Following Turner's identification of the problem this evaluation is to provide insight in the persistence of the informal production of housing and the lack of adequate results of housing strategies dealing with informal settlements. Informing the production of a set of design guidelines for a housing strategy that offers an adequate alternative to the informal production of housing and addresses the sub-standard living conditions in informal settlements and urban sprawl.

1.2   Research method and objectives

The main aim of this thesis is to produce generic guidelines on the design of a typology and housing strategy that best addresses the priorities of the main actors in informal settlements; the inhabitants and the government. This section sets out the methodology, scope and research questions used in the study to achieve this aim. To come to design guidelines the research methods used in this study include literature study, field study, typological research and case study. The thesis has an architectural perspective and focusses in its scope on housing strategies intended to address the sub-standard architectural and urban qualities in informal settlements in Sub-Saharan Africa. The research questions are addressed following a narrative that follows the motives and priorities of housing in informal settlements.

Methodology

The approach of the study is to collect information on housing strategies and priorities from literature and field study, analyse the categorised housing strategies though typological research, evaluate the housing strategies against a framework of housing priorities and produce design guidelines through the case study of relevant strategy examples.

The main research method of this thesis is literature study into the informal production of housing and the housing strategies attempting to provide an alternative thereto. The first chapters present the findings of collecting and disseminating data on the various housing strategies and paradigms. The findings from a field study in Dar es Salaam, Tanzania illustrate much of the conditions in informal settlements in Sub-Saharan Africa. Literature study has thereafter fortified the value of the empirical findings from this field study.

The analysis of the housing strategies focusses on affordability, as the financial viability of a strategy in this context proves to be an important limitation. The strategy analysis is accompanied by typological research. The illustrations of the housing strategies are reduced to their architectural typology in order to categorise the housing strategies efficiently. Whenever an identical architectural form, structure, technique, function or concept is recognised in different contexts the notion of a 'type' is involved. The study of such types, and their use in the making of designs (a special kind of models) is called typological research (De Jong & van der Voordt 2002). This typological research proposes to identify the architectural qualities and logic behind the clustering of the housing strategies.

The housing strategies are evaluated against a framework comprising of housing priorities in informal settlements. This evaluation based on the application of the ideas of John Turner who argued that a relevant housing strategy and architectural typology allows for the priorities of the inhabitants of the informal settlements within a government housing strategy. The proposition is to collect the priorities found in literature study into a framework. This framework divides the priorities between the main actors; the inhabitants and the government, and sorts them in three facets of the strategies: 1) Cost, 2) Control, and 3) Quality. The housing strategies are reviewed against this framework to come to a conclusion on their relevance. The conclusions from this evaluation are collected as a tool for decision making in the design of housing strategies and architectural typologies dealing with informal settlement.

The thesis concludes with case study into relevant strategy examples to uncover ways of dealing with the conflicting priorities in the evaluation framework. The specific methodology used in these case studies is elaborated in chapter 6.

Scope

The thesis focusses on the informal production of housing and the housing strategies designed to provide an alternative thereto. The underlying reasons for the existence of urban poverty and the proliferation of informality in Sub Saharan Africa are briefly touched upon in the first chapter of this thesis, but they are not presented as the main focus of the study as these issues digress from the domain of architecture.

The geographical focus lies on housing strategies intended to address the sub-standard architectural and urban qualities in informal settlements in Sub-Saharan Africa. This region shows the highest proportion of urban population living in informally produced housing. It is important to note is that no two informal settlements are alike, the nature of an informal settlement is subject to various influences like traditional or rural construction methods, available materials and customary practice. Within Sub-Saharan Africa the nature of the informal settlements shows similarities, such as single story construction, low density, peripheral sprawl and construction materials. The scope of the study does not include strategy illustrations from Asia and Latin-America, as the nature of informal settlements in these contexts shows less similarities. An exception to this geographical scope is the housing strategy of in-situ half houses in sub-chapter 4.7, this housing strategy is illustrated by the Quinta Monroy project by Elemental, in Iquique, Chile. A comparable strategy example has not been found in Sub-Saharan Africa, but the principles that underly this housing strategy are deemed a relevant and interesting addition to the study. Therefore it should be noted in comparing this strategy that there is a difference in context.

This study has an architectural perspective, meaning that there is a strong focus on the architectural qualities of the strategy's corresponding typology and the resulting urban fabric. In practice, housing strategies have many variables that complicate a clear categorisation, the produced architectural qualities form the basis on which single cases are categorised. The introduction of the housing priorities in informal settlements forces a widening in the scope beyond the architectural and urban qualities. In identifying housing priorities there is a focus on generic elements such as affordability and control. Context specific elements such as the local politics of implementing a new housing strategy are not included in the scope.

Research questions

The main research questions that informed this study can be summarised as follows:

» *What is the rationale behind the proliferation of the informal construction of housing in Sub-Saharan Africa?*

» *What housing strategies have been proposed to address the informal construction of housing in the Sub-Saharan Africa, and what architectural typologies have they brought forth?*

» *To what extend do the housing strategies address the priorities of the main actors in the informal settlements; the inhabitants and the government?*

» *How do selected cases of the most relevant strategy deal with the consequences of the conflicting priorities in the evaluation framework?*

» *What generic guidelines can be formulated on the design of a housing strategy and architectural typology that addresses the priorities of the main actors in informal settlements; the inhabitants and the government.*

1.3   Structure of the study

The thesis is structured along a narrative elaborating the motives and priorities of housing in informal settlements. The first chapters of the thesis deliver a theoretical base; chapter 2 discusses the rationale behind the informal construction of housing, chapter 3 focusses on the theory and practice of the 'provider paradigm', and chapter 4 discusses these for the 'enabler' paradigm. While presenting and illustrating the housing strategies and their corresponding architectural typologies, the priorities are introduced that form the criteria of an evaluation framework. In the following chapters the criteria are applied to evaluate the housing strategies and deduce solutions. Chapter 5 evaluates the housing strategies against the framework of priorities. In chapter 6 case studies are undertaken in order to identify solutions to conflicting priorities in the evaluation framework. Chapter 7 presents the produced solutions as a set of generic design guidelines.

To start off, chapter 2 investigates the rationale behind the informal construction of housing. Therefore the underlying drivers of the formation of informal settlements are discussed, focussing on the process of rapid of urban population growth under governments with limited capacity. Two strategies are then presented that rely on the informal construction of housing; squatting or informal sale, and informal rent. In discussing and illustrating these strategies, priorities on housing are deduced.

Chapter 3 starts with a theoretical background on the provider paradigm, that describes the initial government attempt to provide affordable housing as a response to the informality. The aim of provider strategies has been to improve the housing quality through eviction and relocation. Two housing strategies are discussed and illustrated while their corresponding architectural typologies are analysed. First the strategy of formal housing estates is elaborated, that proposes the mass production of peripherally located houses. Then the strategy of formal apartments is presented, with the goal to increase urban density.

The enabler paradigm is discussed in chapter 4 starting with an overview of the main ideas and key theorists. Focus lies on the works of John Turner and Charles Abrams, bringing forth the idea that housing is an act performed by people, instead of a static product. This critique on the provision of formal housing led to the development of a new paradigm in housing strategies: enabling instead of providing. Different enabler strategies are distinguished: sites and service projects, core housing, cooperative partnerships, formal settlement upgrading, in-situ half houses and assisted informal multi-story housing. The housing strategies are discussed and illustrated while their corresponding architectural typologies are analysed.

While discussing the housing strategies in the previous chapters, priorities on housing were introduced. Chapter 5 collects and organises these priorities in an evaluation framework, dividing them between two stakeholders, the inhabitant and the government, and recognising three housing aspects, cost, control and quality. The framework is used to review the measure of adherence of the housing strategies to the priorities of the inhabitant and the government. The result displays as a graph of tradeoffs and conflicting priorities, that is proposed as a design decision making tool.

In chapter 6 a case is made for a strategy of assisted informal multi-story housing. The strategy presents the opportunity to act in alignment with all of the inhabitant priorities while negotiating government priorities of increasing housing quality, urban density and government control. Case studies of selected housing strategies are performed in order to find solutions from practice to the conflicting priorities and tradeoffs described in the evaluation.

The final chapter summarises the findings on housing priorities in informal settlements and the evaluation of the presented housing strategies. Ultimately the results from the case studies are distilled into a set of design guidelines. These generic guidelines on the design of a housing strategy and architectural typology are proposed to allow for the priorities of the inhabitants of the informal settlements while negotiating those of the government.

References

De Jong, T. M. & van der Voordt, D. J. M. (2002). *Ways to study and research urban, architectural and technical design*. Delft, DUP.

Mitlin, D. and Satterthwaite, D. (2013). *Urban Poverty in the Global South: Scale and Nature.*

Nairobi City Council (2013). *Kenya's Waste Management challenge*. Nairobi, IRIN.

Participatory Slum Upgrading Programme (2011). *Phase 2 Country Outputs* (retrieved from: www.mypsup.org)

Turner, J.F.C. (1968). *Housing Priorities, Settlement Patterns, and Urban Development in Modernising Countries*, Journal of the American Institute of Planners, 34:6, 354-363, DOI: 10.1080/01944366808977562

Turner, J.F.C. (1972). *Housing as a Verb*. In: Turner, J.F.C. and Fichter, R. (Eds.): *Freedom to Build*. New York: Macmillan, 148–175.

UN-Habitat (2001). *A Voice for the Voiceless, A Message from Mrs. Anna Tibaijuka, the Executive Director of UNCHS*. (retrieved from http://www.un.org/ga/Istanbul+5/booklet3.pdf)

UN-Habitat (2003a). *The Challenge of Slums, global report on human settlements.* London, UN-Habitat.

UN-Habitat (2003b). *Slums of the World. Nairobi, UN-Habitat.*

UN-Habitat (2009). *Global Report on Human Settlements: Backgrounder on Urban Informality.* Nairobi, UN-Habitat.

UN-Habitat (2011a). *The State of the World's Cities Report 2010/11*. Nairobi, UN-Habitat.

UN-Habitat (2012). *Urban Patterns for a Green Economy: Leveraging Density.* Nairobi, UN-Habitat

UN-Habitat (2013). *The State of the World Cities Report 2012/13. London, Earthscan.*

UNDP (2016). *Sustainable Development Goal 11: Sustainable Cities and Communities* (retrieved from: http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-11-sustainable-cities-and-communities.html)

Wakely, P. (2014). *Urban public housing strategies in developing countries: whence and whiter paradigms, policies, programmes and projects*, DPU Working Paper Series: Reflections NO. 163/60

2   Informal settlements

Before the process of the informal production of housing is elaborated in this chapter, the rationale behind the proliferation of informality is introduced, clarifying the problematic. To contextualise the housing priorities of the inhabitants of informal settlements it is relevant to understand the dynamics of urban poverty in Sub-Saharan Africa. The first part of this chapter sets the context of the problematic: informal settlements are not an isolated phenomenon, but rather a product of urban poverty. This thesis briefly discusses the underlying theme's of urban poverty in Sub-Saharan Africa, but does not dwell on them. The first section of this chapter situates the problem of the informal production of housing within its context. It provides an image of the reasons for the formation of informal settlements in Sub-Saharan Africa by addressing the responsible underlying factors. To understand the logic behind the housing strategies elaborated in the coming chapters, the second and third part of this chapter provide insights into the workings of the informal housing process. Two main types of informal housing practice and introduced and elaborated, *squatting and informal sale,* and *informal rent*.

2.1   The formation of Informal Settlements in Sub-Saharan Africa.

When investigating the formation of informal settlements in Sub-Saharan Africa, the underlying driver of the phenomenon can be found in urbanisation. In general the population in Sub-Saharan Africa is shifting from predominantly rural to urban. In this societal shift government policy and institutions have had to adapt to accommodate a rapid urban population growth. The context in which this phenomenon occurs is crucial to understanding the workings of informal settlements. First the rationale behind urbanisation in Sub-Saharan Africa is discussed, then the situation of little government capacity is elaborated in which the phenomenon is taking place. Concluding that in general, the locus of poverty in Sub-Saharan Africa is shifting to cities, a process now recognised by UN-Habitat as the "urbanisation of poverty" (UN-Habitat, 2007).

2.1.1   Urbanisation

"People come to cities not for housing, they come for jobs" (Correa, 2013)

This statement by the late Charles Correa, in his speech "the gestures of human occupation" to the RIBA on Wednesday 15 may 2013, summarises the rationale behind urbanisation: urbanisation is a phenomenon driven by the lure of perceived economic opportunity in the city. Unlocked by the processes of industrialisation and globalisation, economic opportunity presents itself in urban areas, as the logic of industrialisation is based on large scale production and high consumer density. The pull of these economic opportunities on rural population has led to a rapid migration, causing an explosive urban population growth. "Since 1950, the proportion of people working in developing country agriculture has declined from 50 to 30 per cent. The immigrant urban poor have largely moved from the countryside to the cities voluntarily, in order to exploit actual or perceived economic opportunities." (UN-Habitat, 2003) The growth of urban populations in Sub-Saharan Africa takes place within a complex framework of combined factors such as existing poverty, economic inequality and lack of affordable housing opportunities.

Colonialism

While urbanisation in 19th century Europe was fostered by industrialisation and strong economic growth, this was, and still is, not the case is Sub-Saharan Africa (Arroyo, 2013). Industrialisation in Europe has led to an urban population growth, but high mortality rates tempered the pace. The provision of basic services, negatively affected through the urban population growth, was subsequently addressed through stronger government intervention and institutionalisation of public health measures. Eventually natural growth rates rose due to improvements in health, along with economic growth. Strong government intervention shows from the first state-decreed basic housing standards and land use controls, and the eventual emergence of land use planning (Jenkins, Smith, & Wang, 2007).

During this process of urbanisation in Europe Sub-Saharan Africa was under colonial rule. In these countries the process of urbanisation was gradual, highly controlled by the colonial powers. Colonial administrative controls over labour prevented indigenous population to partake in the economic opportunities presented by

industrialisation, decreasing the incentive to come to the city. State planning and housing were provided by the colonising powers, but with a segregation basis between colonial and indigenous societies. Segregation and controls on labour largely excluded the rural population in Sub-Saharan Africa to partake in the benefits of industrialisation (Arroyo, 2013).

Rapid rural-urban migration

The de-colonisation after the world wars marked the beginning of rapid rural-urban migration in Sub-Saharan Africa. There was a large influx from deprived people from rural to urban areas, because colonial administrative controls over labour were removed (Arroyo, 2013). The industrialised cities now brought promise of economic opportunity to the indigenous population. The effects of political and economic changes were reflected in the nature of urban development in developing regions. In a rapid pace, the newly independent countries all over the world were catching up with the process of urbanisation. "Over the last 40 years, Latin America has experienced such a rapid rate of urbanisation that today, 75 per cent of the population lives in urban areas. Asia is also urbanising, currently 36 per cent of Asians live in cities. "In Africa, over half of the urban population (61.7%) lives in informal settlements and by 2050, Africa's urban dwellers are projected to have increased from 400 million to 1.2 billion." (UN-Habitat, 2013b).

2.1.2   Little government capacity

With the rapid urban population growth in Sub-Saharan Africa, government policy and institutional capacity have not grown along with the scale of the complications that resulted from urbanisation. Unlike their past colonial rulers, the national economies of newly independent countries often stagnated and governments were not capable of effectively dealing with urbanisation (Arroyo, 2013). The governments were left a colonial heritage of the strict housing and planning standards from the western world. Sets of imposed standards and external social structures were combined into a new society not reached by the people themselves. Nation states have been imposed on geographically neighbouring societies that have been forced to identify themselves as a 'new whole' in respect to the rest of the world (Mamdani, 1996).

The rapid population influx in cities led to high demands on shelter and basic services, which produced tensions between housing provision and urban development. The rapidity and enormous scale of the rural-urban migration has intensified the informal production of housing to the extend that city planning and management systems were unable to adequately cope with the massive population influx. "Governments in developing countries were not able to mediate the impact of rapid urbanisation as governments in [western] countries did through planning and housing – providing shelter or managing land use for collective benefits (Jenkins, Smith, & Wang, 2007)." As UN-Habitat states in … "Informal settlements and urban poverty are not just a manifestation of a population explosion and demographic change, or even of the vast impersonal forces of globalization. Informal settlements must be seen as the result of a failure in housing policies, laws and delivery systems, as well as of national and urban policies." (UN-Habitat, 2003).

Because of the scale of the urban population growth governments' intervention in the housing provision of the vast majority of citizens was confined to attempts to control private sector initiative in the interests of public health, safety and amenity by imposing standards that many low-income households could not afford to meet, and many city governments could not enforce. Hence, rapid urbanisation in developing countries led to the development of informal settlements as the only solution of the deprived to address their shelter needs through appropriation of public or private land and spontaneous self-help housing. Lack of affordable formal housing for the urban poor has been accompanied by weak governance; particularly in the areas of policy, planning, land and urban management resulting in land speculation and grabbing. (UN-Habitat, 2003)

Globalisation

From the 1950s to the 1970s "the newly formed ex-colonies continued to be dependent on the capitalist system based in Europe, and produced primarily raw materials for manufacturing in these areas, importing the resulting products, with declining terms of trade" (Jenkins, Smith, & Wang, 2007). This dependance resulted in an inability of national economies in Sub-Saharan Africa to compete with established economies. This international economic imbalance has in Sub-Saharan African countries lead to little formal employment

opportunities. An international neo-liberal agenda of state withdrawal, free markets and privatisation exported through colonial links. This agenda had a very negative impact on income distribution in Sub-Saharan Africa, limiting inclusive economic growth and increasing poverty. From 1973 to 1993, inequality, however measured, increased between countries, within countries and in the world as a whole (Un-Habitat, 2003).

To a large extend it is not globalisation per se that has caused countries and cities to abandon redistributive policies that benefit the majority of their citizens, but the perception that they need to be competitive. In the end, the growth in inequality has happened because national governments have abdicated their responsibility to their citizens to promote fairness, redistribution, social justice, and stability in favour of competitiveness and wealth for the few. It is also the outcome of international organisations that have adopted a dominant neoliberal philosophy, which has failed to deliver on most of its promises in Sub-Saharan Africa (UN-Habitat, 2003).

Development Aid

During the period of globalisation the 'development aid' practice started, with a focus on the social and economic development of ex-colonies. Development aid from a modernisation perspective focused on "selective economic and technological aid for development, with related political and socio-cultural modernisation". By contrast, development aid from a dependency theory and policy makers approach focused on "de-linking ex-colonies from the global system dominated by the [western world]; and protected development within nation states and macro-regions, promoting revolutionary political change" (Jenkins, Smith, & Wang, 2007).

Development aid has however provided the conditions for governments of developing countries to become corrupted, tending mainly to the pleasing of development partners and lacking accountability to the inhabitants of the country. This is understandable as the population generally does not pay taxes, and formal economic opportunity is scarce. Urban poverty has been increasing in most developing countries subjected to structural adjustment programmes, programmes that often have had a negative impact on urban economic growth and formal employment opportunities (UN-Habitat 2003). In economic terms, the North, with one quarter of the world population, controls four-fifths of the income earned anywhere in the world. 90% of the manufacturing industries are owned by and located in the North. Inversely, the South, with three quarters of the world populations, has access to one-fifth of the world income. As nations become economically developed, they may become part of the "North", regardless of geographical location; similarly, any nations that do not qualify for "developed" status are in effect deemed to be part of the "South" (Therien, 2010). In the absence of macro economic and political change it is unlikely that the governments of developing countries will be able to provide inhabitants of their country with the public goods and services they require to hold their government accountable for its policy. The existence of a tax paying middle class is a prerequisite for a state in which the government is held accountable for its policy.

Development aid has further increased the dependance of Sub-Saharan African countries on the western world by inducing a stigma of helplessness, weakening the country's international economic position. This stigma negatively effects international trade and business that foster formal employment opportunities, leaving the informal economy to proliferate. Informal employment does not provide the secure and steady income necessary to live in formal housing. The formation of informal settlements is thereby closely linked to global economic cycles, trends in national income distribution, and in more recent years, to national economic development policies. The cyclical nature of capitalism, increased demand for skilled versus unskilled labour, and the negative effects of globalisation, in particular, global economic booms and busts that ratchet up inequality and distribute new wealth unevenly, contribute to the enormous proliferation of informal settlements. In the past, global economic cycles were responsible for creating the informal settlements in the major cities in today's developed world and this pattern is repeating now in Sub-Saharan Africa (UN-Habitat, 2013b).

Socio-spatial exclusion and the right to the city

Informal settlements continue to be spatially disengaged from broader urban systems and inhabitants remain excluded from the benefits of urban opportunities. There is an inextricable link between the location of informal settlements and the persistence of poverty and economic inequality. Informal settlements are often located in the most environmentally and geographically hazardous urban areas like riverbanks; sandy and degraded

soils, near industries and dump sites, in swamps, flood-prone zones, steep slopes. The reason the urban poor are often located in these areas is that the less attractive, or more dangerous a location is, the more affordable it becomes. The impact of living in these areas, whose vulnerability is often exacerbated by climate change, is continually life threatening as no alternatives are provided (UN-Habitat, 2008).

Inhabitants of informal settlements have to deal with discrimination and marginalisation and are excluded from social systems. Compared to other urban dwellers, people living in informal settlements suffer more spatial, social and economic exclusion from the benefits and opportunities of the broader urban environment. They experience constant discrimination and an extreme disadvantage characterised by geographical marginalisation, basic service deficits, poor governance frameworks, limited access to land and property, precarious livelihoods and, due to informal settlements' location, high vulnerability to the adverse impacts of poor and exposed environments, climate change and natural disasters. Geographic marginalisation of particular individuals and groups because of where they live and who they are, is characterised by the inability to access or effectively use a whole range of facilities and resources which improve well-being and position people to take advantage of available opportunities. Particular groups and individuals often suffer a disproportionate 'disadvantage' because of their identity, which is physically represented in informal settlements (Mitlin and Satterthwaite, 2013).

Henri Leverbre argued that this discrimination and exclusion of the urban poor meant that they are being deprived the 'right to the city', a concept introduced by in 1968 as 'a cry and a demand'; that (Marcuse, 2009) develops further specifying that 'the cry' is from the discontented and 'the demand' is from the deprived: the urban poor. The right to the city has been explained as "the right to clean water, clean air, housing, decent sanitation, mobility, eduction, health care, democratic participation in decision making", all of these are necessities for a decent urban life (Brenner, Marcuse, & Mayer, 2012). The urban poor are forced out of the housing market, and are left with only one option: to build, buy or rent informally produced housing: small size, low quality of construction and minimal service provision in informal settlements. They are forced to occupy as little space as possible, which leads to very high densities and unhealthy levels of overcrowding in their settlements. Governments do not adequately address needs of the people living in informal settlements, and thus fail to plan an inclusive approach to housing that accepts the right of the poor to live in good conditions in the city. (Quick guide 2) How the urban poor can access adequate housing and exert their right to the city still remain unanswered questions in Sub-Saharan Africa.

The inevitable informal

The informal condition is a necessary step in the demographic transition. Informality can be seen as the transformation from the customary practices of rural life, to an urban lifestyle. It is important to recognise that in the early years of urbanisation and industrialisation in the Western world, the housing conditions were similar to those found in informal settlements in Sub-Saharan Africa today. "In the 19th century, industrialisation in Europe and America led to rapid urbanisation. The population of London went from about 800,000 in 1800 to over 6.5 million in 1900; during the same period, Paris grew from one-half to over 3 million; and by 1900 New York's population had swelled to 4.2 million. This explosion meant that the poor lived in dark, airless and unsanitary tenements, often without windows, where they were regularly exploited by rapacious landlords and politicians" (UN-Habitat, 2003). These substandard living conditions can now be recognised in the informal settlements of Sub-Saharan Africa.

While there are no reliable global estimates on urban poverty, it is generally presumed that there is currently less poverty in urban areas than in rural areas, and that the urban poor generally attribute more agency to improve their situation then their rural counterparts. However, the rate of growth of the world's urban population living in poverty is now considerably higher than that in rural areas. The absolute number of poor and undernourished in urban areas is increasing, as is the share of urban areas in overall poverty and malnutrition (UN-Habitat, 2007).

2.1.3 **The urbanisation of poverty**

To summarise; the proliferation of informal settlements in Sub-Saharan Africa is the result of urbanisation. Driven by perceived economic opportunities people come to the city to partake in the benefits of urban life. These economic opportunities arise from processes of globalisation and industrialisation, centred in urban areas. Segregation and controls on labour made it impossible during colonial rule for the indigenous rural population in Sub-Saharan Africa to partake in the benefits of industrialisation. After de-colonisation the restrictions on labour controls were removed, leading to rapid rural-urban migration. Newly formed independent governments provided however little formal economic opportunity in the city. Limited government capacity to enforce laws or to provide formal housing have led to an explosive growth of informal settlements. The unfavourable economic position of Sub-Saharan African countries on international markets has caused the government capacity to remain limited, attracting public investment focus away from the urban poor, towards international economic competition. Continuing dependency on development aid has also paradoxically contributed to an increasingly limited government capacity to improve the situation. In "Dead Aid, Why Aid Is Not Working And How There Is Another Way For Africa" Dambisa Moyo presents a case for this phenomenon. The conclusion is that the locus of poverty in Sub-Saharan Africa is shifting to cities, a process now recognised by UN-Habitat as the 'urbanisation of poverty'. This 'urbanisation of poverty' is a trend that is reflected in socio-economic and spatial exclusion of the urban poor in the form of informal settlements. By the absence of alternatives to the informal production of housing the urban poor are denied their 'right to the city'. Although urban centres throughout the world now hold more of the 'poorest of the poor' than ever before, the urban poor are usually able to help themselves and to access official assistance more than their rural counterparts.

References

Arroyo, I. (2013). *Organised self-help housing as an enabling shelter & development strategy. Lessons from current practice, institutional approaches and projects in developing countries*. Licentiate thesis 9. Housing Development & Management, Lund: Lund University

Brenner, N., Marcuse, P., & Mayer, M. (2012). *Cities for People, not for Profit. Critical urban theory and the right to the city*. London: Routledge.

Correa, C. (2013). "*the gestures of human occupation*" speech to the RIBA on Wednesday 15 may 2013 (retrieved from https://www.youtube.com/watch?v=oB8TNT0DHSk)

Ehebrecht, D. (2014). *The Challenge of Informal Settlement upgrading; Breaking New Ground in Hangberg, Cape Town?* Potsdamer Geographische Praxis, Potsdam.

Jenkins, P., Smith, J., & Wang, Y. P. (2007). *Planning and Housing in the rapidly Urbanising World*. London, Routledge.

Mamdani, M. (1996). *Citizen and Subject: Contemporary Africa and the Legacy of Late Colonialism.* Princeton University Press.

Marcuse, P. (2009). *From critical urban theory to the right to the city.* City: analysis of urban trends, culture, theory, policy, action.

Mitlin, D. and Satterthwaite, D. (2013), *Urban Poverty in the Global South: Scale and Nature.*

Therien, J. P. (2010). *Beyond the North-South divide: The two tales of world poverty*. Third World Quarterly.

UN-Habitat (2003a). *The Challenge of Slums, global report on human settlements.* London, UN-Habitat.

UN-Habitat (2007). *What are slums and why do they exist? Twenty First Session of the Governing Council.* Nairobi, UN-Habitat.

UN-Habitat (2008a). *State of the World's Cities 2008/2009*: *Harmonious Cities.* London, Earthscan.

UN-Habitat (2013b). *State of the World's Cities, 2012/2013, Prosperity of Cities.* New York, UN-Habitat.

Werlin, H. (1999). *The Slum Upgrading Myth*. Urban Studies. 36.9: 1523-1534.

2.2   Squatting and Informal Sale | Informal Settlements (Dar es Salaam, Tanzania)
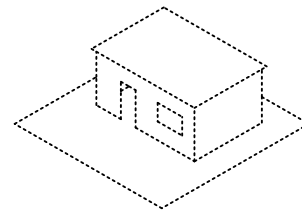
Fig. 2.1   left: Swahili type informal settlement in Dar es Salaam, Tanzania (retrieved from barakafm.org).
                right: typological reduction (own illustration)

The informal production of housing is elaborated in this section, with the aim to provide insight into the workings of the informal housing process. Squatting and informal sale are one of two ways in which the urban poor arrange housing in an informal manner. This section first elaborates a strategy component, which is illustrated by the example of informal settlements of Dar es Salaam, Tanzania. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

2.2.1   Strategy component

Informal settlements develop through the illegal appropriation of land, by people looking for affordable shelter. In the absence of adequate formal housing supply the informal production of housing starts with the appropriation of land. Broadly here are two basic approaches to the informal appropriation of vacant land. Either this occurs through the appropriation and/or illegal sub-division of undeveloped land followed by the construction of affordable shelter and installation of basic infrastructure all with no explicit government official. Or the land is appropriated through unauthorised occupation, or 'squatting' of vacant or under-used central area urban properties (disused buildings or undeveloped land) that are apportioned (rented, sold or gifted) to households, typically leading to severe over-crowding, low levels of environmental health leading to a situation of insecure tenure and lack of living space.

The informal sub-division of land

Illegally subdivided land is affordable for the urban poor because the high risk of eviction forces landowners to lower asking price. Participation in the informal land market and paying for the appropriation and/or illegal sub-division of undeveloped land is followed by the construction of affordable shelter and installation of basic infrastructure all with no explicit official approval governing standards of health, safety or amenity or the form and of the urban fabric of the neighbourhood being created or those of the city at large. A common occurrence is the unauthorised subdivision and sale of peri-urban agricultural land by its owners who recognise that higher financial returns can be made by selling small plots for development, even at prices that are affordable to low-income households, than from agricultural production. Land made available for housing in this way is affordable to the lowest income groups, by the 'risk-cost imposed by its' illegality'. Results of this process are a lack of security of tenure; the threat of official confiscation of land and or demolition of buildings.

Squatting and invading

Often situated in geographically and environmentally hazardous areas, housing that results from squatting may not comply with government planning and building regulations. Illegally squatting on uninhabitable land is the

second option for the urban poor to access land. The unauthorised occupation of vacant or under-used central area urban properties, either disused buildings or undeveloped land, that are apportioned to households, typically lead to severe over-crowding, low levels of environmental health and, often, dangerous physical conditions. The types of squatted informal settlements tend to be on the fringes of towns and cities, where relatively large parcels of undeveloped land are available. Many low-income households, however, cannot afford to be located at distances far from centres of informal employment or outlets for low-skilled enterprise and are therefore dependent on securing affordable accommodation in city-centre locations, such as are provided by abandoned buildings or squatting on road reservations, street sidewalks and pavements.

In Tanzania informal settlements refer to residential agglomerations where the status of land occupation is not illegal but the settlements have not been conventionally planned, surveyed and sanctioned by government institutions responsible for urban housing land delivery and management. Areas like these have been developed without the formal approval of public and land allocation authority. In informal settlements in the emphasis for intervention is not on the illegality of land ownership or occupation but rather on the informal nature of a land development process.

2.2.2   **Architectural component**

According to UN-Habitat; informal settlements are dense settlements comprising communities housed in self constructed shelters under conditions of informal or traditional land tenure. They are characterised by a dense proliferation of small, make-shift shelters built from diverse materials, degradation of the local ecosystem and by severe social problems. The clustering of housing in the settlements is random and unorganised (fig. 2.2b) Problems occur in measuring the extent or defining the boundaries of such settlements. By definition, officially recognised boundaries to these settlements rarely exist, and the settlements themselves often merge almost imperceptibly into formal areas of housing, industrial or rural areas.

Informal housing is defined by deviations from the laws and regulatory frameworks that govern formal access and use of land and buildings (UN-Habitat, 2003). Since informal economic and social systems operate with indifference to, and in non-compliance with, the formal regulatory and administrative structures, informal housing delivery networks are not universal and quantitative information about the scale and depth is scarce and non-standardised. Housing informality represents a spectrum of different shelter locations, conditions and tenure statuses, from slum conditions, to partially upgraded structures, to semi-formal conditions.

Nonetheless, informal housing shares one or more of the following characteristics: informal settlements are located at the urban periphery or within the interstices of the formal city. The settlements are poorly serviced by infrastructure networks and public services. The housing in the settlements is self-designed and built with makeshift materials, it does therefore not fully conform to building and land use standards. Finance for housing comes out of family/group savings and/or loans from informal lenders. As these financial sources become available in instalments the housing is incrementally improved by the occupant over a long period of time.

Fig. 2.2   left: clustering schema: **detached** and randomly **clustered low rise** housing (own illustration).
            right: aerial photograph of the settlement showing resulting urban fabric (Apple maps).

GENERIC USE OF SPACE
- no separation of functions

ADAPTABILITY
- traditional house applied to specific individual circumstances
- modification to context

SECURITY
- small windows
- high social control

INFORMAL BASIC SERVICES
self help (stolen or shared)
- water from vendor
- shared sanitation in courtyard
- stolen electricity
- no waste management

OUTDOOR COOKING
- cooking in the courtyard

CLIMATE DESIGN
- little ventilation
- corrugated steel plate roof for shading

FREESTANDING HOUSE
- freestanding house on informal plot

ACCESSIBILITY
- not connected to formal infrastructure
- located in a field or on informal streets

TRADITIONAL MATERIALS
- informal (low tech) materials and technology
- limited to self build techniques
- not durable

INCREMENTAL CONSTRUCTION
- gradual modernisation
- extendable form
- adaptable to changing needs

PRIVACY
- public space: the field / street
- collective space: the courtyard / garden
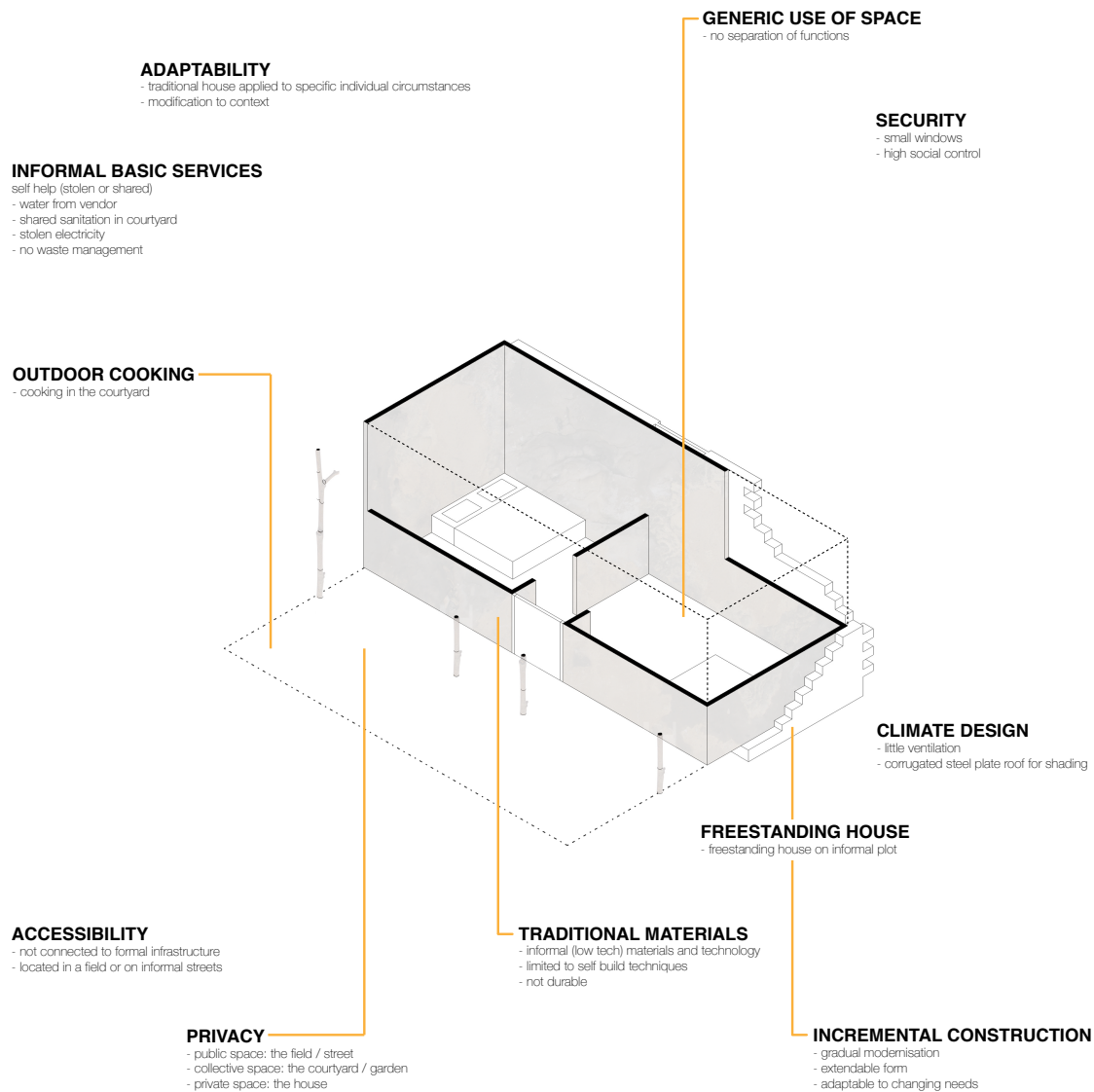- private space: the house

Fig. 2.3   axonometric projection of typical 'half developed' informal housing in Dar es Salaam (own illustration).

This last characteristic, the incremental nature of the informal production of housing, is key in informal development process. Inhabitants construct, extend and improve their dwellings when it becomes a priority for the investment of their resources and energy. During the course of the incremental process the informal settlements remain in a 'half-developed' state that typically is found aesthetically offensive. Formal society tends to refer to them as slums and vest them with frequently unjustifiable pejorative physical and social characteristics. The incremental housing process does not only have financial benefits that enable low income households to access affordable housing when and where they need it. It is also important in building social capital, community cohesion and local governance and management capacities in otherwise socially disparate new urban communities, through the incremental development of locally controlled and managed neighbourhood infrastructure, services and amenities as well as the construction and improvement of individual dwellings.

Incremental procurement of urban housing is not confined to low-income households. Almost all permanent and serviced housing is procured as an incremental process that takes place over relatively long periods of time. Upper and middle-income households with regular incomes and collateral guarantees have access to long-term credit housing loans and mortgages that may take between 15 and 30 years of incremental repayments to redeem. Households with low or irregular incomes and no access to formally recognised collateral, construct minimal basic dwellings at very low cost, which they extend and improve as more resources become available and as the need for bigger or better structures becomes a priority. This process of extension and modification does not attempt to reach a finished product. (Wakely & Riley 2011).

2.2.3   **Conclusion**

Squatting and the informal subdivision of urban land facilitate the informal construction of housing. Though the physical expression of informal housing is different in any context, key characteristics can be recognised: the settlements are poorly serviced by infrastructure and public services, clustering of the housing is typically random and chaotic and the self build environment shows substandard housing quality. The most important characteristic of the informal production of housing is that it is affordable through its illegal status and its incremental building process, which is piecemeal and happens at the inhabitants convenience. That is to say, additions and improvements to housing in informal settlements are made bit by bit when funds become available. To achieve affordability for the inhabitant in a housing strategy this characteristic of incrementality is recognised as the first inhabitant housing priority in informal settlements:

$ Informal construction: the strategy should allow for the incremental nature of housing construction.

References

HMF (2009). *Incremental Building and Housing Microfinance Part I: Building on Informal Housing Finance.* retrieved from http://housingandmicrofinance.blogspot.nl/2009/08/incrementalism-part-i.html

Srinivas, H. (2015) *Defining Squatter Settlements.* retrieved from https://www.gdrc.org/uem/squatters/define-squatter.html

UN-Habitat (2003a). *The Challenge of Slums, global report on human settlements.* London, UN-Habitat.

Wakely, P. & Riley, E. (2011). *The Case for Incremental Housing,* Cities Alliance Policy Research and Working Paper Series No.1. Washington DC, USA.

2.3   Informal Rent | Informal Settlements (Dar es Salaam, Tanzania)

Fig. 2.4   left: material upgrading in an informal settlement in Dar es Salaam, Tanzania (Nguluma, 2003).
            right: typological reduction (own illustration)

The production of housing in informal settlements is, through the informal and incremental nature, more affordable then formal counterparts. For the largest part of the urban poor however, the informal purchase of land and / or housing materials is still out of reach financially. This section presents an alternative to the inflexible and costly ownership of housing: informal rent. Informal rent is one of two ways in which the urban poor arrange housing in an informal manner. This section first elaborates a strategy component, which is illustrated by the example of informal settlements of Dar es Salaam Tanzania. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

2.3.1   Strategy component

The proliferation of informal settlements in Sub-Saharan Africa has been accompanied by an accelerated growth of the informal economy. An integral part of this economy is the informal rent of houses and rooms: By the incremental addition of rooms to their housing informal landlords provide rental rooms, as housing for those who cannot afford, or do not want to, build their own.

The informal economy

Dependance of the urban poor on the informal economy is caused by insufficient government capacity to provide formal economic opportunity and strictly maintain rules and regulations surrounding work. In many cities the informal sector accounts for as much as 60 per cent of employment of the urban population and may well serve the needs of an equally high proportion of citizens through the provision of goods and services. In Sub-Saharan Africa, 78 per cent of non-agricultural employment is in the informal sector making up 42 per cent of GDP. More than 90 per cent of the additional jobs in urban areas that will be created in the next decade will be in small-scale enterprises in the informal sector. All this is taking place during a period when the formal urban labour market is barely rising or even shrinking in most developing countries. Typical informal jobs are unskilled, very-low-paid, and insecure livelihood options, part of a 'subsistence economy' that allows inhabitants to survive but not to progress sufficiently to change their living conditions nor to realise their full potential to contribute to urban productivity. The investment however in the informal production of housing that can be rented out, provides a more stable and secure form of informal income.

Informal rental housing

Rental housing specialists suggest that a reasonable level of monthly income from a formal rental unit should be about 1% of the market sale price of that unit. The fact that rent levels are tied to property prices means that rents can go up as land values rise or as macro-economic forces influence property prices. These market

forces put formal rental housing out of reach of most poor households. That's why informal rental housing alternatives in slums and squatter settlements make up such a large portion of most African cities' rental housing stock. "When housing is developed outside the formal system, it may have all kinds of drawbacks, but the main point is that it is more affordable."

In general the decision to rent informal housing is a deliberate, reasoned choice. One reason may be that the household cannot afford to buy a plot or construction materials, but there are other equally important reasons why rent can be preferred. Renting lets people stay mobile and move to wherever there are opportunities for income generation, without being tied down to a particular place or to regular house payments. Renting provides the flexibility in managing household budgets, moving to more affordable housing when times are hard and to better housing when their incomes increase, or freeing up more of their earnings for more essential needs like food, education, medical care or emergencies. Renting is preferable during transitory periods in the lives of the urban poor, when they are not yet ready to settle down in one place. Renting is convenient for a household who may not want to make long term financial commitment that comes with buying a house, or face the long term costs involved in repairing and maintaining their own house. Renting allows people to send more of their city earnings home to rural relatives, or to invest in buying land or building a house or business back in the village.

Moving in and out of cities has become an inherent part of life for many people in Sub-Saharan Africa, constantly moving between the city and the rural areas, or between different cities. Whether migrants come for higher education, to find a job, or to seek health care, flexible accommodation in the city is necessary, which is provided in the form of informal rental housing. Renting is appealing to new migrants or low income residents who cannot access long term finance, who are unable or uninterested in self-built housing or homeownership or who desire mobility to pursue work opportunities in different places. Informal rental arrangements offer tenants the most flexibility to negotiate payment options, often through a verbal agreement, but this option offers few legal protections for both the safety and property of landlord and tenant. This insecurity increases affordability which is appealing for the urban poor with low and irregular incomes (Stocktaking world bank).

2.3.2   **Architectural component**

The physically resulting informal settlements, as noted in the previous section, represent a spectrum of different shelter locations, conditions and tenure statuses, from slum conditions, to partially upgraded structures, to semi-formal conditions. The informal production of housing for rental purposes presents the same characteristics as the informal housing produced through informal sale or squatting. To illustrate the situation more specifically, the architectural component of this approach is Illustrated by an elaboration on the specific example of the Swahili house, the typical formal housing design copied by informal builders in Dar es Salaam.
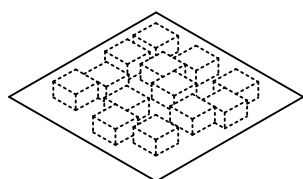

Fig. 2.5   left: clustering schema: **detached** and randomly **clustered low rise** housing (own illustration).
right: aerial photograph of the settlement showing resulting urban fabric (Apple maps).

GENERIC USE OF SPACE
- no separation of functions
- dwelling / renting out for income

SECURITY
- steel bars for windows
- small windows
- entrance from collective hallway
- high social control

ADAPTABILITY
- a typology applied to specific individual circumstances
- modification to context

INFORMAL BASIC SERVICES
self help (stolen or shared)
- water from vendor
- shared sanitation in courtyard
- stolen electricity
- no waste management

UNSAFE INDOOR COOKING
- indoor cooking in the room or hallway

CLIMATE DESIGN
- cross ventilation trough rooms
  (but limited trough overcrowding)
- corrugated steel plate roof for shading

FREESTANDING HOUSE
- freestanding house on informal plot
- overcrowing though horizontal densification

ACCESSIBILITY
- not connected to formal infrastructure
- located on informal streets or small alleys

MODERN MATERIALS
- formal (low tech) materials and technology
- limited to self build techniques
- semi durable

INCREMENTAL CONSTRUCTION
- gradual addition of rooms
- extendable form
- adeptable to changing needs

PRIVACY
- public space: the street / alley
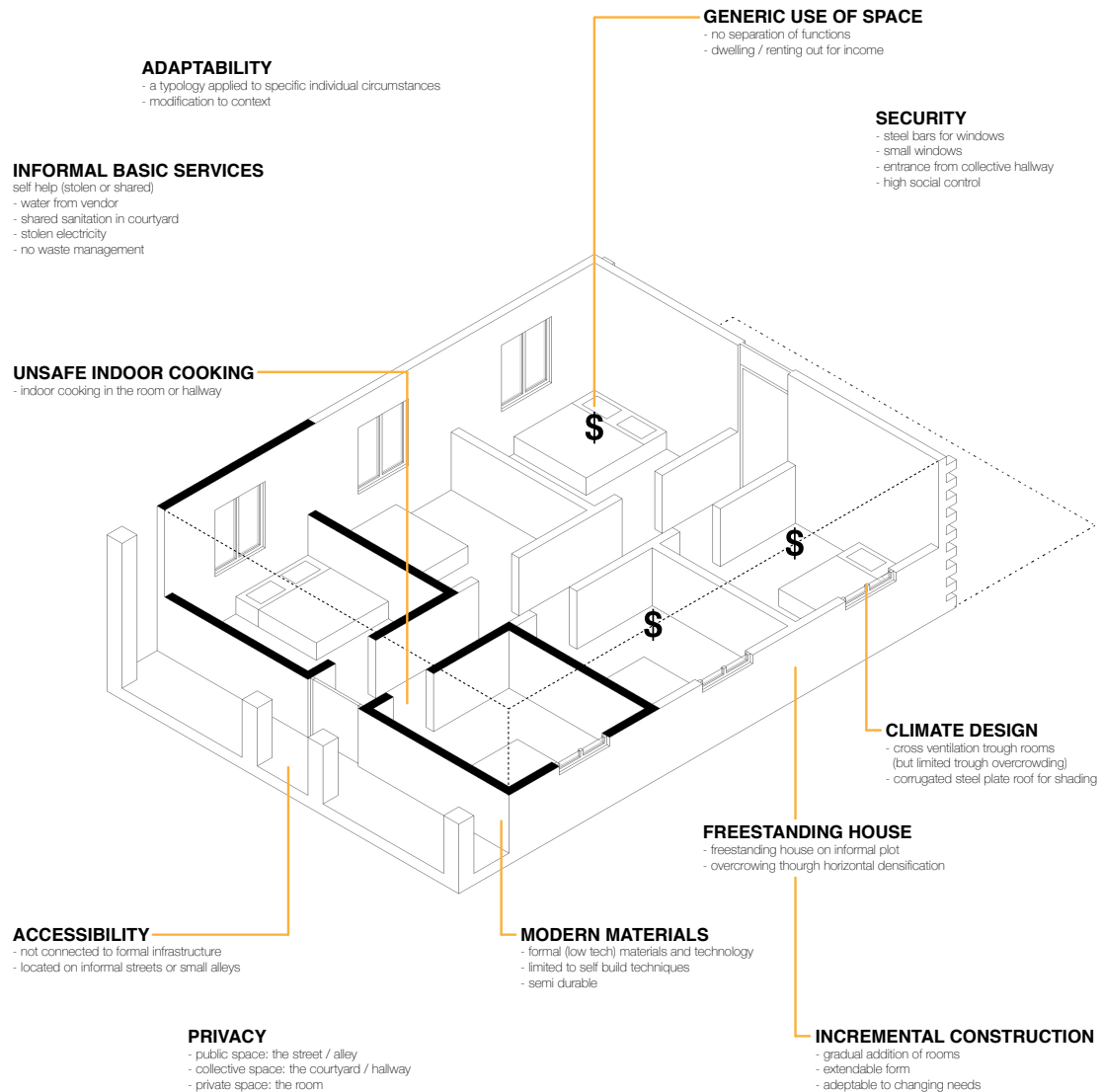- collective space: the courtyard / hallway
- private space: the room

Fig.2.6   axonometric projection of the typical Urban Swahili housing in Dar es Salaam (own illustration).

The Swahili house originated as a rural vernacular building type (see paragraph 2.2.2). In original appearance the walls of the Swahili house are made of mud and poles and covered by a hipped roof. Small windows characterise the facades of these houses which are usually plastered. Foundations are often of coral plinths but can be replaced by a strong and durable soil foundation obtained with 10% cement. The original mud-and-pole built Swahili House can still be found, especially along the seacoast.

The National Housing Corporation of Tanzania reinterpreted this traditional building type, and presented the more formal Urban Swahili house. In this modified house, the layout has progressed from containing communal to more private dwelling spaces. The number of rooms is generally increasing as the size of a house enlarges. Variations of the spatial organisation are said to constitute upon a basic symmetrical principle. The Urban Swahili House is characterised by its veranda in the front, three rooms on each side of a central corridor from which all rooms are accessed, and the backyard. The house type is in general spatially defined by these characteristics. The typology is considered flexible because the ground plan can be changed within the limits of the basic structure. The addition of new rooms, changed positions of doors or windows has led to various forms diverging from the original house design. The advantages of the Urban Swahili House compared to other house types are that it allows for flexibility in furnishing and functional use. Rooms can also be added at the main house or in the backyard. In most cases the Urban Swahili Houses are used for rental purposes. Each tenant occupies one or two rooms together with household members. It is also common that tenants and owners share the house and its communal spaces. The Swahili house type is designed to be extended by the addition of new rooms for renting directly to the main house or at the backyard.

2.3.3 Conclusion

The informal rent of houses and rooms facilitates the most affordable and flexible form of housing for the urban poor in Sub-Saharan Africa. The physical expression of the incremental addition of rooms and houses to informal plots, characterises the resulting urban fabric. The random and chaotic clustering of houses in informal settlements is densifying horizontally, while the housing quality is still sub-standard. The main principle that underlies the phenomenon of informal rent, is that it provides the informal landlord a more stable informal income and investment than other informal opportunities for income generation. The system delivers the urban poor a flexible and inexpensive way to procure urban housing, while providing a choice to rent close to social and economic networks. In recognising these characteristics in informal settlements the facilitation of this system of the informal rent is recognised as the second inhabitant housing priority in informal settlements:

Informal rent: the housing strategy should allow for the workings of the informal rental system.

References

Dawood, A. (2013). *A Pictorial Tour of Informal Housing in Kinondoni, Dar es Salaam*. retrieved from http://housingfinanceafrica.org/a-pictorial-tour-of-informal-housing-in-kinondoni-dar-es-salaam

3   The Provider Paradigm

This chapter examines the initial school of thought in addressing the informal production of housing. The theoretical background of the strategies belonging to the 'provider' paradigm is discussed, while deducing from the housing strategies their corresponding architectural typologies. The first section of this chapter investigates the formal response to informal settlements, elaborating the ideas behind the initial government approach of providing formal housing. The second and third part of this chapter specify two housing strategies that result from this approach: *formal housing estates* and *formal apartments.*

3.1   The formal response to informal settlements

Governments in Sub-Saharan Africa have only since the 1950s started to assume any responsibility for the production of housing for their citizens. Before, public housing was limited to providing civil servants of the colonial powers with what was considered to be 'decent dwellings'. Thereafter, rules on housing were used as an instrument to gain control over populations active in the anti-colonial movement. The policies of public housing were often continued after independence when newly formed governments had optimistic hopes of modernising and rapid economic growth. Housing for the indigenous population had so far been a private affair in rural areas, arranged by the people themselves. With rapid urbanisation causing increasing homelessness in the city and the proliferation of informal settlements, governments started to intervene more directly in the procurement of urban housing by establishing housing authorities, departments or ministries or extending the mandates of ministries of works to embrace the formulation and implementation of new policies and strategies for the production of dwellings. (Wakely, 2014)

Importing modernisation

The 'Western' model of the provider paradigm has been uncritically imported in Sub-Saharan Africa via post-colonial linkages with 'developed' societies, in which socio-economic conditions allowed for the creation of a welfare state (Arroyo, 2013). The rationale behind the implementation of the provider paradigm was to modernise the inadequate housing stock in Sub-Saharan Africa. In the period that colonial powers released their colonies into independence, modernisation theories were influencing the development discourse. Modernising society was taken up as a main target of the newly independent governments. This target was set in an attempt to rapidly neutralise the socio-economic gap between the countries in Sub-Saharan Africa and the 'developed world'. To attain the goal of transforming from agricultural to modern urban and industrialised societies with increasing employment in manufacturing and services, the countries in Sub-Saharan Africa welcomed development aid and technical assistance.

With regard to housing this resulted in the import of Western planning ideas, cultural and architectural styles and technologies. The modernist provider paradigm of slum clearance and the provision of formal housing through the welfare state, had been applied with certain success in industrialised countries. Therefore it was imported and uncritically implemented in Sub-Saharan Africa, without reflecting if the model would work in this specific socio-economic context. State housing provision was implemented "as a key component within the Welfare State... large-scale 'general needs' and 'slum improvement' housing programmes were initiated, usually through local authorities with central government finance" (Jenkins, Smith, & Wang, 2007). High economic growth rates, a consolidated building industry and a strong tax base are among other, preconditions for such a Welfare State to be successful. Those preconditions were not present in the countries of Sub-Saharan Africa. (Arroyo, 2013)

The governments in Sub-Saharan Africa formed institutions to intervene in urban housing markets soon after their political independence from colonialism in the late 1950s and 1960s. The first independent government of Kenya for instance made the procurement of subsidised urban housing the responsibility of municipal government in the major cities. Similarly in Nigeria the clearance of informal settlements and delivery of public housing was the responsibility of local government or local-level parastatal development authorities, such as the Lagos Executive Development Board. In many countries however, housing has mainly been perceived as the technical construction of buildings and infrastructure engineering. Consequently, many public housing agencies and authorities have grown out of, or been attached to Ministries or Departments of Public Works,

generally at national level rather than at the level of municipal or local government. Governments' intervention in housing provision in these instances has largely been confined to attempts to control private sector initiative in the interests of public health, safety and amenity by imposing standards that many low-income households could not afford to meet, and many city governments could not enforce. (Wakely, 2014)

The approach of the provision of formal housing has had a symbolic value as the outcome was highly visible and expressed modernisation. It has underscored the newly formed governments' efforts to support their population, however small the scale of the provision of housing might be; "low cost public housing projects largely failed to meet the target population's need in scale, cost and location, thus never effectively replacing informal settlements" (Huchzermeyer 2004).

The benefits of centralised, large scale production

"Providers argue that to mass produce effectively is to mechanize, to mechanize effectively is to standardize, to standardize effectively enables better control of quality, quantity, and cost" (Hamdi 1995).

There are many financial and economic benefits to the large scale production of housing. The main idea behind the provider paradigm has been that to enable all lower income-households to access appropriately located housing and domestic services of officially acceptable standards of space and construction and to ensure the appropriate use of urban land and the aesthetic quality of the urban environment, government must enter the housing market by constructing, maintaining and managing housing of an acceptable quality with security of tenure at affordable (subsidised) prices and costs, for the exclusive use of low-income households.

The model is characterised by ready-made standardised housing units for mass construction which are provided through centralised production. The provided housing should adhere to the minimum standards and technical requirements for adequate housing. Generally speaking, the provider model focuses on the reduction of housing deficits and at the same time on the improvement of housing quality. However, its bias is predominantly quantitative and it aims at realising economies of scale based on capital-intensive mass production of standardised houses or components and a large consumer market. The idea of the mass provision of housing through governments and private industry also contributes to formal employment and profit generation and thereby fosters economic growth and indirectly improves living standards. Compliance with building regulations and the enabling of planning control is deemed to best be achieved this way. (Wakely, 2014)

Eviction and relocation

The newly independent governments created their own public housing programmes and master plans for urban development and at the same time refused 'non-modern' and traditional ways of housing supply. This resulted in negative perceptions of informal settlements that were considered as substandard and were to be eradicated and replaced by modern housing. The housing strategies of the provider paradigm have often been linked to slum clearance programmes in order to re-house those made homeless by the demolition of illegal, overcrowded, unhealthy and dangerous centrally located informal settlements. Eviction policies caused the destruction of informal settlements and offered the inhabitants as a replacement mass produced minimum-standard housing units in permanent building materials, built according to strictly regulated urban plans. (Arroyo, 2013)

The provided formal housing units that were to house the urban poor, were mainly located in the urban periphery to reduce the costs of land acquisition. The strategies were limited to peripheral sites out of the necessity to satisfy programme requirements of cost limits, statutory standards of space, construction and servicing or topographic and urban characteristics (Wakely, 2014). The periphery proved however to be an unfavourable location in terms of access to social services and employment opportunities and costs of transportation. Government provided formal housing projects in the periphery have either taken the form of large apartment blocks, or have entailed the design and construction of relatively low-density housing estates

of small individual housing units. The following sections will elaborate housing strategies of these two categories.

References

Arroyo, I. (2013). *Organised self-help housing as an enabling shelter & development strategy. Lessons from current practice, institutional approaches and projects in developing countries*. Licentiate thesis 9. Housing Development & Management, Lund: Lund University

Hamdi, N. (1995). *Housing Without Houses: Participation, Flexibility and Enablement*, New York: Van Nostrand Reinhold Company.

Huchzermeyer, M. (2004). *Unlawful Occupation: Informal Settlements and Urban Policy in South Africa and Brazil*. Trenton: Africa World Press.

Jenkins, P., Smith, J., & Wang, Y. P. (2007). *Planning and Housing in the rapidly Urbanising World*. London: Routledge.

Wakely, P. (2014). *Urban public housing strategies in developing countries: whence and whiter paradigms, policies, programmes and projects*, DPU Working Paper Series: Reflections NO. 163/60

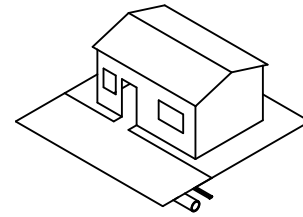## 3.2   Formal Housing Estates | Soweto RDP Housing (Soweto, South Africa)

Fig. 3.1   left: RDP Mass Housing Estate in Soweto, South Africa (retrieved from tembisan.co.za/rdp-houses).
                right: typological reduction (own illustration).

The formal provision of housing is elaborated in this section, with the aim to provide insight into the rationale behind provider housing strategies. Formal housing estates are one of two ways in which the government has provided complete housing in response to the informal production of housing. This section first elaborates a strategy component, which is illustrated by the example of Residential Development Programme (RDP) Housing in Soweto, South Africa. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

3.2.1   Strategy component

The premise of the formal housing estate strategy is to provide housing that adheres to minimal standards on housing quality. The provision of housing is usually subsidised in order to facilitate affordability for the urban poor. Formal housing estates strategies can be part of a policy in which, through eviction and slum clearance, sub-standard housing is demolished and it's inhabitants relocated. The approach aims to provide the urban poor with housing of adequate standards and thereby improve their housing conditions. This provider strategy recognises a problematic in informal settlements and provides alternative housing to improve the upon situation. The key characteristic of the approach is that the government is attempting to take control over the production of housing, and the planning of the city.

The principles behind the strategy

The approach of formal housing estates provides fully serviced formal housing units on plots of land with infrastructure and basic services in order to relocate and rehabilitate the inhabitants of informal settlements. The formal housing is often made affordable by the government provision of subsidies. These subsidies provide funds for those who cannot, through the private housing market, acquire adequate housing. The provider approach advocates that it is the role of the government to provide housing that meets the standards of modern urban life, to those who cannot afford to pay for it themselves. The belief that governments should take responsibility for constructing housing for urban poor households has been durable. When governments design, build and deliver low-income housing, it is seen as a way of ensuring that the housing is of good quality and developed in an "orderly" manner. According to the views of the provider paradigm the informal production of housing does not produce such an adequate housing environment and does not allow the government to control urban planning. The mass housing estates that are provided as an alternative aim to realise economies of scale and utilise the benefits of industrial construction methods. As a result mass housing estates often provide a homogeneous and repetitious field of one-size-fits-all housing, optimised to the most effective use of the government housing subsidy.

Soweto RDP Housing

In 1994, the first democratic government of South Africa introduced a new housing policy. The intention of the policy was to ensure the provision of adequate housing to all citizens and permanent residents of South Africa. This policy was based on provision of a financial subsidy to households that had incomes below a certain threshold. The subsidy is project-linked, it has been provided in the form of project funding for the acquisition of land and provision of infrastructure and housing. This subsidy policy has been reconceptualised as the integrated Residential Development Programme.

The formal housing estates of the Residential Development Programme (RDP) Housing in Soweto are used as an example to illustrate the strategy. The South African government has consistently devoted a large share of its public funds to the provision of subsidised housing. Subsidised delivery has been very impressive in quantitive terms; about 2.3 million housing units have been delivered in South Africa from1994 to 2009. The RDP housing is the product of specialised supply and demand-side value chains. The formality of the housing is guaranteed through its valid legal title, structurally sound nature and compliance with local planning standards and building codes, and opportunity to use as collateral for a long-term mortgage loan. The RDP housing strategy housing is the product of coordination between public and private sector activities, involving land, infrastructure, design and construction on the supply side, and a corresponding set of demand side inputs related to housing finance.

3.2.2   **Architectural component**

The Formal housing backlog in South Africa has mainly been approached by the government from the perspective that housing quality should be improved. RDP housing can be seen as the government's answer to the substandard housing quality in informal settlements dominated by overcrowding and lack of durable housing. The results of overcrowding are a lack of adequate living space for the inhabitant. Together with the lack of access to water and sanitation, overcrowding is very much related to negative health indicators; high incidence of diseases and child mortality. Sufficient living space is a target in the RDP housing, which means that no more than three people should share the same room. The lack of durable housing in informal settlements is a deprivation that directly relates to the substandard quality of the housing stock. Durable housing of a permanent nature is a is the target in the provision of RDP housing.

Logic behind the clustering

RDP housing produces a specific urban fabric. The minimum standards for the housing prescribe a detached house on a 250 square meter plot. Due to the peripheral location of the housing project, such space has been available. Plots are organised in an infrastructural grid. The resulting urban fabric shows extensive fields of repetitious standardised housing. The houses in these developments are distinguished only by their house numbers; these follow a numerical order that is continuous through the housing project.
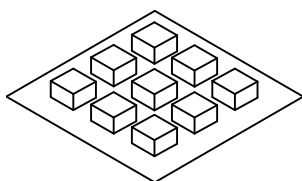

Fig. 3.2   left: clustering schema: **detached housing** organised in a street grid (own illustration).
right: aerial photograph of the settlement showing resulting urban fabric (Apple maps).
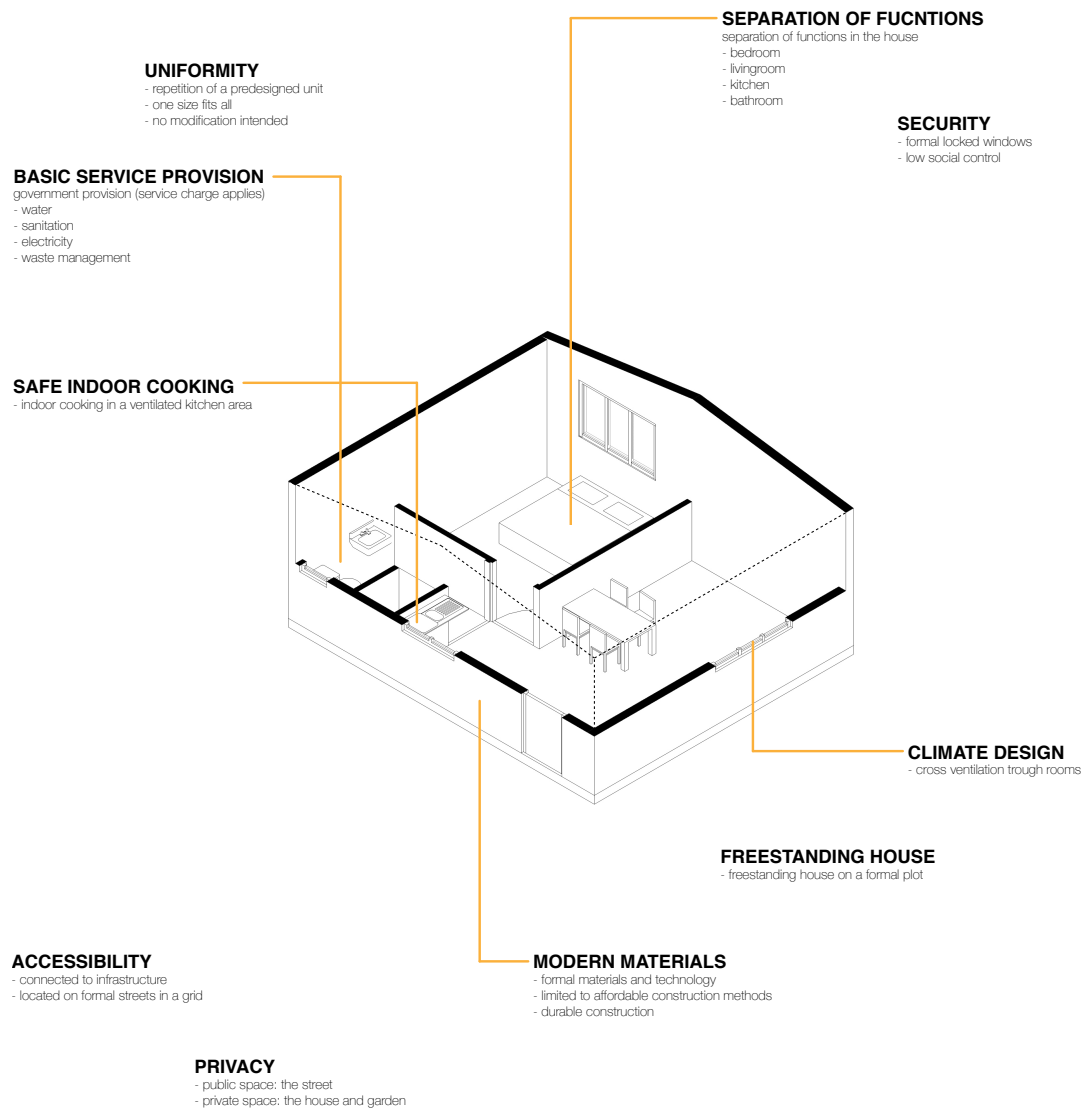
UNIFORMITY
- repetition of a predesigned unit
- one size fits all
- no modification intended

SEPARATION OF FUCNTIONS
separation of functions in the house
- bedroom
- livingroom
- kitchen
- bathroom

SECURITY
- formal locked windows
- low social control

BASIC SERVICE PROVISION
government provision (service charge applies)
- water
- sanitation
- electricity
- waste management

SAFE INDOOR COOKING
- indoor cooking in a ventilated kitchen area

CLIMATE DESIGN
- cross ventilation trough rooms

FREESTANDING HOUSE
- freestanding house on a formal plot

ACCESSIBILITY
- connected to infrastructure
- located on formal streets in a grid

MODERN MATERIALS
- formal materials and technology
- limited to affordable construction methods
- durable construction

PRIVACY
- public space: the street
- private space: the house and garden

Fig. 3.3 axonometric projection of a typical RDP house in the Soweto identifying of the housing quality (own illustration).

Quality of the housing

A typical house built in South Africa under the Reconstruction and Development Plan has an area of 36 square meter and is located on a 250 square meter lot. Each of the housing units consists of a bedroom and a lounge / kitchen, with a separate lavatory. Generally, these homes are built with brick and mortar with galvanised iron roofs, metal doors and usually two or three small windows. Not all RDP homes are the same size; some can measure up to 45 square meter. However only 30% of all houses built by the government have been larger than 30 meter. Local municipalities and provincial governments all have different specifications for RDP housing units, resulting in these discrepancies. The housing strategy includes basic services (e.g., running water, sewerage and electricity) and amenities (e.g., schools and clinics) that are regarded as essential in to adequate housing conditions. All of the houses have access to clean running water and are connected to a sewage system. The cost of a typical RDP home in is about €3.000 to €3.300 (ZAR 45,000 to 50,000) per unit as the subsidy permits.

The building standards and quality of these housing units are at the forefront of the housing debate in South Africa because the government has yet to set a level of acceptable standards required for contractors and developers. Currently the minimum government standards are for a 40m2 house on a individually owned plot with adequate water supply and sanitation. South Africa's Housing policy continues to evolve the RDP housing programme in response to the need to create housing options for those still living in informal settlements across the country. While donor agencies seek to reduce standards as a way of ensuring the widest possible

provision of needed housing, and enhancing affordability, government agencies are intent on imposing high standards on all construction projects, at best because they are keen to reduce maintenance costs and at worst because they aspire to a highly formalised vision of their cities.

3.2.3   **Conclusion**

The housing strategy of formal housing estates addresses the sub-standard housing conditions in the informal production of housing through providing of a formal alternative. As the strategy of RDP housing illustrates, housing units that conform to the governments building standards are provided, usually subsidised in an attempt to make them affordable to the urban poor. The focus of government intervention in these strategies is on the improved quality of the provided housing. The strategy showcases the government priority to provide adequate housing quality to urban poor, as an alternative to the informal production of housing.

☑ **Housing Quality: the housing strategy should deliver an adequate quality of the housing**

References

Finmark Trust (2012). *Subsidised Housing Assets, Exploring the Performance of Government Subsidized Housing in South Africa.* retrieved from http://informalcity.co.za/subsidised-housing

Turok, I. (2015). *Op-Ed: What will housing megaprojects do to our cities?* retrieved from https://www.dailymaverick.co.za/article/2015-11-19-op-ed-what-will-housing-megaprojects-do-to-our-cities/#

3.3   Formal Apartments | Jemo Condominiums I, I & III (Addis Ababa, Ethiopia)

Fig. 3.4   left: Jemo condominiums build in the periphery of Addis Ababa (UN-Habitat, 2010 / Katherine Hegab).
right: typological reduction (own illustration).

Although mass housing estates provide an alternative to the informal production of housing with increased housing quality, the density of the produced urban fabric remains low. In the strategy of formal apartments the urgency for a more dense provision of formal housing is recognised. This section first elaborates a strategy component, which is illustrated by the example of the Jemo Condominium site I,II & III in Addis Ababa, Ethiopia. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

3.3.1   Strategy component

The basic premise of formal apartments strategy is that adequate housing qualities should be realised in government provided housing, while taking into account the relevance of sufficient urban density. The approach acknowledges that a compact urban fabric increases the affordability of infrastructure and decreases the effects of urban sprawl. Much like the formal housing estate strategy, the aim is to provide housing that adheres to minimal standards on housing quality. Government provided housing subsidies or loans are supposed to facilitate affordability for the urban poor. Provider strategies often combine eviction and slum clearance with the relocation of the in inhabitants of informal settlements. The approach aims to provide the urban poor with housing of adequate standards and urban density. The key characteristic of the approach is that the government attempts to take control over the quality of the housing stock and the urban density of the city.

The principles behind the strategy

The formal apartments approach provides fully serviced formal apartment units, that are mostly clustered in large scale condominium buildings. Infrastructure and basic services can be provided at a lower cost than in mass housing estates, as a more compact urban fabric reduces infrastructural costs. The formal housing is often made affordable through loans or by the government provision of subsidies. In the case of a housing loan, the apartment serves as the collateral for the bank. The role of the government in the strategy is interpreted as the provider of adequate housing and urban planning. In the rapid growth of the city a need is recognised for the development of affordable housing of higher density then formal housing estates provide. Along the initiative to provide housing that meets the standards of modern urban life, the standards of modern urbanism are a target in government policy. The informal production of housing does in this light not produce an adequate housing environment. The formal apartments that are provided as an alternative, aim to realise economies of scale and utilise the benefits of industrial construction methods. The resulting apartment buildings comprise of relatively small housing units, that are made affordable through their vertical stacking and the sharing of construction elements.

Jemo Condominiums I, II & III

To illustrate the strategy of providing formal apartments, the Jemo condominium project in Addis Ababa is presented. This project is part of the Ethiopian Government's ambitious Integrated Housing Development Programme (IHDP), providing low- and middle-income housing on a large scale. Since 2005 the goal of this programme has been to construct 400,000 condominium units, to date almost half of the targeted amount of units has been built of which 10,000 are located in the Jemo site. (UN-HABITAT, 2011) Addis Ababa has a housing backlog of about 350 000 housing units, and this is estimated to be growing by about 60 000 per year.

The Jemo site is located in the periphery of Addis Ababa. This peripheral location is based upon the modernist principles of the separation of urban functions and the affordability of the peripheral land. The government aims to realise the benefits of mass production in this provider strategy. Affordability is proposed by optimising construction cost per dwelling through large scale repetition and cost effective techniques. The financing system of the condominium housing is supposed to fully recover its costs. The total costs of the condominium project include the cost of housing construction, labour costs, and infrastructure costs. Within the condominium project the relative weight of these are 60, 20 and 20 per cent respectively. The government recovers the main share of the construction cost of the housing units from the inhabitant via sale, made possible by a bank mortgage of which the apartment serves as collateral. The remaining costs and the infrastructure and basic services are financed through the sale of commercial units. The financing system proposes that the government and private sector initially invest public funds in the construction of the housing, that are to be completely recovered over time from the inhabitants and shop owners. The financing strategy requires the inhabitant to make a down-payment of 20% of the apartment cost, 80% is a mortgage with the Commercial Bank of Ethiopia. The inhabitants enter into a contractual loan agreement on the basis of monthly interest and principal repayments. Initially, interest rates for studio units have been zero per cent and 2 per cent for 1-bedroom units, but the system has been changed and includes annual interest rates of 8.5 per cent for all units.

3.3.2   **Architectural component**

Logic behind the clustering

Condominium blocks on the Jemo site are clustered around a green open space. The ample green space is intended to 'remove the stigma of housing for the poor', as green open space is typically not found in informal development. The site layout of the condominium blocks, commercial units, and communal buildings depends on the specific site, responding to available land area, land typography, and required densities. A typical condominium block comprises of four unit typologies: a studio, 1-bedroom, 2-bedroom, and 3-bedroom unit types. Each unit includes a bathroom, which includes a shower, a flush-toilet, and basin, and a separate kitchen. Each unit has water, sewerage, and electricity connections.
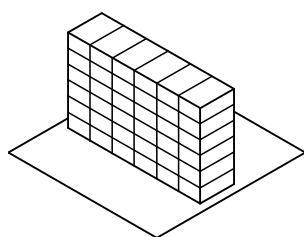

Fig. 3.5   left: clustering schema: **slab** organised around green open space (own illustration).
            right: aerial photograph of the Jemo site showing resulting urban fabric (Apple maps).
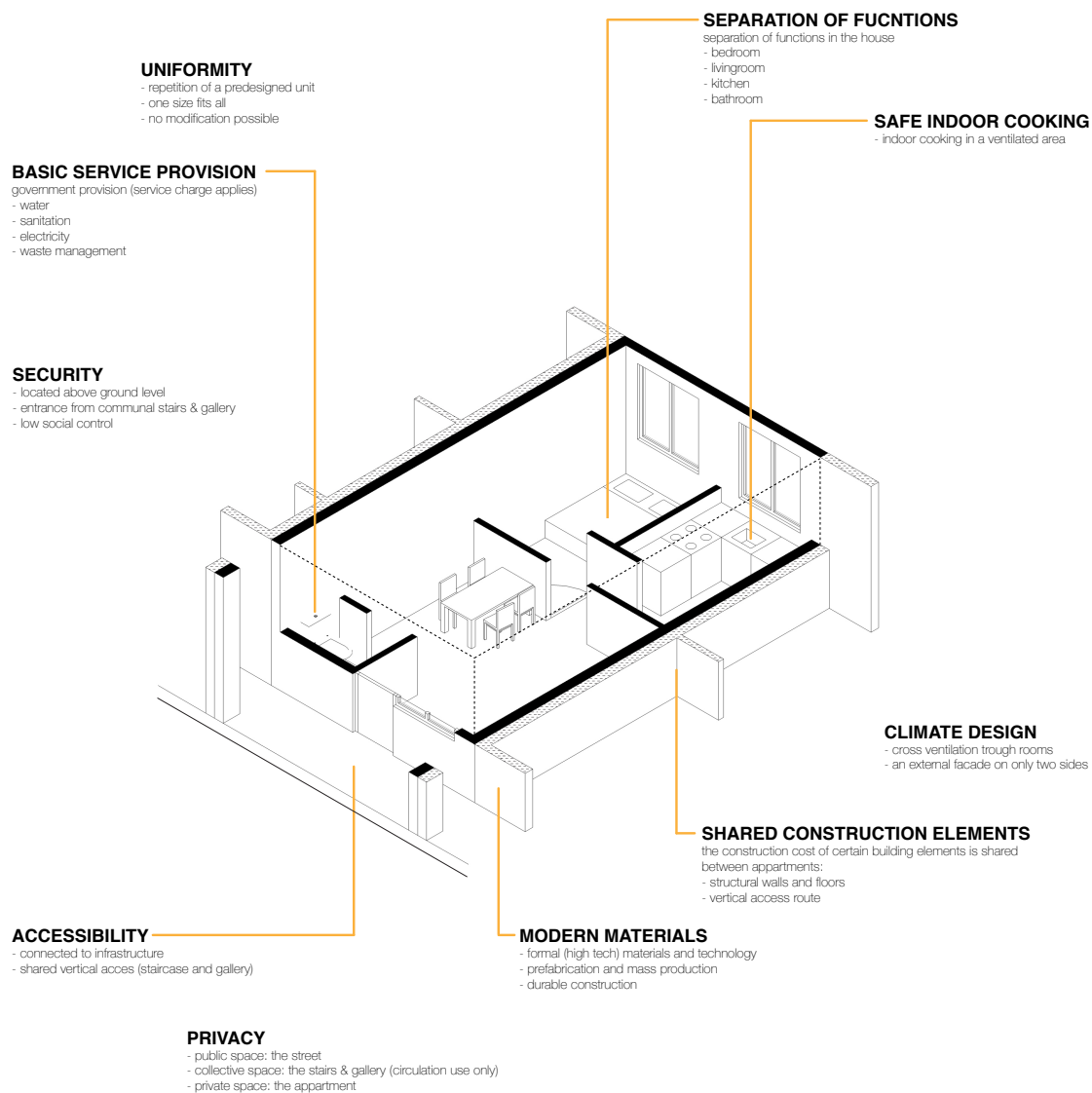
SEPARATION OF FUCNTIONS
separation of functions in the house
- bedroom
- livingroom
- kitchen
- bathroom

SAFE INDOOR COOKING
- indoor cooking in a ventilated area

UNIFORMITY
- repetition of a predesigned unit
- one size fits all
- no modification possible

BASIC SERVICE PROVISION
government provision (service charge applies)
- water
- sanitation
- electricity
- waste management

SECURITY
- located above ground level
- entrance from communal stairs & gallery
- low social control

CLIMATE DESIGN
- cross ventilation trough rooms
- an external facade on only two sides

SHARED CONSTRUCTION ELEMENTS
the construction cost of certain building elements is shared
between appartments:
- structural walls and floors
- vertical access route

ACCESSIBILITY
- connected to infrastructure
- shared vertical acces (staircase and gallery)

MODERN MATERIALS
- formal (high tech) materials and technology
- prefabrication and mass production
- durable construction

PRIVACY
- public space: the street
- collective space: the stairs & gallery (circulation use only)
- private space: the appartment

Fig. 3.6   axonometric projection of a unit in the Jemo Condominiums identifying of the housing quality (own illustration).

Typically 40 per cent of units are 1-bedroom as statistics have shown that the balance between floor-area and purchasing price of a 1-bedroom unit is the most popular amongst condominium-applicants. The unit types are distributed evenly across each storey, rather than each storey having only one type to encourage a mix of income groups. The same overall design strategy is used across all projects, although minor modifications are made to make each project site specific. The modular design reduces construction times and allows for the repetition and adaptation of designs across projects. Densification is the driving concept behind the clustering of the housing units. The Ethiopian government believes that is generally more expensive to create lateral development than vertical development so high-rise housing should be encouraged, especially in valuable inner-city locations. The condominium projects range in density from 175 to 300 households per hectare. At present condominium blocks are 'ground floor plus four storeys in height, in some cases five storeys, therefore avoiding the need for a mechanical lift, which minimises associated construction and maintenance costs.

The main aim of densification is to counter the urban sprawl, caused by the informal production of housing. The term urban sprawl signifies the uncontrolled and disproportionate expansion of an urban area into the surrounding countryside, forming low-density poorly planned patterns of development. It is a spatial phenomenon where a city spreads outwards, even beyond its suburbs to its outskirts. Urban sprawl regarded as irresponsible and, often, poorly planned development that destroys agricultural and natural land and systems. To prevent urban sprawl and promote sustainable urban extension, it is necessary to achieve high density, which is the foundation of a sustainable neighbourhood. High density essentially means a high

concentration of people and their activities. Efficient land use slows down urban sprawl as high density neighbourhoods can accommodate more people per area.

Compared with low density development, high density has economic, social and environmental benefits. High density development results in decreased costs of public services such as police and emergency response, school transport, roads, water and sewage, reduced car dependency and parking demand, and increased support for public transport. The concept of density can be divided into physical and population density. When building single storey houses, high population densities require a large footprint, which result in the encroachment upon open spaces. By constructing multi-story houses the population density is increased while the footprint of the building remains the same. This unlocks profits in terms of infrastructure provision, open space and reduced travel distances.

Quality of the housing

In the Jemo condominium project the apartments are constructed out of pre-cast concrete elements produced at a large scale. The mass production of pre-cast elements contributes a 12 per cent reduction in construction costs, when compared to a standard formal house. Another 38 per cent reduction was contributed by the management and level of internal finishing: the phasing of the strategy and the absence of floor tiles, the floor screed finish and absence of wall plaster all contributed towards increased the affordability of the strategy. The condominium blocks are constructed from a frame of reinforced concrete with masonry infill walls, plastered both inside and out. The design utilises standard sizes of materials therefore reducing costs further (for instance standard hollow brick dimensions are kept to remove the need for cutting them to size). Windows and doors are made from metal frames with single glazing.

The condominium units achieve a significant housing quality. Inhabitants that have moved into condominium housing have a greatly improved physical environment compared with their previous informal housing. All units have basic services and infrastructure and unit owners have security of tenure. To improve construction efficiency and reduce costs, the government is currently investigating alternative building technologies and systems. they are concentrating their efforts on increasing the use of local construction techniques and materials, and promoting private investment in the national production of cement, glass, and iron.

3.3.3   **Conclusion**

The Jemo condominiums project emphasises the benefits of mass production and the importance of high density development. Contemporary views on density state that high densities and compact cities are fundamental in sustainable urbanisation and economic growth. The project recognises the need to promote compactness and maximise land efficiency. Proper and well-designed density is the key to meet the challenge of rapid urbanisation and benefit from the economies of scale and to promote sustainable urban extension. In the planning of the Jemo condominium site it was important to have proper and well designed density of at least 150 people/ha. Urban sprawl leads to significantly higher overall costs than would be found in more carefully planned communities with higher residential densities and contiguous development. In the analysis of the housing strategy of formal apartments, the government priority of adequate density becomes apparent:

☑   **Urban Density: the housing strategy should deliver an adequate urban density**

A limitation to the strategy of providing formal apartments can be recognised in the documentation. The Jemo Condominium project is lacking in affordability for the inhabitant, who is often defaulting on the repayment of invested government funds. The limited cost recovery of the financing system, obstructs the long term financial sustainability of the strategy. Initially the financing system of the project impedes the urban poor from securing a unit as they do not have the financial capacity to pay the required down-payment. A common practice for the urban poor is to pool resources between family and friends to meet this down-payment. After occupation, servicing the monthly mortgage proves almost impossible because of the lack of a stable formal employment or income source. On paper the programme is structured to be completely cost-recoverable. The inhabitant will eventually pay for the complete market value of their condominiums and land and infrastructure cost will be recovered through the sale of commercial units. However, no credit or income checks on potential inhabitants are undertaken. The assumption is that if inhabitants have the financial capacity to meet their

mortgage obligations, they will do so. If not, they will rent out their unit and finance the mortgage through this income. When repayment of monthly mortgage fees exceeds its grace period the Commercial Bank of Ethiopia may evict and replace the inhabitant.

To improve affordability of the apartments four different unit typologies were introduced, small units would be sold at a reduced rate while the sale of larger units would compensate the reduction. This approach however wrongly assumed that use-value of the unit size would positively relate the income level of the inhabitant. The smaller and therefore cheaper units should be occupied by the poorest households. However, experience has shown that the poorest, who often have large families, have little use for the small apartment unit. The small units are ill-fitting to the housing needs of large low-income families. Adding to the inadequate size the unit and building design does not successfully respond to occupants' lifestyles and activities. Most inhabitants are accustomed to living close to the ground and so adjusting to life in multi-storied apartment blocks is proving a challenge. Local customary activities in Addis Ababa such as the preparation of traditional injera bread and slaughtering of animals are complicated by the spatial organisation of the apartments.

Compounding the large financial obligations with the limited use-value of the apartments, many low-income households opt for the informal rent of their condominium unit. The government estimates suggest that in total up to 70 percent of homeowners rent out their condominium to increase their income to ease the struggle of paying back their bank loan, and receive a regular income. There are no legal or local community administration restrictions on this strategy and no checks made on unit occupation. Due to the limited use-value of the formal apartments and their high market value, the housing strategy struggles to provide an adequate alternative to the informal production of housing. An inhabitant priority can herein be identified: when the market value greatly surpasses the use-value of the housing, the housing strategy does not align with the inhabitants priorities. An adequate alternative to the informal production of housing should therefore recognise the following priority of the inhabitant:

High Value Formal Housing:
the market value of the housing unit should not greatly surpass its use-value

---

References

Gardner, T. (2016). *Ethiopians adjust to life in Africa's most ambitious social housing project.* retrieved from http://news.trust.org/item/20161025130317-ep173

UN-Habitat. (2010b). *The Ethiopia Case of Condominium Housing: The Integrated Housing Development Programme*. Nairobi: UN-Habitat.

UN-Habitat (2012). *Urban Patterns for a Green Economy: Leveraging Density.* Nairobi, UN-Habitat

4   The Enabler Paradigm

This chapter examines the school of thought that follows the ideas of John F.C. Turner in addressing the informal production of housing. The theoretical background of the strategies belonging to the 'enabler' paradigm is discussed, while deducing from the housing strategies their corresponding architectural typologies. The first section of this chapter investigates the mimicking of informal practice, elaborating the ideas behind the approach to enable or support the production of housing for the urban poor. An unintended form of enabling policy is discussed, extended formal housing, which presents a case for the validity of the principles of the enabler paradigm. The chapter continues by specifying the housing strategies that can be grouped under the enabler paradigm: sites and service projects, core housing projects, cooperative housing partnerships, formal settlement upgrading and in situ half houses. Lastly a form of enabling is discussed that does not, as other housing strategies, focus on physical intervention, but on the technical assistance to introduce informal multi-story housing.

4.1   Mimicking Informal Practice

"The enabling approach calls for policy shifts away from direct provision of housing by governments to alternative approaches to housing development and improvement involving all stakeholders (including the public, private, academic and civil society actors) and, most importantly, people themselves" (UN-Habitat, 2012a)

The ideas behind the enabler paradigm originated from a critique on the provider model. Theorists such as John F.C. Turner and Charles Abrams argued that the provision of formal housing has been not been able to produce an adequate alternative to the informal production of housing. Moreover the productive efforts of the urban poor, in housing themselves, have been counteracted through eviction and relocation. The setting of minimal standards for housing has resulted in housing, too expensive for the government to subsidise on a large scale and unaffordable for the urban poor, who only have the means to house themselves in a unenviable and therefore affordable way. The housing strategies of the provider paradigm have produced static housing products that are ill fitted to the dynamic household composition and needs of the urban poor. The proponents of the enabler paradigm emphasise the creative and productive efforts of the urban poor in arranging their own housing. Allowing for dweller control over housing construction should be a priority in a successful housing strategy that addresses the informal production of housing.

4.1.1   Critique on the provider paradigm

The government provision of formal housing has not been able to address effectively the shelter needs of the rapidly growing population of urban poor in Sub-Saharan Africa according to the writings of John F.C. Turner. His Latin American studies suggested that housing shortages and the proliferation of informal settlements were primarily caused, by bureaucratic, heteronomous systems based on hierarchical structures and centralised, large-scale technology that underpinned slum clearance and the government provision of formal housing (Turner, 1968). Turner argued that the provider model was failing for three interconnected reasons: 1) Removing the inhabitant from the decision-making processes of their housing construction alienated them from the end product. 2) This alienation rendered dwellers less interested and investing in maintaining and paying for the housing, which added more costs to an already expensive process of mass redevelopment that relied on non-renewable resources (Turner, 1978). 3) The unaffordability and unpopularity of the provider housing strategies, and their frequent bankruptcy and closure, fuelled mass squatting, which contributed to the growing chaos and loss of administrative control over urban and economic growth.

The eradication of informal settlements, eviction of their inhabitants and relocation in formal housing has demolished more housing than it provided. At the same time the demand for affordable housing for the urban poor has continued to increase due to rapid urban population growth. Formal housing programmes through direct government provision of housing failed in addressing effectively the housing demands of the urban poor. The housing strategies had problems in reaching the urban poor, although highly subsidised, these housing

was not affordable to low-income families. Even though rent controls were applied, limitations in accessing formal credit systems made the government subsidised housing unable in targeting the urban poor as main beneficiary of these programmes. The underlying causes were that the housing was located inappropriately regarding jobs opportunities, provisions for maintenance were inadequate and most notably the taxes, rent and service charges were financially unviable for the urban poor. These conditions often resulted in the sale of public housing units to higher income groups. Additionally, the delivery systems of public housing suffered from various problems such as "[...] corruption, political interference, inefficiency, inflexibility, unfair allocation and extensive delays [...]" (UN-Habitat 2003a).

The government subsidies for the provision of formal housing decreased over time as in many countries, other sectors of the economy, such as import-substitution industrial development and national distribution networks, became higher political priorities for the investment of public resources in construction than finding an alternative to the informal production of housing. In addition the managerial and financial cost of maintaining the formal housing stock, most of which was rented rather than sold to the urban poor, became politically difficult to maintain. As a result in many cities the relatively new public housing began to deteriorate rapidly with no way by which its cost could be recovered. Such was the strain on national and municipal financial and managerial resources that few provider housing strategies were able to meet their ambitious construction targets. Despite these drawbacks, many governments have continued to pursue state-built housing policies, and large developments of subsidised public housing continue to appear here and there in cities, while financial systems to capture savings and generate resources to pay for these housing programmes continue to be set up.

Insufficient quantity

The inability of provider housing strategies to meet their quantitative targets for the production of formal housing and to facilitate their maintenance in use, has been a main limitation to the approach. The high costs of the formal housing, designed to adhere to strict building codes, resulted in a limited number of units. The lack in quantity of government provided formal housing and housing finance programmes in Sub-Saharan Africa was exaggerated because the housing strategies were addressing issues of standards that had been ignored during colonial periods. The adoption of housing solutions from developed countries failed in the the newly independent countries because they relied on "heavily subsidised blocks of public housing flats with high standards of construction and infrastructure, zoning and building code regulations". Setting minimum standards for modern housing, made housing financially inaccessible to the urban poor. The success of housing strategies belonging to the provider paradigm depends on the availability of financial resources, a modern building industry and a well functioning planning system. These preconditions were not in place in Sub-Saharan Africa. The few successfully build housing units were allocated to civil servants at subsidised rents, as in the colonial period. For the majority of the population there was no alternative to the informal production of housing.

In order to increase house production and reduce housing cost the idea of 'low cost housing' was introduced (Abrams). The cost reductions within the provider paradigm strategies however sacrificed the flexibility and adaptability of the housing. There was a need to reduce the construction costs to increase affordability and to off-load responsibility for the maintenance and management of the housing. Access to housing was to be linked more directly with wider social policies for urban poverty reduction and the alleviation of its social impact. The urgency finding an alternative became apparent with the 1971 round of national population censuses, showing the extent of the proliferation of informal settlements in virtually all cities of the developing world.

Ill fit to needs

"the immense variability to individual households needs and the inelasticity of low-income people's housing demand creates a difficult situation for any government; the satisfaction of housing needs by central institutions is an impossibility for governments with very small budgets and faced with rapidly growing masses of people with very low incomes"

Formal housing is often incompatible with the lifestyles of the urban poor, since the housing design does not permit residents self construction efforts or incremental house extensions when people's income and changing needs require such adaptations. The design of the housing units did not allow for extensions in the case of changes in family composition. Charles Correa in 'the new landscape' explains that especially formal apartment blocks are expensive, energy demanding, climatically unsound, and that more indoor space is required when residents are cut off from access to outdoor space. The provider paradigm housing was largely culturally and practically inadequate as it did not provide open spaces for communal activities and for creating home-based income opportunities. When it comes to constructions, the provider strategy does not endorse knowledge improvements of local artisans or local production of building materials. Repairs were difficult to carry out for inhabitants, and government maintenance was not sufficiently provided

"The policy of limiting the allocation of housing units in specific projects to specific income groups – and of imposing specific housing types – naturally limits the social mix and inevitably increases the administrative costs both in the short and the long run" (Turner J. F., 1967).

4.1.2 The benefits of self help

"We must give up the futile or destructive attempt to impose our own will, and we must support those who are fighting to regain the authority our executive institutions and corporations have usurped"

Turner (1972) states that "conventionally built low-income housing is indeed a heavy social overhead, largely because it fails to utilise the users' own potential initiative and resources". This idea brought forth a shift in the World Bank's urban housing policy away from state-led slum clearance towards incremental improvement by slum dwellers themselves (Davis, 2007). This shift to a more positive view of informal settlements was influential for the World Bank to provide funding for enabler strategies. However when this debate about self-help in housing provision became a popular topic in academics and policies, the concept was nothing new and had been applied in different contexts throughout history.

Turner (1976) defines self-help as the concept that signifies the competence of a household to arrange accommodation according to its priorities. Self help signifies the efficacy and productivity of informal housing processes of the urban poor: an existing resource that might be exploited to advantage by government housing authorities. Derived from his experience in Peru Turner "[...] concluded that urban squatters in the developing world are the best judge of their own needs, and are better able than anyone else (including governments) to address them" (Harris 2003). He stressed the ability of poor communities to self-build and argued that self-help housing would be more flexible, more affordable, would satisfy individual needs and allowed for the expression of human creativity.

Moreover, economic opportunities would be created during the construction phase. Informal settlements were to be considered as being a first step in a natural urban and socio-economic development process, indeed a solution rather than a problem. The principle to enable self-help therefore became the central aspect of an internationally promoted housing approach towards these types of settlements. Hence, informal settlement dwellers were now to be supported with materials, technical advice and tenure security in enabler housing strategies. Engaging the inhabitant in the construction, maintenance and management of their housing, was introduced in the housing strategies in many countries, mostly enabler strategies were introduced alongside the government provision of formal housing that was rarely abandoned completely.

Despite the recognised limits to devolved decision making and autonomy by people producing their own housing (Burgess, 1982), Turner's written work can be seen as largely responsible for persuading academics, donor agencies, government officials and professionals that the creative activities of people in housing themselves (in informal settlements) should be seen as part of the 'solution' rather than as the major urban problem that it was perceived to be by many city officials.

The importance of dweller control

Explicit in much of Turner's work is the assertion that the government and other interested parties, such as NGOs and the private construction sector, should relinquish control of the housing process and that this should be achieved through the "resorption of government back into the body of the community" (Turner, 1972). Turner was urging that as much choice and freedom be granted to the inhabitants of urban housing, formal and informal, as was possible within the prevailing system of government, a suggestion that was, at a later stage, viewed with some scepticism by theorists such as Rod Burgess, who commented that "...Turner is naïve if he thinks that these groups are going to forsake their economic interests in a fit of charity!" (1977).

This proposition by Turner however reflected more viewpoints that lacked capitalist ideas of seeing housing as commodity with use value and market value. The Marxist ideas pursued by Burgess (1977) argued that self-help housing becomes cheaper with the removal of paid labour (sweat equity) of the dweller not the absence of profits which relieves the government of some expenses on the poor. While in his earlier works, Turner emphasised individual self-building and the need for an extensive level of autonomy from the state, he later stressed the arguments of self-management, community organisation and the supporting role of the government. He identified restricted and specified tasks for the government: "Turner argued for reducing the government's role to ensuring security of tenure for land and housing, applying lower official standards, and providing access to financial and appropriate technological support" (Jenkins et al. 2007, 159).

In his introduction to *Housing by People: Towards autonomy in building environments*, Colin Ward presented what he described as Turner's three laws of housing, with which he summarised the essence of Turner's writing and thought. The following paragraphs elaborate his main views.

When dwellers control their housing process, it is better for them and the housing environment.

Turner's main concept on housing is anchored in the idea of freedom to build: claiming that dweller control is paramount to the success of any housing programme in order to overcome bureaucratic and technological barriers. Turner emphasises that what matters in housing the urban poor is "who decides" in the process. Therefore formally provided architecture, that is presented as a finished product to its future inhabitant, is unfit. Turner states that only when housing is determined by households and local institutions and the enterprises that they control, can the requisite variety in dwelling environments be achieved. Only then can supply and demand be properly matched and consequently satisfied. And only then will people invest their own relatively plentiful and generally renewable resources.

The self-help component in enabling strategies is by Turner not only and not necessarily meant as the contribution of sweat equity in the construction process. It primarily implicates greater control in decision-making in design and in the construction process in general. "It is not to say that every family should build its own house [...] but rather that households should be free to choose their own housing, to build or direct its construction if they wish, and to use and manage it in their own ways" (1972).

The important thing about housing is what it does in the life of the dwellers rather than what it physically is.

Another central concept in the writings of Turner is the idea that there is a "conceptual error of understanding housing as a noun and of identifying values and objects instead of understanding housing as an action and seeing values in the roles that procedures and products play in people's lives". Turner emphasises the progressive character of housing provision and argued that adequate housing is nothing that could be achieved within timely restricted one-of projects but rather over time. He thus suggests "[...] that the ideal we should strive for is a model which conceives housing as an activity in which the users [...] are the principal actors. His accentuation of phrases such as 'housing as a verb' became well-known and contributed to a change in perceptions of slums and informal settlements.

For people, the value of housing lies in what it does for them. It is not so much a function of what it looks like and what it is for the architects and builders, bankers and speculators and short-term politicians. Turner argues that governments fail to see the use-value of housing, as formally provided housing focusses on rigid minimal building standards and produces housing designs that are not responsive to the dynamic nature of housing needs of the urban poor. The use-values of these large housing projects in all parts of the world are very low. So low, in fact, that most households rather rent out, or sell on their housing. When the urban poor or low income dwellers do remain in the housing, they do not much care to appropriate or maintain it. Carelessness and vandalism are the hallmarks of modern mass housing in Sub-Saharan Africa.

Dwellers can tolerate or accept a problem with their housing much more readily if it was a result of their own action or choice as opposed to that of another.

A final concept that Turner proposes is that in any situation, it is much more tolerable or acceptable to deal with problems, if they arise from free choice. A dissatisfactory situation is far less tolerable when it is imposed, then when it is a result of chosen actions. In this light informal production of housing can be explained as the deliberate choice of the inhabitants, who prefer living in sub-standard housing conditions with the benefits of an urban lifestyle, over living in rural areas without those benefits. On the other hand the relocation to government provided housing might offer a relatively higher standard of living, but is dissatisfactory on other levels. For the urban poor to tolerate housing problems the decisions regarding the housing process should be controlled by the dwellers in a bottom-up approach, since this will affect the construction process and quality of the houses corresponding to dweller economic, social and cultural characteristics.

The conclusion, that what matters in housing is what it does for people rather than what it is, leads to the principle of self-government in housing. Only when housing is determined by households and local institutions and the enterprises that they control, can the requisite variety in dwelling environments be achieved. Only then can supply and demand be properly matched and consequently satisfied. And only then will people invest their own relatively plentiful and generally renewable resources.the practices in which low-income groups solve their housing needs primarily through their own resources of labour and finance. A successful housing strategy should allows poor communities to act as key decision makers in project planning, design, management and implementation with state support in initial project funding, training on project management and oversight during implementation.

4.1.4   A tradeoff in controll

Governments in Sub-Saharan Africa have through the strategies of the provider paradigm attempted to claim control over the urban housing stock in their countries. Eviction and slum clearance policies followed by the government provision of formal housing have mainly been undertaken to improve the substandard housing conditions in informal settlements and to take control of the urban fabric of the rapidly growing cities. The provider strategies are founded on the premise that the government should control the housing provision for the urban poor and the urban planning of the city. Recognising the substandard housing qualities and uncontrolled growth of the city, governments followed the example of 'developed countries', attempting to provide 'social housing' since private housing markets did not accommodate the urban poor. Rapid urban growth has placed an increasing importance on government control over urban planning. The reasoning in this chapter has however shown that in the context of Sub-Saharan Africa, as in other 'developing' regions of the 'global south', limitations to this attempt in government control over housing for the urban poor can be recognised.

The concept of dweller control over housing has been introduced to the debate on finding an adequate alternative to the informal production of housing, recognising the limitations of government control. "When dwellers control the major decisions and are free to make their own contributions in the design, construction, or management of their housing; both this process and the environment produced stimulate individual and social well-being" (Turner 1972). Turner claims the centrality of the concept of dweller-control over the self-help housing process and relates dweller-control to freedom and to well-being. However "when people have no control over, nor responsibility for key decisions in the housing process, on the other hand, dwelling environments may instead become a barrier to personal fulfilment and a burden on the economy".

The conflicting priorities of both the government and the inhabitant benefitting from the control over the production of housing result in a tradeoff. The government claims responsibility for the public or collective interests within the process, while the needs of the inhabitants are, according to the theories elaborated in this section, best suited by dweller control over the production of housing. The inhabitant prioritises autonomy and dweller control over the process of housing, while the government prioritises centralised control over the produced housing and urban qualities:

The inhabitant should be able to control the building process and product

tradeoff

The government should be able to control the building process and product

---

References

Abrams, C. (1964). *Man's Struggle for Shelter in an Urbanising World*. Cambridge: Massachusetts Institute of Technology Press

Burgess, R. (1978). *Petty Commodity Housing or Dweller Control? A Critique of John Turner's Views on Housing Policy*. World Development.

Burgess, R. (1982). *Self Help Housing Advocacy: A Curious Form Of Radicalism. A critique of the work of John Turner*, in, Ward, P. (ed): *Self Help Housing. A critique*, Mansell Publishing LTD, London.

Hamdi, N. (1995). *Housing Without Houses: Participation, Flexibility and Enablement*, New York: Van Nostrand Reinhold Company.

Jenkins, P., Smith, J., & Wang, Y. P. (2007). *Planning and Housing in the rapidly Urbanising World*. London: Routledge.

Marcuse, P. (1992). *Why Conventional Self-Help Projects Won't Work*, in Mathéy (ed), *Beyond Self-Help Housing*, United Kingdom: Mansell Publishing Limited.

Mathey, K., ed. (1992). *Beyond Self-Help Housing*. United Kingdom: Mansell Publishing Limited.

Pugh, C. (2001). *The Theory and Practice of Housing Sector Development for Developing Countries, 1950-99*. Housing Studies. 16.4: 399-423

Turner, J.F.C. (1968). *Housing Priorities, Settlement Patterns, and Urban Development in Modernising Countries*, Journal of the American Institute of Planners, 34:6, 354-363, DOI: 10.1080/01944366808977562

Turner, J.F.C. (1972). *Housing as a Verb*. In: Turner, J.F.C. and Fichter, R. (Eds.): *Freedom to Build*. New York: Macmillan, 148–175.

Turner, J.F.C. (1976). *Housing by People, Towards Autonomy in Building Environments.* London, Marion Boyars.

Turner, J.F.C. (1996). *Tools for Building Community: An Examination of 13 Hypotheses*, Habitat International, 20 (3), 339-47.

Wakely, P. (2014). *Urban public housing strategies in developing countries: whence and whiter paradigms, policies, programmes and projects*, DPU Working Paper Series: Reflections NO. 163/60

4.2   Extended Formal Housing | Dunoon RDP housing (Cape Town, South Africa)

Fig. 4.1   left: RDP housing in Dunoon, Cape Town has been vertically extended (retrieved from www.informalcity.co.za).
             right: typological reduction (own illustration).

An unintended form of enabling policy is presented in this section; extended formal housing, which provides a case for the validity of the principles of the enabler paradigm. The strategy is, for lack of government enabling intentions, actually a form of self help. The difference however, is that the starting point of construction has not been a squatted or illegally sub-divided plot of land, but a formally provided house. In presenting the unauthorised extension of formal housing, the significance of dweller control over construction is brought forth. This section first elaborates a strategy component, which is illustrated by the example of extended RDP Housing in Dunoon, Cape Town, South Africa. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

4.2.1   Strategy component

The inhabitants of government provided formal housing often make unauthorised changes and extensions to their dwellings in order to improve physical conditions or to meet the need for more space or privacy (Tipple). Through transformations families increase the number of rooms in their houses providing informal rental housing for tenants whose needs are often not met in government housing projects. Transformations are carried out to meet the needs of the next generation, to accommodate extra households and to generate income. The effects of transformation increase urban density and prevent the process of filtering down of the housing stock. Tipple argues that user-initiated extensions are a valuable form of inhabitant driven supply of housing for the urban poor, and governments should support these actors by employing enabling policies to facilitate their efforts.

The principles behind the strategy
The prevalence of unauthorised extension of formal housing validates the idea that formally provided government housing is ill fitting to the dynamic needs and priorities of the inhabitant. By means of extension, the inhabitant takes back control over their housing. Moreover, extension of existing homes is an affordable option that can be used to increase the housing stock. Most transformed houses have a semi-private space that allows owners to rent out rooms, which is an affordable housing option for the urban poor, who cannot afford self-contained units. Transformers tend to rely on small contractors or local craftsmen to build extensions and since the process is labor-intensive, it creates jobs for the local labor force. Extensions increase population density in neighbourhoods, reducing urban sprawl and ensuring that resources are used efficiently. Most transformers have lived in their neighbourhoods for a long time and have established strong social, cultural and economic ties. This social cohesion is preserved through transformations but can be easily destroyed by redevelopment projects.

Dunoon RDP housing

The township of Du Noon is an informal settlement that is part of the Milnerton Municipality in Cape Town, South Africa. It is bounded by a railway line on the south-west, Potsdam Road on the north-west, a highway on the east and agricultural land on the north-east. As a Post-Apartheid settlement that owes its origins to a Provincial Governmental housing project that started in 1996, Du Noon has been developed as an area for RDP housing. The settlement is uncharacteristically well located near industrial, manufacturing, agricultural and residential job opportunities. The presence of such economic opportunity has resulted in rapid informal densification of Du Noon. Increasing land and housing value, due to the attractive location, provided the opportunity to develop more permanently constructed, lettable apartments. This sparked the emergence of a new type of informal, privately developed lettable housing in Du Noon, Cape Town.

4.2.2   **Architectural component**

The typical RDP housing of Du Noon has been extended horizontally, but notably also vertically resulting in a new type of 'informal flats'. The development of these 'informal flats' was financed in a variety of ways, but never with a bank loan. Some were financed with profits from vegetable or alcohol trade and others through informal rental income. The financial model is similar to the renting out of backyard shacks, but the rent is on average three times higher. Backyard sheds are a prevalent form of the informal production of housing in South Africa, where land owners construct a shed in their backyard to rent out, and generate a steady form of informal income.

The Du Noon Settlement is zoned as 'Informal Residential'. This zoning has facilitated the legal development of lettable housing, due to it placing unlimited restrictions on the number of housing units per plot, provided that the primary use of the building is for residential purposes. The informal flats of Du Noon provide a high dense form of informal rental housing, partly facilitated by the legality of the formal RDP house and partly by the relative high housing value, allowing more costly building techniques to be relevant for construction. The transformations of RDP housing in Du Noon supply low cost shelter where economic opportunity is recognised but where housing shortage is acute.

Logic behind the clustering

The clustering of the housing in Du Noon has been defined by the RDP housing scheme: typically a 36 m^2 house would be built in the centre of a 250 m^2 property. The attractive location of the settlement in relation to job opportunities has caused a proliferation of horizontal and vertical extension of the RDP housing. Horizontally housing is encroaching upon open space and streets, leading to extreme housing density per plot. The unintended extension has not been limited to function as housing, the extensions are also used for commercial purposes newly embedded in the urban fabric. The mix of functions in the buildings, has resulted in an architectural typology that pushes right up to the road edge and participates in the spatial definition of the street. Many of the RDP buildings have a shop on ground floor, there are also examples of rentable office space.

Fig. 4.2   left: clustering schema: expanded **detached housing** organised in an overcrowded street grid (own illustration).
right: aerial photograph of the settlement showing resulting urban fabric (Apple maps).
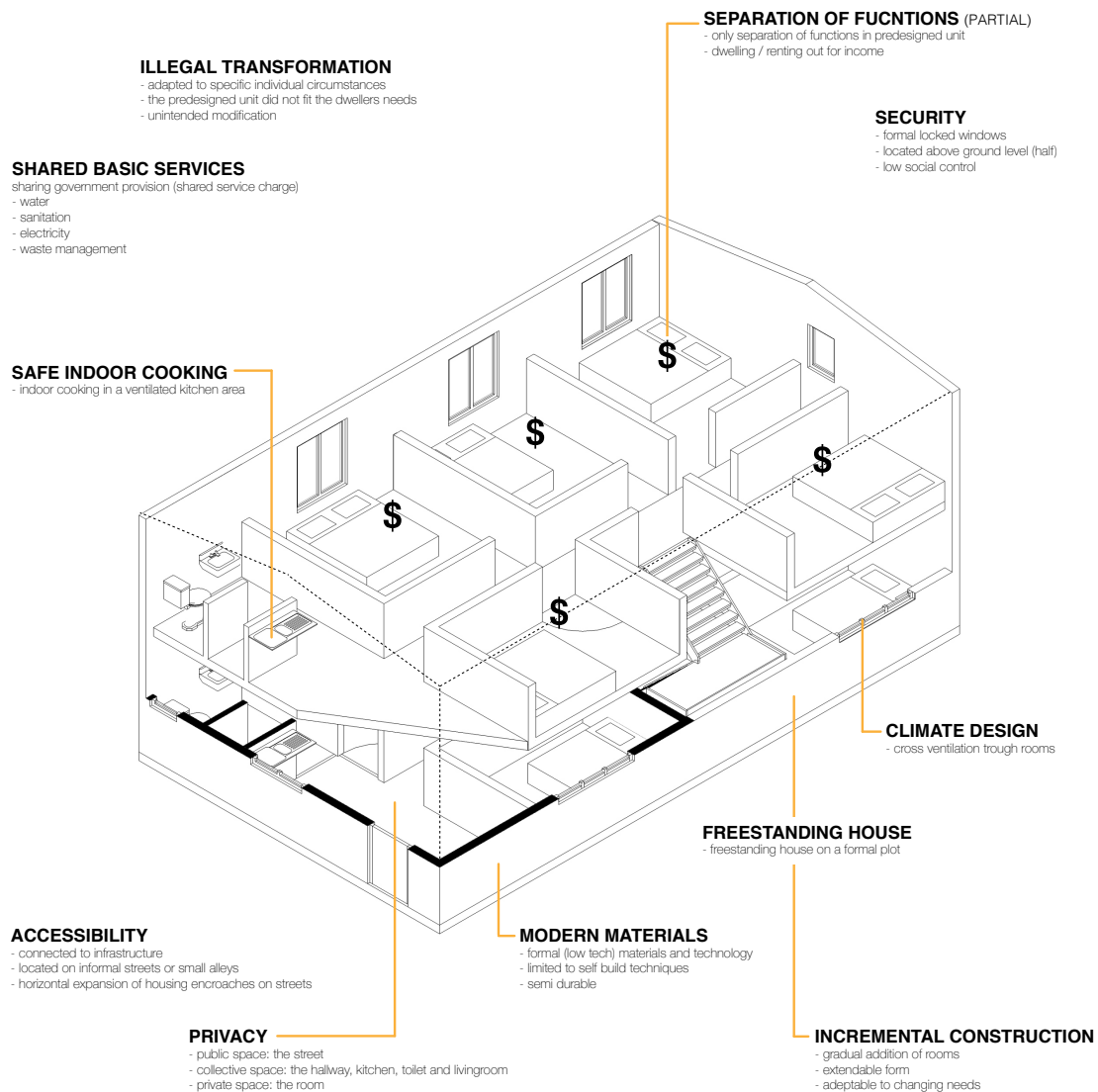
SEPARATION OF FUCNTIONS (PARTIAL)
- only separation of functions in predesigned unit
- dwelling / renting out for income

SECURITY
- formal locked windows
- located above ground level (half)
- low social control

ILLEGAL TRANSFORMATION
- adapted to specific individual circumstances
- the predesigned unit did not fit the dwellers needs
- unintended modification

SHARED BASIC SERVICES
sharing government provision (shared service charge)
- water
- sanitation
- electricity
- waste management

SAFE INDOOR COOKING
- indoor cooking in a ventilated kitchen area

CLIMATE DESIGN
- cross ventilation trough rooms

FREESTANDING HOUSE
- freestanding house on a formal plot

ACCESSIBILITY
- connected to infrastructure
- located on informal streets or small alleys
- horizontal expansion of housing encroaches on streets

MODERN MATERIALS
- formal (low tech) materials and technology
- limited to self build techniques
- semi durable

PRIVACY
- public space: the street
- collective space: the hallway, kitchen, toilet and livingroom
- private space: the room

INCREMENTAL CONSTRUCTION
- gradual addition of rooms
- extendable form
- adeptable to changing needs

Fig. 4.3   axonometric projection of a typical RDP house in Du Noon showing the unintended extension (own illustration).

Quality of the housing

The Du Noon flats have developed in a typical spatial organisation that consists of a series of single rooms accessed via a central corridor with shared amenities. The rooms are occupied by between one and four people, with an average size of 8m^2. The rental price for a room ranges between €30 to €70 per month, with all rooms being occupied in reasonably similar ways. Because of the similarity in room sizes, the content of each room is typically similar; a double bed, cupboard, couch or chairs, television, microwave, two plate stove and sometimes a fridge.

A common method for financing the extension of rooms is that incrementally completed rooms are rented out while the remainder are still under construction. The buildings that were studied are constructed from masonry, with roofs made of timber beams and covered with roof sheeting. The internal floors are either timber beams and plywood boards or various forms of concrete floors. In general the buildings are built fairly well however, there are some violations of the National Building Regulations, most notably the fire regulations. The most common problems are a lack of a second route of escape and non-conformity with the stair designs. Most of these problems could have been overcome if the owners had access to professional advice.

4.2.3 **Conclusion**

In the Du Noon settlement the dynamic nature of the housing priorities of the inhabitants are made explicit in an intentionally static formal context. The organic or incremental process of housing, typical of informal settlements, is piecemeal and happens at the inhabitants convenience. Additions and improvements to housing are made bit by bit when funds become available. The unintended transformation of the one-size-fits-all RDP housing serves here as an example of this inhabitant priority. The initial design of the formal housing has not been able to accommodate the dynamic needs of the inhabitant. The inhabitants of Du Noon have reclaimed through informal extension of their housing, their dweller control. The unintended and inhabitant initiated opportunities for incremental growth, vertical extension and informal rent, have aligned the housing in the Du Noon settlement with its inhabitants priorities.

As a replicable housing strategy the unintended extension of formal housing fails to provide an affordable alternative to the informal production of housing on an adequate scale: the limitations to formal provision have been elaborated in the first section of this chapter. Thereby has the extension in Du Noon been highly dependant on the favourable location of the specific settlement. The strategy of extended formal housing has merely been presented here to stress the often inadequate representation of inhabitants priorities in formal housing strategies.

References

AL&HDC (2012) *Du Noon.* retrieved from http://www.alhdc.org.za/static_content/?p=48

Poulsen, L. & Silverman, M. (2012). *Learning from our own backyard*. retrieved from http://informalcity.co.za/learning-from-backyard

Tipple, G. (1991). *Self-Help Transformations of Low Cost Housing. An Introductory Study*, CARDO, Newcastle Upon Tyne.

Tipple, G. (2000). *Extending Themselves: User Initiated Transformations of Government-Built Housing in Developing Countries*, Liverpool University Press, U.K.

Wolf, H. (2010). *Flats of Du Noon, A study of Owner Developed Rentable Housing*. retrieved from www.informalcity.co.za/print/41

Wolf, H. (2011). *A study of privately developed rentable housing in Du Noon, Cape Town*. retrieved from http://www.sahf.org.za/Images/2011%20Proceedings/PowerPoints/Wolff_Heinrich.pdf

4.3   **Site and Services** | Dandora (Nairobi, Kenya)

Fig. 4.4   left: Dandora (before occupation) Nairobi, Kenya (UN-Habitat, 2006).
             right: typological reduction (own illustration).

The strategy proponents of the enabling paradigm are elaborated in this section, with the aim to specify the different approaches to 'enabling' or 'support'. The first strategy that is introduced is the site and services approach, that is characterised by the provision of a serviced plot as an adequate base for the further production of housing. This section first elaborates a strategy component, which is illustrated by the example of the site and services project in Dandora, Nairobi, Kenya. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

4.3.1   **Strategy component**

The basic premise of the site and services strategy is the provision of plots of land, either via ownership or land lease tenure, along with a bare minimum of essential infrastructure needed for inhabitation. This approach stems from the realisation that the government provision of a complete formal house cannot be afforded by most low-income families, nor subsidised by the government. This enabler approach shifts the focus from providing a fully serviced house to that of supplying the ingredients necessary for adequate housing. The key characteristic of the approach is the investment of the inhabitants' "sweat equity" in construction through the auto-construction of housing.

The principles behind the strategy
The site and services approach provides plots of land with infrastructure and basic services in order to relocate and rehabilitate the inhabitants of informal settlements. These serviced plots are proposed to be used for the auto construction of housing, controlled by the dweller. The site and services approach advocates that the role of the government limits to the preparation of land parcels or plots with certain basic infrastructure, that are to be sold or leased to the inhabitant. The process of housing construction is left to the inhabitant themselves, to use their own resources, such as informal income or family labour or various other types of community participation models, to build their house. The inhabitant can construct their housing at their own phase, depending on the availability of financial and other resources. In some projects which take a cost-recovery approach, the inhabitant may be expected to repay the costs of land and development gradually, but in other projects these are provided for free, as a public subsidy. The premise of site and services strategies is to share the responsibility for procuring decent, affordable housing in the city between the state and the people. This form of enabling aims to achieve minimum government preconditions, merely control over location, for an acceptable form of the informal production of housing.

Dandora

The Dandora site and services project was designed in 1974 as part of a series of site and services projects supported by the World Bank. The government of Kenya was aided with considerable foreign assistance and loans for the project. Over a five year period, according to the World Bank, Dandora was intended to cater for 5% of Nairobi's total urban growth, targeting low income inhabitants. The project was based on the idea of low-income families building their own houses, initially in simple materials, which could later be improved. Each inhabitant would be allocated a wet core and a loan for building materials on the Dandora site.

The Dandora project was initiated to test the legitimacy of the site and services strategy in providing low-cost shelter for low-income households in Nairobi. The philosophy was to combine public investment in land and infrastructure with mobilisation of the savings and labour of the inhabitant. In Nairobi, unemployment, inadequate incomes and a severe shortage of low-cost housing, coinciding with post-independence population growth and migration had at the time of the project already resulted in a proliferation of informally produced housing. The private sector nor the government could meet more than a fraction of the need for housing accessible to low-income people. The government had catered for 10% of the annual housing need and the formal private sector did not address low-income people at all. In any case, if formal housing was provided by the government, one third of the population could not even afford the cheapest variety of rental housing.

The Dandora project has by the world bank been proposed as a solution to this problem. The project realises the main government benefit of the enabler approach; that a division of responsibilities between the government and the inhabitants should increase the affordability of the housing strategy. The Dandora project enables the government of Kenya to share responsibility for the provision of housing with the inhabitant, and thus save scarce public resources. Because the large scale provision of infrastructure and services are planned, they are cheaper to build and maintain than when installing them in existing informal settlements. The Dandora project aims to facilitate dweller control over the pace and form of house construction, while providing the minimum safety and public health standards that are lacking in unguided informal development.

4.3.2   **Architectural component**

The Dandora project consisted of the provision of 6.000 plots demarcated and provided with wet cores, that held a toilet and shower. A materials loan was provided to fund the purchase of sufficient building materials for auto-construction of one room. Technical assistance on housing construction was provided to the inhabitants. Further amenities that the project provided are community facilities that include six primary schools, two health centres, two multi-purpose community centres, a sports complex, four hundred market stalls and a workshop cluster. The project provided the settlement with trunk infrastructure such as sewers, stabilisation ponds, drains, access roads and street lighting. Roads are constructed in claylike 'murram' and drains are open.

Fig. 4.5   left: clustering schema: **compound housing**, organised in a street grid (own illustration).
right: aerial photograph of the Dandora area showing the resulting urban fabric (Apple maps)
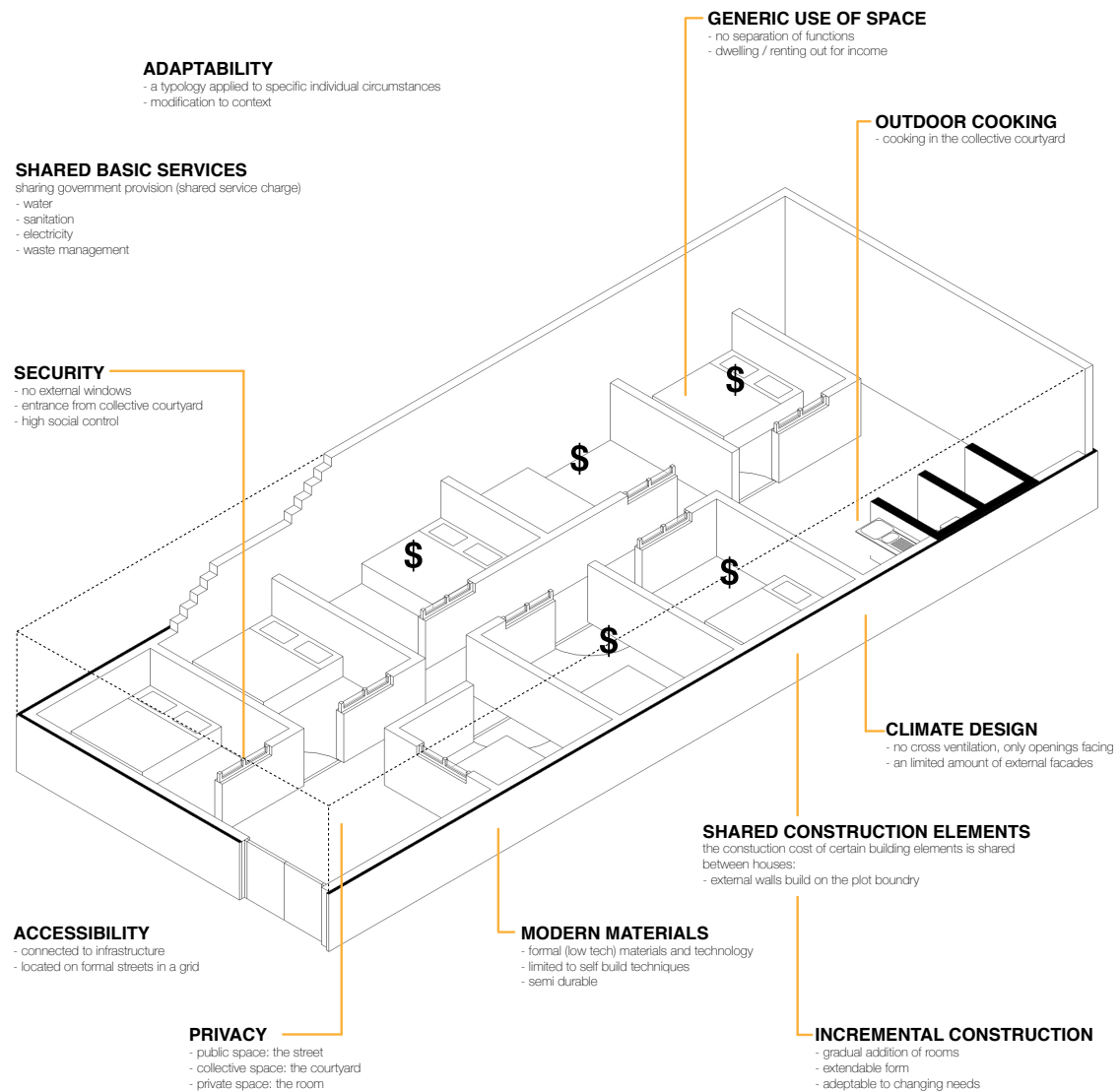
GENERIC USE OF SPACE
- no separation of functions
- dwelling / renting out for income

ADAPTABILITY
- a typology applied to specific individual circumstances
- modification to context

OUTDOOR COOKING
- cooking in the collective courtyard

SHARED BASIC SERVICES
sharing government provision (shared service charge)
- water
- sanitation
- electricity
- waste management

SECURITY
- no external windows
- entrance from collective courtyard
- high social control

CLIMATE DESIGN
- no cross ventilation, only openings facing
- an limited amount of external facades

SHARED CONSTRUCTION ELEMENTS
the constuction cost of certain building elements is shared
between houses:
- external walls build on the plot boundry

ACCESSIBILITY
- connected to infrastructure
- located on formal streets in a grid

MODERN MATERIALS
- formal (low tech) materials and technology
- limited to self build techniques
- semi durable

PRIVACY
- public space: the street
- collective space: the courtyard
- private space: the room

INCREMENTAL CONSTRUCTION
- gradual addition of rooms
- extendable form
- adeptable to changing needs

Fig.4.6   axonometric projection of a site and services plot in Dandora showing a typical addition of rooms (own illustration).

The Kenyan Government retained ownership of the land, providing all allottees with 50 year renewable leases. If plot-holders wanted to sell their plots, the Nairobi City Council is supposed to mediate and pay compensation to the plot owner for investments such as building materials and 'sweat equity'. Plots would be reallocated by the NCC at prices covering all costs.

Logic behind the clustering

The idea behind the clustering of the housing is based on a basic infrastructural grid that holds different plot sizes. By African standards, plot sizes were reduced considerably from the World bank standard size of 250-450m^2 plots to plots of only 100-160m^2. The reduction was to serve two purposes: firstly to reduce infrastructure costs, and secondly to limit the maximum possible number of rooms per plot to five or six. The main thought behind limiting the maximum amount of rooms was to prevent large-scale subletting, and to obtain units which, if sublet at the outset, could one day be converted into family homes. The inhabitants have however, through the introduction of an efficient courtyard typology, generally been able produce more rooms on the plot than intended.

Quality of the housing

In site and services strategies the government takes responsibility for preparing the plots and bringing in basic infrastructure, it is the responsibility of the inhabitant to see that adequate housing is constructed. In the Dandora project most houses expanded with at least two rooms within the first year of occupation. The expansion has initially been aimed at satisfying the family's spatial needs. Subsequent expansion has been undertaken to generate a steady informal income through the sub-letting of rooms. In many cases additional rooms have been built using a different typology from that approved by the city council.

The provided materials loans are only supposed to be seed capital to finance two rooms. Most inhabitants have been able to mobilise funds from savings, wages, rent, private loans and gifts, in order to complete the construction of the four rooms allowed, in most cases ever more. In the Dandora site and services strategy, inhabitants are were intentionally bound to construct a house which meets certain standards set by the governments. The argument for setting such government standards is that the objective of the scheme is to improve the living conditions of the inhabitants, whereas, if they are allowed to build regardless of standards, the inhabitants may produce the same qualities as found in informal settlements. Unfortunately, standards often make the construction of the house expensive for the inhabitant. In the Dandora project the inhabitants have not been allowed to use cheap materials, which not only include second-hand and waste materials but also indigenous materials such as thatch and mud. Inhabitants have also had to hire skilled labourers to build their houses, because they lack the skills and the time to construct the prescribed house on a self-help basis.

4.3.3 Conclusion

The government of Kenya has, with the support of the World bank, undertaken the Dandora project with the ambitious aim to provide a large scale solution as an alternative to the informal production of housing. In its approach the characteristics of the enabler paradigm are apparent. The housing strategy provides the inhabitant with a certain amount of dweller control and facilitates those public services that the inhabitant cannot easily arrange for themselves. For the government the main benefit of the strategy is that the provision of serviced plots is more affordable than the provision of complete housing. For governments the need for an increased affordability of housing solutions for the urban poor has been an important driver of the site and services approach.

To divide the financial responsibilities of housing provision between the government and the urban poor themselves, provides the chance to save scarce public funds. Site and services projects enable the government to share the financing of the provision of housing with the inhabitant, and thus increase affordability for the government. In providing the minimum safety and public health standards that are lacking in informal development, the government provides an alternative to the informal production of housing that is less costly then the provision of complete formal housing.

$ Formal construction: the strategy should allow the government not to provide complete housing

---

References

Anyamba, Tom. (2011). *Incremental Housing, The Case of Nairobi Dandora and Umoja Housing Projects.* (presentation)

UN-Habitat (1984). *Community Participation - Sites and Service Schemes: The Scope for Community Participation* - Training Module

UN-Habitat (2006). *Case Study of Site and Service Schemes in Kenya, Lessons from Dandora and Thika* [e-book]

4.4   Core Housing | Budiriro Core Housing (Budiriro , Zimbabwe)

Fig. 4.7   left: Core houses (before occupation) in Budiriro, Zimbabwe (retrieved from 263chat.com/budiriro).
             right: typological reduction (own illustration).

Closely connected to site and services projects, a second strategy proponent of the enabling paradigm can be recognised, negotiating an alternative to the negative connotations of the 'fields of toilets' that are produced in the site and services projects. This second approach to the idea of 'enabling' or 'support': the strategy of core housing, is characterised by the provision of part of a formal house on a serviced plot, that is to be completed by the inhabitant. This section first elaborates a strategy component, which is illustrated by the example of the core housing project in Budiriro, Zimbabwe. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

4.4.1   **Strategy component**

The approach of core housing focusses on finding an appropriate balance between the formal and informal production of housing. The strategy attempts to make the best use of what theorists perceive the inhabitant can contribute, while at the same time using the strengths of the formal sector in mass construction. Core housing is essentially a technical solution to the conceptual problem of how to combine the formal and the informal. Charles Abram's view of the intended inhabitants of core housing are "...those who cannot afford a finished house". He described them as the next step up from site and services schemes on the affordability scale, as those would cater to the needs of "...the poorest who would otherwise squat" (Mathéy, 1992). In comparison with site and services projects however, the inhabitant of a core housing project has limited control over the construction their housing, because they are only to be brought in after a certain point in the development process. There is a clear point after which the formal sector is to withdraw, leaving the settlement to be further developed by the inhabitants. There is also a clear point before which the inhabitants are not to be involved in decision making.

The principles behind the strategy

A core house is a structure that is somehow incomplete, and most importantly that it is minimal in its size or level of completion, and professionally designed with the intention that residents or their direct agents add space to it after occupation. The results of core housing are however little different than the staged provision of formal housing estates. The core is built by formal contractors, while the inhabitants extensions are to be built according to plans supplied by the project developer. Dweller control over the expansion of the construction, is further limited by the stimulation of the materials supplier and small contractor sectors. Core housing attempts to split the costs of construction, from the acknowledgement that governments cannot not afford the subsidised provision of a formal house, while the inhabitant cannot afford it either. Mitigating priorities, the government lowers standards for a time while the houses reach completion, but basic housing standards are ensured when compared to the site and service approach (Ward, 1982). Core housing is thus a highly

controlled and limited form enabling. The housing areas that result have similar characteristics to government provided formal housing estates, realised through a different division of responsibilities, but with a similar level of dweller control.

Budiriro core housing

The Budiriro core housing scheme is a relatively recent project that the government of Zimbabwe has undertaken to address the housing backlog in Harare. The country has a housing backlog of over 1,2 million units and according to the Zimbabwe Agenda for Sustainable Socio-Economic Transformation, Government plans to construct 125 000 housing units by 2018. The project is targeted at low-income, first-time home owners and so far, about 500 houses have been successfully allocated to beneficiaries. Harare City has relaxed the six months mandatory waiting period for new entrants on the housing waiting list before they can qualify for allocation. The developer has also increased the tenure of mortgage loans from 10 years to 20 years to stimulate the provision of accommodation.

4.4.2   **Architectural component**

The Budiriro project comprises of the provision of 3,000 core housing units that are provided with infrastructure and services. The inhabitant is to complete the core house following a standard design, with limited technical assistance. The Central Africa Building Society (CABS) has in cooperation with the government of Harare provided trunk infrastructure, such as sewers, stabilisation ponds, drains, access roads and street lighting. CABS requires applicants for the housing scheme to be first time house owners, that have a low but steady income. A precondition to participate in the core housing scheme is that the CABS provides the mortgage to repay the costs of the land, infrastructure, services and the core house. The applicant is also required to have their income come through a CABS bank account, as a way to ensure repayment.

Logic behind the clustering

The logic behind the clustering of the housing is based on a basic infrastructural grid that holds similar plot sizes. The clustering is closely resembles formal mass housing estates, that typically consist of a 36 m^2 house would in the centre of a 250m^2 property. Strict building guidelines prohibit horizontal extension of the housing or the concentration of extreme housing density per plot. The government of Harare upholds a zero tolerance clearance policy within the Budiriro area for housing that does not conform with building codes. According to eviction notices, the illegal occupants have to vacate the land, demolish their structures and remove the rubble within a 48 hours, failing which council would demolish the structure on its own and impound the property. "Take notice that you are using and/or occupying council land illegally, as you do not have either a lease with or the permission of the council. Further, take notice that within 48 hours from service of this notice upon you, you must depart from the land, remove all your properties from the land and demolish any structure you have erected on the land and remove all the rubbles from the land". "If you fail to comply with this notice, steps will be taken by either council or its appointed agent to summarily evict you, demolish any structures and impound any property from the land and you will be liable to all the expenses incurred."
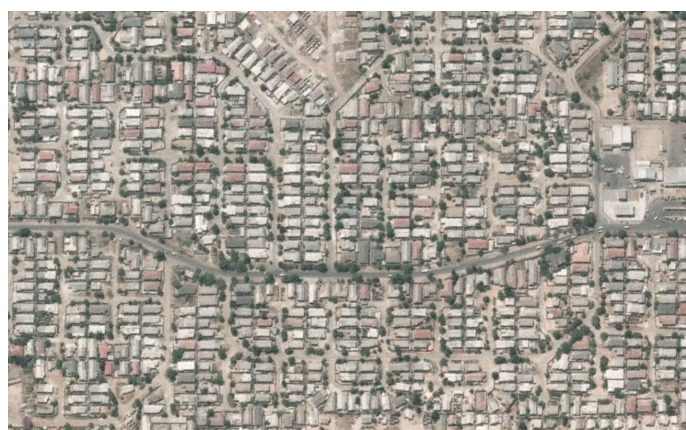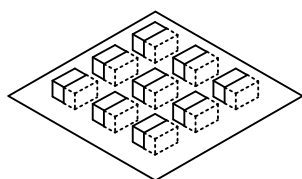

Fig. 4.8   left: clustering schema: **detached housing**, organised in a street grid (own illustration).
          right: aerial photograph of the Budiriro area showing the resulting urban fabric (Apple maps).
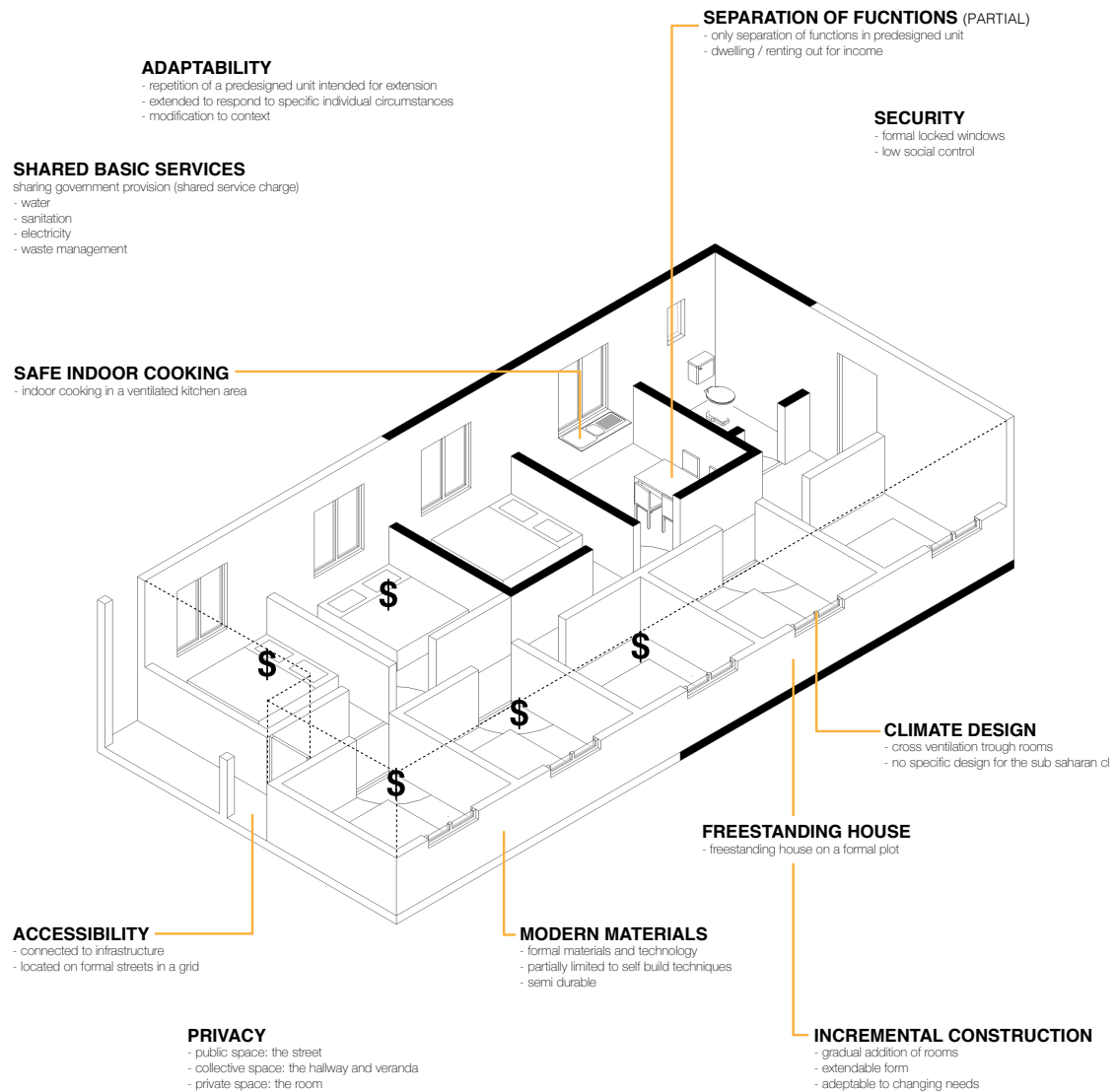
SEPARATION OF FUCNTIONS (PARTIAL)
- only separation of functions in predesigned unit
- dwelling / renting out for income

ADAPTABILITY
- repetition of a predesigned unit intended for extension
- extended to respond to specific individual circumstances
- modification to context

SECURITY
- formal locked windows
- low social control

SHARED BASIC SERVICES
sharing government provision (shared service charge)
- water
- sanitation
- electricity
- waste management

SAFE INDOOR COOKING
- indoor cooking in a ventilated kitchen area

CLIMATE DESIGN
- cross ventilation trough rooms
- no specific design for the sub saharan cl

FREESTANDING HOUSE
- freestanding house on a formal plot

ACCESSIBILITY
- connected to infrastructure
- located on formal streets in a grid

MODERN MATERIALS
- formal materials and technology
- partially limited to self build techniques
- semi durable

PRIVACY
- public space: the street
- collective space: the hallway and veranda
- private space: the room

INCREMENTAL CONSTRUCTION
- gradual addition of rooms
- extendable form
- adeptable to changing needs

Fig. 4.9   axonometric projection of a core house in Budiriro showing a typical addition of rooms (own illustration).

Quality of the housing

The Budiriro core housing scheme presents the option between three types of available core housing: The first option is a 47m² core house comprising of two bedrooms, a lounge, a kitchen, a toilet and a bathroom. This variety of housing unit is geared toward the low to middle income earner that prioritises a adequate house form the outset, and does not want to depend on auto-construction and long consolidation times. Incremental extension of the house can be preformed when it is convenient for the inhabitant, as there is no urgent need to extend. The second option is a 27m² core house comprising of one bedroom, a kitchen, a toilet and a bathroom. This variety of housing unit is geared toward those with the lowest income, requiring the added value of auto-construction before the house reaches an adequate quality. The final option is a core house comprising of the 27m² core house, plus an additional plinth for 3 rooms. This intermediate form provides a solid base for the auto-construction of additional rooms, but differs little in cost from the 47m² core house. The approved designs for further construction of the housing result in a typical detached house with rooms along a central hallway. Strict building standards for expansion of the core housing, have resulted in the uniform consolidation patterns of the housing.

4.4.3   Conclusion

Core housing strategies attempt in their approach, to find a balance between the productive benefits of enabling and the benefits of large scale formal construction. As an intermediary approach between the formal provision of mass housing estates and site and service projects, the strategy aims to mitigate the limitations of

both policies. The combination of two approaches however also diminished certain positive attributes of the strategies: little to no dweller control over the construction of housing is recognised in the prescriptive core housing designs. The housing has to be extended or completed in accordance with strict building standards and planning guidelines that limit possibilities for adaptation to specific needs. While inhabitants have to contribute towards the auto-construction of the housing, the costs of the core housing differ little from those of complete formal housing. Much of the cost of core housing projects continues to be taken up by the provision of land, infrastructure and basic services.

There are two important improvements that the strategy of core housing offers in relation to the closely related site and service approach; an ensured quality of housing and an improved consolidation time. The quality of housing has been identified as an important government priority in chapter 2 of this thesis. A sufficient consolidation time of the housing strategy is now added as a government priority, that identifies the timeframe in which the housing quantity and quality is to be achieved.

An argument that is often presented against site and service projects is that they show insufficient consolidation of the settlement within the timeframe set at the start of the project. The strategy of core housing recognises the importance to provide an initial inhabitable core, through which the settlement develops much more readily into a consolidated urban area, than in the related site and service approach.

☑ **Consolidation time: the strategy should have an adequate consolidation time**

References

CABS (2015) *Budiriro Housing Scheme, Basic Requirements*. retrieved from http://www.cabs.co.zw/sites/default/files/BUDIRIRO%20HOUSING%20SCHEME%202015.pdf

Mapuke, G. G. (2015) *House plans in Zimbabwe*. retrieved from https://www.youtube.com/watch?v=cteoOlQvito

4.5   Cooperative Partnerships | Muungano Housing Cooperative (Dar es Salaam, Tanzania)

Fig. 4.10   left: Muungano Housing Cooperative in Dar es Salaam, Tanzania (retrieved from negativemirror.wordpress.com).
            right: typological reduction (own illustration).

A different approach from the site and services and core housing projects focusses on providing financial solutions to 'enable' or 'support' the production of housing. The strategy of cooperative housing partnerships aims to provide formal housing quality through the collective organisation of a community's financial means and application for housing micro-finance loans. This section first elaborates a strategy component, which is illustrated by the example of the Muungano Housing Cooperative in Dar es Salaam, Tanzania. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

4.5.1   Strategy component

"Cooperative housing is a force for good, a people-first housing option founded on community values of social justice and mutual self-help" (Cooperative Federation of Canada, 2011). The enabling approach of cooperative housing partnerships focusses on the financing of adequate housing for its members through the principles and processes of cooperatives. These principles and processes are characterised by collectivity and community organisation. In cooperative partnerships inhabitants support each other in collective saving, accessing finance to secure legal tenure and in incrementally building typical formal housing and infrastructure. A housing cooperative responds to the needs of its members by adopting the methods and practices of the cooperative housing system, to facilitate incremental payment of housing construction while achieving housing quality of formal standards.

The principles behind the strategy
The International Cooperatives Alliance (cited by CHF International, 2002), defines a housing cooperative as: "… a legal association formed for the purpose of providing housing to its members on a continuing basis. It is owned and controlled by its members. It is distinguished from other housing associations by its ownership structure and its commitment to cooperative principles". Strategies of cooperative housing partnerships have many forms, but a common purpose can be recognised: a housing cooperative facilitates the collective effort to organise financial means in order to provide for its members security of tenure, infrastructure and basic services, and the construction and management of housing. Housing Cooperatives allow the inhabitant to incrementally build typical formal housing. The strategy attempts to solve the affordability issues of provider housing strategies through an alternative financing approach. This enabler strategy emphasises financial solutions to produce the housing qualities and social standing of formal housing. Dweller control over the construction of housing is not regarded a focal point, as the produced housing often closely resembles typical formal housing.

Muungano housing cooperative

The Muugano housing cooperative in Chamazi resulted from the collective effort of a group of inhabitants that was evicted from their informal homes in Dar es Salaam. The inhabitants of the informal settlement of Kurasini became homeless in 2007 after the Tanzanian government decided to demolish their housing to pave way for the development of the country's biggest harbour. Most of the inhabitants of the demolished homes went on to rent informal housing in other informal settlements in the city. One group of around 300 families however started to organise themselves under a pro-urban poor housing cooperative: Muungano Housing Cooperative Society. The Tanzanian Centre for Community Initiatives with the support from Slum Dwellers International has guided the formation of the cooperative. The organised inhabitants aimed to acquire a plot in the Chamazi area, located 20 kilometres from Dar es Salaam city centre, to realise themselves the construction 300 formal quality houses.

4.5.2   **Architectural component**

The Muungano Housing Cooperative pools the saving and contributions of the inhabitant members in order to finance the formal acquisition of a plot, and the construction of housing. Because there were no title deeds for the land they bought informally, the government was requested by the Centre for Community Initiatives to survey the site and issue the community with official ownership. Being organised in a housing cooperative allowed the inhabitants to borrow the funds to put up 300 units for their resettlement. So far, 60 houses have been constructed and are owned by the families. The plan is to build another 130 houses for rent, eight of which have already been completed.

Logic behind the clustering

In order to obtain official ownership of the land, the community was involved in conducting an enumeration of the settlement, which motivated various community initiatives, such as a community policing team, solid waste management team and borehole water scheme and increased cooperative membership and saving. Sanitation was also addressed on the site through the construction of a wetland scheme which is drawing residents to the area, with a current total of 60 households residing at Chamazi. Water for construction is provided by a borehole on site. Through involvement in planning, designing, and implementation cooperative members have gained increased skills and capacity to manage the construction processes.

Quality of the housing

The inhabitants set out to produce housing of formal standards, financed through collective organisation under a housing cooperative. The intention has been to improve the affordability of the housing by utilising materials that could be produced on site and through unskilled labour. Houses were constructed using materials such as interlocking soil cement blocks and sisal fibber roofing tiles which are both low cost and can easily be constructed by the inhabitants. The bricks, roofing tiles, fixtures and fittings used in the housing have all been made on site. This not only build the capacity of the inhabitants by learning new skills, but it also reduced the costs considerably. At the height of the construction process two people were producing 700 bricks a day.

Fig. 4.11   left: clustering schema: **detached housing**, organised along streets (own illustration).
right: aerial photograph of the Chamazi area showing the urban fabric (Apple maps).

UNIFORMITY
- repetition of a predesigned unit
- one size fits all
- no modification intended

BASIC SERVICE PROVISION
government provision (service charge applies)
- water
- sanitation
- electricity
- waste management

SECURITY
- formal locked windows
- high social control

SEPARATION OF FUCNTIONS
separation of functions in the house
- bedroom
- livingroom
- kitchen
- bathroom

SAFE INDOOR COOKING
- indoor cooking in a ventilated area

CLIMATE DESIGN
- cross ventilation trough rooms

FREESTANDING HOUSE
- freestanding house on a formal plot

ACCESSIBILITY
- connected to infrastructure
- located on formal streets in a grid

MODERN MATERIALS
- formal materials and technology
- limited to affordable construction methods
- durable construction

PRIVACY
- public space: the street
- private space: the house

INCREMENTAL CONSTRUCTION
- gradual construction of the building when funds
  become available

Fig. 4.12   axonometric projection of a house in Chamazi build through the Muugano Housing Cooperative (own illustration).

4.5.3   **Conclusion**

The Muugano housing cooperative in Chamazi shows the aspiration of a displaced community to procure formal quality housing by themselves. Organising themselves in a housing cooperative and pooling their savings, the community has been able to obtain legal title to a suitable piece of land. The construction process of the housing in the project has been slowed down most by shortages: the cost of modern building materials and the lack of technical know-how to optimise the construction process. This limiting factor has halted the construction until more funds become available. The shortage of 'modern' construction materials is regarded one of the most important limitations to the improvement of the housing conditions in informal settlements. Katilla states (Bongoland) that these shortages form the main limitation to the consolidation and improvement of housing conditions of informal settlements in general, rather than the absence of a title deed and the lack security regarding property.

The popularity of 'modern' construction materials has put enormous strain on their demand, greatly limiting their availability and affordability. The aspiration to procure formal housing has a certain social status, that is related to a certain image of the layout and materiality of a typical formal house. The perception of concrete or brick as symbols of modernity and permanence in housing construction, has increased their popularity over local, affordable and more climate appropriate materials. "Traditional materials have been totally denigrated in favour of cement and breeze blocks, which have powerful connotations of modernity, progress and social status". People with the necessary means buy these industrial building materials at inflated prices and in small

quantities on the open market, which does not lead to the appreciable or rapid renovation of informally produced housing.

The strategy of housing cooperatives provides communities in informal settlement the chance to procure typical formal housing, in the absence of affordable government provided housing. In relation to site and service schemes and core housing projects, the strategy of housing cooperatives exudes a status of self reliance, that contrasts with the stigma of dependence that accompanies cheap core housing or the allocation of a toilet in an open field. Characteristic for the architectural typology of cooperative housing projects is their similarity to formal mass housing estates. The main difference is that control over the location and construction of housing is taken up by the community that organises themselves, contrary to top down planned mass housing schemes. This facilitates the incremental production of formal quality housing, that holds a high social status in relation to site and services or core housing projects.

☑   **Social Implications: the social status of the housing and materials should be satisfactory**

References

Mhekela, T. J.& Kombo, H. M. (2015). *Assesment of the Contribution of Housing Co-operatives in the Provision of Affordable Housing, The Case of Muungano Housing Co-operative Chamazi.* Dar es Salaam.
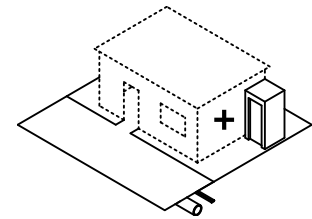
Fig. 4.13   left: Flamingo Crescent in Cape Town, South Africa (retrieved from sasdialliance.org.za).
            right: typological reduction (own illustration).

Alternatively to the housing strategies described before, the strategy of formal settlement upgrading rejects the idea that inhabitants of informal settlements should be resettled. The strategy presents the approach of upgrading informally produced housing, instead of relocating its inhabitants. The strategy 'enables' or 'supports' the inhabitant in-situ to acquire housing of adequate quality and connection to infrastructure. This section first elaborates a strategy component, which is illustrated by the example of the Flamingo Crescent neighbourhood, Cape Town, South Africa. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

4.6.1   **Strategy component**

The enabler strategy of formal settlement upgrading proposes a government focus on the upgrading of informal settlements by means of improving the physical, social and economic environment, without displacing the people who live there. The approach asserts that ".. formalising informal settlements is the least expensive, most humane way of enhancing a city's much-needed stock of affordable housing, instead of destroying it." (UN-Habitat) The focus of formal settlement upgrading lies mainly in technical assistance to install paved walkways, drains, water supply lines, street lights, electricity networks, sanitation and garbage disposal. Infrastructure and basic service provision are recognised as the crucial factor in improving the housing conditions in the informal settlements. In addition formal settlement upgrading strategies aim to build the capacities of the inhabitant in order to access adequate housing.

The principles behind the strategy
Unlike resettlement, upgrading causes minimal disturbance to the inhabitants' lives and to the delicate networks of mutual support in informal settlements. Upgrading usually involves some changes to the existing community layout, to make room for installing improved infrastructure facilities. These changes however should aim to be minimal, unless the community opts to totally rebuild their settlement, and start from scratch with a new plan, infrastructure and housing. The strategy aims to accommodate the needs of people whose houses must be demolished or shifted to make way for improvements. The nature of any upgrading project depends on the priorities and resources of the people living in that community. An upgrading project can be a powerful opportunity for the inhabitants to build their capacities in housing construction. Communities can develop their collective strengths through practical and concrete activities, and build better relationships with their local governments.

Flamingo Crescent
The Flamingo Crescent community was created in 2007 when the City of Cape Town relocated people living on streets and under bridges in Constantia, Wetton and Lansdowne to a vacant plot of municipal land in Lansdowne. The plot is situated between industrial warehouses and timber depots on a street by the same

name. Its strategic location, close to industrial hubs and convenient transport routes, offers beneficial access to surrounding industry, job opportunities, social amenities, public transport routes other hubs of economic activity. By 2012, the community had grown to four hundred people who resided in a hundred structures. Residents shared two taps and seven chemical toilets in working condition which were serviced three times per week. All residents used contained fires in tin-drums as a source of light and heat due to the absence of electricity. Structures consisted of a patchwork of old wood, cardboard, plastic and aluminium pieces, these materials posed fire hazards in summer and flooding and drainage problems in winter. Structures were situated around a broad u-shaped pathway, intersected by smaller, narrow footpaths leading to more densely situated structures. According to the settlement's enumeration and profiling data, 95% of Flamingo's working population was unemployed, there were around forty-five children who did not have a safe place to play on the settlement's streets.

4.6.2   **Architectural component**

The in-situ upgrading of Flamingo Crescent aimed to reconfigure the spatial layout of the settlement to ensure the provision of services and the formalisation of roads. This involved the upgrading of existing structures with fire-retardant material, the provision of basic services such as installation of water, sanitation and electricity per upgraded structure, paved access roads throughout the settlement, road names and postal addresses, refuse removal, and the construction of a centrally located creche and multi-purpose centre. For the inhabitants of the settlement the project aimed to increase the community's self-reliance and capacity for community organisation, providing skills capacitation through community driven data collection, and the community management of the implementation of the project. Additional aims were an increased community cohesion facilitated by the in-situ nature of upgrading and a positive change in mindset and conception of 'the future' facilitated through increased self-reliance of the inhabitants.

Logic behind the clustering

After the community enumerated the settlement, the outcome was used as an entry point for the negotiations over the new spatial layout of the settlement. Over the course of one week, community members gathered socio-demographic data about their settlement in terms of population, number of structures and households, service provision, the spread of employment and reasons for moving to the settlement. The implementation of the upgrading occurred on a cluster-by-cluster basis. During break down and construction of structures, residents stayed with neighbouring households which enabled upgrading to take place in-situ. This minimised disruption and built community cohesion.

All structures in the settlement where upgraded over the course of half a year. The government laid the ground works, levelled settlement surfaces and conducted regular site meetings with the steering committee. A steering committee assisted the inhabitants in managing the physical implementation of the project. By the completion of the project, electricity and individual household services were installed and access roads paved. The result was lauded as a successful demonstration of community-led, participatory planning, collaborative implementation and improvement of informal settlements.

Fig. 4.14   left: clustering schema: **row housing**, organised around courtyards (own illustration).
              right: aerial photograph of the Flamingo Crescent showing resulting urban fabric (Apple maps).

GENERIC USE OF SPACE
- no separation of functions
- single room house

SECURITY
- small windows
- high social control

UNIFORMITY
- repetition of a standard unit
- no modification intended

BASIC SERVICE PROVISION
government provision (service charge applies)
- water
- sanitation
- electricity
- waste management

OUTDOOR COOKING
- cooking in the courtyard

CLIMATE DESIGN
- no cross ventilation, only openings facing
- an limited amount of external facades
- low thermal capacity of materials

SHARED CONSTRUCTION ELEMENTS
the construction cost of certain building elements is shared
between houses:
- separating walls between the row houses

ACCESSIBILITY
- connected to infrastructure
- located on formal streets or courtyards

LOW COST MATERIALS
- semi formal (low tech) materials and technology
- limited to affordable construction methods
- not durable

PRIVACY
- public space: the street
- collective space: the courtyard
- private space: the house

Fig. 4.15   axonometric projection of a house upgraded in the Flamingo Crescent upgrading project (own illustration).

Quality of the housing

The physical impact of the formal upgrading strategy has focussed primarily on the upgrading of infrastructure and land, and less on improving the quality of housing. The revised spatial layout of the settlement provides collective open spaces that improve safety within settlement. The upgraded structures still resemble their predecessors in materiality and form, but upgraded water and sanitation services provide a much healthier living environment. Settlement wide electrification, paved access roads with official road names and individual post addresses provide a sense of dignity and contribute toward a stronger tenure security for settlement residents. The project has resulted in the registration of every community member in the city database.

The formal settlement upgrading involved changes to the existing community layout to make room for installing improved infrastructure facilities. The community has found tactful ways to accommodate the needs of people whose houses had to be demolished or shifted to make way for improvements. The main goal in the formal upgrading project has been for the new urban environment to allow for the same daily routines, social structures and income opportunities as the informal settlement did initially, while improving upon the quality of the living environment.

4.6.3   Conclusion

The strategy of formal settlement upgrading allows the inhabitant to remain living in the same location, leaving in tact their social networks and vicinity to their job. A stable source of income is the highest priority to the

urban dweller. Since the urban poor cannot afford transport costs, they must live within walking distance from opportunities for income generation. Low demands are placed on the state and quality of the plot or housing if it is in the right location. When poor households get a regular income, priorities change, then it becomes meaningful to find a house of adequate quality as incomes may allow certain travel costs. (Urban Vestbro)

The strategies discussed in the previous sub-chapters have required inhabitants to relocate away form existing social structures and the job opportunities that they came to live in the informal settlements for. UN-Habitat now hold the belief that removing people from their homes in informal settlements and re-housing them on alternative site should never be the first-choice option for policy makers. Resettlement almost always destroys social networks, breaks up communities, dramatically reduces people's earning capacities, increases their transport costs, interrupts their children's schooling and generally increases their poverty. Because low-income housing is so scarce, demolishing slums and informal settlements and relocating their inhabitants causes a net loss of housing units nobody can afford to replace, and compounds the problems of housing shortages. "Experience shows that it costs 10 to 15 times more to develop new housing than it costs to upgrade the housing, living environments and settlements in which people have already lived and have already invested." (UN-Habitat)

Formal settlement upgrading allows inhabitants to remain living in the place where they live, it thereby helps to consolidate communities, enhance social stability and build on existing support mechanisms. It encourages participation in the many aspects of a community's redevelopment, first in the planning and implementation of the upgrading project, later in many other spinoff social and economic activities managed collectively within the community. It stimulates people to invest in improvements to their housing and living environments, by endorsing their long-term rights to occupy that land through long-term secure land tenure. It improves people's wellbeing and living conditions by improving their housing and living environments, and by freeing them from the looming threat of eviction. It builds assets and enhances the value of people's houses and land, by improving their land tenure security. As assets, the houses can be used for income-generating activities, rented or sold in a crisis, or used as collateral to get a loan. When people upgrade crowded, unplanned settlements, they can reorganise plots and make space for infrastructure, pre- schools, playgrounds, clinics and places of worship. It builds morale and pride. Upgrading a poor community's housing and basic services not only fulfils an important function of local government, but also raises people's morale, pride, civic engagement and ambition to invest further in their houses and neighbourhoods. It improves incomes when people can use their improved, secure houses for income-earning: shops, room rentals and home workshops. Having a legal address also makes it easier to get better-paying jobs in the formal sector. Unlike resettlement, upgrading causes minimal disturbance to people's lives and to the delicate networks of mutual support in poor communities.

The housing should be located near existing jobs and social structures

tradeoff

The housing should be located in an area determined by the government

---

References

WPI, CORC (2013). *Reblockig: A Partnership Guide.* Handbook to support the reblocking of informal settlements through a multiple stakeholder effort

WPI, CTPC (2013) *Cape Town Project Centre; Resources and references.* retrieved from http://wp.wpi.edu/capetown/projects/p2013/community-mobilisation-through-reblocking-in-flamingo-crescent/resources-and-references/

SDI South African Alliance (2015) *Flamingo Crescent informal settlement upgrading.* retrieved from http://sasdialliance.org.za/projects/flamingo-crescent/

4.7   In-Situ Half Houses | Quinta Monroy (Iquique, Chile)
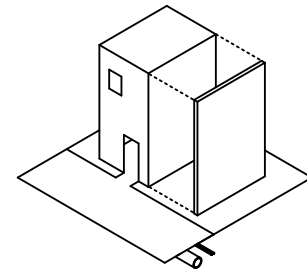
Fig. 4.16   left: Quinta Monroy project by Elemental in Iquique, Chile (retrieved from www.archdaily.com/elemental).
right: typological reduction (own illustration).

Another housing strategy that prioritises settlement upgrading over the relocation of informal settlement dwellers, can be identified in the strategy of in-situ half houses. It should be noted that this housing strategy has, for its scale and cost, so far not been implemented in Sub-Saharan Africa, the geographic scope of this research. The principle that underlies this housing strategy however, does present a relevant contribution to the range of strategies belonging to the enabler paradigm. This section first elaborates a strategy component, which is illustrated by the Latin American example of Quinta Monroy, in Iquique, Chile. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

4.7.1   Strategy component

The enabler strategy of in-situ half houses combines the sensibilities of formal settlement upgrading with the principles of core housing. The approach of the strategy is to invest government resources in providing 'the difficult half' of a formal house. This approach manages to address the issues of relocation in core housing while leveraging high urban density and housing quality. In the strategy of in-situ half houses almost half of the house is produced through auto-construction by there inhabitant, allowing for growth to occur within the framework of the provided structure. The physical form of the typology limits however the inhabitants control over construction, as it sets clear bounds to this incremental growth over time.

The principles behind the strategy

The premise of the strategy is to replace the substandard housing in informal settlements with 'half a good house'. In combining elements from the enabling strategies of core housing and formal settlement upgrading, an open typology is produced that allows for inhabitant appropriation and informal extension. This openness proposes to facilitate the changing needs of an inhabitant's household. The strategy allows, through formal multi-story construction methods, for an increased housing quality and urban density when compared to the informal settlement it substitutes. It should be noted however that this strategy has not been implemented yet in Sub-Saharan Africa, as the financial situation of governments most always requires a choice to be made between in situ upgrading of the infrastructure, and relocation to cheaper land in the periphery for a core housing.

Quinta Monroy

Quinta Monroy is a 5.000m² neighbourhood that houses about a hundred families who have illegally occupied the site for thirty years. Thanks to its central location in the city of Iquique, Quinta Monroy had grown into a labyrinth of precarious informal housing. Difficult to police and in sharp contrast with the formal surroundings, the government had planned to raze the entire settlement and relocate the inhabitants. There was however a resounding objection from the inhabitants at the prospect of being displaced, which led the government to

reconsider the proposal. The government attracted an architectural office to investigate possibilities for the inhabitants to remain living in the location they had been housed for 30 years. Elemental, a local architectural office, was commissioned to explore housing alternatives for the site. The principal Architect, Alejandro Aravena, had spent time researching housing alternatives at Harvard University and the Catholic University of Chile, looking in particular to housing strategies belonging to the enabler paradigm. This background in enabler strategies informed his approach to the challenging design assignment. The housing had to be developed with an allocated subsidy for each family of €7.000 (7.500USD), this includes the cost for land infrastructure and architecture. The high land value of the site did not leave enough funds to construct standard formal housing. The size of the site also did not permit for typical detached housing as a solution to house all of the families living in the settlement. The aim of the government subsidy was to prevent the inhabitants form having to take on a large debt in order to own a house. Each family was to own their own unit outright, so the building cost had to be extraordinarily low.

4.7.2   Architectural component

The solution that was brought forth by Elemental, was inspired by the principles of core housing: to provide only half of a formal house. Due to the fact that half of each housing unit's volume, was planned to be self-built, the building had to be porous enough to allow each unit to expand within its structure. The initial building was to be designed therefore as a supporting, rather than a constraining, framework in order to avoid any negative effects of auto-construction on the urban environment over time, but also to facilitate the expansion process.

Formal housing that does not allow for growth over time often is unable to grow in value, therefore, the house is not perceived as an asset in the financial sense. Housing that does not have any perceived value other that of the shelter leads to mistreatment and poor maintenance. A house that people can appropriate and eventually expand, can increase in value and its long term maintenance due to the degree of environmental control given to the user means it will appreciate, to the point where the owner can eventually move up the property ladder.

Logic behind the clustering

The authorities found it difficult to police the tightly clustered informal housing in the Quinta Monroy settlements. The settlement was to be reconfigured with the same high density but in a clear layout. All of the one hundred families had to be accommodated on the small site. Typical mass housing schemes would only accommodate sixty of the one hundred families on the site. In order to fit all hundred housing units into the limited size of the site without building a high-rise apartment block, on which there was a stigma among existing residents, existing social housing typologies had to be reinterpreted. The overall arrangement took the families that were living on the land, and redistributed them into 4 smaller communities, each arranged around a common public space. The units were basically designed as duplexes with units on the lower floors taking up three bays, while the upper units had two stories and took up two bays. The initial space of each unit was about 30m², and could be expanded up to 72m².

Fig. 4.17   left: clustering schema: stacked **row housing**, organised around courtyards (own illustration).
          right: aerial photograph of the Quinta Monroy showing resulting urban fabric (Apple maps).

SEPARATION OF FUCNTIONS (PARTIAL)
- only separation of functions in predesigned unit
- dwelling / renting out for income

ADAPTABILITY
- repetition of a predesigned unit intended for extension
- extension is limited to a predesigned void

SAFE INDOOR COOKING
- indoor cooking in a ventilated area

BASIC SERVICE PROVISION
government provision (service charge applies)
- water
- sanitation
- electricity
- waste management

SECURITY
- small windows
- high social control

CLIMATE DESIGN
- cross ventilation trough rooms

SHARED CONSTRUCTION ELEMENTS
the construction cost of certain building elements is shared between houses:
- the wall bounding the extension void

ACCESSIBILITY
- reblocking connects the house to formal infrastructure
- located on (in)formal streets
- shared courtyard behind the house

MODERN AND LOW COST MATERIALS
- formal materials and technology in predesigned unit
- extension limited to affordable construction methods
- durable and semi durable construction

PRIVACY
- public space: the street
- collective space: the courtyard
- private space: the house

INCREMENTAL CONSTRUCTION
- gradual addition of rooms
- extendable form
- extension is limited to a predesigned void

Fig.4.18   axonometric projection of a half house in the Quinta Monroy project with the incremental infill (own illustration).

Quality of the housing

The design of the housing units reevaluates the nescesarry qualities of typical social housing in order to minimise costs. The inhabitants were involved in the design process in order to establish which living requirements are absolutely fundamental and which can be added later when the family had established enough funds. The architects role has primarily been one of enabler, contrary to the usual prescriptive core housing design. The incremental construction of the infill occurred surprisingly fast, and with high quality. Families were bringing in contractors to extend the house, and only a quarter were reusing materials, in order to achieve a higher quality finish. Most houses have been painted in bright colours and the act of cladding and colouring is not just restricted to the extended components but has migrated to the existing structure. Individual identity is outwardly expressed in the community through material variations, without compromising on an overall formality. On one level Quinta Monroy can be seen to have some of the positive qualities of a slum settlement, such as individualism, dweller control, and sub communities formed around courtyards, without the negative ones associated with lack of infrastructure, although it could also be argued that by compartmentalising the inhabitants into their own defined 'unit', the architect has subverted the community that previously existed. Additionally, some residents have constructed outbuildings adjacent to their properties which they run or rent out as shops to generate extra income.

4.7.3 Conclusion

The project of Quinta Monroy by Elemental brings forth an interesting negotiation of the principles found in other enabler paradigm strategies. The approach provides an in-situ upgrading strategy that delivers formal quality housing through the construction of "half a good house". This can be seen as an improvement upon core housing, as there is no relocation of the inhabitant. Thereby the strategy also forms an improvement upon formal settlement upgrading, as described in the previous chapter, in the sense that the provided housing makes for a much denser and higher quality urban environment.

It is no coincidence that the example project of Quinta Monroy falls outside of the geographic scope of this study, as the economic conditions in Chile allow for a €7.000 government subsidy per household in the project. The economic conditions in Sub-Saharan Africa unfortunately do not allow for such government funding on the scale of the housing backlog. In-situ half houses are through their costs not a viable alternative to the informal production of housing in Sub-Saharan Africa. But the strategy does illustrate an alternative in the range of enabler strategies that takes into account the importance to avoid relocation and the tactic to provide that part of the construction, that allows for consolidation into dense urban housing of formal quality.

References

Aravena, A (2011). *Elemental; a Do Tank.* Architectural Design 81 (3): 32-37

Aravena, A. & Iacobelli, A. (2012). *Elemental: Incremental Housing and Participatory Design Manual.* Hatje Cantz Verlag GmbH & Compagny KG
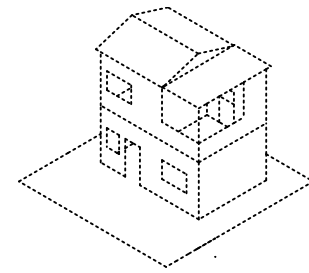
Fig. 4.19   left: Empower Shack 1.0 in Cape Town, South Africa (retrieved from www.designboom.com/empowershack).
right: typological reduction (own illustration).

To conclude the range of enabler strategies, this section discusses a form of 'enabling' or 'support' that does not focus on physical intervention, but on the technical assistance to introduce informal multi-story housing. The strategy is, for lack of physical government intervention, mostly a form of self help. In providing technical assistance however, there is an attempt of the government to steer and control the informally produced urban fabric and housing quality. This section first elaborates a strategy component, which is illustrated by the example of the Empower Shack 1.0 in Cape Town, South Africa. Then the architectural component of the illustration is discussed in an attempt to identify the typical urban and architectural qualities of the strategy's reduced typology.

4.8.1   **Strategy component**

The premise of the strategy to assist informal multi-story housing is not to impose any formal control on the location or phasing of housing construction, but to limit government intervention to the assistance to build vertically. The underlying idea is to use scarce public funds to provide technical assistance to encourage the inhabitants themselves to drive the city's reconstruction. The aim is to introduce into the informal production of housing the possibility to extend vertically. Especially in informal settlements that deal with horizontal overcrowding, the approach answers to the government priority for a more dense urban fabric, countering the urban sprawl that is typically produced by the current practices of informal construction. The value of the informally acquired land is seen as the main asset of the inhabitant of the informal settlement. By introducing new construction techniques the vertical extension of informal housing offers the opportunity to optimise the use-value of this asset. Building the capacity to construct multi-story housing, the inhabitants of informal settlements are empowered to improve upon the current informal production of housing.

The principles behind the strategy
The strategy of assisted informal multi-story housing recognises the benefits of the informal production of housing. The approach allows the inhabitant to control the location and construction of their housing, facilitating an alignment with the inhabitants specific needs and individual priorities. The role of the government is limited to assistance through capacity building and managerial ways to contribute standard multi-story house designs for auto-construction by inhabitants. This auto-construction is in practice carried out by local construction workers, but the point is that the construction is carried out informally and in an incremental way, when funds become available and housing needs change. This approach closely connects with Turners ideology, that initiated the thinking of the enabler paradigm. The strategy aligns with his ideas about the role of the government in this context as a supporter of the productive efforts of the urban poor. The strategy of assisting informal multi-story housing interprets the ideas behind the enabling policy as limited to assistance and advice on informality, instead of the partial provision of formality.

Empower Shack

Empower Shack is an interdisciplinary development project directed by Urban-Think Tank and the local NGO Ikhayalami Development Services, in collaboration with the BT-Section community and associated local and international partners. The project is developed as a response to urban informality, offering not only improved housing but a strategy that allows the inhabitants of informal settlements to dynamically structure their urban environment in response to their needs. Empower Shack is intended to alleviate the housing crisis in informal settlements incrementally and from the perspective of the inhabitant.

Alfredo Brillembourg, the founder and co-director of Urban-Think Tank, stresses that the objective of the project "has been not to impose anything, but rather to encouraging the inhabitants themselves to drive the improvement of the housing situation." The project provides each inhabitant with access to a microcredit and the necessary capacity to improve their housing. The project has spearheaded a main priority of the inhabitants: to build their own home over time, with zero on mortgage and zero credit. "People don't want to have thirty-year mortgages, they don't want to pay banks and get little boxes of social housing." Seventy to eighty percent of the city is made up by housing, the project aims to empower the urban poor through the construction of housing to give the inhabitants of informal settlements some city-making ability.

4.8.2   **Architectural component**

The Empower Shack project focusses on a cluster of 68 houses within the BT-Section of the Khayelitsha township. Through innovative design and organisational models, the project aims to develop a comprehensive and sustainable informal settlement upgrading strategy centred around two core components: participatory spatial planning and a two-story housing prototype. First the logic behind the clustering of the housing units elaborates the spatial reorganisation of the settlement, then the housing quality of the multi-story prototype is elaborated.

Logic behind the clustering

The idea behind the clustering of the housing capitalises on the one important asset the inhabitants of informal settlements have: land. "*Land is the only thing they have, land is the asset of the squatter.*" Optimising the use of this resource involves building vertically. When homes extend vertically, the inhabitant is able to create shops on the first floor, rent out the second floor. Unlocking the capacity to build vertically empowers the inhabitant to use the land they inhabit more efficiently. Multi-story housing produces higher urban densities then the current single story informal housing, and the steady informal income from lettable rooms can contribute toward improving the quality of the housing as an investment. The project aims to acquire security of tenure for the inhabitants through a community led restructuring of the settlement called 'reblocking'. Providing secure tenure is a vital part of community upgrading. Without it, people's continued vulnerability to eviction will make them reluctant to invest further in their housing and living environment. The process of reblocking is very similar to the settlement upgrading in chapter 4.6.

Fig. 4.20   left: clustering schema: randomly **clustered low rise** (own illustration).
            right: aerial photograph of the Khayelitsha area in Cape Town showing the existing context (Apple maps).

GENERIC USE OF SPACE
- no separation of functions
- dividing the space with curtains

ADAPTABILITY
- a typology applied to specific individual circumstances
- modification to context

OUTDOOR COOKING
- cooking in the courtyard

INFORMAL BASIC SERVICES
self help (stolen or shared)
- water from vendor
- shared sanitation in courtyard
- stolen electricity
- no waste management

SECURITY
- small windows
- high social control

CLIMATE DESIGN
- cross ventilation trough rooms

FREESTANDING HOUSE
- freestanding house on informal plot

ACCESSIBILITY
- connected to infrastructure
- located on formal courtyards

LOW COST MATERIALS
- semi formal (low tech) materials and technology
- limited to self build techniques
- not durable

PRIVACY
- public space: the street
- collective space: the courtyard
- private space: the house

Fig. 4.21   axonometric projection of the Empower Shack showing a multi-story self help approach (own illustration).

The 'reblocking' of the settlement in the project is an exercise in participatory spatial planning, featuring a master plan that begins to structure informally developed neighbourhoods to include courtyards, public space, and improved circulation. Each home is allotted a determined amount of space that allows the structure to expand as the inhabitants need it, still fitting within a more organised framework. The 'reblocking' process employs new digital visualisation tools and micro-financing, to create an interface between the inhabitants, professionals, and the government. The project aims to develop an approach that responds to contemporary social, ecological, and market dynamics, and which will provide incentives for the state to extend tenure rights. This would create a legally durable foundation for future incremental upgrading.

Quality of the housing

The main architectural contribution that the project proposes is a construction method that facilitates the production of two-storey houses with an ensured stability via an inner frame. The project proposes that this small technical detail unlocks the potential of the auto-construction of multi-story housing. As the urban poor's greatest asset is the land they hold; The inhabitant can double their capital. The advice to the inhabitants is to rent out the second storey of their house or use it for business purposes.

The materiality of the architectural typology in informed by the inhabitants preference for familiar, currently used and widely available materials: corrugated sheet metal and wood. The inhabitants have to build the homes fast or they won't have anywhere to sleep at night. "The aesthetic of the house is the least of their problems and

they can upgrade it over time." Over the course of the research and in close communication with community leader Phumezo Tsibanto, a prototype of the Empower Shack was developed featuring a two story metal-clad modular wood frame structure that is economical for the inhabitants and appropriate for auto-construction. The shack is a two-storey basic timber frame with a sanitation core, clad in metal sheeting. In creating a two-storey dwelling, the footprint of the existing shacks could be halved, creating more room for public open space, improving pedestrian mobility and reducing the spread of fire. Internally, the shack can be configured to residents desires and needs, with the ability to choose from a series of prefabricated facades with varied opening configurations.

4.8.3   **Conclusion**

The strategy of informal multi-story housing allows for government focus on technical assistance to improve housing quality and increase urban density instead of providing costly infrastructure, basic services and tenure security. This approach aims to utilise a very limited amount of resources, in order to achieve a very large scale effect. In the absence of political change the focus of governments will remain on international economic competition, while housing the urban poor remains a matter of self help for the majority of people in Sub Saharan Africa. Governments have proven unable to afford the provision of infrastructure, basic services and secure tenure, on a scale that matches the informal production of housing. Therefore the strategy of assisted informal multi-story housing proposes to guide and steer the informal production of housing into a direction that better addresses priorities of the government, especially an increased urban density that counters the results of urban sprawl. The option for governments to postpone their responsibility to provide formality can be recognised as a priority.

$ **Infrastructure Provision: the strategy should allow the government not to provide infrastructure**

$ **Basic service provision: the strategy should allow the government not to provide basic services**

$ **Secure tenure provision: the strategy should allow the government not to provide tenure security**

As a consequence of the formal provision of infrastructure, basic services and secure tenure, governments require the inhabitant to participate in formal society, which provides certain benefits, but consequentially provides certain financial obligations. Even the minimal government intervention of site and service schemes, described in chapter 4.2, has experienced serious affordability problems, being plagued by poor cost recovery. The site and services approach would be based on misconceptions about what urban poor households need, what they can afford and what they can achieve. Many site and services schemes have failed to be affordable and accessible to the lowest- income groups who were their targets. The inhabitants are upon entering a formal environment required to make payments for their land and pay to construct a new house. Transport, water and electricity costs only add to this burden. According to John Turner the introduction of secure tenure and amenities are for the urban poor more of an inconvenience then an improvement. The provision of tenure, infrastructure and basic services often require undesirable relocation. While with the informal production of housing they are offered the alternative to avoid paying taxes and service charges, allowing the inhabitant to arrange to their own priorities the necessities for survival.
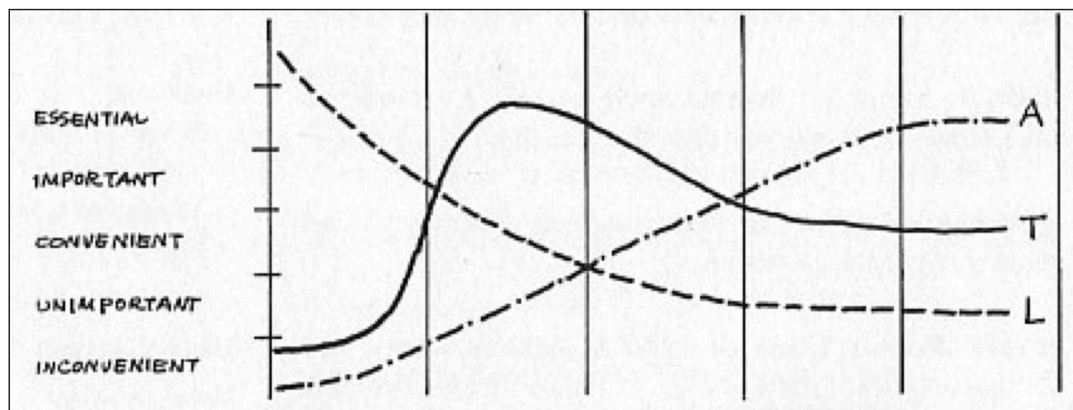
Fig. 4.22   Diagrammatic portrayal of housing priorities by income group, A = amenities; T = tenure; L = location (Turner).

John Turner diagrammatically portrayed his theory on the priorities of the urban poor with respect to housing (fig 4.22). On the left side are those who are without any income at all. For them control over their location near job opportunities is absolutely most important for survival, while security of tenure and amenities such as infrastructure and adequate housing are less important. In the middle there are those who have a regular but limited income. For them land tenure becomes more important than distance to job opportunities, while the house itself has lower priority. On the right we find those with higher incomes. They can afford transport cost. When they have secured land tenure they can start giving priority to amenities such as water, hard-surface streets, drainage and the house itself. (Caminos, Turner & Steffian 1969)

For the urban poor, a strategy that provides secure tenure and amenities such as basic services and infrastructure does not align with the inhabitants priorities. Such securities come at a cost: the payment of formal taxes and service charges. When the informal production of housing is a viable alternative: formalisation is avoided by those that do not have a steady income.

Taxes: the inhabitant should be able to avoid paying taxes or service charges in the strategy

---

References

Amaya, L. (2015). *Interview with Alfredo Brilembourg, founder of Urban Think Tank.* retrieved from http://archinect.com/features/article/124819398/interview-with-alfredo-brillembourg-founder-of-urban-think-tank

Caminos, H., Turner, J. F. C. & Steffian J. A. (1969) *Urban Dwelling Environments. An elementary survey for the study of design determinants*, Cambridge & London: MIT press

Domus (2015). *Empower Shack*. retrieved from http://www.domusweb.it/en/news/2015/04/18/empower_shack.html

Frearson, A. (2014) *Urban-Think Tank develops housing prototype for South African slums.* retrieved from https://www.dezeen.com/2014/03/07/empower-shack-urban-think-tank-housing-south-africa-slums/

5 Strategy Evaluation

The housing strategies, presented in the previous chapters, are evaluated against a framework that consists of the housing priorities in informal settlements. This evaluation is based on the ideas of John F.C. Turner who argued that a relevant housing strategy and architectural typology allows for the priorities of the inhabitants of the informal settlements within a government housing strategy. In the evaluation framework the housing priorities are divided between the main actors in informal settlements; the inhabitants and the government, and they are sorted by three aspects of the strategies: 1) cost, 2) control, and 3) quality. The housing strategies are reviewed against this framework attempting to find tradeoffs in priorities and their interconnected consequences. The results from this evaluation are schematically portrayed in a graph that serves as a tool for decision making in the design of housing strategies and architectural typologies dealing with informal settlements. The first section of this chapter produces the results of the application of the evaluation framework. Then a critical reading of these results is presented, in an attempt to decipher the characteristics of dealing with the priorities in these strategies. Lastly the limitations of this approach are acknowledged.

5.1 Application of the Evaluation Framework

In the next pages of the thesis the following results are presented:

1)   an overview of the housing strategies that were introduced in the previous chapters,
2)   an overview of the collected priorities that form the evaluation framework,
3)   a table in which the evaluation framework is applied to the housing strategies,
4)   a graph visualising the results of this table.

HOUSING STRATEGY OVERVIEW

SELF HELP / PROVIDING / ENABLING

SELF HELP
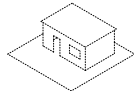
squatting and informal sale		SELF
informal rent		SELF
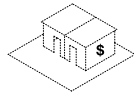
PROVIDER PARADIGM
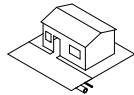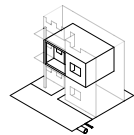
formal housing estates	TENURE	GOV $ $ $
formal apartments	TENURE	GOV $ $ $

ENABLER PARADIGM
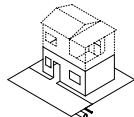
extended formal housing		SELF
sites and services	TENURE	GOV
core housing	TENURE	GOV
cooperative partnerships	TENURE	NGO
settlement upgrading	TENURE	GOV NGO
in-situ half housing	TENURE	GOV
assisted informal multi-story housing		SELF
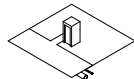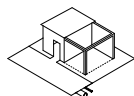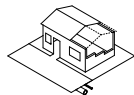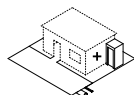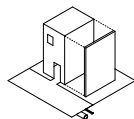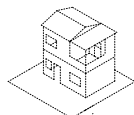
STRATEGY EVALUATION FRAMEWORK

CRITERIA BASED ON GOVERNMENT AND INHABITANT PRIORITIES

INHABITANT PRIORITIES

COSTS		**informal construction**	**low**
		does the strategy allow for the incremental payment of housing construction?	
		informal rent	**mid**
		does the strategy allow for the workings of the informal rental system?	
		taxes	**mid**
		is inhabitant able to avoid paying taxes (service charges) in the strategy?	
CONTROL		**location**	**high**
		is the housing located near existing jobs / social structures?	
		control over construction	**high**
		does the inhabitant control the building process (incremental) and product?	
QUALITIES		**high value formal housing**	**low**
		is inhabiting the housing more likely than renting it out / selling it on for it's high value?	
		social implications	**low**
		Is the social status of the housing and materials satisfactory?	

GOVERNMENT PRIORITIES

COSTS		**formal construction**	**high**
		does the strategy allow the government not to provide housing construction?	
		infrastructure provision	**high**
		does the strategy allow the government not to provide infrastructure?	
		basic service provision	**high**
		does the strategy allow the government not to provide basic services?	
		secure tenure provision	**high**
		does the strategy allow the government not to provide tenure security?	
CONTROL		**location**	**low**
		is the housing located in an area determined by the government?	
		control over construction	**low**
		does the government control the building process (instant) and product?	
		consolidation time	**low**
		does the strategy have an adequate consolidation time?	
QUALITIES		**housing quality**	**mid**
		does the strategy deliver an adequate quality of housing?	
		urban density	**mid**
		does the strategy deliver an adequate urban density?	

[foldout EVALUATION FRAMEWORK AI]

[foldout EVALUATION FRAMEWORK Ai]

5.2   Evaluation

This evaluation presents a critical reading of the results of the applied evaluation framework. It is a closer look into the tradeoffs and consequences that connect inhabitant and government priorities. The attempt is to decipher the characteristics of dealing with the priorities in housing strategies. This section describes first the measure of alignment of housing strategies with the priorities, and concludes then on the characteristics of dealing with the priorities.

Alignment of the housing strategies with priorities

The informal production of housing aligns with the main priorities of the inhabitants. It focusses on the economic benefits of an urban lifestyle: providing affordable rental housing, an alternative to formal taxes or service charges, the incremental payment for construction and the possibility to rent out rooms as a source of income. The inhabitant is in control of the location and construction of the housing. The produced qualities: the housing quality, urban density and social implications are of inferior priority to the inhabitant. To the government the informal production of housing facilitates the possibility that governments do not allocate public funds to the construction of housing, infrastructure, basic services and security of tenure. The produced urban fabric however does not meet in the government priorities of control and quality.

The strategies belonging to the provider paradigm do not align with the priorities of inhabitant on multiple levels. They are not designed to allow for incremental expansion of the housing when household composition changes. The strategies are not designed to allow for the informal rent of part of the house. Inhabitants are required to pay taxes and services charges for formal supply of basic services. The location and the construction of the housing are not controlled by the inhabitant. High value housing is often sold on or rented out completely, while the inhabitant returns to live in informal settlements. For the government great alignment to the priorities is achieved, most important are the adequate living conditions through improved housing quality. The government is in control of the location and construction of the housing. The costs for the government of the construction of housing, infrastructure, basic services and security of tenure are however high. Provider paradigm strategies display discrepancies with almost all inhabitants priorities, making their relevance questionable when reflecting on the ideas that Turner brought forward.

The strategies belonging to the enabler paradigm are build on the ideas that questioned the relevance of the provider paradigm. However, most strategies belonging to this school of thought encounter similar discrepancies with inhabitant priorities. The strategies require the inhabitant to pay taxes and services charges for the formal supply of basic services. None of the enabler strategies places the control over location and construction completely with the inhabitant; therefore leaving the informal production of housing as an attractive alternative. Most strategies have been conceived before urban sprawl was made an urgent priority to address, therefore the produced urban fabric lacks density. Even though the enabler strategies partially redistribute control over either location or construction to the inhabitant; the informal production of housing remains more in line with inhabitant priorities.

Exceptions within the paradigm of enabling are the strategies of extended formal housing and assisted multi-story informal housing. These strategies can be categorised in the grey area between enabler strategies and the informal production of housing as they are hardly influenced by government intervention. The strategies perform in the evaluation similar to informal practices, following the same logic as the informal production of housing. But either though expanding on an existing formal structure of informed by technical assistance align more the priorities of the government in terms of the produced qualities.

Characteristics of dealing with the priorities

The main tradeoff that is presented in the evaluation framework, is the tradeoff in control over the location and construction of housing. The conflicting interests of the actors on the aspect of control can be recognised from the problem statement: the government lacks control over the informal production of housing, taking issue with the substandard conditions and urban sprawl. The inhabitant takes issue with the lack of affordable alternatives that give them control to choose the location and construction of housing.

The tradeoff in control can be seen as the main characteristic to deal with in housing strategies that address the informal production of housing. A number of consequences is brought forth by this tradeoff in control between the actors. This sections seeks to identify their logic and interconnection. The following consequences are listed as characteristics that need to be addressed in the design of a housing strategy dealing with the informal production of housing:

- *The informal production of housing aligns most with the priorities of the inhabitant, taking full control over the location and construction of housing.*

- *Informal rent is the most flexible and affordable housing strategy for the inhabitant, allowing control through a choice what room to rent. The strategy also facilitates a source of income for house owners.*

- *The informal production of housing provides a base level of housing quality and urban density that is produced when government control over housing location and construction are minimal.*

- *Government intervention that reduces the inhabitant's control over the housing location, construction or both reduces the alignment of the strategy with inhabitant priorities, as long as the informal production of housing is condoned by the government.*

- *Government intervention, by taking control over the housing location, construction or both, results in an increase of government cost.*

- *High government costs reduce the equity of the strategy due to limited available funds, and disable an approach that addresses adequately the scale of the problem.*

- *Government intervention, by taking control over the housing location, construction or both, resulting in instant formalisation, requires the inhabitant to pay taxes and services charges they cannot afford.*

- *Taxes and service charges directly oppose the priorities of the inhabitants. The monthly charges are unwanted when informality is condoned as an alternative. The incremental costs of informal construction are preferred, seen as an investment showcasing physical results of accumulated effort.*

- *Government intervention, by taking control over the housing location, construction or both, results in high quality housing, this does however not align with the inhabitant priorities. High quality housing either poses a significant strain on the inhabitants financial resources or is sold on / rented out for financial gain, missing its aim.*

- *Housing quality and urban density are to be gradually improved in a housing strategy that minimally limits inhabitant control over the location and construction of housing.*

5.3   Limitations

In reviewing housing strategies that address the informal production of housing against an evaluation framework of housing priorities, the intention has been to come to a conclusion on the relevance of the strategies. Thereby a tool has been produced for decision making in the design of housing strategies and architectural typologies dealing with informal settlements. A number of limitations to this approach have to be acknowledged.

The approach of descriptive research can vary greatly. Usually a choice must be made, given the limited means of study, between research aiming for study in width (a limited number of data on a lot of objects) and study in depth (for instance thorough description of one single case). The advantage of a case study (casuistry) is that it allows deeper penetration into the core of the matter. The corresponding disadvantage is that it is often difficult to generalise on the basis of one single case and to draw general conclusions. (Source) In this study an attempt is made the mitigate the limitations of both approaches by identifying a wide collection of housing strategies, reducing them to their architectural typology and categorising the strategies accordingly. In the analysis of the housing strategies a single case is presented to elaborate in dept the mechanics of the strategy. It must be acknowledged that the selection and categorisation of housing strategies remains greatly

generalised. Due to limited means of study this thesis does not claim to present a complete overview of all housing strategies dealing with the informal production of housing. The single cases illustrating the housing strategies complicate in turn generalisation and the drawing of general conclusions.

Similar to the wide variety in housing strategies that address the informal production of housing, the variety and subjectivity of housing priorities poses a limitation to their selection and categorisation. The evaluation framework recognises two main actors and three aspects of housing strategies in which these priorities can are sorted; 1) cost, 2) control, and 3) quality. This categorisation is the result of a process identifying a wide collection of priorities and deriving their core values. The study acknowledges that the selection and categorisation of individual housing priorities remains greatly generalised. The scale of the informal production of housing and its individual and contextual nature, result in an unlimited variety and complexity of individual priorities. The priorities presented in this framework represent a generalised inventarisation of principles, rather then the specific housing priorities of certain inhabitant of an informal settlement.

The geographic scope of the evaluation shows a generalisation of the situation in informal settlements in Sub-Saharan Africa. It is important to acknowledge the uniqueness and contextuality of informally produced housing and the informal settlements they collectively form. The local political, economic and social conditions influence the physical manifestation of informal settlements. To reflect this the evaluation framework is informed by a complex set of local variables such as: laws on land ownership, land value, availability of building materials, state of the infrastructure and basic service providers, etc. Alterations in these local variables can mean great changes in the housing priorities; in terms of costs for instance. It is acknowledged that these local variables have been made specific in this thesis to the situation of Dar es Salaam in Tanzania. Evaluation of housing strategies for a different location requires a revision of these elements to suit the local context. The schematic model can be applied to a specific case, given that local influences on priorities and locally relevant housing strategies are to a made specific.

The evaluation framework can be utilised as a schematic tool for decision making in the design of housing strategies and architectural typologies dealing with informal settlements. The schematic nature of the tool poses a limitation that has to be acknowledged. The intention to present all information is in a single table or graph in leads to an oversimplification of the priorities, not allowing for the visualisation of all nuances. The simplification facilitates a comparison in the review of the strategies, but limits the accuracy of their representation of the estimated value of priorities and costs. The focus of this evaluation has been on a comparable review the alignment of housing strategies with the priorities of the main actors in informal settlements and to find tradeoffs in priorities and their interconnected consequences.

6   Case Studies: Assisted Informal Multi-story Housing

This chapter proposes to study selected cases of the most relevant housing strategy, investigating how in these cases conflicting priorities in the evaluation framework are addressed. The most relevant strategy is defined here as the strategy that best addresses the priorities of the main actors in informal settlements; the inhabitants and the government. Reflecting on the characteristics of dealing with priorities in housing strategies, the first section of this chapter makes a case for the strategy of assisted informal multi-story housing. This strategy negotiates government priorities of reduced urban sprawl and increased housing quality, while allowing for the inhabitants priorities though the strategy's informal character.

Case studies of selected housing strategies are performed in the second part of this chapter in order to find solutions from practice to the conflicting priorities and tradeoffs described in the evaluation. Briefly the case study method is described, then the cases are presented. The focus of the case studies lies on specifying the benefits of the informal production of housing and identifying solutions for an improved housing quality and urban density. The aim is to conclude on a set of generic guidelines on the design of a strategy of assisted informal multi-story housing, negotiating the housing priorities of the inhabitants of informal settlements and their governments.

6.1   A case for assisted informal multi-story housing

The evaluation of housing strategies has shown their measure of alignment with the priorities on housing in informal settlements. While enabler strategies have been introduced as an alternative to provider strategies in an attempt to recognise inhabitant priorities, the evaluation negates their success in coming to complete alignment. This section presents a case for a strategy that reconceptualises the ideas of John F.C. Turner that underly the enabler paradigm. Fully allowing for the benefits of the informal production of housing, the strategy attempts through technical assistance to improve housing quality and urban density.

When housing is developed outside the formal system, it may have all kinds of drawbacks, but the main point is that it is more appropriate the needs of its inhabitant. This idea summarises the essence of the informal production of housing. Whatever drawbacks squatting, informal sale or informal rent might have, the main priority for the inhabitant is that it is the most appropriate form of housing available to them. The informal production of housing is arranged in accordance with the inhabitants priorities, the quality of the produced housing and urban fabric are however limited to their individual capacity.

The premise of housing strategies belonging to the enabler paradigm has been that this capacity can be enhanced by providing part of a formal house, or the plot and infrastructure. It has been noted by Richard Harris in 'A double irony: the originality and influence of John F.C. Turner' that Turner himself was critical of the interpretation of his ideas in large scale housing strategies. *"By 1973 the World Bank was beginning to provide loans for housing projects, and initially they favoured site-and-service schemes that mandated self-help. Turner himself expressed reservations about these structured schemes, but they have usually been regarded as a significant concession towards the point of view that he had been expressing."* These reservations refer to passages in Turners book *'Freedom to build'* pertaining to the role of the professional *"assuming that he knows more that the 'uneducated' by virtue of his schooling"*, and the discussion on *"the feasibility and desirability of centralised administration in housing" (Turner and Fitcher, 1972).*

When we reflect on the main ideas that Turner brings forth, a case can be made for a strategy that does not control the provision of part of a formal house, nor the plot and infrastructure. *"When dwellers control the major decisions and are free to make their own contribution to the design, construction or management of their housing, both the process and the environment produced stimulate individual and social well-being. When people have no control over, nor the responsibility for key decisions in the housing process, on the other hand, dwelling environments may instead become a barrier to personal fulfilment and a burden on the economy"* (Turner and Fitcher, 1972) It can be argued that all of the priorities presented in the evaluation framework qualify as key decisions in the housing process, and thus should be facilitated in a housing

strategy. A strategy build on the premise that individual capacity should be enhanced via technical assistance, not via the large scale provision of core houses or serviced plots.

A relatively new strategy that holds to the principles of the enabler paradigm is recognised in assisting informal multi-story housing. The housing strategy introduced in the last section of the enabler paradigm chapter reconceptualises the thinking of John Turner, leveraging more inhabitant control on the construction and the location of housing. Technical assistance introducing multi-story construction facilitates higher density than the current informal single story construction, assistance to improved construction techniques and methods increases housing quality.

In relation to other strategies dealing with the informal production of housing, this strategy has minimal government costs. By not providing individual housing or plots, but rather universal assistance in construction, the strategy can address a large scale. The importance of a realistic strategy scale should be underlined, as the informal production of housing continues to proliferate.

"Land is a valuable commodity in growing cities, and detached units, the norm in slum areas, are not the most efficient use of available space; yet conventional multi-story construction is too costly a solution."Kinetic Design Group The strategy provides solutions for a more appropriate urban density. The strategy unlocks vertical densification, sometimes accompanied by community reblocking projects.

The inhabitant costs of the strategy are limited to individual capacity. Through technical assistance the housing quality is improved, but with full dweller control over construction, the assistance offers merely a suggestion on the different use of materials. Affordability is therefore similar to the current informal production of housing. Assisted informal multi-story housing is moreover affordable in relation to other strategies is for its facilitation of the informal rental system and the possibility not to pay taxes and basic services charges. incremental construction

Turners advocacy for the 'informal production of housing as an asset', is reinterpreted in this strategy improved though technical assistance, not, as in early enabler paradigm strategies, through partial providing. When not all of the inhabitant priorities are met in a strategy, the informal production of housing will be the alternative choice. This strategy attempts to reach an acceptable form of the informal production of housing: the aim to act in alignment with all of the inhabitant priorities while negotiating government priorities of increasing housing quality, urban density and government control

Limitations to assisted informal multi-story housing

Limitations to the strategy of informal multi-story housing can be identified in relation to other strategies discussed in this thesis. The characteristic tradeoff in control as specified in the previous chapter, explains the negative consequence of inhabitant control over the location and construction of their housing. Comparing the approach with the housing strategy that exhibit strong government control, e.g. providing formal apartments, government priorities of high urban density and housing quality are lacking. High tech construction methods unlocked by the formal production of housing can achieve much higher densities than self construction techniques. The assisted informal multi-story housing strategy lacks the overview of centrally controlled urban planning. Another limitation to the strategy of assisted informal multi-storey housing is that informal technical assistance may lead to the hazardous situations caused by untrained and ill informed replication of the prototype or pilot project.

Considering these limitations, the strategy is proposed as a more acceptable form of unaided informal housing. Government driven housing has frequently been criticised for being too expensive as well as for its peripheral location, and the inability to provide enough units and the lack of cost-recovery for maintenance purposes. And these factors mentioned has been force people to opt for self-help housing. As housing strategies that exhibit strong government control are costly and do not align with inhabitant priorities on housing, the lack of overview and formal construction methods has to be taken as collateral damage. The proposal is to see the strategy as an positive shift up from the informal production of housing, not a departure from provider strategies, through enabler strategies, further and further away from the benefits of formal

control. This strategy negotiates government priorities of reduced urban sprawl and increased housing quality, while allowing for the inhabitants priorities though the strategy's informal character.

6.2   Case study method

Before introducing the case studies, their methodology and selection are briefly discussed. This section first presents the research methods that have been applied and the research question that is addressed by this empirical study. An elaboration on the selection of relevant cases follows.

Methodology

The methodology of this part of the study follows the principles of inductive theory-generation, or conceptualisation, which is based on findings from within the cases. It is proposed that generic guidelines can be derived from the case studies through a process of induction. (Johansson 2003) The guidelines are generalised from the analysis of practical solutions to the conflicting priorities and tradeoffs described in the evaluation. Overarching principles are sought that are typical to the strategy; aligning government priorities on quality with complete dweller control over the location and construction of housing. An emphasis has been placed on the architectural analysis of the prototypes, in drawings and schemes, to illustrate solutions. The focus of the analysis lies on specifying the benefits of the informal production of housing and identifying solutions for an improved housing quality and urban density. Analysing within the case studies, ways of dealing with the consequences of conflicting housing priorities in Informal Settlements.

The main research question that underlies this part of the study is phrased as:

»   *How do selected cases of the most relevant strategy deal with the consequences of conflicting priorities in the evaluation framework?*

In making a case for assisted informal multi-story housing, the most relevant strategy has been proposed. The consequences of the conflicting priorities have been presented in the evaluation of housing strategies. The principles that determine the selection of the cases are elaborated next.

Case Selection

To elaborate the selection of the cases two parameters are discussed; the coherence to the housing strategy of assisted informal multi-story housing, and the availability of documentation. Five cases are presented that fit the selection criteria.

The coherence of the case to the strategy of assisted informal multi-story housing is determined by reviewing the main determinants of the strategy. The housing strategy must target informal settlements in Sub-Saharan Africa, and present a multi story housing typology. The strategy must follow the logic of the enabler paradigm, utilising the informal production of housing as a resource. The produced housing should be affordable by facilitating incremental payment for construction. Government control is limited to a pilot or prototype house that can be adopted by the inhabitant for self construction. The resulting multi-story housing must be constructed by the inhabitant in-situ, informed by the government through capacity building. A more practical criterion for the selection of cases is the availability of documentation. In order to provide an accurate analysis of the cases the information on the implementation of the housing strategy and the documentation of the architectural design are required.

Application of the selection criteria brings forth five cases: 1) the Kambi Moto housing project in Nairobi, Kenya, 2) Empower shack 2.0 in Cape Town, South Africa, 3) the Sustainable Incremental Construction Unit (SICU) in Addis Ababa, Ethiopia, 4) Casas Melhoradas 3.0 in Maputo, Mozambique, and 5) the Table House in South Africa.

References

Johansson, R. (2003). *Case Study Methodology*. A key note speech at the International Conference "Methodologies in Housing Research" organised by the Royal Institute of Technology in cooperation with the International Association of People–Environment Studies, Stockholm.

Turner, J.F.C. and Fichter, R. (1972.): *Freedom to Build*. New York: Macmillan.

page intentionally left blank

6.3   Case 1: Kambi Moto Housing Project in Nairobi, Kenya

Kambi Moto is a densely populated informal settlement in the Huruma neighbourhood in the north-east of Nairobi. Since 2000 the Kambi Moto Housing Project has been enabling the 270 settlement households to gain security of tenure and to design and construct their own homes, whilst simultaneously developing their skills in procurement and project management procedures. The premise of the Kambi Moto Housing Project is to enable and facilitate a local community to carry out its own upgrading.

This case study focuses on recognising concrete solutions for the informal production of multi-story housing. First the strategy component of the Kambi Moto Housing Project is discussed, elaborating how the typology is implemented. Then the architectural component is addressed, focussing on the benefits of informality and solutions to improve the housing quality and urban density.

Fig. 6.1   the Kambi Moto Housing Project in the Huruma Settlement in Nairobi, Kenya (retrieved from staticflickr.com).

6.3.1   **Strategy component**

Kambi Moto is an informal settlement that formed when squatters appropriated open land, originally intended as a car-parking area for adjacent formally-built low-cost houses. The name of the area means 'place of fire' as the high density of housing structures made from wood and scrap materials have burned down on several occasions. The households have remained in this overcrowded location due to its proximity to the city's infrastructure and income opportunities.

The Kambi Moto project started with the aim to improve the living conditions in the area. The Nairobi City Planning Department, with local NGO Pamoja Trust and both universities in the city, proposed a collaboration with the residents of Kambi Moto. The community was proposed to undertake an enumeration exercise and form a local savings group. Then the planning department would negotiate a special dispensation with the city council that all 270 households living in Kambi Moto would be able to stay on the land, and to receive formal tenure. Upgrading would then be carried out incrementally and in-situ so that the households would not have to move out of the community. The local saving group would serve as a housing cooperative in pooling the communities savings and extending loans per construction phase.

Delivering the strategy through involvement of local professionals

Local professionals bring crucial context specific knowledge into the strategy and are able to connect meaningfully with the inhabitants of the informal settlement without language or customary boundaries. In Kenya, technical assistance of architects and engineers is limited mainly to government and corporate or affluent private clients. The large majority of the population does not receive any support or assistance in the construction of their housing from trained professionals. Although local craftsmen have through years of practice acquired useful construction skills, there is a need for value that can be added by the technical and design professionals.

The Kambi Moto project seeks to improve the skills of local architects, planners and builders by encouraging them to work amongst the urban poor, rather than moving to work in the global North. The local professionals and semi-professionals involved in the project received training and motivation to work locally, enhancing their skills by providing better service to the community-built housing process. The goal is to develop and test locally-generated planning solutions for the urban poor, therefore a rooted understanding of the local conditions is a prerequisite to professional input. The informal professionals work alongside the community in Kambi Moto to enable them to build their own homes and gain security of land tenure community on sound procurement procedures and management of the projects.

Delivering the strategy through capacity building of inhabitant

Capacity building allows the inhabitant to take on a more active role in the upgrading of their settlement, the acquired skills can be used to generate income through working on the upgrading of other settlements. In the Kambi Moto project the tasks of local professionals had to been adopted by community members to avoid long-term reliance on professional input. The local professionals and semi-professionals have been contributing in their specialisation to the housing project, whilst simultaneously developing and supporting the technical skills of the inhabitants. The procurement procedures and management of the projects, were over time adopted by community members, though training and advice. The community was empowered to own and manage the whole process, developing skills and increasing capacity as the project continues. The programme aims to build the capacity of the local communities such that they themselves carry out the upgrading work alongside skilled labourers hired with the funds generated by the community-based savings groups combined with loans from the local NGO. Due to the improved skills, the community members are now applying and qualifying for formal construction work outside the settlement. The community of Kambi Moto is assisting other urban poor communities in Nairobi and other towns in their struggle to enhance and secure their housing situation.

Fig. 6.2   above: the projected urban fabric, showing difference in construction phasing between units. (own illustration).
                below: clustering principe: **back-to-back row housing** sharing structural walls on three sides (own illustration).
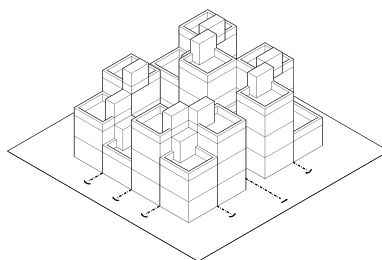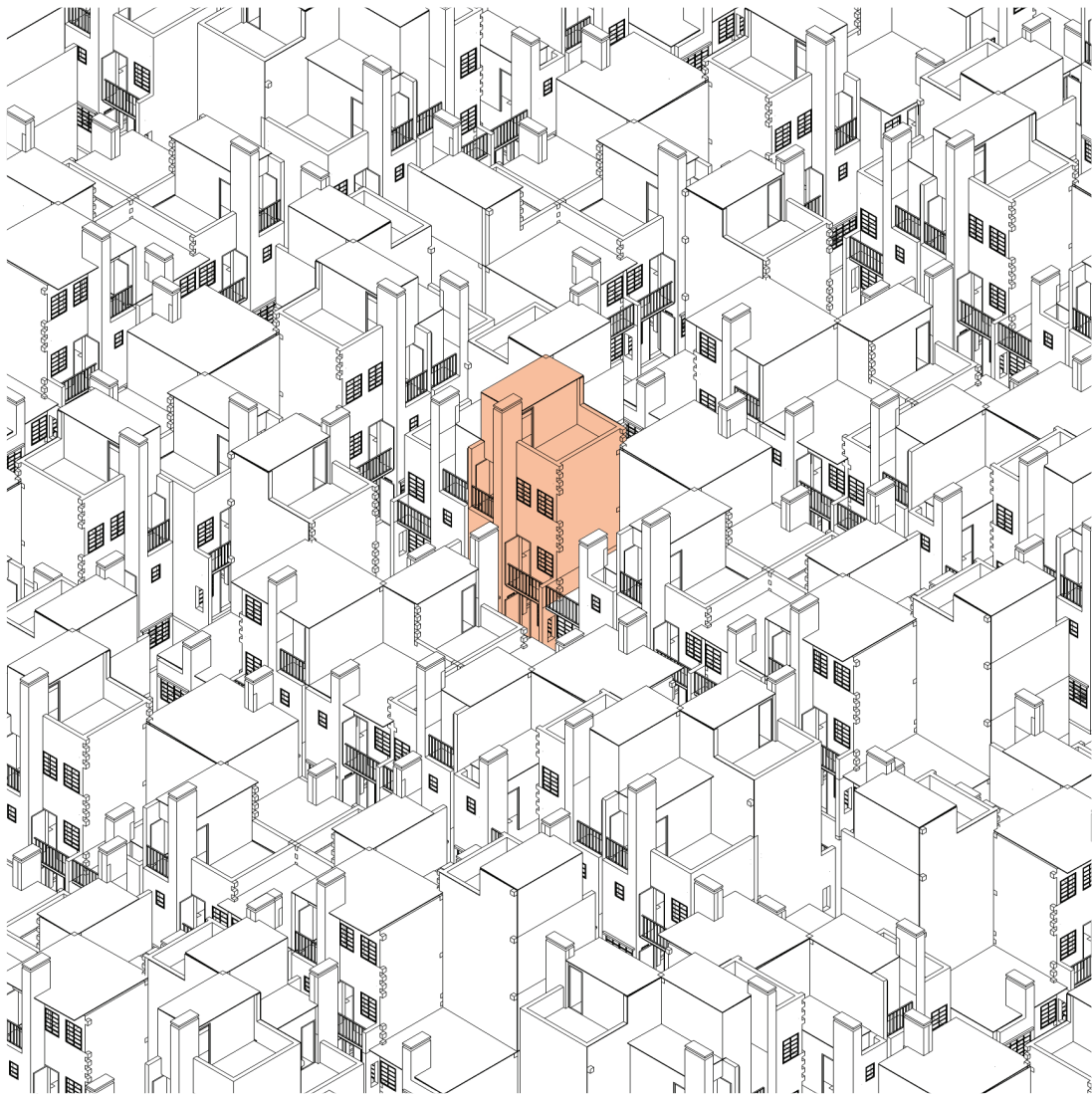
Delivering the strategy through life-size models

A life-size model allows for concrete discussion on the proposed architectural design within the strategy, the spatial organisation of the dwelling is no longer abstract in drawings, but physical and tangible. The Kambi Moto project intends to assist the community in a participatory design process, in line with the enabling approach of capacity building and the assistance of local professionals. The collaborative design process between the professionals and the community has mainly been communicated through the use of life-size demonstration models. These models reduced the level of abstraction in the design process and provided a tangible result for the community to work towards. A number of designs were showcased using a life-size cloth and wood model. Upon seeing what housing quality could be achieved, the participatory design process settled on a single design organised over three floors that could be built incrementally over time.

6.3.2 **Architectural component**

Designed to allow for the incremental addition of rooms

The incremental addition of rooms in a designed alternative to informal housing facilitates the inhabitant to pay for construction when funds become available. Allowing the the design of the building for incremrtenal growth responds to the inhabitant priority to accommodate changing household situations in their home, and to rent out rooms to generate income. The housing design in the Kambi Moto project is incremental, where each family is starts inhabiting a basic one-bedroom, one-story space with a small sink and bathroom that can eventually be expanded vertically up to three stories. The complete design is organised over three floors that can be built piecemeal (see fig. 3). Not only is the housing design proposed to be incremental, also the upgrading of the settlements is undertaken in instalments. The phased construction process, in which twenty to thirty houses are built at a time, has limited disruption to the inhabitants life in the settlement. When homes are demolished for reconstruction, the scale of this replacement allows the community to accommodate the effected inhabitants within the settlement but also provides the benefit from bulk buying of materials, and enable learning to be passed from one phase to the next.

Designed to follow the local knowledge and experience of the informal housing

The local knowledge and experience of informal housing should be recognised as an important design value. The Kambi Moto project recognises the value of local experience and knowledge about the location. The informal structure footprints often indicate the most suitable positioning of the structures in term of topography and weather. The planning of the settlement took this into account, assuming the local knowledge of the site and conditions when considering natural storm-water run-off, path and road access.

Designed with materials that are affordable, sourced locally and regarded modern.

Housing should match the inhabitants priorities in materiality: affordability of the materials depends mostly on the width of their use and their scarcity, locally sourced materials are often affordable and most sustainable, modern materials have a higher social status then traditional ones. In the Kambi Moto project the choice of locally available stone and components fabricated on site has reduced the need for expensive, energy-intensive materials (for example cement and steel) and has involved training community members to produce materials, providing skills and an income. Locally available lava stone blocks were used as building materials for the new homes, rather than cement blocks. For the floor slabs and roof terraces, the Laady building method, a pre-fabricated concrete mini floor slab that uses a fraction of steel and cement compared to conventional concrete, was chosen. In order to reduce the labour costs, the households themselves provide unskilled labour. The labour contributions are organised and based on a rotating system, whereby residents work in construction teams on a particular group of houses, built in phases of between 20 and 30 houses. Some community members gain additional income from those members with external employment who prefer to pay for unskilled labour. The use of these materials and a process reliant on human rather than mechanical labour significantly affordability of the construction of the new homes and infrastructure.
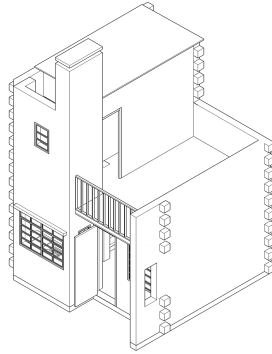
Fig. 6.3   phased construction of a housing unit Kambi Moto Housing Project (own illustration).
Fig. 6.4   exploded axonometry of a housing unit in the Kambi Moto Housing Project (own illustration).
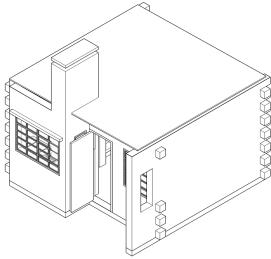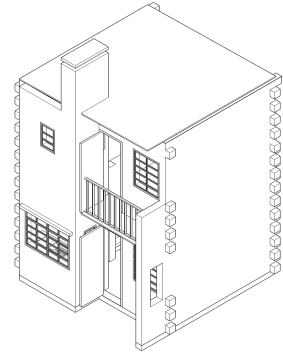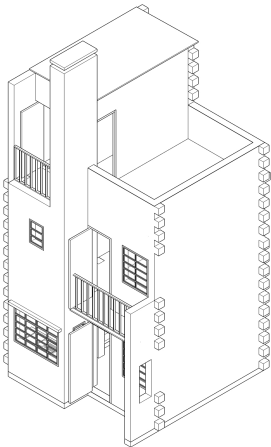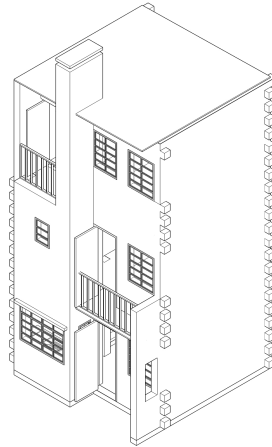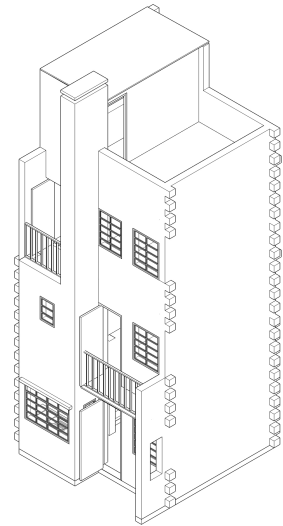
PHASE 1

PHASE 2

PHASE 3

PHASE 4

PHASE 5

PHASE 6

DESIGN FOR THE INCREMENTAL
ADDITION OF ROOMS

AFFORDABLE LOCALLY SOURCED AND
MODERN MATERIALS

CONCRETE BLOCKS

STEEL WINDOWFRAMES AND BALUSTRADES

CONCRETE STAIRCASE

CORRUGATED METAL SHEET ROOF

STACKING OF STRUCTURAL WALLS

EFFICIENT CLUSTERING OF THE
HOUSING UNIT

HIGH DENSITY OF FLOORSPACE

STACKING ROOMS G + 3

SHARING STRUCTURAL WALLS ON 3 SIDES

LITTLE DIFFERENTIATION IN
CONSTRCUTION ELEMENETS

SELF CONSTRUCTION TECHNIQUES

NO HEAVY MACHINERY REQUIRED

SELF PRODUCED MATERIALS

CONCRETE BLOCK SAVING SCHEME

CONCRETE BEAM AND BLOCK FLOOR

A SAFE AND PRIVATE SPACE TO COOK

COMMUNITY REBLOCKING

DWELLER CONTROLLED LOCATION

SOLID CONCRETE FOUNDATIONS
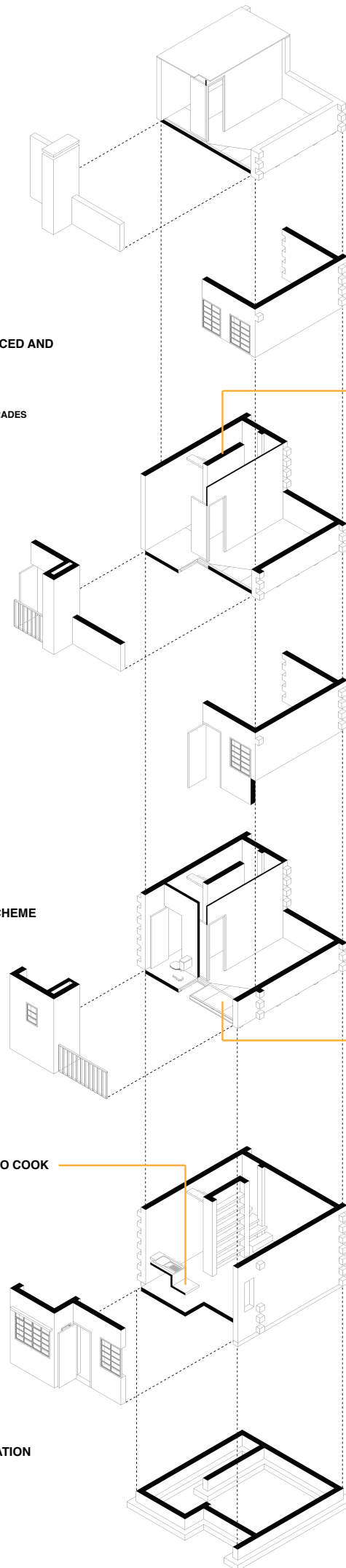
Designed to achieve high density and share construction costs through efficient clustering

The clustering of housing units should produce a high density environment to counter urban sprawl and facilitate infrastructure provision. Sharing construction elements in the clustering of housing units reduces the construction cost per unit. The land of the Kambi Moto area has been transferred to the community as a whole, with each household receiving sectional title for an equal plot. Due to the high density of the settlement each household received an area of 20.25 square meters. Essential to clustering of the housing was the adaptation of the planning regulations to prioritise the pedestrian nature of the settlement and maximise the land available, whilst enabling emergency vehicle access. The innovative urban layout that combines the pedestrian nature of the settlement with access for emergency vehicles has enabled all the 270 households to stay on site. The house design that has an extremely small footprint and allows for incremental vertical extension has increased affordability. Efficient clustering of the housing units has been key to achieve a high urban density and housing quality.

6.3.3 **Limitations**

The Kambi Moto project has encountered two main limitations that are recognised in documentation: long-term affordability, and the negation of the informal rental system.

During the phased construction process of the Kambi Moto project problems started to arise with the repayment of loans from the local saving group. With a new house structure and formal land title some households desired more growth and neglected to service their existing loans. This has been addressed by the collective saving scheme by making the provisions of new loans, for the second and third phases of the incremental building process, conditional on the repayment of the initial loans. Many of the inhabitants do not have regular incomes and are unable to afford repaying their initial loan to apply for new additions, resorting instead to the informal use of very low cost and low quality materials to expand. The main reason for the inability of the inhabitant to repay their loan, is that their housing budget not only has to address repayment of the loan, but also should cover formal taxes and the charges for basic services, in contrast to their previous situation. This has negatively affected the speed of the construction process and forms a challenge to the long-term sustainability of the project. The construction of the project began in 2003, and the first 34 units were completed in 2005. Another 20 units were completed in 2009, and the rest are yet to be completed.

The project has encountered resistance from residents of the Kambi Moto area who owned their informal housing. There are inhabitants who owned a number of structures, up to twenty in some cases, and whose lucrative rental income would disappear if the project would freely give formal title to all residents. The structure owners who acted as informal landlords, have over time invested their informal income in housing to secure a steady form of income. The Kambi Moto project has through intervention from Nairobi City Planning Department and local NGO Pamoja Trust denied the informal landlord any rights to the housing they owned; The project has after enumeration provided equal rights to all households in the area. The design of the housing unit in the Kambi Moto project is arranged in such a way that the informal rent of part of the housing would require a tenant to access the staircase through the owner's living room. The spatial organisation of the house makes it very difficult to rent out an upper room/floor and still maintain privacy. The wishes of residents to acquire more property from which to make an income are resisted, arguing that the informal rent is not a legitimate form of income.

References

Baliga, N. (2005). *Community Based Upgrading and Tenure Regularization: Insights from Nairobi, Kenya*. Masters Thesis, Masters of Science in Urban Planning, Columbia University.

BSHF (2009). *Technical Team Planning for Self-Help Housing in the Kambi Moto Community*. retrieved from https://www.bshf.org/world-habitat-awards/winners-and-finalists/technical-team-planning-for-self-help-housing-in-the-kambi-moto-community/

Perry, L. W. (2012). *Kambi Moto: three years later*. retrieved from http://incrementalhouse.blogspot.nl/2012/01/kamimoto-three-years-later.html#more

Perry, L. W. (2012). *Kambi Moto housing by Pamoja Trust; Nairobi, Kenya.* retrieved from http://www.architectureindevelopment.org/project.php?id=225

COOPI (2010). *Huruma slum upgrading project - COOPI - Kenya.* retrieved from https://www.youtube.com/watch?v=2EsoJAnipXA

6.4   Case 2: Empower Shack 2.0 in Cape Town, South Africa

Empower Shack is an interdisciplinary development project directed by Urban Think Tank and the local NGO Ikhayalami Development Services, in collaboration with a Cape Town informal settlement community and associated local and international partners. The project is focused on a cluster of 68 houses within the informal settlement of Khayelitsha. The premise of the Empower Shack 2.0 Project is to enable a community to 'reblock' and to facilitate the construction of two-story shacks that offer an improved housing quality and urban density.

This case study focuses on recognising concrete solutions for the informal production of multi-story housing. First the strategy component of the Empower Shack 2.0 Project is discussed, elaborating how the typology is implemented. Then the architectural component is addressed, focussing on the benefits of informality and solutions to improve the housing quality and urban density.

Fig. 6.5   Empower Shack 2.0 project in Cape Town, South Africa (retrieved from www.designindaba.com).

6.4.1 **Strategy component**

Urban-Think Tank co-founder Alfredo Brillembourg describes the strategy and intensions of the Empower Shack project as follows: "*Our work on the Empower Shack project is not the result of the usual architectural pursuit for a new housing typology. While we are absolutely trying to innovate upon the design and technology of low-cost housing, we're more concerned with the general 'system' that surrounds housing in the context of informal South African settlements. This includes the infrastructure that makes housing decent, such as power and sanitation, along with the urban configuration of homes. The Empower Shack project seeks to address these larger challenges, and in doing so, hopefully changes not just the built landscape of places like Khayelitsha, but also the social, political and economic structures that shape residents' lives.*" Empower Shack is a project that seeks practical and enduring solutions to improve the living conditions in the informal settlements of Cape Town. Through innovative design and organisational models, the project aims to develop a comprehensive and sustainable informal settlement upgrading strategy centred around four core components: a two-story housing prototype, participatory spatial planning, ecological landscape management, and integrated livelihoods programming.

The Empower Shack project has targeted a group of 68 households in the informal settlement of Khayelitsha. After a process of thorough site research the project aims to look beyond the substandard living conditions of the local shack dwellings, and finds inspiration in these structures efficient use of material and ease of construction. Existing shacks have become the basis for a housing prototype designed in collaboration with the local community. Vertical extension is prioritised over aesthetic qualities. "After all, the poor's greatest asset is the land they are sitting on; in this way [extending vertically], they can double their capital. The aesthetic of the house is the least of their problems and they can upgrade it over time." Similarly to the case of Kambi Moto, the Empower shack project trains the local community in the construction of their housing and provides basic planning for the area, the goal is to provide the inhabitants with the agency to reconstruct their community with much higher standards.

The Empower Shack project aims to provide generic strategies as an alternative to the informal production of housing, that remain embedded within community-driven processes around resource allocation. Home ownership in the project is facilitated through linking individuals to cluster micro-financing, formalising a rental market through cluster associations, and introducing a Land Release Credit concept, where one resident will trade land for credits, in the form of discounts on the house, in return for releasing land to another resident. Fifty percent of the total cost is funded by a grant currently provided by a Swiss re-insurance company (which it is hoped will be replaced by the South African government), 25% is provided by the community, and the other 25% by rental income.

6.4.2 **Architectural component**

The first version of the Empower shack has been conceived as a two-storey basic timber frame with a sanitation core, clad in metal sheeting (see paragraph 4.8). In creating a two-storey dwelling, the footprint of the existing shacks could be halved, creating more room for public open space, improving pedestrian mobility and reducing the spread of fire. Internally, the shack could be configured to residents desires and needs, with the ability to choose from a series of prefabricated facades with varied opening configurations. The Empower Shack 2.0 delivers a greater level of permanence than the original, described by Brillembourg as "just an activation". Designed over two or three storeys, the second version of the Empower Shack incorporates concrete block walls combined with corrugated iron set out in a row house typology.

Fig. 6.6   above: the projected urban fabric, showing the sequencing of units in rows. (own illustration).
            below: clustering principe: **row housing** sharing structural walls on two sides (own illustration).
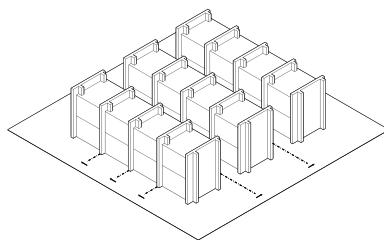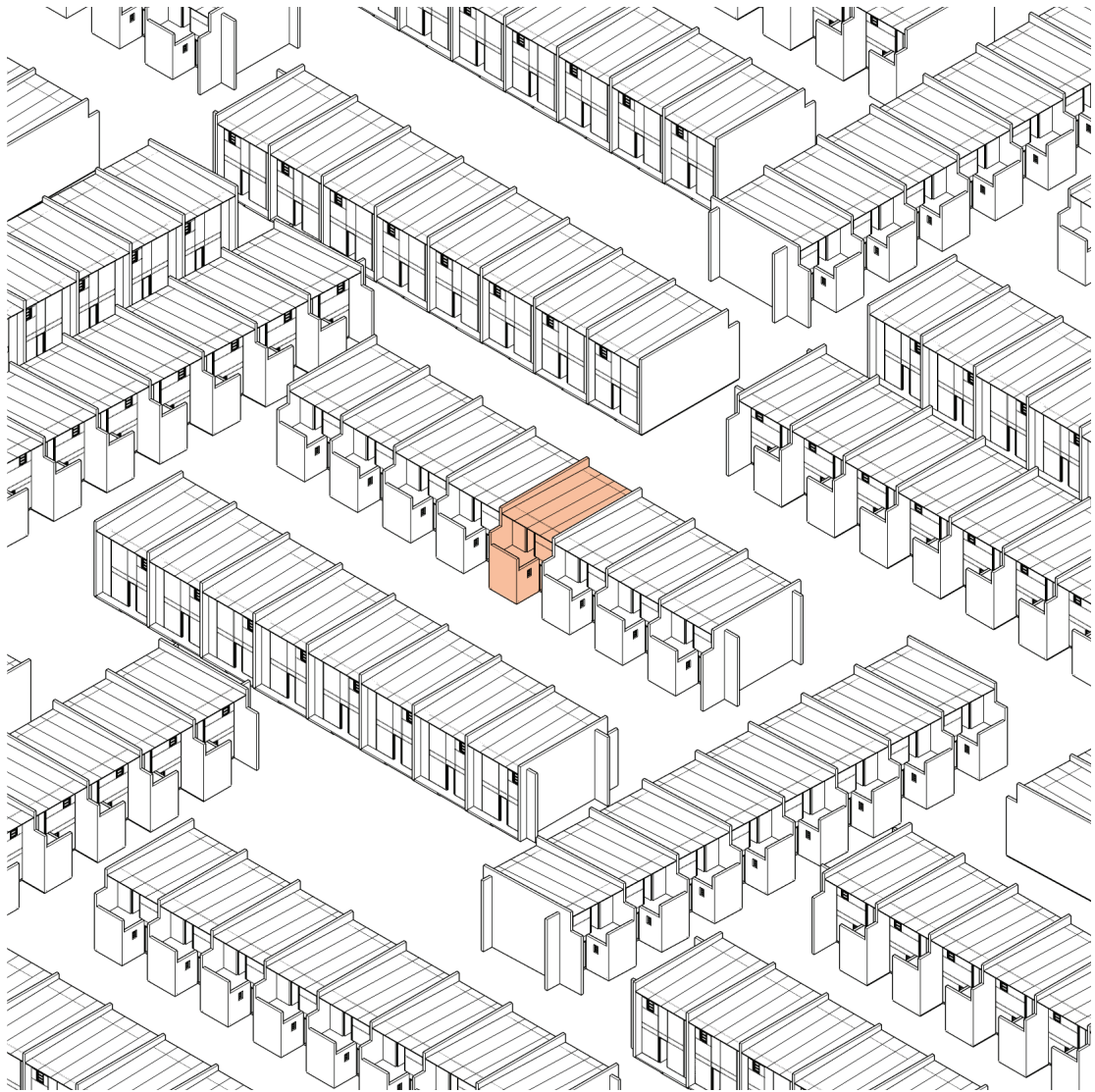
Designed in combination with community organisation to regularise or 'reblock' the settlement

Implementing the design for multi-story housing into a strategy for the regularisation of informal settlements facilitates accessibility and the provision of infrastructure that are lacking in the current urban fabric of informal settlements. The Empower Shack project proposes a settlement upgrading strategy in collaboration with inhabitants, professionals and the government. The focus is not only on the physical upgrading of dwellings, but also spatial planning, ecological landscape management and financing programs for residents. A system of 'reblocking' is proposed to formalise the settlement: a collaborative process involving the realignment of houses to facilitate courtyards and thoroughfares. Participatory planning workshops run with the local NGO Ikhayalami and a self-selected team from the community that focussed on urban planning exercises to understand the scale and use of the space, where thoroughfares would run, ownership of shared urban spaces and general cluster configurations.

Designed to incorporate solid foundations to ensure structural stability

Solid foundations are a prerequisite to multi-story construction. Without proper foundations the structural stability of multi-story housing is insufficient. The architectural design of the Empower Shack 2.0 incorporates solid foundations to ensure structural stability, and to incorporate basic service ducts. The foundations take up half the footprint of the area, a floating concrete slab takes up the other half, supported on the foundations and the foundations of the neighbouring unit. The structural concrete block wall and the serviced functions, the bathroom and kitchen unit, are located on the foundations. The preinstalled ducts will facilitate connection to basic services when the community is able to pay and government is able to provide the infrastructure.

Designed to allow stacking of structural walls

There are two methods to vertically extend the housing recognised in the cases, the stacking of structural walls proposes a uniform solution to the facade and structure of the housing. In the Empower Shack project verticality is created by stacking structural walls that separate housing units. The clustering allows external permanent walls to be shared, freeing up space for landscaping, thoroughfares and shared social areas, while residents, using corrugated iron, can build the front walls. Designed over two or three storeys, Empower shack 2.0 incorporates bricks and mortar with corrugated iron set out in a row house typology.

Designed with a lightweight wood floor to separate rooms within the housing unit

There are two methods recognised in the cases for the manual construction of a floor, a lightweight wood floor provides affordable solution, but does not provide a separation between the stories in fire resistance and privacy. The floors in the Empower shack units are constructed out of wood in order to provide a lightweight and low cost floor solution.
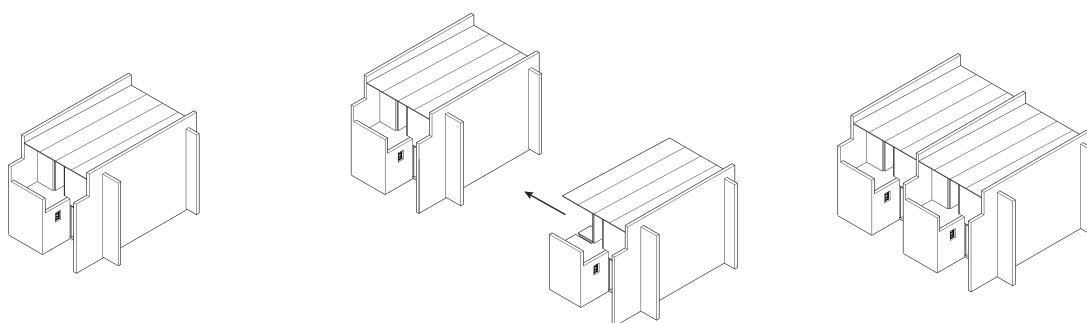
Designed to incorporate a lightweight and well ventilated roof and allow for cross ventilation and sufficient shading

A lightweight and well ventilated roof is a prerequisite to climatic comfort in the hot climates of Sub-Saharan Africa. Cross ventilation and sufficient shading have to be attended to in the design of housing, taking in to account the climatic conditions. In the Empower Shack project "the roof is a pre-fab Structured Insulated Panel made from Chromadek EPS-IBR, usually associated with cool room warehouse storage units, which provides optimum summer inside temperature comfort," says architect Scott Lloyd of the Urban Think Tank team. "Roof overhangs and vertical shading from rewalls have been calculated to shield the facade from afternoon summer sun. We use a locally manufactured heat-stop translucent profile on the facade to allow light but cut out 60% of radiant heat. Planting, site position, and wind corridors all help regulate the comfort on the urban scale."
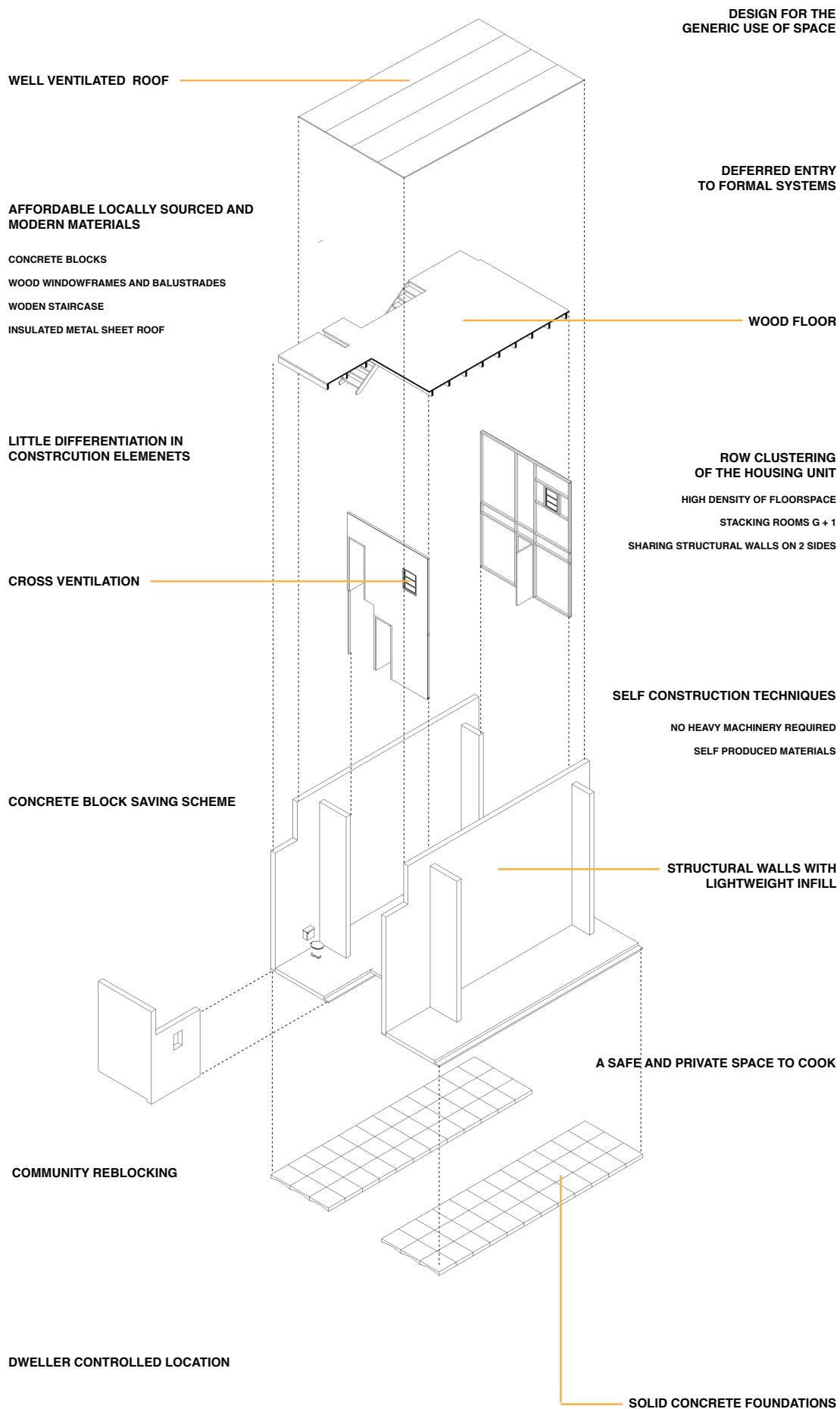
Fig. 6.7   addition of housing units of the Empower Shack 2.0 project (own illustration).
Fig. 6.8   exploded axonometry of a housing unit in the Empower Shack 2.0 project (own illustration).

ADDITION

DESIGN FOR THE
GENERIC USE OF SPACE

WELL VENTILATED ROOF

DEFERRED ENTRY
TO FORMAL SYSTEMS

AFFORDABLE LOCALLY SOURCED AND
MODERN MATERIALS

CONCRETE BLOCKS

WOOD WINDOWFRAMES AND BALUSTRADES

WODEN STAIRCASE

INSULATED METAL SHEET ROOF

WOOD FLOOR

LITTLE DIFFERENTIATION IN
CONSTRCUTION ELEMENETS

ROW CLUSTERING
OF THE HOUSING UNIT

HIGH DENSITY OF FLOORSPACE

STACKING ROOMS G + 1

SHARING STRUCTURAL WALLS ON 2 SIDES

CROSS VENTILATION

SELF CONSTRUCTION TECHNIQUES

NO HEAVY MACHINERY REQUIRED

SELF PRODUCED MATERIALS

CONCRETE BLOCK SAVING SCHEME

STRUCTURAL WALLS WITH
LIGHTWEIGHT INFILL

A SAFE AND PRIVATE SPACE TO COOK

COMMUNITY REBLOCKING

DWELLER CONTROLLED LOCATION

SOLID CONCRETE FOUNDATIONS

6.4.3   **Limitations**

In the Empower Shack 2.0 project some limitations can be recognised: the challenge of designing a non prescriptive housing concept, the scale of the reblocking programme and the density of the produced urban fabric.

The empower shack project has intended to produce a non-prescriptive architectural system: "We don't want to impose anything, we encourage the inhabitants themselves to drive the city's reconstruction, using what they use today: corrugated sheet metal and wood." Initially the contribution of the Empower Shack project was limited to systematically introducing verticality into informally produced shacks. This approach did not prescribe a design, and allowed the inhabitant dweller control. In the 2.0 version of the Empower Shack however, a standardised design for upgrading is introduced. The economic use of shared concrete block walls demands for a defined architectural output, limiting the non-prescriptive nature of the system. The result of the Empower Shack 2.0 is limited in dweller control as the row housing clustering principle determines greatly the spatial organisation of the housing.

The scale of the Empower Shack project is limited its community reblocking component. So far a cluster of 68 houses within the informal settlement of Khayelitsha has been the pilot for the Empower Shack project. The proposed architectural typology can be implemented on large scale, as it aims to be replicated trough informal production. The typology is proposed to be informally constructed as an improved alternative to the current shacks. The community reblocking programme however and accompanying micro financing scheme do not have a similar up-scalability. These components of the Empower Shack strategy depend on forming community collectives with the help of NGO's or the government to come to restructuring plans. In order for the reblocking approach to address the scale of informality problematic in Cape Town, a significant investment is necessary to facilitate community collectives in every informal settlement.

A third limitation to the Empower Shack project can be recognised in the urban fabric it aims to produce. The current situation in informal settlements is dominated by small detached shacks, not connected to formal infrastructure. The Empower Shack reblocking project proposes an alternative of row housing along formal streets. The principle is that by introducing verticality, space on the ground floor, public space opens up for accessibility. By providing the same amount of floorspace and rooms in the informal settlement, the row house typology does not facilitate an increase in the housing capacity of the informal settlement. The improved housing conditions and accessibility lead however to higher housing value and higher rent for tenants. Other forms of clustering, as seen in the Kambi Moto projects for example, are able to reach higher densities. A clustering principle that increases the housing capacity of the informal settlement can reduce the effects of urban sprawl and keep housing in the informal settlement affordable.

References

Earthworks (2016). *Low impact, high creativity – greener approaches to housing*. retrieved from http://earthworksmagazine.co.za/projects/low-impact-high-creativity-greener-approaches-to-housing/

Future Cape Town (2016). *WATCH : Informal Settlement Upgrading with Empower Shack.* retrieved from http://futurecapetown.com/2016/04/watch-empower-shack-from-urban-think-tank/#.WPCOllJ7Gsw

Future Cape Town (2016). *The first 4 units at the Empower Shack project completed*. retrieved from http://futurecapetown.com/2016/02/the-first-4-units-at-the-empower-shack-project-completed/#.WPCO91J7Gsy

Tory-Henderson, N. (2016). *Empower Shack*. retrieved from http://www.arcspace.com/features/urban-think-tank/empower-shack/

Urban Think Tank (2015). *Empower Shack.* retrieved from http://u-tt.com/project/empower-shack/

page intentionally left blank

6.5   Case 3: the Sustainable Incremental Construction Unit (SICU) in Addis Ababa, Ethiopia

The Sustainable Incremental Construction Unit is a product of the "welcome Africa" project, an international academic research project between Ethiopian and German universities. The aim of this project is to establish a pilot alternative to the governmental condominium housing program in a highly dense informal settlement of Addis Ababa. Focus is on community development and participation and job creation. The premise of the SICU Project is to introduce an two-story experimental building prototype for high density incremental housing construction.

This case study focuses on recognising concrete solutions for the informal production of multi-story housing. First the strategy component of the SICU Project is discussed, elaborating how the typology is implemented. Then the architectural component is addressed, focussing on the benefits of informality and solutions to improve the housing quality and urban density.

Fig. 6.9   Sustainable Incremental Construction Unit (SICU) in Addis Ababa, Ethiopia (retrieved from icebauhaus.com).

Strategy Component

The SICU pilot unit is situated in a typical informal settlement of Addis Ababa. Formal housing provision in this city is dominated by concrete frame and cast in-situ construction of condominium buildings. The city has banned natural materials from being used in buildings since 2009, limiting the solutions available for house construction. The SICU project aims to investigate possibilities for an alternative urban housing unit in this context and attempts to address the climatic, economic, cultural, and social sustainability factors. This is achieved by using locally-available and locally-produced prefabricated building elements with standardised dimensions, an easy to construct modular system, and a culturally and socially motivated design that enables highly flexible forms of occupancy. At the same time, the approach targets mass-customization, affordability and "up-scalability" of a building prototype.

Almost all of the unit´s components are prefabricated and produced by micro and small- scale businesses, an opportunity to catalyse the local informal economy. To communicate the methodology used and to propose different paths to replicability, the process was documented in every stage. This is showcased in a manual 'for simple and straightforward construction'. Within the process-oriented project, close to 90% of the building components including prefabricated concrete elements and lightweight eucalyptus frames are produced by local micro and small-scale enterprises. The approach creates the opportunity for skilled employment and capacity building, and also allows homeowners to complete the construction themselves, installing building components and finishes according to their needs. Considering the current focus on condominium housing in Ethiopia this project will present a cost-efficient and faster alternative for the construction sector and keeps the value chains for production and assembly within the country. As an academic experiment SICU intends to bring together various wills to materialise a design that is easy to build with unqualified labor, that uses low cost prefabricated elements that can be assembled in few days.

The first SICU concept was developed with a hypothetical Ethiopian urban site, program and incremental construction process in mind. The initial concept was adapted to the conditions of an actual selected site and the clients with their corresponding public and private functions by researching and implementing innovative and low-cost constructions and materials for urban areas in Ethiopia to address the high demand for housing in the country.

Delivering the strategy through a prototype unit / settlement

The use of a prototype unit or settlement to deliver a new standard for the informal production of housing to local craftsmen, allows a housing strategy to have large scale effects. Informal replication of a prototype allows citywide effects with limited financial means. The aim of SICU has been to provide a prototype alternative for the condominium construction industry in Ethiopia. By learning from and applying such a modular building strategy, a self-constructed affordable housing unit is designed. The design makes it possible to activate private resources and create private work force to erect necessary housing units for Ethiopia, which introduces the possibility to ''do more with less''. Through the efficient employment of resources, energy, labor and time, *Incremental Construction* demonstrates that the city's complex and seemingly insurmountable installation process of housing units could be overcome. The prototype, a showcase of integrative disciplinary research and experimentation, raises up new space arrangements and building methods to give the evidence for cost efficient implementation. The research considers locally available material resources and the local mode of living, introducing innovative construction techniques. It also offers a parallel strategy to the existing governmental housing project in the city offering different options and possibilities in how to make dense urban settlements.

Fig. 6.10   above: the projected urban fabric, showing different clustering formations of the units. (own illustration).
below: clustering principe: **detached housing** sharing circulation space (own illustration).
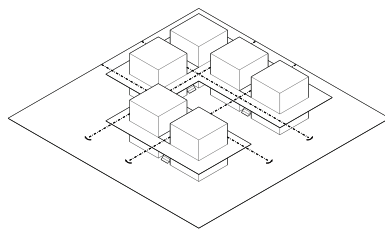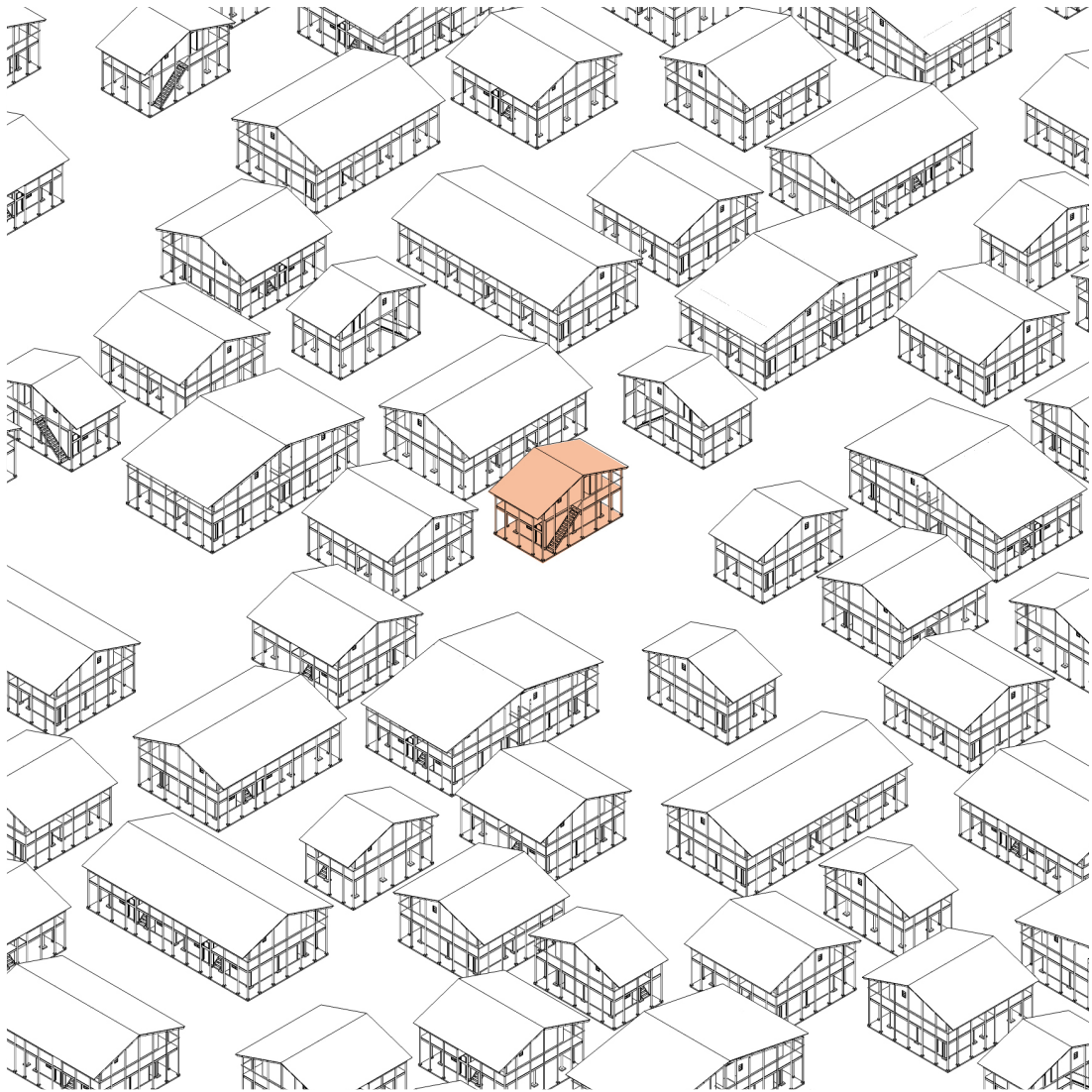
6.5.2 **Architectural Component**

The SICU prototype is a compact double-story unit comprised of a prefabricated concrete lower structure and lightweight eucalyptus frames for the upper floor. After all parts have been prefabricated, the building has been constructed in ten days by 35 students from three countries and serves to demonstrate an alternative housing approach to the provision of formal apartments and to prompt further discussions between policy makers, industry and academia.

Designing non-distinct rooms to facilitate a generic use of space

Rooms in the architectural design should facilitate a generic use of space, as the dynamic nature of the household situation in informal settlements requires flexibility. Generic use of space facilitates vastly different functions of the housing without additional construction or transformation. In the SICU project the physical structure is designed so as to support the incremental nature of situations in the Addis Ababa context. The translation of a growing urban population, growing families, growing communities, growing economy is vivid in the architectural spaces that foster and accommodate such changes. SICU, has very open and conventional spaces that give room for further change and appropriation by users. There is an interface space, (the shaded space at the ground level and the terrace at the top level) which is to accommodate future needs of the inhabitants. The public private transition is a very important aspect in traditional Ethiopian living domains. This tradition is respected at SICU in multiple layering of spaces.

Designed to facilitate the informal rent of part of the building and allow the integration of shops / services at street level for a mixed use environment

Facilitating the informal rent and the integration of shops in the design facilitates steady forms of informal income for the owner of the housing. The informal economy does not provide long term stability in the lives of inhabitants of informal settlements, one of the few reliable forms of informal income however is the subletting of rooms. The "unfinished" two storey SICU house has an open space in the ground floor, intended for commercial or working space, while the domestic activities are organised on the upper floor. It is up to the user when and how to expand the house which can be extended by 28 square meters. Incrementality is provided in expanding the housing area vertically and horizontally as well as for its easy construction and replicability. The idea of incremental change and growth is not only planned on one single household unit. It is envisaged that SICU, as a piece of architecture is repeatable. It is designed in a way that it is possible to be planned and mass constructed in various urban scenarios.
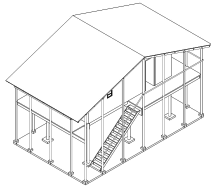
Designed to reduce the amount of costly construction elements

The amount of costly construction elements such as staircases and glazing should be minimal for the design to remain affordable. An interesting design component in the SICU project is the feature of shared circulation space. The space surrounding the core room allows for the introduction of a collective intermediary hierarchy of public and private space. Sharing the construction elements of this space, such as costly stairs reduces the individual cost of multi-story construction per unit. The design of SICU is through this shaded buffer zone intended to be more responsive to the local climate then the condominium projects it provides and alternative to. The components of the SICU can be modular elements produced on site such as the concrete footings and columns for the ground floor. The walls combine materials such as wooden boards and rubber sheets from tires; the roof is made of corrugated metal sheets and the stairs are prefabricated steel. The objective is to use available materials as well as to recycle as much as possible.
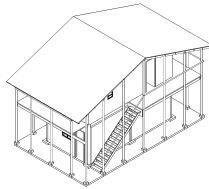
Fig. 6.11   addition of rooms / housing units of the SICU project (own illustration).
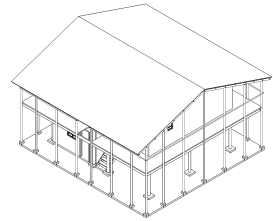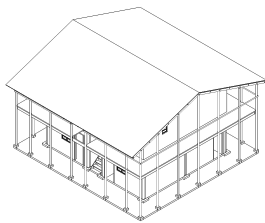Fig. 6.12   exploded axonometry of a housing unit in the SICU project (own illustration).
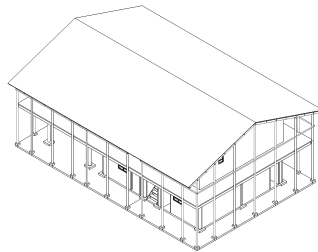
PHASE 1
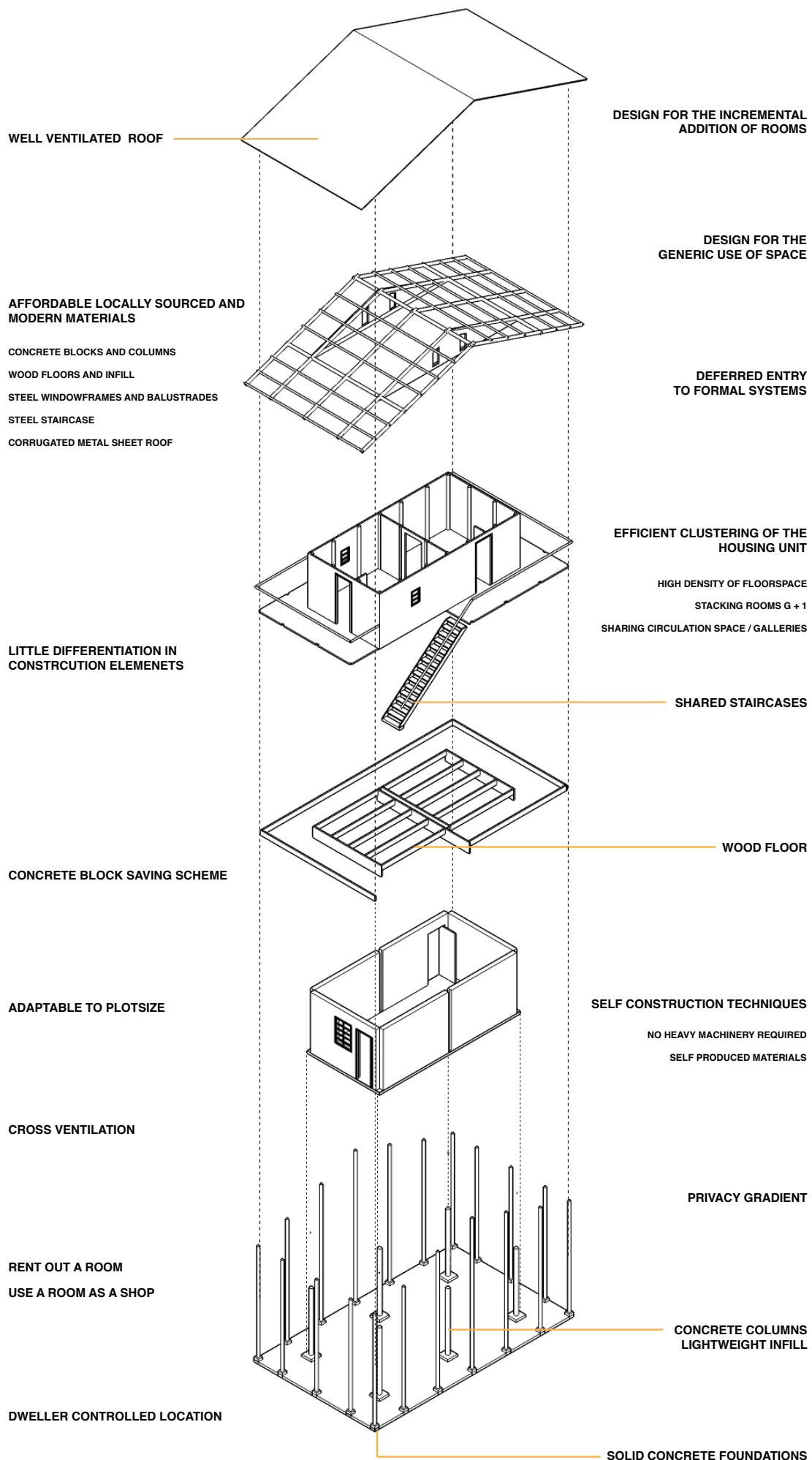
PHASE 2

PHASE 3

PHASE 4

PHASE 5

OPEN ENDED

WELL VENTILATED ROOF

DESIGN FOR THE INCREMENTAL
ADDITION OF ROOMS

DESIGN FOR THE
GENERIC USE OF SPACE

AFFORDABLE LOCALLY SOURCED AND
MODERN MATERIALS

CONCRETE BLOCKS AND COLUMNS

WOOD FLOORS AND INFILL

STEEL WINDOWFRAMES AND BALUSTRADES

STEEL STAIRCASE

CORRUGATED METAL SHEET ROOF

DEFERRED ENTRY
TO FORMAL SYSTEMS

EFFICIENT CLUSTERING OF THE
HOUSING UNIT

HIGH DENSITY OF FLOORSPACE

STACKING ROOMS G + 1

SHARING CIRCULATION SPACE / GALLERIES

LITTLE DIFFERENTIATION IN
CONSTRCUTION ELEMENETS

SHARED STAIRCASES

WOOD FLOOR

CONCRETE BLOCK SAVING SCHEME

ADAPTABLE TO PLOTSIZE

SELF CONSTRUCTION TECHNIQUES

NO HEAVY MACHINERY REQUIRED

SELF PRODUCED MATERIALS

CROSS VENTILATION

PRIVACY GRADIENT

RENT OUT A ROOM

USE A ROOM AS A SHOP

CONCRETE COLUMNS
LIGHTWEIGHT INFILL

DWELLER CONTROLLED LOCATION

SOLID CONCRETE FOUNDATIONS

Deliver new opportunities for income generation for informal construction professionals

By introducing new ways of building, new techniques and materials enter the informal construction market. Informal construction professionals and local craftsmen can benefit economically from a new demand for construction materials and services. Different building elements within the *SICU* system have been strategically designed and sorted for convenient development by micro, small scale and medium business enterprises. From the *SICU* building elements manual, pre-existing or newly-organised youth associations can identify a building system or component which is profitable for them, and pursue its production as a business initiative. The pre-prepared design that is modular allows for easy adaptability for small-scale manufacturers to adopt essential details and proportions and then further modify them, as required. In addition, the physical structure is designed to support the incremental nature of construction in the Addis Ababa context. The approach allows homeowners of incomplete structures to further the construction themselves; installing building components such as enclosure walls, windows, internal partitions, and finishes, according to their needs.

6.5.3   **Limitations**

The main limitation that was presented upon reflection on the project has been that the construction and design of the prototype have been introverted.

In the words of Dirk Donath "we would have done well to go out and explain the project to the people in the neighborhood a few more times. It should be clear here that SICU is not an all time modernist gesture of urban solutions. It is still an ongoing experiment but with great potential and a definite alternative for the context of Addis Ababa." SICU aims to address the challenges presented by rapid urbanisation, but a successful alternative to the informal production of housing cannot focus solely on technologies or materials or budgets; it needs to integrate the one factor that can make it successful: people´s agency. By placing focus on the technological perspective of affordable housing, the social relevance for the inhabitants of taking part in the design of their housing alternative has been limited. The SICU project has provided an alternative for the inhabitants of informal settlements, instead of enabling the inhabitant to define an alternative themselves.

References

Architecture in development (2016). *Low-cost modular housing scheme: Addis Ababa, Ethiopia*. retrieved from http://www.architectureindevelopment.org/project.php?id=210#!prettyPhoto

Lafarge Holcim Foundation (2015). *Incremental Construction; Low-cost modular housing scheme*, retrieved from https://www.lafargeholcim-foundation.org/Projects/incremental-construction

Schultz J. (2015). *Sustainable Incremental Construction Unit.* retrieved from http://www.appropedia.org/Sustainable_Incremental_Construction_Unit

SICU project team (2015). *Build your own SICU.* retrieved from http://icebauhaus.sudile.com/index.php/BUILD_YOUR_OWN_SICU

page intentionally left blank

6.6   Case 4: Casas Melhoradas 3.0 in Maputo, Mozambique

Casas Melhoradas 3.0 consists of a vertical addition to an old house in proximity to the city centre of Maputo, in the informal settlement of Polana Caniço. The project demonstrates how existing buildings can be transformed to meet the need to build more dense. The premise of the Casas Melhoradas project is to develop sustainable and affordable housing, aimed at using space and infrastructure more economically and thus initiating a more sustainable urban development in the informal settlements of Maputo Mozambique.

This case study focuses on recognising concrete solutions for the informal production of multi-story housing. First the strategy component of the Cases Melhoradas 3.0 Project is discussed, analysing how the typology is implemented. Then the architectural component is addressed, focussing on the benefits of informality and solutions to improve the housing quality and urban density.

Fig. 6.13   Casas Melhoradas 3.0 in Maputo, Mozambique (retrieved from casasmelhoradas.com)

Strategy Component

Housing in the slums of Maputo is almost exclusively single-story and the urban densities are relatively low, generally decreases with the distance from the centre. The continuing urban sprawl with low urban densities in the periphery of the city decreases the mobility and increases the need for investments in infrastructure while public investments in infrastructure are limited. Strategies for countering the extensive urban sprawl by increasing the urban density are therefore essential for initiating a more sustainable urban development. There is limited experience with high densities in this context, as multi storey construction is expensive. However, the demand for centrally located space cause increasing land prices, providing the economic framework for urban densification through multi-story construction in the slums.

The Casas Melhoradas project has a three-fold focus on housing for low income groups in the informal settlements of Maputo: 1) developing alternative construction methods to improve the quality and decrease the cost of housing; 2) developing housing typologies that utilise space and infrastructure more economically to initiate a more sustainable urban development; 3) engaging in construction of affordable rental housing through public and private partnerships to scale up the impact of the project.

The project aim to develop semi-industrial building component production, and is experimenting with prefabricated element construction, produced locally in Maputo's slums, based on local capacities. Thereby the project seeks to limit the waste of resources, reduce the price, reduce the time of the construction process and improve the quality of housing. The project aims to produce multi-story housing typologies, rooted in the local socio-economic and cultural conditions, seeking to utilise space more efficiently, in order to contain the urban sprawl and use the infrastructure more economically. Thereby, the project seeks to facilitate the development of more compact urban environments in the slums and make future infrastructure investments more cost-effective. On this background, the project seeks to improve mobility, improve the access to infrastructure and economise space.

The developed housing models, building techniques and production methods are tested in full scale in collaboration with local builders, through construction of prototypes and are subsequently evaluated to identify the most appropriate solutions for low-income groups in Maputo. Finally, the project seeks to engage in public and private partnerships on construction of affordable rental housing in order to scale the impact of the project.

Fig. 6.14   above: the projected urban fabric, showing addition of the extension onto existing housing. (own illustration).
below: clustering principe: vertical extension of **detached housing** (own illustration).
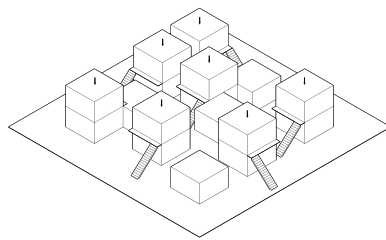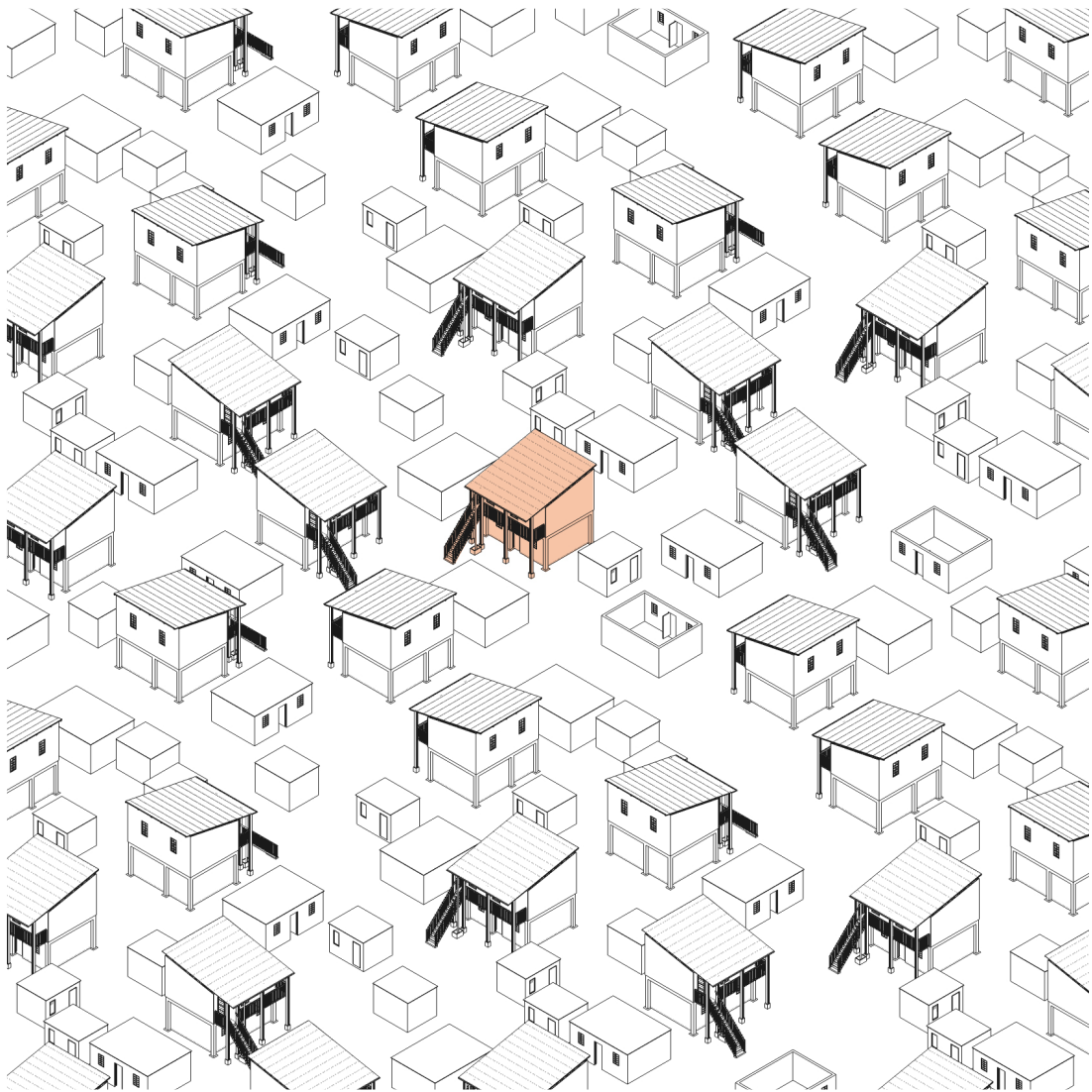
6.6.2   **Architectural Component**

Phase 3 of the Casas Melhoradas project has been built in 2016 and consists of a vertical addition to an existing house in proximity to the city centre, in the informal settlement of Polana Caniço. The project demonstrates how existing buildings can be transformed to meet the need to build more dense. An additional concrete structure has been added to the old house supporting the new first floor timber construction. The project has been constructed with locally produced timber elements and the vigotas e abobadilhas (beam and block) technology was implemented to construct a concrete slab. New windows were added to the old ground floor, improving the indoor climate. A deep access gallery oriented towards the private outdoor areas give access to the two new housing units and works as a covered porch, which provide shade from the sun and shelter from the rain.

Designed to add to / replace current habitation in a dweller controlled location

In-situ upgrading of informal housing allows the inhabitant to remain living in the location that holds their social and economic networks. Relocation of the inhabitant does not align with the housing priorities of the inhabitant. The Cases Melhoradas 3.0 project has the aim to add to the urban density of the informal settlements of Maputo, without evicting and demolishing existing housing. The approach is to add an additional story to the existing informal buildings. The project aims to preserve and enhance the existing, historically-grown, urban social network of a specific community, and proposes to increase the density of the informal settlement by adding to the existing housing supply, extending housing vertically.

Designed as a pattern to allow for dweller control over construction and individual appropriation

A generic design of the housing unit should allow for customisation to the specific local conditions and to the individual needs of the inhabitant. A design should allow the inhabitant to control and appropriate the construction of their housing. The Cases Melhoradas 3.0 produces an housing extension that responds in its form to the existing housing it is an addition to.

Designed only with techniques that allow for self construction

Only techniques that allow for self construction allow for replication by the informal production of housing. To attain an appropriate strategy scale, the informal construction sector should be able to replicate the design without costly machinery or transport. The Cases Melhoradas project utilised techniques and materials that can be implemented by the inhabitants of informal settlements and local informal construction professionals. The fabrication of components on site has reduced the need for expensive, energy-intensive materials and has involved training community members to produce materials, providing skills and an income.

Designed with a concrete beam and block floor to separate housing units

There are two methods recognised in the cases for the manual construction of a floor, a concrete floor can be created using the beam and block technology. This concrete floor is more expensive than lightweight wood, but it is able provide a separation between the stories in fire resistance and privacy. In the Cases Melhoradas project the typical 'vigotas e abobadilhas' or beam and block technology is utilised. The beam and block technology allows for manual construction of a concrete floor, without costly formwork, prefabrication or transport.

Fig. 6.15   addition of a room in the Casas Melhoradas 3.0 project (own illustration).
Fig. 6.16   exploded axonometry of a housing unit in the Casas Melhoradas 3.0 project (own illustration).
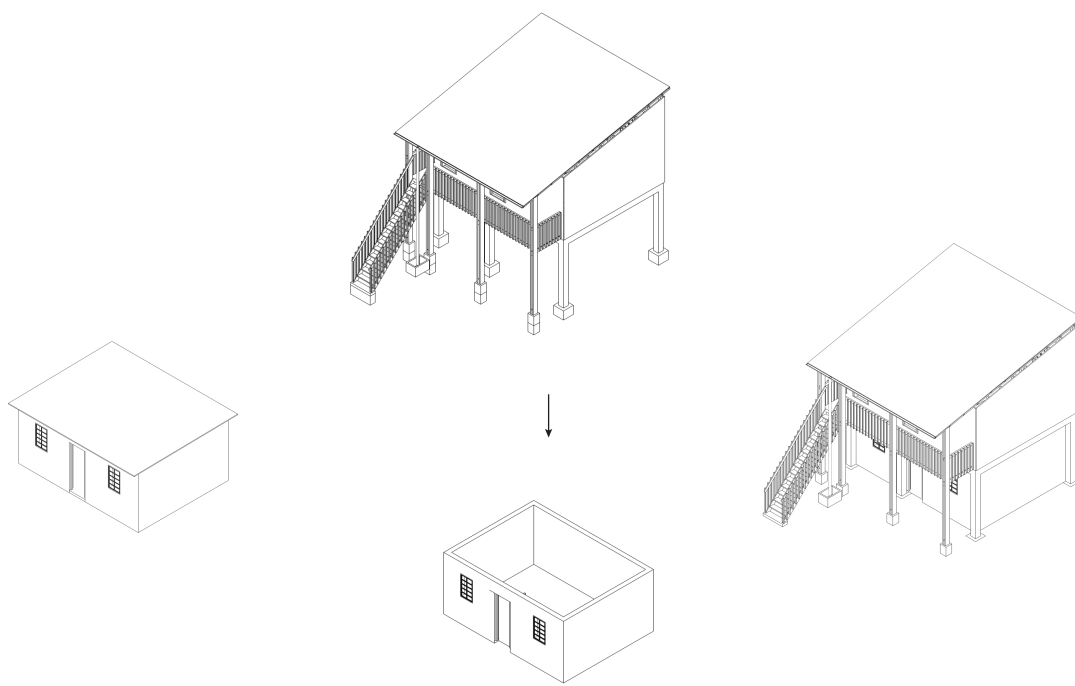
ADDITION

DESIGN FOR THE
GENERIC USE OF SPACE

WELL VENTILATED ROOF

AFFORDABLE LOCALLY SOURCED AND
MODERN MATERIALS

CONCRETE COLUMNS AND FLOOR

WOOD INFILL

WOOD WINDOWFRAMES AND BALUSTRADES

WOOD STAIRCASE

CORRUGATED METAL SHEET ROOF

STACKING OF STRUCTURAL WALLS

EXISITNG CLUSTERING

HIGH DENSITY OF FLOORSPACE

STACKING ROOMS G + 1

CROSS VENTILATION

SELF CONSTRUCTION TECHNIQUES

NO HEAVY MACHINERY REQUIRED

SELF PRODUCED MATERIALS

DEFERRED ENTRY
TO FORMAL SYSTEMS

CONCRETE BEAM AND BLOCK FLOOR

CONCRETE COLUMNS
LIGHTWEIGHT INFILL

ADAPTABLE TO EXISTING HOUSE

LITTLE DIFFERENTIATION IN
CONSTRCUTION ELEMENETS

DWELLER CONTROLLED LOCATION

RENT OUT A ROOM

SOLID CONCRETE FOUNDATIONS
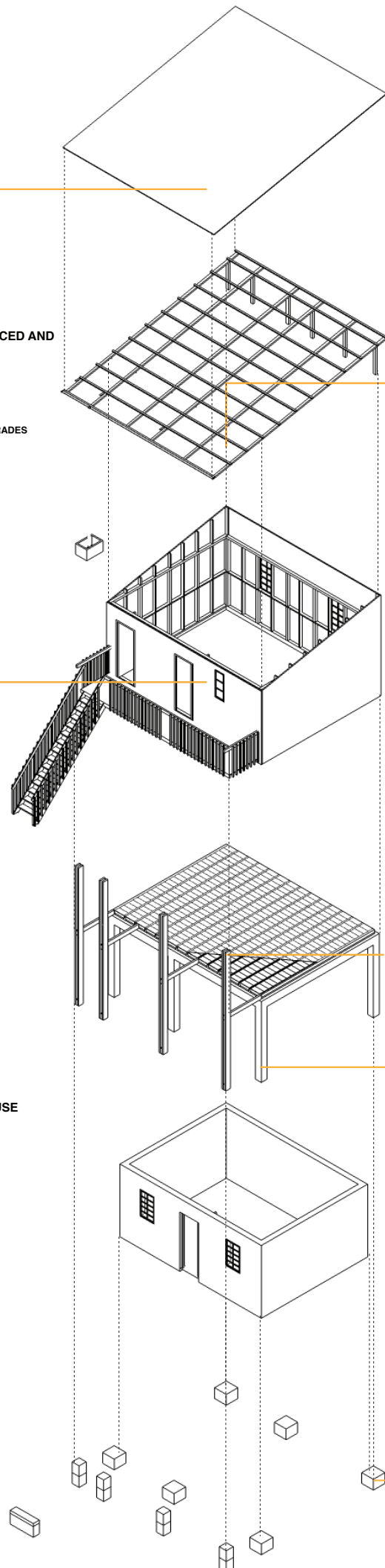
6.6.3 Limitations

In discussing the Cases Meloradas 3.0 project, two main limitations are noted: the dependancy of the design on the qualities and location of the existing housing, and the lack of a step toward formalisation of the informal settlement.

The Cases Melhoradas 3.0 project aims to provide densification of informal settlements through the vertical extension of existing 'cases de blocos'. The rationale behind extension is a recognition of the value of the existing housing in informal settlements, that has been accumulated by the inhabitants over time. A demolish and rebuild approach does not preserve the accumulated assets of the inhabitant. A significant limitation to the extension approach is however the dependance on the location and qualities of the existing housing. In vertically extending an existing house, there is little room for creative architectural input. The Cases Melhoradas 3.0 project has directed its main contribution to the introduction of low cost materials and construction techniques. But the volume and spatial organisation of the architectural product where largely dictated by the existing house.

Much like the SICU and Table House projects, the Casas Melhoradas project is not integrated within an infrastructure or community upgrading programme. This facilitates up-scaleability, as the architectural typology can be adopted by informal practice and replicated all over the city. The lack of an integrated approach when introducing vertical densification however, causes the existing problems in informal settlements, of inaccessibility and lack of basic service provision, to increase. By introducing the possibility to increase the housing capacity if the informal settlement, pressure increases on the already insufficient infrastructural systems. In the cases Melhoradas 3.0 project this increased strain on the existing urban fabric provides a significant limitation.

References

Casas Melhoradas (2015). *Casas Melhoradas.* retrieved from http://casasmelhoradas.com

Architecture in Development (2015). *Casas Melhoradas, Maputo, Mozambique*. retrieved from http://www.architectureindevelopment.org/project.php?id=564

Sebambo, K. (2015) *Low-cost house in Mozambique features corrugated iron and wood.* retrieved from http://www.designindaba.com/articles/creative-work/low-cost-house-mozambique-features-corrugated-iron-and-wood-0

Santos, S. (2015) *Royal Danish Academy of Fine Arts Designs Low-Income Housing Prototypes in Mozambique.* retrieved from http://www.archdaily.com/775748/royal-danish-academy-of-fine-arts-designs-low-income-housing-prototypes-in-mozambique

page intentionally left blank

6.7   Case 5: the Table House in Cape Town, South Africa

The Table House project is a deceptively simple, low-cost combination of posts and beams that can be adapted by inhabitants to suit their specific needs. The concept is a collaboration of Cape Town-based Noero Architects and Rainer Hehl, from the Architecture Design Innovation Program at Berlin's Technical University. The premise of the Table House is to enable a cost effective method of vertical densification, open-ended enough to allow for dweller control, empowering the owner to take charge and shape their home to suit their particular needs.

This case study focuses on recognising concrete solutions for the informal production of multi-story housing. First the strategy component of the Table House Project is discussed, analysing how the typology is implemented. Then the architectural component is addressed, focussing on the benefits of informality and solutions to improve the housing quality and urban density.

Fig. 6.17   Table House in Cape Town, South Africa (BAU Collaborative/Noero Architects, 2016)

6.7.1 **Strategy Component**

The urban fabric of Cape Town has been defined by separation and segregation. According to Jo Noero the inhabitants of informal settlements in the city are convinced that their shacks are "temporary homes while they wait for formal housing", resulting in a lack of investment and appropriation of teh housing in the informal settlements. The design concept of the Table House aims to respond to this situation in three ways, the objectives are to enable the inhabitant to: 1) take charge of extending their house to accommodate a growing household, 2) transform the temporary nature of the informal production of housing into amore permanent one, 3) to develop the housing vertically since the ground level is overcrowded. The Table House is proposed to attain these objectives in a cost effective manner, and also engage the imagination of the inhabitant, giving them control over their housing. The contribution of the Table House, aims to be absolutely minimal: the minimum effort that architecture needs to make in order to create an opportunity for the inhabitant, which can lead to variety. The goal is to trigger a response in people, so that they start to feel responsible for their housing.

Dweller control, as discussed earlier in this thesis, is proposed by Noero and Hehl to change the relationship of people with their property. When people own or have an investment in a property, the relationship changes from temporary to permanent. Noero and Hehl see in the housing strategies of the enabler paradigm as a limited interpretation of the principle of dweller control. "Governments have seen the concept of self-help in enabling strategies as an opportunity to reduce the cost of housing by making people build houses for themselves". They argue that theorists, John Turner among others, were talking about dweller control as a concept that is not limited to "who builds", but more importantly "who decides". The attempt should not be to just make housing cheaper through a reduction in formal construction costs, but to allow for dweller control. Dweller control over "what is build" is reflected in the minimally prescriptive contribution of the architects, allowing the inhabitant to define their own housing.

6.7.2 **Architectural Component**

The table house is a minimal, permanent structure that requires little work to construct and allows the inhabitant full control over the organisation of the internal spaces of the house. The biggest challenge facing the inhabitants of informal settlements is the skill and technical know-how to build upward, which is the only way that growth can take place given the overcrowded nature of the informal settlements. The construction of the Table House is well within the capacity of local people, with the only capital cost being the materials. The cost is deemed affordable for low-income families, considering the opportunities it provides. According to the architects the Table House is a system of which the permutations are endless, and the potential limitless. A diagonally braced sliding system was developed which could be adjusted to create a table top in the different sizes (from 2.4x2.4m, to a maximum of 4.4x4.4m) necessary to accommodate different sized shacks. The design of a system of connections that would enable lateral expansion of the table structure in all four directions has received considerable attention. A support system has been devised for the four columns to ensure that they are correctly placed relative to the shack, and were straight and true. The resulting system allows for vertical densification, offers a relatively cost-effective and safe way to expand a dwelling, and is open-ended enough to allow the owner to take charge and shape the home to suit their particular needs.

Designed with little differentiation in construction elements to reduce cost

Little differentiation in construction elements, generally results in an affordable design. When attempting to design an affordable solution to the informal production of housing, reducing the amount of specific new construction elements necessary increases the viability of the adoption of the design. The main principle underlying the Table House project is its minimal nature. Less architectural design is intended to provide more inhabitant control and to improve the affordability of the concept. To further improve the affordability of the design, the amount of different construction elements is limited. Every material or tool that is introduced to the current production of informal housing increases the cost, and decreases the viability of the design solution as an adequate alternative to the informal production of housing.

Fig. 6.18   above: the projected urban fabric, showing different clustering formations of the units. (own illustration).
   below: clustering principe: **detached housing** shacks sharing a table construction frame (own illustration).
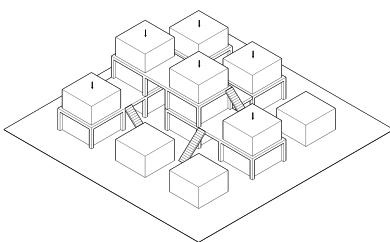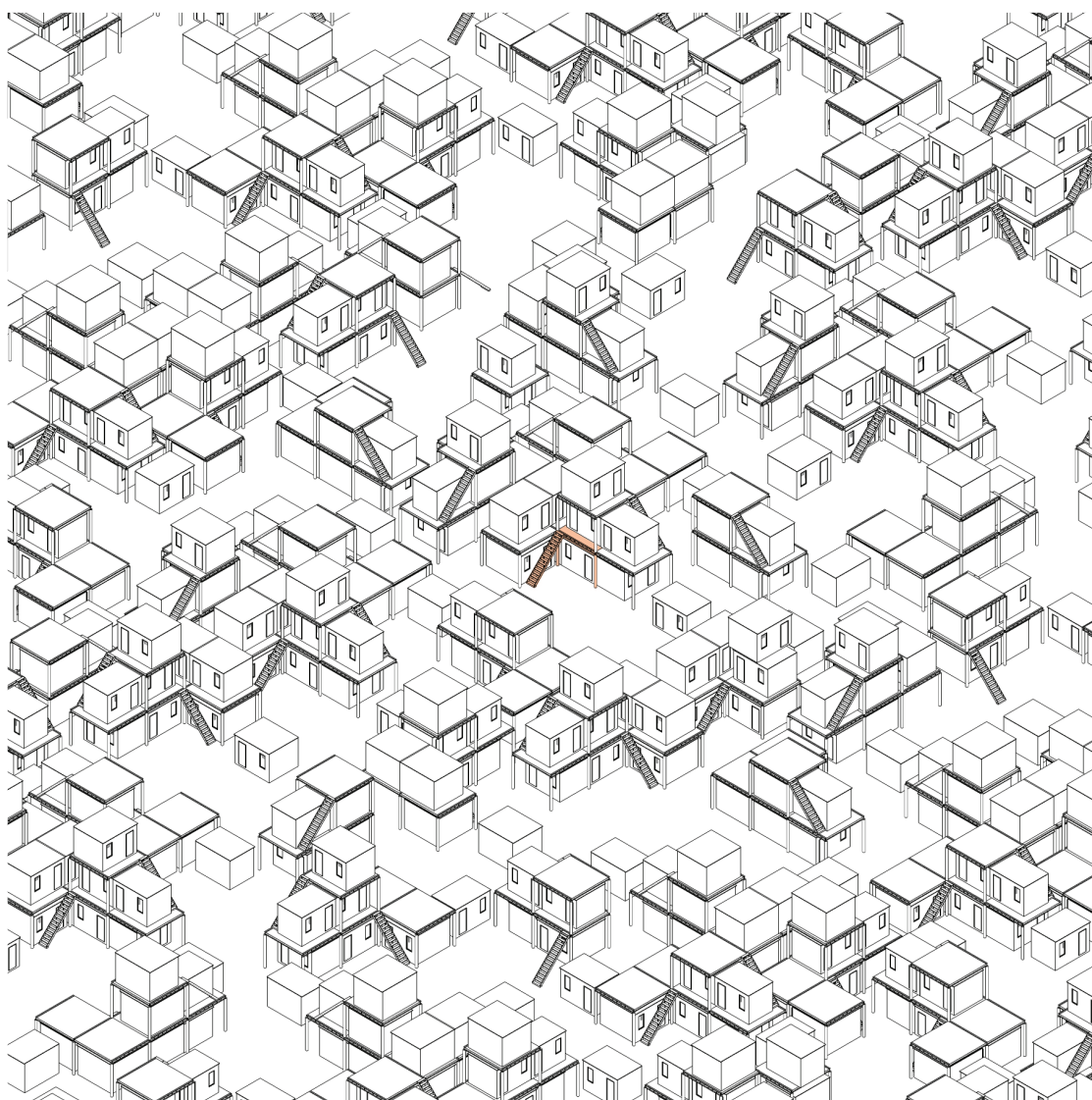
The Table house project focusses on providing the minimal contribution to produce multi-story construction. There is the option of developing additional components—staircases, cladding systems, etc.—that can, over time, form the basis for profitable businesses run by local entrepreneurs. But the viability of the design concept does not depend on these additions.

Designed to fit into formal systems with deferred entry (delaying tax payment) allowing for informal basic service alternatives until formalisation

When a housing strategy requires instant formalisation, the (often unemployed) inhabitant is confronted with costs they have not yet been required to pay. For many inhabitants of upgraded informal settlements and formal housing the requirement to pay taxes and basic service charges have led them to rent out their house to a middle class family who can afford such payments. The Table house project does not specify and approach to formalise the informal settlement and thereby require the payment of taxes and service charges. The project proposes that the inhabitant utilises the current affordable informal basic service alternatives until the households are able to collectively demand and pay for formalisation. The Table House allows the inhabitant to make a more permanent claim to the land they inhabit, in comparison to the current lightweight shacks. The project "offers hope to shack dwellers that they too can put down roots and create more permanent homes for themselves". Without the requirement to fit into formal systems immediately, demanding taxes payments and basic service charges, the project does facilitate an affordability in this alternative for vertical densification of informal settlements.

Designed as a pattern, open to contextualisation

A generic design of the housing unit should allow for customisation to the specific local conditions of the context and to the individual needs of the inhabitant. A design should allow the inhabitant to control phasing of the construction and individual appropriation. The Table House is an attempt to minimise the architectural design of multi story housing, allowing maximum dweller control over construction of housing. In its openness the design resembles Le Corbusiers Dom-ino project, proposed as an open floor plan consisting of concrete slabs supported by a minimal number of thin, reinforced concrete columns around the edges, with a stairway providing access to each level on one side of the floor plan. Both these designs aim to provide a model for complete freedom to design the interior configuration.

Designed to create a hierarchy of public to private spaces increasing social control and security

The design of the housing should include a hierarchy of public to private spaces. Especially in the design of a multi-story typology, the design of open space is relevant in informal settlements. Local housing customs often cannot be accommodated in apartments that have no connection to private or collective open space. The Table house design allows for the introduction of an collective open space above the ground floor. This introduces the opportunity to create collective space increasing social control and security among inhabitants. The stable new ground plane above the existing one can accommodate shared functions as a intermediary between public and private space.
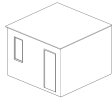
Designed to stack housing units trough concrete columns with lightweight infill

There are two methods to vertically extend informal housing recognised in the cases, a Dom-ino like concrete structure proposes a solution that allows the inhabitant a freedom and control over the spatial organisation of the separation walls. The minimal effort that is proposed in the Table House project to allow for optimal dweller control is a structural frame that can be filled in to the owners specific needs. Within a structural frame of concrete columns and a beam and block floor the inhabitant can fill in a shack as they are constructed currently in the informal settlement.
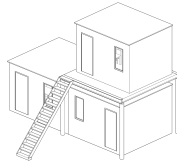
Fig. 6.19   addition of rooms / housing units in the Table House project (own illustration).
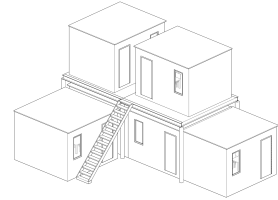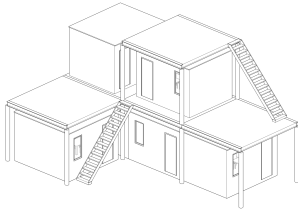Fig. 6.20   exploded axonometry of a table frame of the Table House project (own illustration)
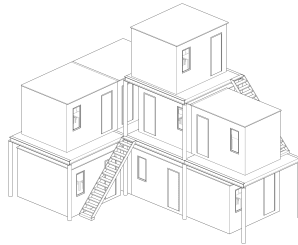
PHASE 1

PHASE 2
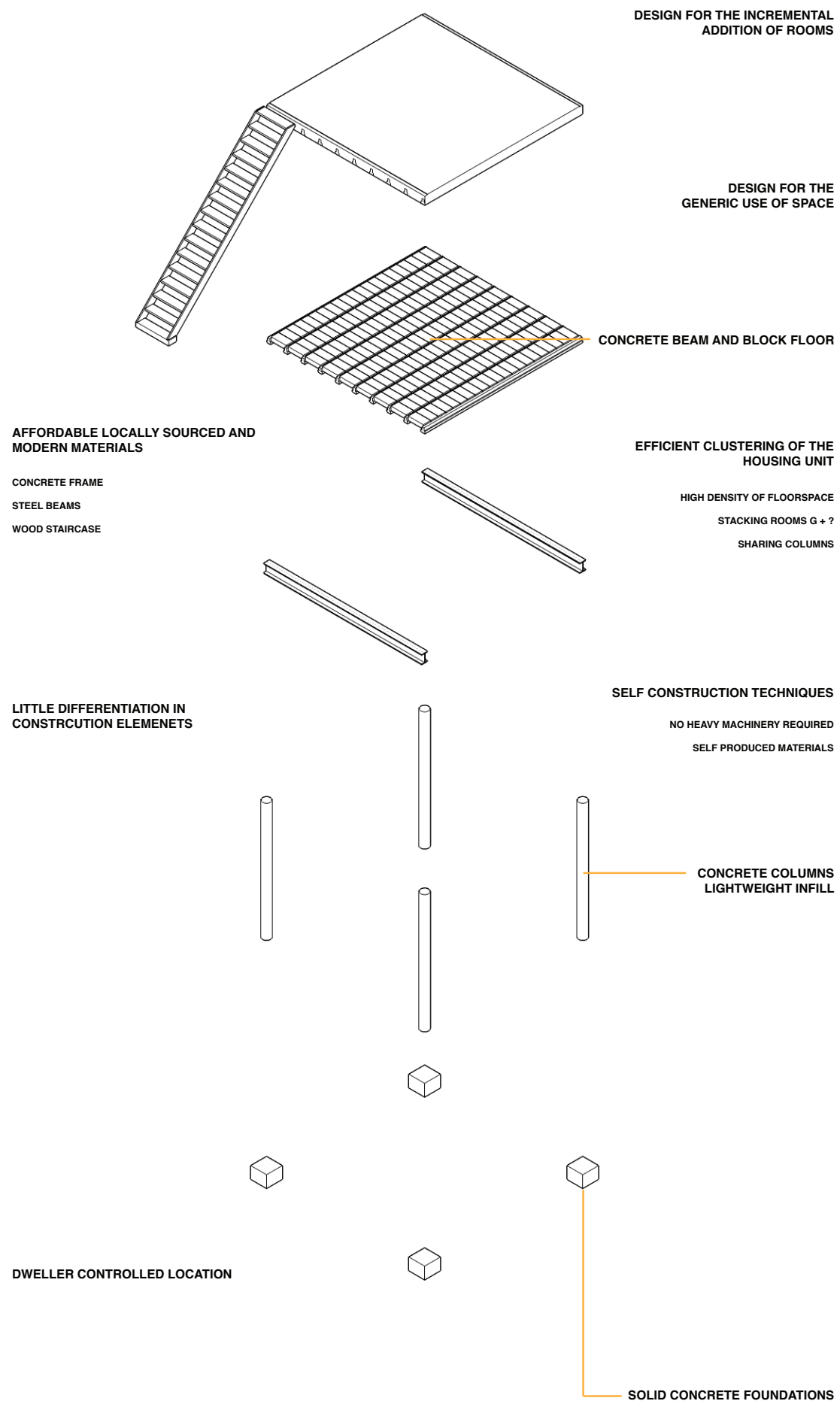

PHASE 3

PHASE 4

PHASE 5

OPEN ENDED

DESIGN FOR THE INCREMENTAL
ADDITION OF ROOMS

DESIGN FOR THE
GENERIC USE OF SPACE

CONCRETE BEAM AND BLOCK FLOOR

AFFORDABLE LOCALLY SOURCED AND
MODERN MATERIALS

CONCRETE FRAME

STEEL BEAMS

WOOD STAIRCASE

EFFICIENT CLUSTERING OF THE
HOUSING UNIT

HIGH DENSITY OF FLOORSPACE

STACKING ROOMS G + ?

SHARING COLUMNS

LITTLE DIFFERENTIATION IN
CONSTRCUTION ELEMENETS

SELF CONSTRUCTION TECHNIQUES

NO HEAVY MACHINERY REQUIRED

SELF PRODUCED MATERIALS

CONCRETE COLUMNS
LIGHTWEIGHT INFILL

DWELLER CONTROLLED LOCATION

SOLID CONCRETE FOUNDATIONS

6.7.3 Limitations

There are certain limitations to the Table House approach, two main issues stand out: the lack of suggestions to improve housing quality, and the density intensification of an inaccessible and under-serviced settlement.

An important limitation to the table house project is paradoxically it's main strength; its non-prescriptive nature. As the Table house design does not provide any architectural input other then a generic floor on columns, the possibilities for the inhabitant are endless. However this architectural product is far from an inhabitable house; it only facilitates the stacking of poor quality shacks. The design focusses solely on the issues of density and permanence, while many more housing issues arise in the daily lives of inhabitants of informal settlements. By not prescribing a housing design, the The Table house neglects to contribute any solutions or ideas on issues such as: safe cooking, fire safety, basic service provision, privacy, climate design, security, sanitation, accessibility, etc. A substantial limitation to the aspiration not to control any part of the housing design other then introducing verticality, is that inhabitants are not suggested any improvements to their informally produced housing.

Since the Table House project is not part of a community upgrading or infrastructural programme, there is no guidance in urban planning. While the project aims to increase the density in informal settlements, there is no solution to typical informal settlement issues of accessibility and basic service provision. By contributing a technique for densification, the amount of inhabitants making use of the already insufficient accessibility and informal basic services increases, contributing to a greater problematic. The project allows for full dweller control over housing, giving the inhabitant no principles or rules for clustering of the housing, as extension is possible in every direction. Without guidance the individual densification efforts are unlikely to allow for sufficient open space and access routes. The urban fabric in informal settlements will therefore not escape an inaccessible and unsustainable character. Would the project specify an relation to infrastructure provision or formalisation, a major limitation to the project could be overcome.

References

Wilk, E. (2016) *Jo Noero on Self-Help Housing, Neoliberalism, & What Patrik Schumacher Doesn't Understand.* retrieved from http://www.metropolismag.com/Point-of-View/November-2016/What-Went-Wrong-with-Self-Help-Housing-And-How-to-Fix-It/

BAU Collaborative/Noero Architects (2016). *Cape Town and the Housing Question*. retrieved from http://www.urbanxchanger.com/eng/conteudos/visualizar/Top-Table

7   Conclusions

This chapter presents the conclusions of the thesis, separated in two parts; the first part addresses in housing strategies and typologies the priorities of the main actors involved, the second part presents generic guidelines on the design of housing for the urban poor. The results are first summarised of the evaluation of housing strategies presented in chapters 2,3,4 and 5. A brief overview of the evaluation concludes on the characteristics of dealing with conflicting priorities in housing strategies. The second part presents the results of the in chapter 6 performed case studies of relevant strategy examples, concluding on design guidelines derived from practical solutions found in prototypes or pilot projects of assisted informal multi-story housing, addressing the conflicting priories in the evaluation framework.

Addressing in housing strategies and typologies the priorities of the main actors involved

The proliferation of the informal construction of housing in Sub-Saharan Africa is fuelled by rural urban migration. The locus of poverty in Sub-Saharan Africa is shifting to cities, a process now recognised as the "urbanisation of poverty". In the absence of sufficient provision or enabling of housing, this process manifests in the proliferation of informal settlements. But "…informal settlements and urban poverty are not just a manifestation of a population explosion and demographic change, or even of the vast impersonal forces of globalization. Informal settlements must be seen as the result of a failure in housing policies, laws and delivery systems, as well as of national and urban policies. Although urban centres throughout the world now hold more of the 'poorest of the poor' than ever before, the urban poor are usually able to help themselves and to access official assistance more than their rural counterparts. Indeed, the immigrant poor have largely moved to city slums voluntarily in order to find jobs" (UN-Habitat, 2003a).

Government intervention in housing for the urban poor, has followed two schools of thought: the provider paradigm and the enabler paradigm. Strategies belonging to the provider paradigm focus on the reduction of housing deficits and improvement of housing quality though the government provision of housing. The bias is predominantly quantitative and aims to realise economies of scale based on capital-intensive mass production of standardised houses or components and a large consumer market. Enabling strategies recognise the efficacy and productivity of the informal housing processes of the urban poor: an existing resource that might be exploited to advantage by government housing authorities. As John Turner argues: "informal settlements solve more problems (of housing low income families and communities) than they create". Strategies belonging to the enabler paradigm oppose the provision of housing arguing that what matters in housing is what it does for people rather than what it is, leading to the principle of self-government in housing: dweller control.

Evaluation of the housing strategies has shown their measure of adherence to the priorities of the main stakeholders in informal settlements: the inhabitant and the government. It can be observed that the informal production of housing is arranged most in alignment with the identified inhabitant priorities. Alignment with cost related government priorities explain the prevalence of a laissez-faire approach to the informal production of housing. Although enabler strategies arose from the critique that provider paradigm strategies produce "mismatches between people's needs and the housing supplied by institutions" (Turner 1972), they themselves do not better align with inhabitants' priorities. A key misconception in these strategies has been that dweller control was defined by self construction, but not by control over what is constructed where, and when. Both paradigms lack this form of dweller control and produce housing that requires the inhabitant to participate in formal society, with consequential tax obligations and basic service charges. The main conclusion drawn in the evaluation is the recognition of a tradeoff in control over the location and construction of housing. This tradeoff produces a set of interlinking characteristics for dealing with conflicting priorities in informal settlements. These characteristics are made explicit in a visual decision making tool (refer to page nr.)

Design guidelines for housing strategies addressing the informal production of housing

The main objective of this thesis has been to produce design guidelines on the typology and housing strategy that best addresses the priorities of the main actors in informal settlements; the inhabitants and the government. A case is made for the approach of assisted informal multi-story housing: by supporting and improving the current informal production of housing and its informal rental system, the strategy aims to align government priorities on quality with a financial motivation (cost priority) for the inhabitant.

In advocating a strategy of assisted informal multi-story housing, the inhabitant benefits from the solutions that are offered by the informal production of housing. Government priorities of increased urban density and housing quality are proposed to be addressed through suggestion, that proposes a financial benefit to the informal house owner of increased possibilities in extending their house and renting out rooms. By introducing self built techniques to realise multi-story construction, the current limitation to expansion in informal settlements, horizontal overcrowding, is removed, allowing the inhabitant owner to expand and construct more rooms for informal rent. The strategy proposes a financial motivation to bring the government priorities of adequate housing quality and urban density more in alignment with the inhabitant priority of income generation from informal rent. Introducing vertical extension of the informal housing, negotiates an increased urban density, limiting the phenomenon of urban sprawl.

The strategy aims to support and improve the systems of informal rental housing delivery that are in place and already working well, as opposed to policies which seek to replace and disturb the functioning systems, or forcing them to go underground. The strategy of assisted informal multi-story housing negotiates government priorities of reduced urban sprawl and increased housing quality, while allowing for the inhabitants priorities recognised in the informal production of housing. More specifically: the strategy allows for complete dweller control over the location and construction of housing, merely suggesting new technologies that allow for the improvement of the current practice of informal rent, according to government priorities.

In an attempt to formulate practical solutions on how the assisted informal multi-story approach addresses the conflicting priories in the evaluation framework, five case study project have been reviewed: 1) The Kambi Moto project in Nairobi, Kenya, 2) Empower Shack 2.0 in Cape Town, South Africa, 3) the Sustainable Incremental Construction Unit (SICU) in Addis Ababa, Ethiopia, 4) Casas Melhoradas in Maputo, Mozambique & 5) the Table House project in Cape Town South Africa.

The case studies have focussed on identifying solutions from practice to the interlinking characteristics of dealing with conflicting priorities in informal settlements. Overarching principles are sought that are typical to the strategy; aligning government priorities on quality with complete dweller control over the location and construction of housing. An emphasis has been placed on the architectural analysis of the prototypes, in drawings and schemes, to illustrate solutions. (pages ..) The study has brought forth a diverse set of design principles. The next page presents these in a set of guidelines ordered in 4 categories:

1)   *The benefits of informality: housing arranged in alignment with dweller priorities.*

2)   *Assistance to improve quality: government standards (control) on construction and housing quality.*

3)   *Multi-story intensification of density: government standards (control) on location and urban density.*

4)   *Implementation of the strategy: how government standards (control) are delivered to the inhabitant.*

[GUIDELINES]

Bibliography

Abrams, C. (1964). *Man's Struggle for Shelter in an Urbanising World*. Cambridge: Massachusetts Institute of Technology Press

Acioly, C. and Davidson, F. (1996). *Density in Urban Development*, in Building Issues Vol. 8, Lund University.

Appadurai, A. (2002). *Deep Democracy: Urban Governmentality and the Horizon of Politics*. Public Culture 14.1: 21-47.

Arroyo, I. (2013). *Organised self-help housing as an enabling shelter & development strategy. Lessons from current practice, institutional approaches and projects in developing countries*. Licentiate thesis 9. Housing Development & Management, Lund: Lund University

Bredenoord, J., van Lindert, P., & Smets, P. G. S. M. (Eds.) (2014). *Affordable Housing in the Urban Global South: Seeking Sustainable Solutions*. New York: Routledge.

Brenner, N., Marcuse, P., & Mayer, M. (2012). *Cities for People, not for Profit. Critical urban theory and the right to the city*. London: Routledge.

Bruenckner, J. K., & Lall, S. V. (2014). *Cities in Developing Countries: Fuelled by Rural-Urban Migration, Lacking in Tenure Security, and Short of Affordable Housing,* Handbook of Regional and Urban Economics (Vol. 5): Elsevier.

Burgess, R. (1978). *Petty Commodity Housing or Dweller Control? A Critique of John Turner's Views on Housing Policy*. World Development.

Burgess, R. (1982). *Self Help Housing Advocacy: A Curious Form Of Radicalism. A critique of the work of John Turner*, in, Ward, P. (ed): *Self Help Housing. A critique*, Mansell Publishing LTD, London.

Correa, C. (1989). *The New Landscape: Urbanisation in the Third World*. Singapore: Butterworth Architecture

Correa, C. (2013). "*the gestures of human occupation*" speech to the RIBA on Wednesday 15 may 2013 (retrieved from https://www.youtube.com/watch?v=oB8TNT0DHSk)

Correa, C. (2014). Lecture at Delft University of Technology, in Faculty of Architecture. Delft.

Davis, M (2004). *Planet of Slums: Urban Involution and the Informal Proletariat*. New Left Review.

De Jong, T. M. & van der Voordt, D. J. M. (2002). *Ways to study and research urban, architectural and technical design*. Delft, DUP.

Donley-Reid (1990). *A Structuring Structure: The Swahili House*, in Kent, S. (ed.), *Domestic Architecture and Use of Space: An Inter Disciplinary Cross-cultural Study*, Cambridge University.

Ehebrecht, D. (2014). *The Challenge of Informal Settlement upgrading; Breaking New Ground in Hangberg, Cape Town?* Potsdamer Geographische Praxis, Potsdam.

Fathy, H. (1973). *Architecture for the Poor*, University of Chicago Press.

Finmark Trust (2012). *Subsidised Housing Assets, Exploring the Performance of Government Subsidised Housing in South Africa.* retrieved from http://informalcity.co.za/subsidised-housing

Hamdi, N. (1995). *Housing Without Houses: Participation, Flexibility and Enablement*, New York: Van Nostrand Reinhold Company.

Harris, R. (2003). *A double irony: the originality and influence of John F.C. Turner*. Habitat International, 27 (2), 245–69.

Huchzermeyer, M. (2004). *Unlawful Occupation: Informal Settlements and Urban Policy in South Africa and Brazil*. Trenton: Africa World Press.

Huque, A. (1982). *The Myth of Self-Help Housing, A critical Analysis of the Conventional Depiction of Shanty Towns*, Royal Institute of Technology.

Jenkins, P., Smith, J., & Wang, Y. P. (2007). *Planning and Housing in the rapidly Urbanising World*. London: Routledge.

Kruse, H. & Torstensson, L. (2010). *Vertical extension of the Urban Swahili house. A proposal for standardised two-story construction*, Master thesis in Civil Engineering and Urban Management, The Royal institute of Technology, Stockholm.

Lupala, J.M. (2002). *Urban types in rapidly urbanising cities. Analysis of Formal and Informal settlements in Dar es Salaam, Tanzania*. Doctoral Thesis. Department of Infrastructure, The Royal Institute of Technology, Stockholm.

Mamdani, M. (1996). *Citizen and Subject: Contemporary Africa and the Legacy of Late Colonialism.* Princeton University Press.

Marcuse, P. (1992). *Why Conventional Self-Help Projects Won't Work*, in Mathéy (ed), *Beyond Self-Help Housing*, United Kingdom: Mansell Publishing Limited.

Marcuse, P. (2009). *From critical urban theory to the right to the city.* City: analysis of urban trends, culture, theory, policy, action.

Mathey, K., ed. (1992). *Beyond Self-Help Housing*. United Kingdom: Mansell Publishing Limited.

Mitlin, D. and Satterthwaite, D. (2013). *Urban Poverty in the Global South: Scale and Nature.*

Nairobi City Council (2013). *Kenya's Waste Management challenge*. Nairobi, IRIN.

Napier, M. (2002). *Core Housing, Enablement and Urban Poverty. The Consolidation Paths of Households Living in Two South African Settlements.* Doctoral Thesis, University of Newcastle upon Tyne.

Nguluma, H. M. (2003). *Housing Themselves. Transformations, Modernisation and Spatial Qualities in Informal Settlements in Dar es Salaam, Tanzania*. Doctoral thesis, KTH.

Participatory Slum Upgrading Programme (2011). *Phase 2 Country Outputs* (retrieved from: www.mypsup.org)

Payne, G. & Majale, M. (2004). *The Urban Housing Manual. Making Regulatory Frameworks Work for the Poor.* London: Earthscan Publications

Pugh, C. (2000). *Squatter Settlements: Their Sustainability, Architectural Contributions, and Socio-Economic Roles*. In: Cities 17 (5), 325–337.

Pugh, C. (2001). *The Theory and Practice of Housing Sector Development for Developing Countries, 1950-99*. Housing Studies. 16.4: 399-423

Rasmussen, M. I. (2013). *The Power of Informal Settlements. The Case of Dar Es Salaam, Tanzania*. Planum. The Journal of Urbanism vol. 1 / 2013.

Saunders, D. (2010). *Arrival City: How the Largest Migration in History Is Reshaping Our World*. Random House.

Sheuya, S. (2004). *Housing transformations and Urban Livelihoods in informal settlements.* Spring Research Series No 45.

Smith, D.A. (1996). *Third World Cities in Global Perspective: The Political Economy of Uneven Urbanisation*. USA: Westview Press, Inc.

Stokes, C.J. (1962). *A Theory of Slums,* Land Economics. 38.3: 187-197.

Therien, J. P. (2010). *Beyond the North-South divide: The two tales of world poverty*. Third World Quarterly.

Tipple, G. (1991). *Self-Help Transformations of Low Cost Housing. An Introductory Study*, CARDO, Newcastle Upon Tyne.

Tipple, G. (2000). *Extending Themselves: User Initiated Transformations of Government-Built Housing in Developing Countries*, Liverpool University Press, U.K.

Turner, J.F.C. (1968). *Housing Priorities, Settlement Patterns, and Urban Development in Modernising Countries*, Journal of the American Institute of Planners, 34:6, 354-363, DOI: 10.1080/ 01944366808977562

Turner, J.F.C. (1972). *Housing as a Verb*. In: Turner, J.F.C. and Fichter, R. (Eds.): *Freedom to Build*. New York: Macmillan, 148–175.

Turner, J.F.C. (1976). *Housing by People, Towards Autonomy in Building Environments.* London, Marion Boyars.

Turner, J.F.C. (1996). *Tools for Building Community: An Examination of 13 Hypotheses*, Habitat International, 20 (3), 339-47.

UN-Habitat (2001). *A Voice for the Voiceless, A Message from Mrs. Anna Tibaijuka, the Executive Director of UNCHS*. retrieved from http://www.un.org/ga/Istanbul+5/booklet3.pdf

UN-Habitat (2002). *Cities without Slums,* Nairobi, The World Urban Forum.

UN-Habitat (2003a). *The Challenge of Slums, global report on human settlements.* London, UN-Habitat.

UN-Habitat (2006). *Enabling Shelter Strategies. Review of Experience from Two Decades of Implementation*. Nairobi, UN-Habitat.

UN-Habitat (2007). *What are slums and why do they exist? Twenty First Session of the Governing Council.* Nairobi, UN-Habitat.

UN-Habitat (2008a). *State of the World's Cities 2008/2009*: *Harmonious Cities.* London, Earthscan.

UN-Habitat (2008b). *The State of African Cities 2008: A framework for addressing Africa's urban challenges*. Nairobi, UN-Habitat.

UN-Habitat (2009). *Global Report on Human Settlements: Backgrounder on Urban Informality.* Nairobi, UN-Habitat.

UN-Habitat (2010a). *State of African Cities 2010: Governance, Inequality and Urban Land Markets.* Nairobi, UN-Habitat.

UN-Habitat. (2010b). *The Ethiopia Case of Condominium Housing: The Integrated Housing Development Programme*. Nairobi: UN-Habitat.

UN-Habitat (2011a). *The State of the World's Cities Report 2010/11*. Nairobi, UN-Habitat.

UN-Habitat (2011b). *Quick Guide 2: Low-income Housing Housing the Poor in African Cities.* Nairobi, UN-Habitat

UN-Habitat (2012). *Urban Patterns for a Green Economy: Leveraging Density.* Nairobi, UN-Habitat

UN-Habitat (2013a). *Time to think urban: 53 UN-Habitat Model Projects - 2013/2014.* Nairobi, UN-Habitat.

UN-Habitat (2013b). *State of the World's Cities, 2012/2013, Prosperity of Cities.* New York, UN-Habitat.

UN-Habitat (2014). *Housing & slum upgrading*, retrieved from http://unhabitat.org/urbanthemes/housing-slum-upgrading

UNCHS (1996). *An Urbanising World: Global Report on Human Settlements.* Oxford, UNCHS.

UNDP (2016). *Sustainable Development Goal 11: Sustainable Cities and Communities* (retrieved from: http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-11-sustainable-cities-and-communities.html)

Vestbro, D.U. (1975). *Social life and dwelling space. An analysis of three house types in Dar es Salaam*. University of Lund, College of Architecture.

Vestbro, D.U. (2008). *Are architects and planners obstacles to slum upgrading?* Papers from a seminar in Barcelona in April 2008. Division of Urban and Regional Studies, KTH Royal Institute of Technology, Stockholm.

Vestbro, D.U. (2012). *Development aspects of formal and informal urban types*

Wakely, P. & Riley, E. (2011). *The Case for Incremental Housing,* Cities Alliance Policy Research and Working Paper Series No.1. Washington DC, USA.

Wakely, P. (2014). *Urban public housing strategies in developing countries: whence and whiter paradigms, policies, programmes and projects*, DPU Working Paper Series: Reflections NO. 163/60

Werlin, H. (1999). *The Slum Upgrading Myth*. Urban Studies. 36.9: 1523-1534.

Wolf, Heinrich. (2010). *Flats of Du Noon, A study of Owner Developed Rentable Housing*. retrieved from www.informalcity.co.za/print/41

World Bank (1990). *World Development Report 1990 – Poverty*. Oxford, Oxford University Press.

World Bank (1993). *Housing – Enabling Markets to Work.* Washington D.C., World Bank.

Yin, R. (1994). *Case Study Research, Design and Methods.* London, SAGE Publications.

Zack, T. & Charlton, S. (2009). *Background paper on low-income housing in Africa*. Nairobi, UN-Habitat.