Legitimizing Informality:
A Self-Built Path to Self-Reliance in Mombasa

by

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Dalhousie University is located in Mi'kmaq'i,
the ancestral and unceded territory of the Mi'kmaq.
We are all Treaty people.

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Abstract

Today, over half the world's population lives in cities. As a result of urban migration, cities in the developing world are currently experiencing an unprecedented surge of informal settlements. Such is the case in Mombasa, a vibrant, multicultural port city on the coast of Kenya, currently facing an ongoing housing crisis attributed to the influx of urban migrants.

All too often, these settlements are a manifestation of urban exclusion, and their inhabitants are overlooked in city planning initiatives and developmental strategies, leaving them without options to improve their well-being.

This thesis questions the role informal settlements play in our world today and looks to harness the resilience, flexibility and creativity they are known to display. Through a self-build approach, architectural interventions that embrace the kinetic nature of informal settlements will be designed, focusing on communal space, self-reliance and knowledge mobilization to create spaces that support resident lives and livelihoods.

Acknowledgements

To Susan Fitzgerald and Richard Kroeker, who provided unwavering support and pivotal insights throughout the thesis project, thank you. To Christina Verissimo, who helped push my ideas forward and brought out the best version of the architect within me, thank you.

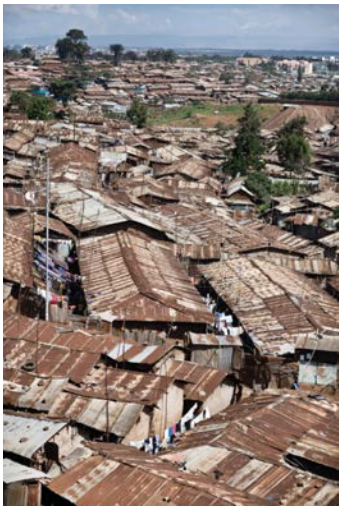
Thank you to my peers for inspiring me to overcome mental hurdles and comforting me when deadlines were approaching. Getting interrupted from work for an impromptu brainstorming or crit session by you was my favourite part of architecture school.

To Yara, for the discussions, encouragement, and company through all the lockdowns, you were always by my side even if you were far away. Thank you for pushing me to do my best.

Finally, thank you to my family, who worked so hard to provide me with the opportunity to pursue my passion. To my parents, who always support my endeavours wholeheartedly and have shown me the importance of giving back, thank you. And to my brother, for always being there to keep me motivated with your little pep talks, thank you.

Chapter 1: Introduction

Today, roughly one in every six people alive resides in an informal settlement where they occupy land illegally within cities in the developing world (UN Habitat 2004). Often seen as scars on the urban fabric of a city, such settlements are defined by their substandard housing, crowded living conditions, a lack of legal security, and inadequate infrastructure (UN Habitat 2003, 18). However, the people living there and the communities formed are just as legitimate as those in the formal city. Nevertheless, development plans often overlook these residents, rendering the people without a voice and further exacerbating the issues they face.



The densely packed corrugated roofs of Kibera settlement, Nairobi (Torfinn 2009).

While attempts to upgrade informal settlements have been made, they often fail to improve the inhabitants' lives, especially since these top-down initiatives tend to focus more on creating aesthetics similar to the formal fabric of the city. Setting such a standard fails to accommodate the needs of the initial informal dweller, leaving them in search for housing that better meets their needs, often forcing them to relocate into another informal settlement and pushing them towards lands that are difficult to inhabit.

Generic towers overlooking slums similar to the ones which once stood in their place (Petrella et al. 2016, 26).

If our intentions are to genuinely improve the well-being of those living in informal settlements, it is integral to first understand their situation and the conditions of informality in order to better inform the eventual solution. This entails getting rid of the notion that fixing such settlements requires them to be formalized. Instead, we should focus on rediscovering the unique aspects of informality that have made them so resilient and allowed them to provide solutions (although not ideal) for an exponentially expanding population whose needs continue to change.

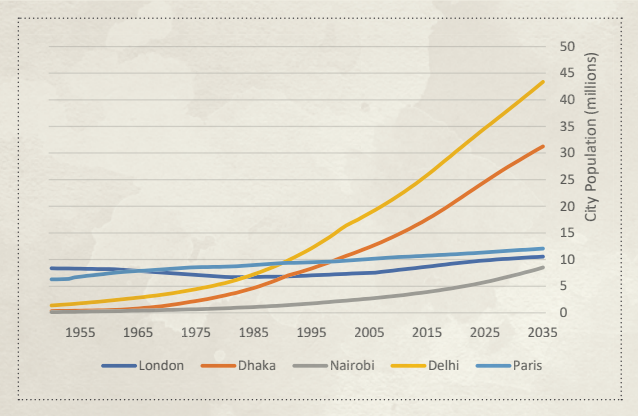
Based in Mombasa, Kenya, this thesis will begin by outlining the causes and consequences of informality to better understand the situation at hand. From there, the notion of the self-built community will be explored to build a theoretical framework on which this thesis is based. Through this process, the temporal and kinetic nature of informal settlements will be translated into a flexible design and used to address situations of informality, demonstrating how we might bolster a sense of community in a space that is constantly changing. This will serve as a pilot project that empowers informal dwellers through building construction education, prioritizing the transfer of knowledge and generating income in the process.

Mombasa's airport road splits an informal settlement from a developed neighbourhood and a petroleum refinery. Many informal settlement remain trapped by such roads, leaving little room for lateral growth (Google Earth n.d.)

Chapter 2: Informality at a Glance

Consequences of Rapid Urbanization

Throughout the 20th century, rates of urbanization largely surpassed their anticipated projections. As the global population increased from 2.5 billion people in 1950 to almost 8 billion today, cities have absorbed nearly two-thirds of the population explosion (Davis 2006, 2). Moreover, current rates of urbanization in the developing world surpass those of Europe and North America, where cities have had the chance to progressively develop over longer periods of time.

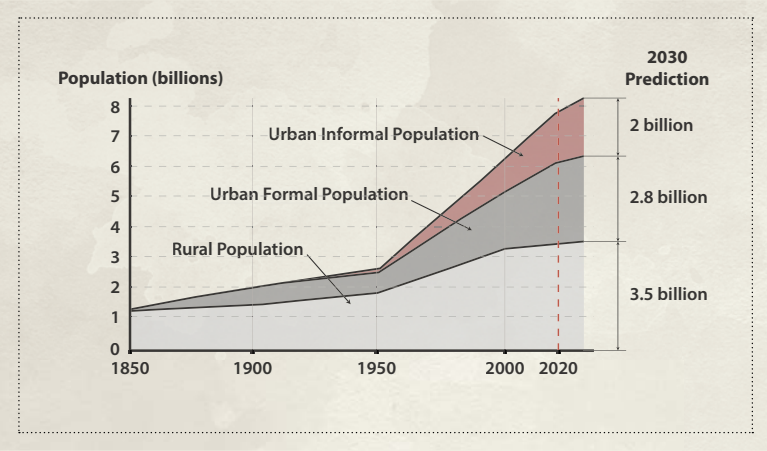


Population demographics of 5 cities, showcasing the rapid population increase of developing cities (Delhi, Dhaka and Nairobi) compared to more developed cities (London and Paris). (data from World Population Review n.d.b)

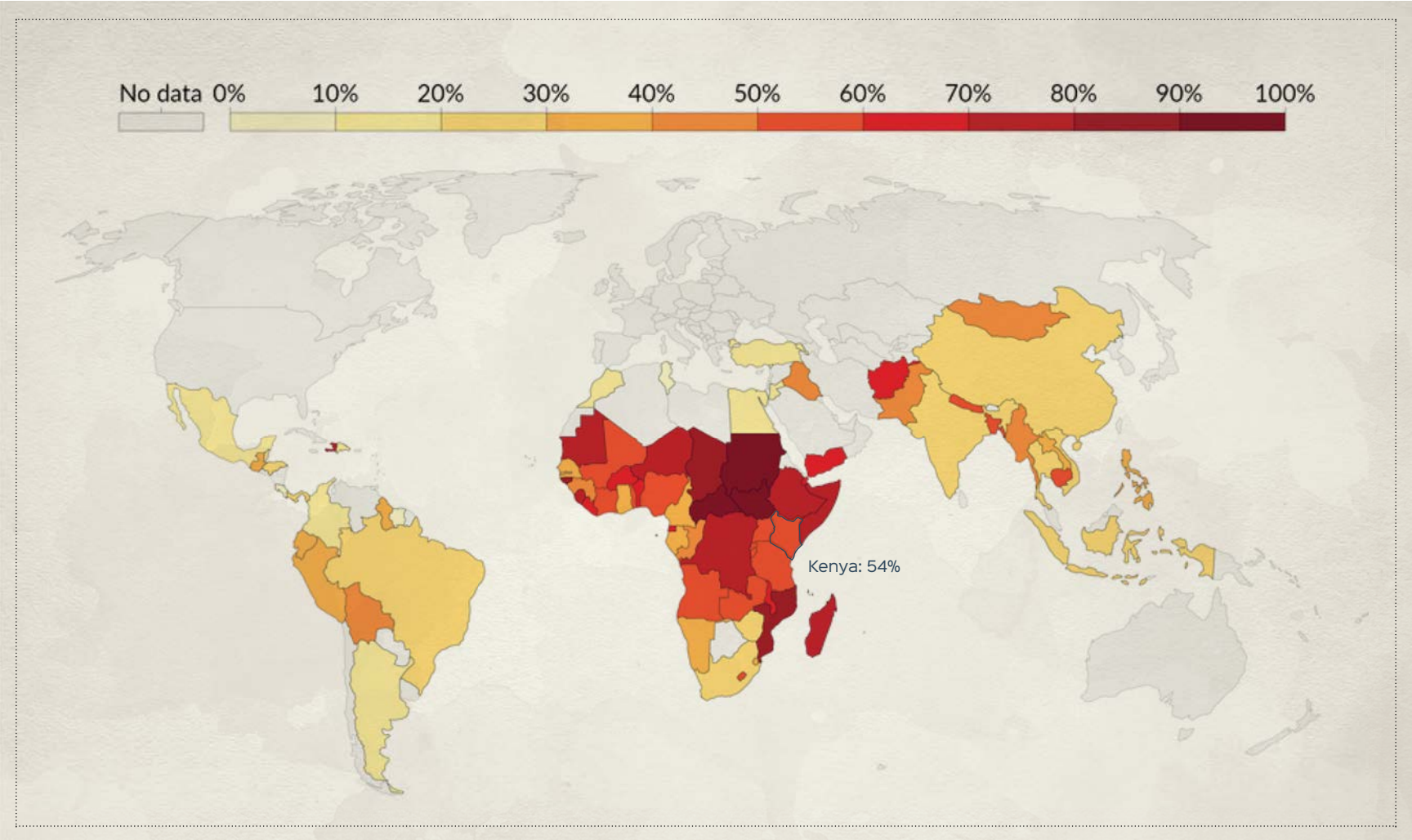
As the population in the developed world begins to stabilize, the developing world will continue to take the final increase in population. To accomplish this, it is estimated that ninety-five percent of the remaining population increase will be absorbed by the urban areas of developing countries, making it difficult to imagine how cities already struggling with informality will accept such an influx of population through the years to come (Davis 2006, 6).

Despite having ample land for humanity to theoretically develop on, there are specific forces pushing people away from the countryside and into cities, such as the mechanization of agriculture and availability of food imports. When coupled with the idea that cities provide economic opportunity, the forces cause urban density to inflate (Davis 2006, 14). As the population continues to grow, governments lack the capacity to effectively match the needs of urbanization, leading to severe shortages of affordable housing and infrastructure services, proving to be a challenge for urban management (Petrella et al. 2016, 11).

Without proper job opportunities and connections to people already living in the city, incoming urban migrants then have no other choice but to move to an informal settlement. The process of informal expansion is already far underway, visible by the percentage of slums in the global south. The situation in Africa is even more drastic, where Africa's slums are growing at twice the speed of the continent's exploding cities. In Kenya, 85 percent of the population growth between 1989 and 1999 was absorbed in the densely packed slums of Nairobi and Mombasa (Davis 2006, 19).



Population graph highlighting rural, urban informal and urban formal trends. As the rural population is leveling off, the urban will continue to take in the increasing population (data from World Bank n.d.).



Share of urban population living in informal settlements. Today, there is already a significant difference between the global North and the global South. If developing countries are expected to intake the remaining 95% increase in population, the iway in which urban informality is addressed needs to change (data from World Bank n.d.).

Non-durable metal sheet housing in Chaani, Mombasa (Google Street View n.d.).

Women carrying jerrycans full of water from the communal stand pipe to their homes, often quite a long distance (Petrella et al. 2016, 19).

Without adequate sanitation facilities, waste often piles up in streams and along roads (Ehresmann 2004, 5).

What is an Informal Settlement?

Informality takes up several forms throughout the world, shaped by the surrounding culture. While it is difficult to define all informality under the same umbrella, this thesis will apply the UN's criteria for identifying an informal settlement. According to the United Nations Human Settlements Programme (UN-Habitat), a slum is a contiguous settlement where the inhabitants are characterized as having inadequate housing and basic services. More specifically, a settlement is considered informal if its inhabitants suffer from one or more of the following conditions (UN Habitat 2003, 18).

1. Structural quality/durability of dwellings
2. Access to improved water
3. Sufficient living area
4. Access to improved sanitation
5. Security of tenure

The Informal-Formal Spectrum

Informality is often viewed as the opposite of the 'formal' world, existing in a dichotomy and categorized as one or the other. However, urban informality in the Kenyan context and around the world is established within a formal-informal continuum of urban development. This continuum applies to the interrelation and various aspects of urban development, including the built environment, the economy, and service provision (Lizarralde 2015, 6). The following illustration showcases this continuum in an informal settlement, where regardless of program, there exists a range of development within the same settlement, emphasizing the ability of informal settlements to constantly improve through time.

An example of various building conditions within the Chaani informal settlement, showcasing the continuum of the formal-informal spectrum. Over time, settlers have been able to accumulate enough wealth and resources to build increasingly durable structure within the settlement.

World View on Informality

Traditional media tends to depict informal settlements as spaces which cause significant health issues and limit the potential of their residents. They are also portrayed as dangerous, crime-ridden areas of cities, where the informal economy exists with little to no government regulation (Lizarralde 2015, 4).

However, architects and urban planners are now challenging this interpretation of informal settlements, recognizing that this issue is by no means set to disappear and are taking it upon themselves to help design solutions that move beyond the destruction and relocation of these settlements (Sinclair 2006, 42). Janice Perlman indicates that it is the stereotype of informal settlements that is their most significant obstacle to overcome. Through her observation of Brazil's favelas, she recognized the prevalence of highly qualified and capable people who are not given the same opportunity as others due to the stereotype associated with living in the favelas (Perlman 1980, 96).

This thesis will attempt to make the argument that while they may have negative aspects associated with them, informal settlements can actually provide solutions to the expanding population problem we are facing if they are understood in their true potential.

Common Misconceptions About Informal Settlements

To best design for informal settlements, we first must understand what they are and the purpose they serve. Since architecture schooling programs currently lack an emphasis on the informal sector, our perception of these settlements

and the people within can be unintentionally skewed by the media, which tends to portray them in a negative light. In his book *Invisible Houses*, GoInzalo Lizzaralde begins his idea on creating a framework for informal development by first addressing these misconceptions in his opening chapter, titled “Learning From The Poor” (Lizarralde 2015, 6).

The following portion of the chapter explores some common misconceptions associated with informal settlements. Considering the reality of these settlements from the inhabitants’ point of view can help us design with the people who reside there in the most appropriate manner, rather than imposing our own ideals into these contexts.

Slums and Informal Settlements in Developing Countries are Decaying Environments

While this might be true in select cases, it is not the reality in most informal settlements and is primarily based on comparisons to living standards set by the modern developed world. Turner views these standards merely as a means of evaluating physical characteristics which do more harm than good by marginalizing those who cannot afford the rents and mortgages that come along with it (Turner and Fichter 1972, 145). Instead, when observed beyond the immediate chaos they portray, informal settlements are found to be vibrant and dynamic neighbourhoods on a path of constant improvement (Lizarralde 2015, 6). Communities can be characterized by careful planning in the use of limited housing space and innovative construction techniques in areas urban developers have deemed unsuitable for construction (as seen in Brazil’s favelas).

Understanding informality this way allows us to give more agency to the residents who have proved themselves to be

more capable than we imagine. Instead of assigning them the role of *beneficiary*, they should be seen as *co-creators.*

Nothing is Worse Than Living in a Slum

Contrary to popular belief, slums are not the sites of the worst living conditions in the developing world, nor do they accommodate the poorest of the poor. In reality, the poorest citizens are found to be those living in rural areas of the developing world (hence, the unprecedented urban migration we can see today). Comparatively, the urban poor are better off than their rural counterparts, emphasizing the role of such settlements in escaping the poverty faced in rural areas (Lizarralde, 2015, 6). Additionally, not everyone residing in urban slums is poor; instead, there is often a heterogeneous group of people from various walks of life in different levels of economic power, hence the idea of adopting a spectrum of informality.

It then holds that we should recognize and emphasize the role of urban informal settlements in escaping poverty and ensure our approach to upgrading is not homogeneous, as this only tends to waste resources.

Residents are Waiting for an Opportunity to "Escape" From Such Settlements

It goes without saying that most informal dwellers would wish to see their living conditions improve, but the belief that they dislike living in the slums and wish to "escape" at first chance has led to poor housing solutions and policies in the past (Lizarralde 2015, 7). In fact, the social and informal networks found within these settlements give their residents reasons to build bonds within their settlement. Networks of friends, family, clients and service providers play a prominent

role in the lives of the residents by providing some form of economic and social safety. While harmful for any society, fragmenting or disturbing these networks is particularly harmful to already vulnerable communities in impoverished areas (Lizarralde 2015, 7).

It would be crucial to keep these networks intact during the process of upgrading. In-situ upgrading schemes where the existing site is minimally altered would help achieve this.

Prioritizing Informal Voices

At the end of his book, Lizarralde concludes the issue by accepting and embracing the complexity of the situation rather than attempt to simplify it in order to search for easier solutions. He emphasizes the need to listen to the resident's opinions and concerns when considering any project which might regard them, something many upgrading policies have failed to do (Lizzaralde 2015, 180). Here, there is an emphasis on giving informal dwellers individual agency and utilizing the informal construction sector within the process. Other organizations such as governments and various private stakeholders will no doubt play a role in any upgrading process, yet only through the attainment of individual agency and intensive interactions between actors and these stakeholders can the process truly become sustainable and adaptive (Lizzaralde 2015, 211).

By listening and working with the residents we can embrace this complexity and create solutions which are long lasting and beneficial. Without hearing resident voices, we would find it hard to comprehend the many unique dynamics of each individual settlement and the respective approaches required.

Mkazi wa makazi duni - The Informal Settler

Mhamiaji wa mjini - The Urban Migrant

Mama muuzaji - The Food Vendor

Mzazi husika - The Concerned Parent

Common concerns from Mombasa's informal dwellers when asked about upgrading schemes, focusing on their concerns and reluctancies to participate. Appropriated from relevant news articles and interviews.

The Kinetic City: Rahul Mehrotra

Mehrotra distinguished between the formal and informal as entities of permanence and temporality respectively. While cities are largely imagined as permanent entities, the massive scale of the *informalization* of cities has brought about a more flexible and temporary entity. He dubs these two opposing entities the *Static City* and *Kinetic* City:

> The first is the Static City. Built of more permanent material such as concrete, steel and brick, it forms a two-dimensional entity on conventional city maps and is monumental in its presence. The second is the Kinetic City. Incomprehensible as a two-dimensional entity, this is a city in motion – a three-dimensional construct of incremental development. The Kinetic City is temporary in nature and often built with recycled material: plastic sheets, scrap metal, canvas and waste wood. It constantly modifies and reinvents itself. (Meharotra 2008, 212)

While the kinetic (or informal) is often viewed through a negative lens, Mehrotra sees large promise in the idea of this temporal architecture as a means of addressing an increasing population and the increasing movement across national boundaries as a result of natural or political instability.

Without romanticizing the situation, he portrays informality and its importance in conveying a cities' identity, recognizing the temporary as an integral part of the city and seeing whether it can be encompassed within urban design, in terms of urban form, public spaces, and governance structures.

> It is not necessarily the city of the poor, as most images might suggest; rather it is a temporal articulation and occupation of space, which not only creates a richer sensibility of spatial occupation, but also suggests how spatial limits are expanded to include formally unimagined uses in dense urban conditions. (Mehrotra 2008, 212)

The challenge facing integration of informality into the formal city is the same in Mumbai as it is in Mombasa. Here, it is vital to cope with the city's transformation by attempting to reconcile these opposite conditions as being simultaneously valid. The existence of two entities in the same space implies that we must accommodate and overlap varying uses, perceptions, and physical forms.

Mehrotra imagines a more flexible practice of architecture and planning more aligned with emergent realities that would enable us to deal with more complex scenarios than those of static, or stable environments constructed to create an illusion of permanence. This would allow us to learn from the extreme conditions on how to manage and negotiate different layers of the urban while accommodating emergent needs and the often largely neglected parts of urban society.

This thesis will build upon the idea of reimagining the role of informal cities and the possibilities that could arise if people who reside there are given a chance and the opportunity to improve their community. The goal here is not to solve the issue of informality but design spaces which support residents' lives, whilst focusing on knowledge mobilization so that people can learn how to improve their community for themselves.

Thesis Question

How can a design process embrace the characteristics of an informal settlement to create spaces that support residents' lives and livelihoods as their needs continue to change?

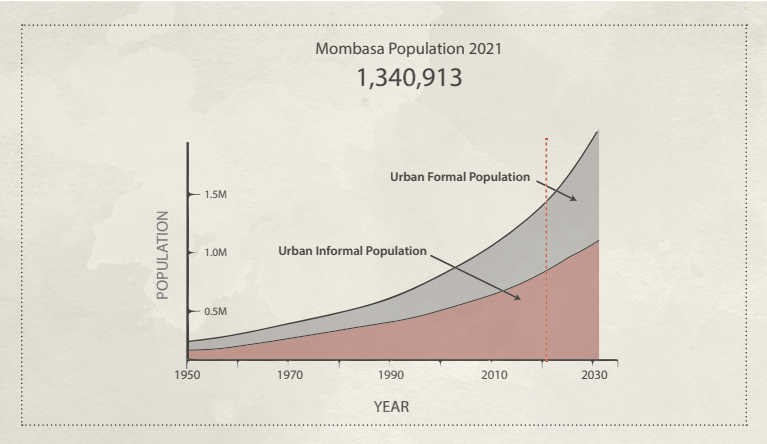
Chapter 3: Context

Mombasa: A Multicultural Port City

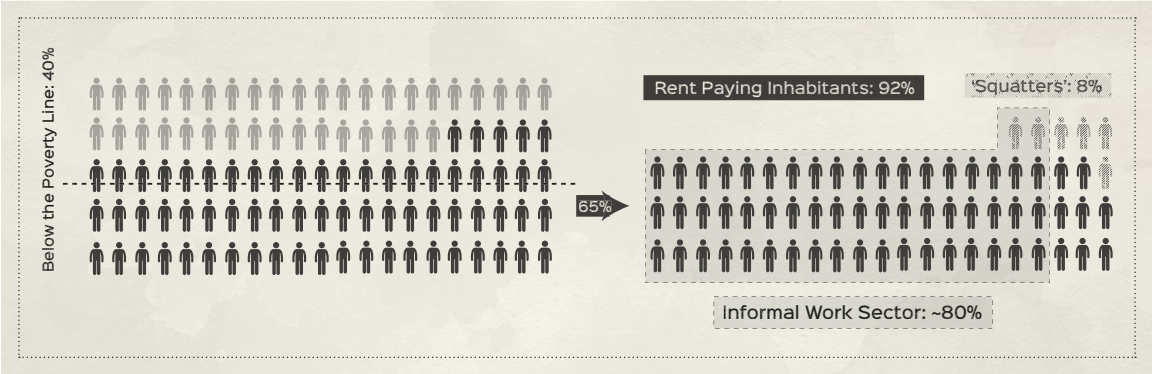
Mombasa is a colourful, multicultural city, steeped in history. As Kenya's largest port and second most populous city, it was first mentioned by name by the 12th-century Arab geographer Al Idrisi, who described it as a prosperous trade emporium selling spices, gold and ivory to ships from Arabia and Asia (Horrobin 1971, 47). Today, the city has absorbed cultural influences to create a vibrant amalgamation of more than a thousand years of history, visible everywhere from the architecture to the food to the numerous inclusive festivities.

Urbanization and Informality in Mombasa

Like most cities in the developing world, Mombasa is currently suffering from an influx in population with limited housing and infrastructure supply to accommodate a substantial increase in urban population. As Kenya's urban population is predicted to grow from 26% today to almost 50% in 2050, there are rising concerns for its cities' ability to accommodate informal dwellers, which already consist of 60% of the population today (data from World Bank n.d.).



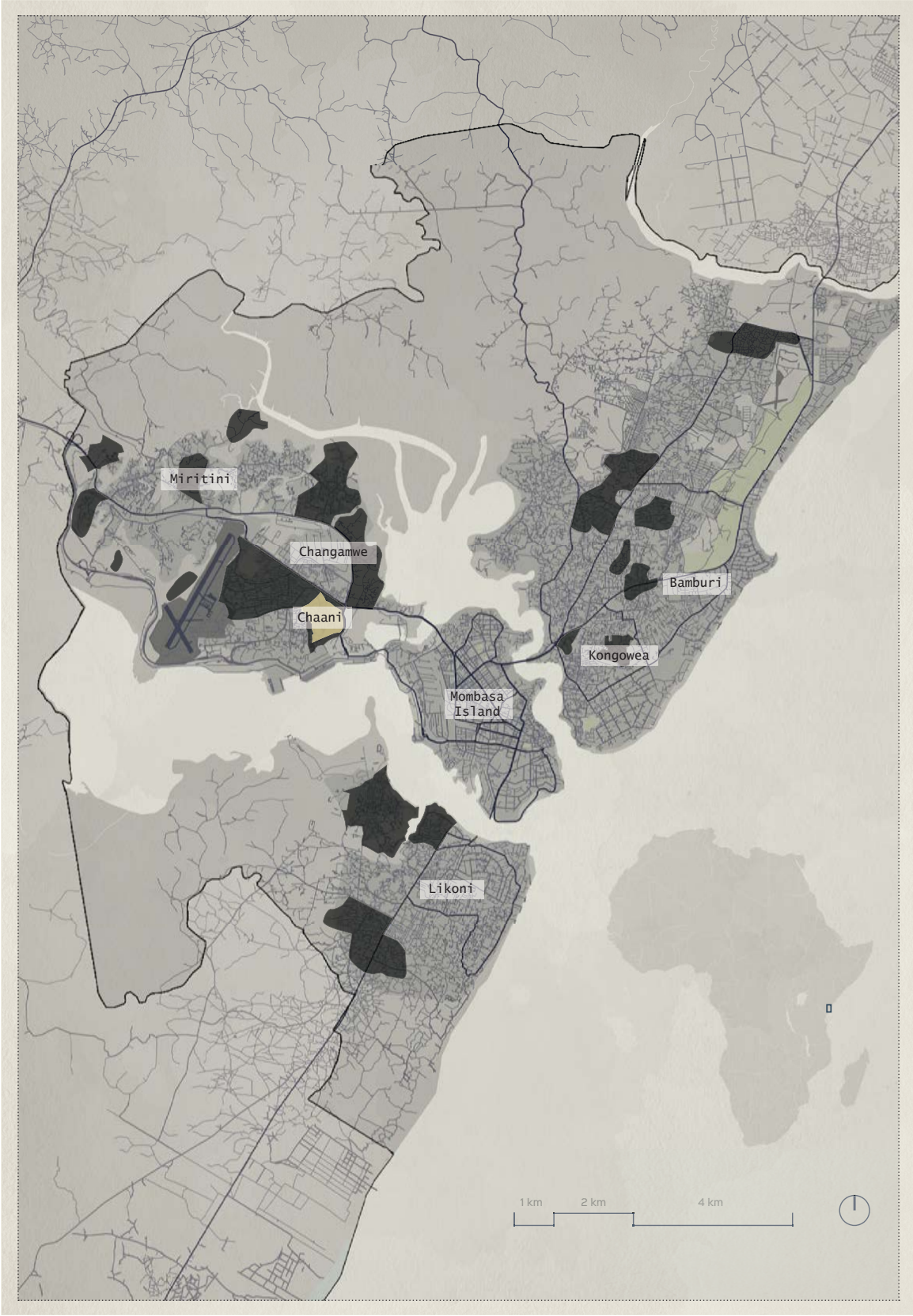
Mombasa's population growth (data from World Population Review n.d.a).



Informal population of Mombasa showing how many people pay a rent to a landlord yet still live in fear of eviction (data from World Bank n.d.).

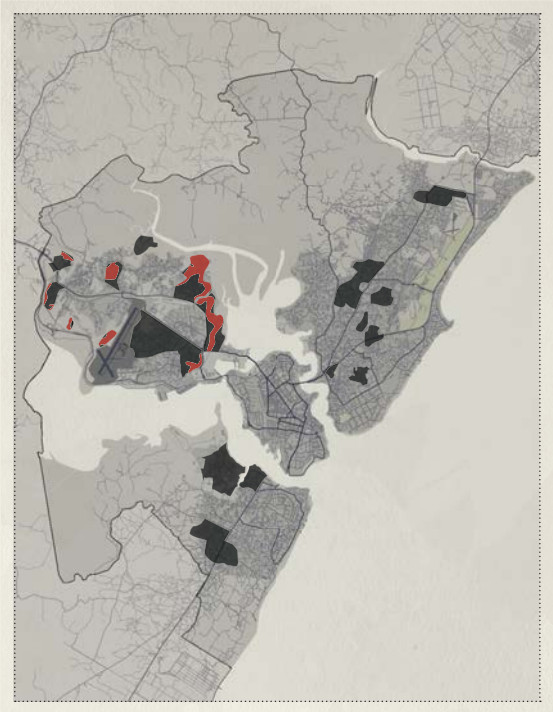
Unlike many urban centres which host their informal dwellers in areas that bring complications when developing, Mombasa's informal settlements are not limited to these harsh conditions and are often located close to major employment areas, such as industrial areas and commercial centres, along rivers and wetlands, infrastructure land reserves, on accessible peripheries, and on open public spaces. Overall, they are located in areas both suitable and unsuitable for development, but due to the complicated land ownership situation, they have been left out of development strategies, leaving them to develop on their own.

This pattern of occupying land dated back to British colonialism, where Mombasa municipal archives show that applications for land ownership were first invited in 1915 and claims of ownership were received, recognized and a cadastral map prepared by British authority. At that time, Arabs were considered to be the rulers and laws were moulded by the Muslim religion, which allowed them to claim a significant portion of land. However, many people abandoned their land post-independence, resulting in people illegally moving into the unoccupied land (Magutu 1997, 310).

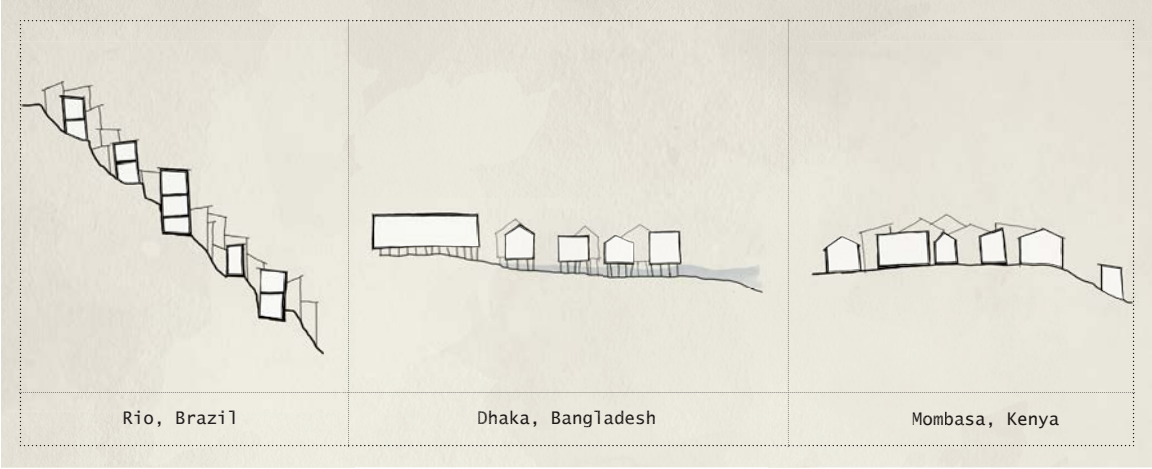


Map of Mombasa highlighting the informal settlements.

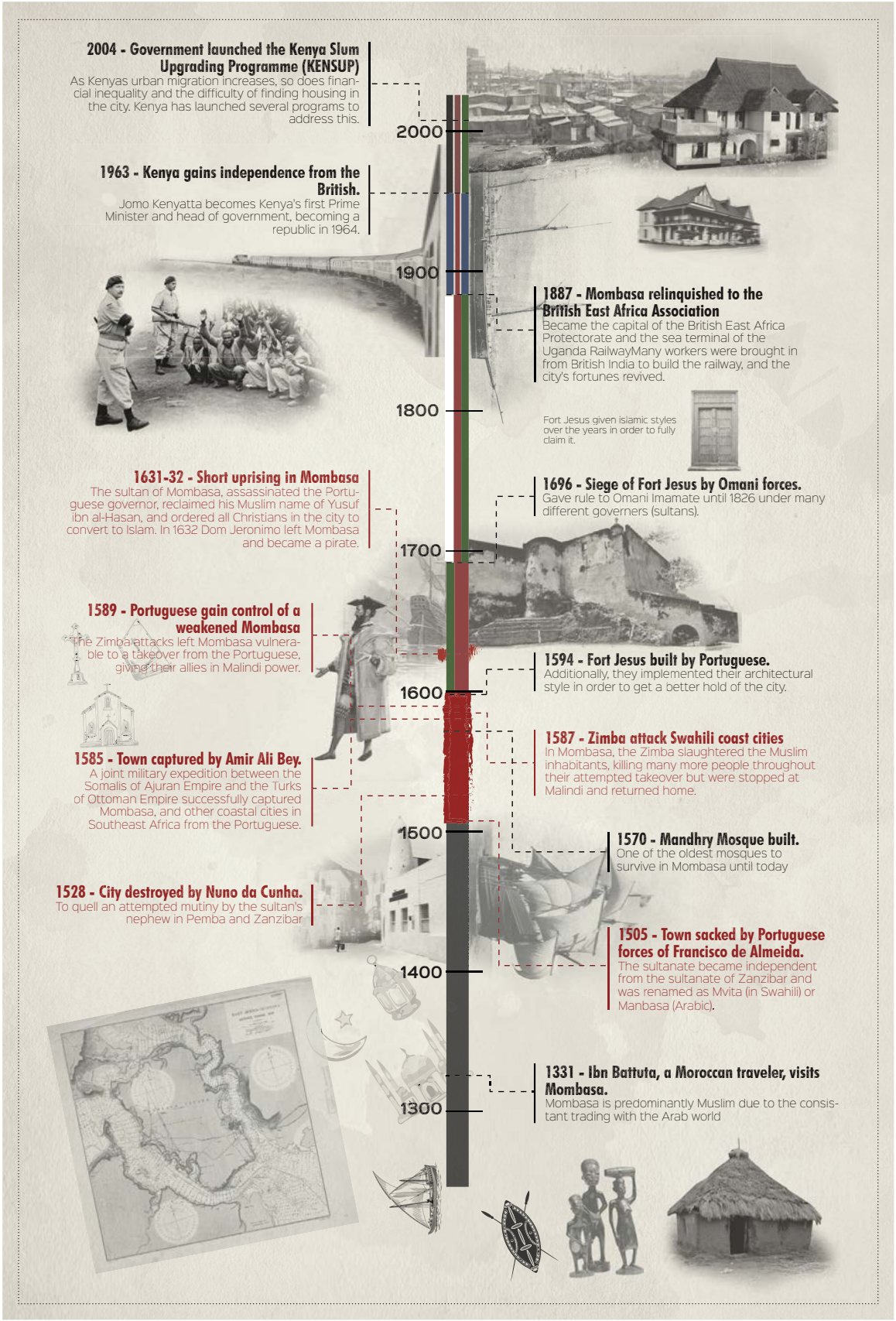
Lands considered difficult to develop on due to their steepness.



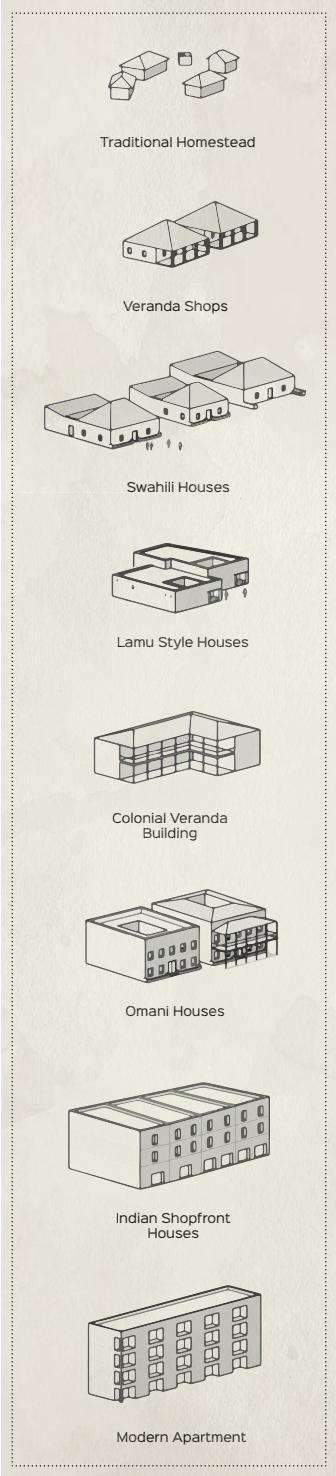
Overlapping steep slopes on the informal settlements shows that a marginal number of residents are pushed towards these areas.



Informality takes different forms and faces various difficulties around the world. In Mombasa, people have been fortunate not to have been pushed towards difficult to inhabit areas. However, the number of informal settlements occupying these areas is currently increasing.



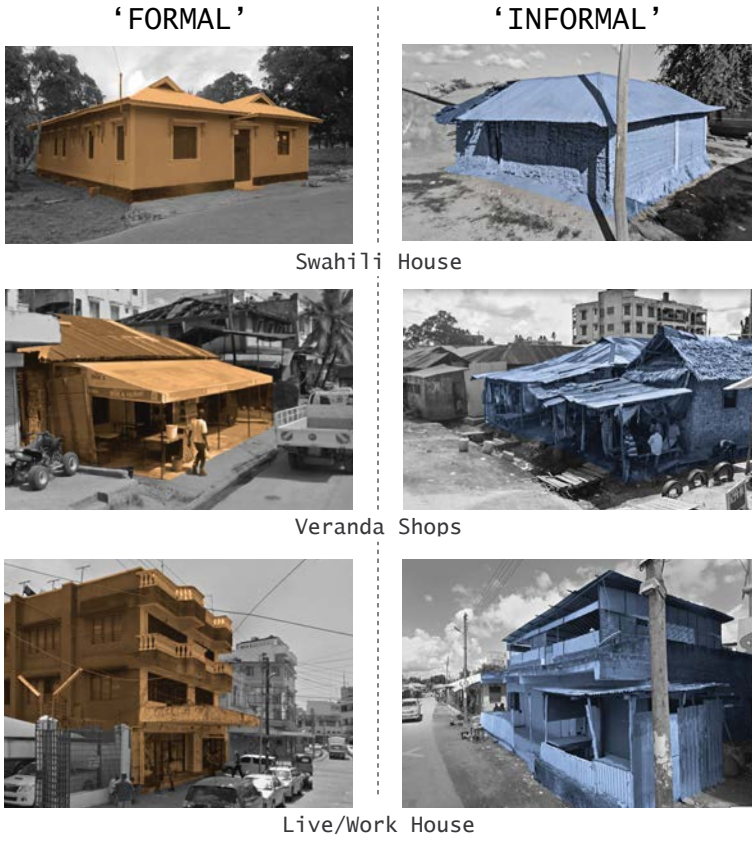
Illustrated timeline depicting the numerous shifts in power that influenced the culture and architecture of Mombasa



Various architecture styles found throughout both formal and informal areas in Mombasa (Steyn 2015, 69)

Architecture

In Mombasa, the constant shift in power dynamics and influence on the city have helped shape the architecture we see today. Features ranging from traditional vernacular Swahili architecture to the British-influenced verandas have transcended individual style architecture, influencing various architectural styles found there, independent of their origin (Meier 2016, 25). The basic elements of these forms have been amalgamated over the years to create a system that does not define itself by a single style, but instead incorporates features of each culture.



Despite their use of alternate materials, the informal architecture mirrors that of the formal city (Images retrieved from Google Street View n.d.).

The variety of styles are visible in both the formal and informal areas and serve as an opportunity to bridge the two through the architectural language of form.

Economy

With over 80% of informal dweller having some sort of involvement in the informal economy, it becomes clear that we cannot expect to transfer these jobs into the formal sector without risking harm to the residents economic safety (Petrella et al. 2016, 16). These networks of jobs are vast and can reach the downtown of Mombasa Island.

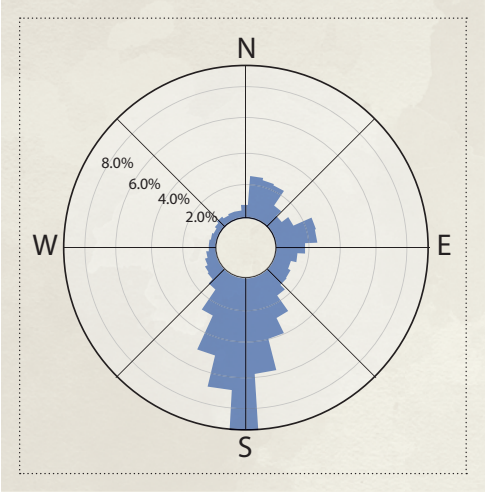
An incremental approach would ensure these networks remained intact through the process and prioritize gradually bolstering them to increase income security.

Climate

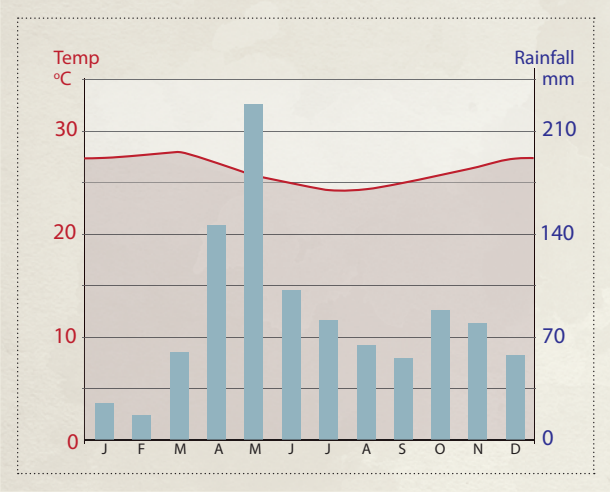
As a city located on the equator, Mombasa sees a temperate climate year-round. The temperature fluctuates between an average high of 31°C in the month of March and reaches an average low of 22°C in August. However, the temperatures also reach up to 27°C during the cooler months, necessitating shade and cooling methodologies throughout the entire year. Even within cooler months, people are found seeking shelter from the sun under trees or verandas.

There is significant precipitation year-round, averaging around 1140mm annually over the last ten years. While the driest months receive 11mm of rainfall, the amount of rain can reach 220mm throughout the month of May. The constant rainfall bodes opportunities for agriculture and water capture during a majority of the year.

Southerly winds are the most predominant in Mombasa, which receives over half the prevailing wind from the south. Shaping passive ventilation to take advantage of this constant wind would considerably help in cooling interior spaces.



Wind rose depicting Mombasa's prevailing winds (Climate-Data n.d.).

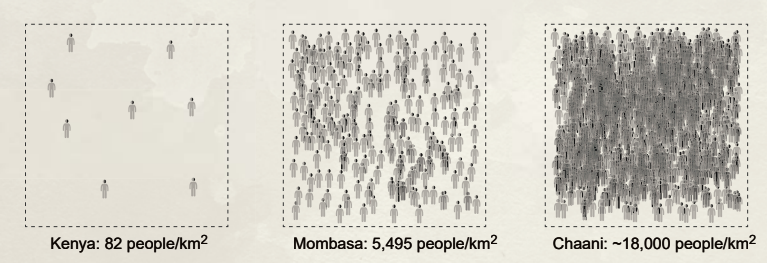


Average monthly temperature and rainfall (data from Climate-Data n.d.).

Key map of Mombasa highlighting Chaani informal settlement.

Project Site: Chaani informal Settlement

Chaani settlement is located downtown on the mainland, approximately six kilometres west of Mombasa Island. The settlement is confined by the Port Reitz Road to the north and west, and the Kipevu Road to the east. To the west, situated close by, is Moi International airport and the Changamwe harbour front is to the south. The settlement covers about 90 hectares, has a population of over 20,000 and a density of approximately 200 persons per hectare (Magutu 1997, 307).



Population density diagram showcasing the difference between Kenya as a whole, the city of Mombasa and Chaani settlement.

Why Did People Settle Here?

During the colonial period, ownership claims of coastal land by Arabs, Asians and some Swahilis were recognized and freehold titles were given to individuals. Chaani was initially recognized under such a freehold title. However, most of the landowners lived in towns and rarely visited their land plots, some of whom had abandoned their land altogether, giving an opportunity for people to settle on the unoccupied land (Magutu 1997, 310).

The largest population surge came after independence, consisting largely of mainland ethnic groups who came to the coast, looking for employment opportunities (Magutu 1997, 311). As land shortages in Chaani settlement emerged, new migrants began to build to the east and south-east of the settlement on land unsuitable for dwellings. Here, the Chaani valley is quite steep and unsuitable for building without strong retaining walls. Nevertheless, people built precarious housing units constructed of mud and wattle. Most of the new houses belong to newly arrived migrants who were desperately in need of housing while they searched for employment opportunities in the city of Mombasa (Magutu 1997, 310).

A mix of people have resided there for generations and built their wealth up, becoming integral members of the area as they own structures that they rent out. Additionally, there is a constant flux of urban migrants who either leave due to site conditions and lack of community or are integrated enough and stay for a long time. Despite their length of stay within the settlement, it is not certain whether they will be able to continue residing here due to the complicated land ownership situation present today.

Land Ownership Today

Like in any informal settlement, land ownership policy here plays a large role in determining the security of tenure, and therefore, the legitimacy of people's claims to their homes.

In 1979, a sites and services scheme was launched in Chaani in collaboration with the World Bank. Prior to the scheme, land ownership was left ambiguous, and residents were considered to be squatters. However, as part of the upgrading scheme, the government consolidated all land in Chaani through a mandatory purchase order that classified it as public land (Magutu 1997, 310). In an attempt to upgrade the settlement, a self-help staged development was adopted, where ownership and tenure security were granted to those who chose to upgrade their structures. Unfortunately, the scheme was not properly organized, and loans were not easily acquired, resulting in many settlers living without the security they were promised and still in fear of eviction. Since someone can legally purchase the land settlers currently live on from the government, people here have been trying their best to upgrade and secure their plots.

A methodology of upgrading that does not rely on loans, or at the very least minimizes them, would greatly help settlers acquire durable structures that could qualify for a land ownership title.

Settlement Analysis

The settlement appears somewhat divided today into portions which benefitted from the sites and services scheme mentioned above and those that did not. The scheme was set to see an entire transformation of Chaani, with roads and services to be added throughout the settlement.

However, upgrades were halted after the construction of the central loop road, leaving many settlers in the same conditions as before, evident by the existing road conditions. Today, the central loop is the only 2 way vehicular road that is paved.

Today this road is Chaani's main connection to the city and the access improves economic opportunity for those residing along it as they are able to set up shops or stalls.

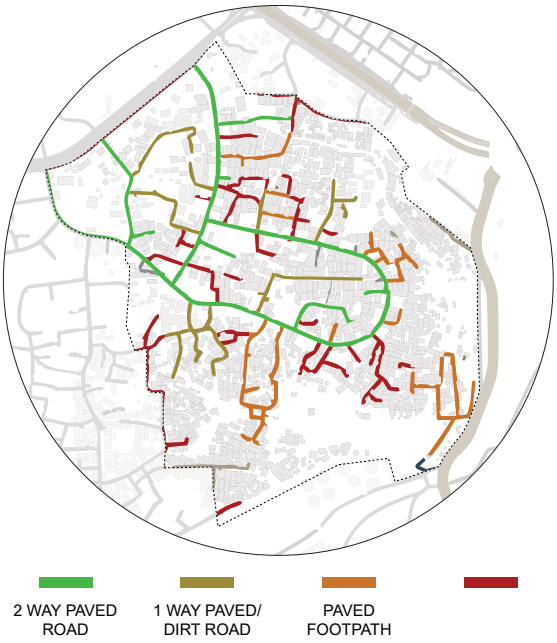
Sattelite imagery depicting the densly packed settlement of Chaani, highlighting the central loop road built as part of a sites and services scheme (Google Earth n.d.).

As the population of Chaani continues to increase, whether through urban migration or expansion of families, the limited space is becoming an obstacle for people trying to set up their homes in the more accessible areas of the settlement. As a result, people have been forced into the steep valleys where they are further disconnected from society, living without addresses and finding it increasingly difficult to earn an income without travelling far distances.

Additionally, during the sites and services scheme, a trunk sewer was dug out but never connected to Mombasa's sewer system. Today, this is where a majority of Chaani's waste is disposed of and left to accumulate, increasing sanitation risks.

Another factor negatively impacting residents of this settlement is the lack of publicly available open space. When observed through satellite imagery, it appears as though there is plenty of open space within the settlement. However, the majority of these spaces are restricted within fences, reserved for schoolyards, religious programming or businesses.

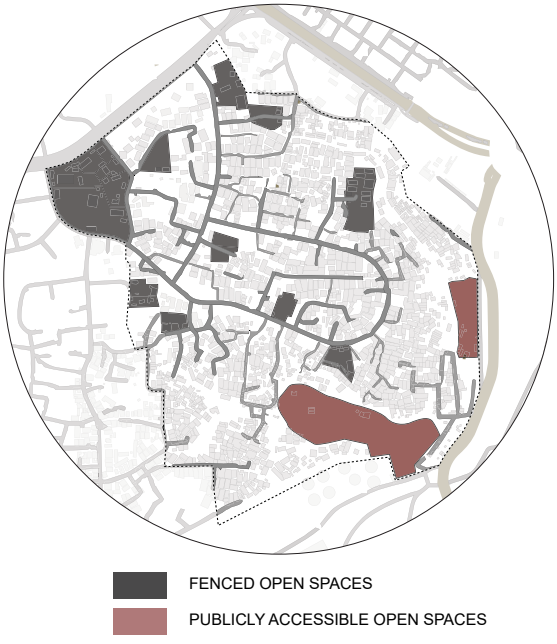
Open space is extremely valuable within informal settlements, where any available space serves as an opportunity for someone to settle and develop. It is no surprise then that most lots containing any form of open space are demarcated by fences in order to restrict the sprawling construction of houses, regardless of their programming. The only remaining publicly available open space is confined to steep areas less suitable for development.



Designated paths within Chaani. Note the only two-way paved road is the central loop, while the majority of paths are not vehicle accessible.

Steep areas currently host few residents due to their challenging terrain. However, increasing amounts of people are moving here due to the lack of options.

Incomplete trunk sewer where most of Chaani's waste is disposed.



The majority of open space within the settlement is blocked from the public by fences with the exception of the steep valleys.

Chapter 4: Design Approach

Turnkey projects often resulted in failure to improve the well-being of the residents who initially lived there (Lizerralde 2015, 13).

The Self-Build Movement

Prior to developing upgrading strategies for informal settlements, the main course of action was to erase the settlement, relocate the settlers and construct modernist residential towers in their place. The constructed towers, referred to as *turnkey projects*, were either planned as public housing or accommodation for the wealthy (Lizarralde 2015, 6). Regardless of the route taken, these projects paid little mind to the needs of the initial inhabitants, who rarely benefited from such projects.

As early as the ‘30s and ‘40s, some within the profession began to question the role of architects in serving the needs of those who could least afford their services. Homeowners had been successfully building their own homes for generations. Moreover, they had been doing so without the aid of government agencies, architects, or outside funding. What were slums but just another form of owner-built housing? These were the ideas that led to the creation of the self-build movement (Sinclair 2006, 42).

Architecture for the Poor: Hassan Fathy

One of the most notable early experiments in self-help-style housing was the work of Hassan Fathy in Egypt. In the 1940s, residents of a village named Gourna had been made to relocate to an area nearby after it was found that the village existed above tombs of noble ancient Egyptians. Having been given the task of designing the new village, Fathy saw it as an opportunity to test out his ideas of a low-cost architecture based on the sustainable building techniques that had sheltered Egyptians for centuries.

Traditional Egyptian construction using plaster to outline a parabola on the end wall (Fathy 1976, 245)

With a shortage of construction materials caused by the war, Fathy opted to use local materials, in this case, mud brick commonly found in traditional Egyptian architecture (Fathy 1976, 37). Additionally, the government's lack of interest left the project without enough finances to hire contractors to help construct the design. Fathy decided that rather than abandon the project and leave the villagers without homes, he would work with them to construct his design. He translated his design to incorporate traditional village crafts and vernacular architecture found in Gourna to ensure the village retained the identity it once held (Fathy 1976, 35).

Fathy saw the architect's role as that of a personal consultant yielding his or her training to the aspirations of the homeowner and to the demands of local construction methods and materials (Sinclair 2006, 44).

> For, of course. a man has a mind of his own, and a pair of hands that do what his mind tells them. . . . Give him half a chance and a man will solve his part of the problem-without the help of architects, contractors, or planners-far better than any government authority ever can. . . . Each family will build its own house to its own requirements, and will inevitably make it into a lively work of art. Here, in each private person's longing for a house. in his eagerness to make one himself, is the alternative to the disastrous mass housing schemes of so many governments. (Fathy 1976, 32)

New Gourna Mosque, built using traditional materials and construction methods (Blair 1978).

Freedom to Build: John F.C. Turner

John F.C. Turner also questioned the role of an architect in dealing with the issue. He instead saw these settlements as wells of knowledge pertaining to their local surroundings that the architect should work from:

> The certified professional makes a fool of himself, and often does a great deal of harm to other people, by assuming that he knows more than the uneducated by virtue of his schooling. All that second- and third-hand knowledge and intellectual exercising does for him, however, is to reduce his ability to listen and learn about situations significantly different from his own social and economic experience-with consequences that can be tragic when he has the power to impose his solutions on those who are not strong enough to resist. (Turner and Fichter 1972, 147)

The issue of informality is inherently complicated, where no two cases are identical. When individual aspects of each unique situation are considered, it becomes next to impossible for architects to create ideal solutions for every scenario. Turner and Fathy both recognized the critical role the informal dwellers themselves play in tackling the issue, where the dwellers would be the most equipped people in deciding what architecture would benefit them most.

The architect would then play the role of educator of building construction and mediator between people and the built environment, guiding the peoples' desires through their knowledge of the construction field. By teaching the people efficient and cost-effective construction techniques, each person can go about solving their own issues, guided by a set of standards and rules each individual settlement can create for themselves. To do this though, the architect must study the local landscapes and learn from the inhabitants who live there to understand what building construction might best suit the particular environment.

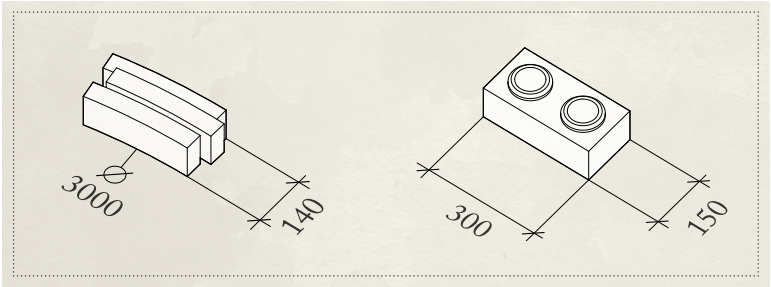
Material palette commonly found inside Chaani,

Local Materials

The buildings in Chaani settlement are constructed from a variety of materials, used in both the flexible and permanent architecture of the settlement. Using the materials already found within the settlement is advantageous since these would be the most commonly available and the ones residents are most familiar with. In turn, this would minimize the reliance on external sources for building materials while creating a cyclical flow of materials within the settlement.

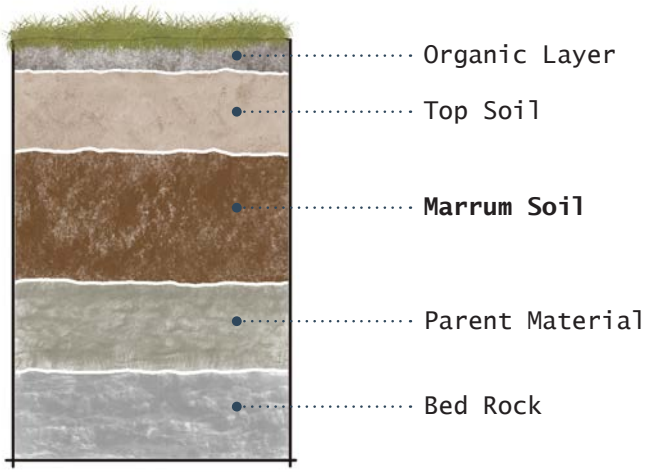
Interlocking Stabilized Soils Blocks

Interlocking Stabilized Soil Blocks (ISSBs) offer a great opportunity for construction in the Kenyan context. There are a range of advantages in using them as a base building block. These blocks are a descendant of the compressed earth block used in many recent projects throughout the equatorial and sub-Saharan climate, known for its thermal capabilities in such contexts (Hema et al. 2020, 12). However, the addition of a protruding interlocking mechanism has made construction processes substantially more comprehensive for informal dwellers. As demonstrated by several recent upgrading projects, utilization of these blocks gives informal dwellers the possibility of creating durable structures with a minimal amount of cost and skill in the construction field (Pérez-Peña 2009, 9).



Two forms of ISSB blocks used in this project; A curved block used for making water tanks and a rectangular block with perforations that make adding rebar reinforcement easier.

ISSB making process.



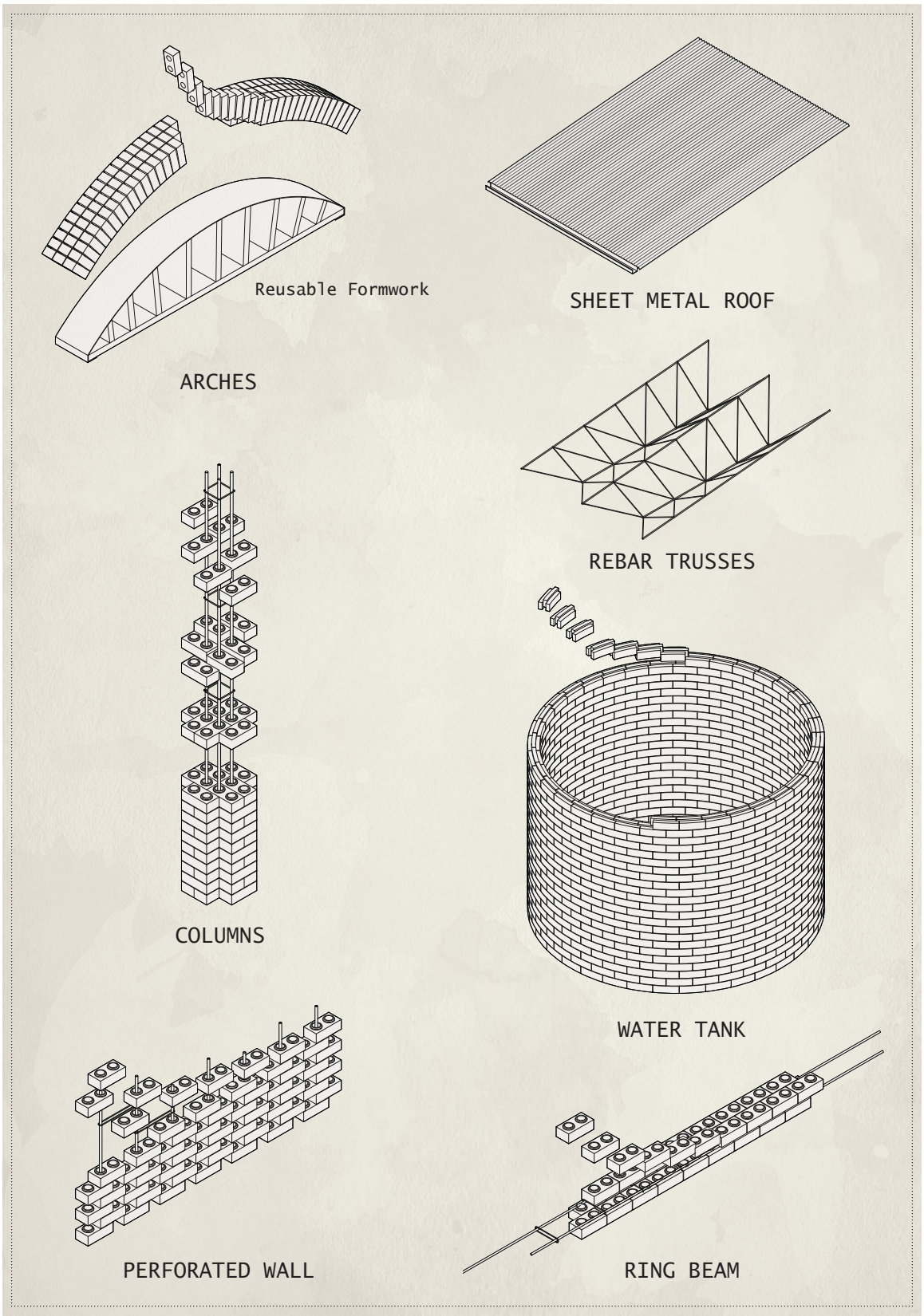
Layers of soil in the East African coastal region. Marrum soil is found only a few feet below grade and easily dug up.

Components

The primary substance used to make this block is marrum soil, abundantly available right below the residents' feet. Usually a by-product of construction, it is disposed of when digging foundations and flattening the land. An advantage of this process would be the reduced quantity of cement required to stabilize the blocks, compared to the amount required for manufacturing concrete. Since cement is purchased from outside the settlement, reducing the amount required would significantly lower construction costs. This simple process has been around for decades in East Africa but was underutilized due to a lack of awareness. Today, as the price of construction materials is increasing, so is the popularity of such blocks.

Block Making Process

The process to manufacture such blocks is relatively simple, where a single machine can be operated by two individuals and produce upwards of 800 blocks per day. Interchangeable moulds are used to manufacture differently shaped blocks within the same machine, increasing its versatility.



A kit of parts: By primarily utilizing the ISSB and accompanying it with rebar, a multitude of architecture elements can be created.

Kit of Parts

The ISSB's fit together in different ways to create various elements that can be combined, resulting in a multitude of architectural forms, whilst allowing for easier reproducibility.

Through studying local building techniques, a set of tools that corresponds to the kit of parts was developed. It was essential to ensure these tools are readily available and easily operated by the residents and the materials are ones with which they are familiar.

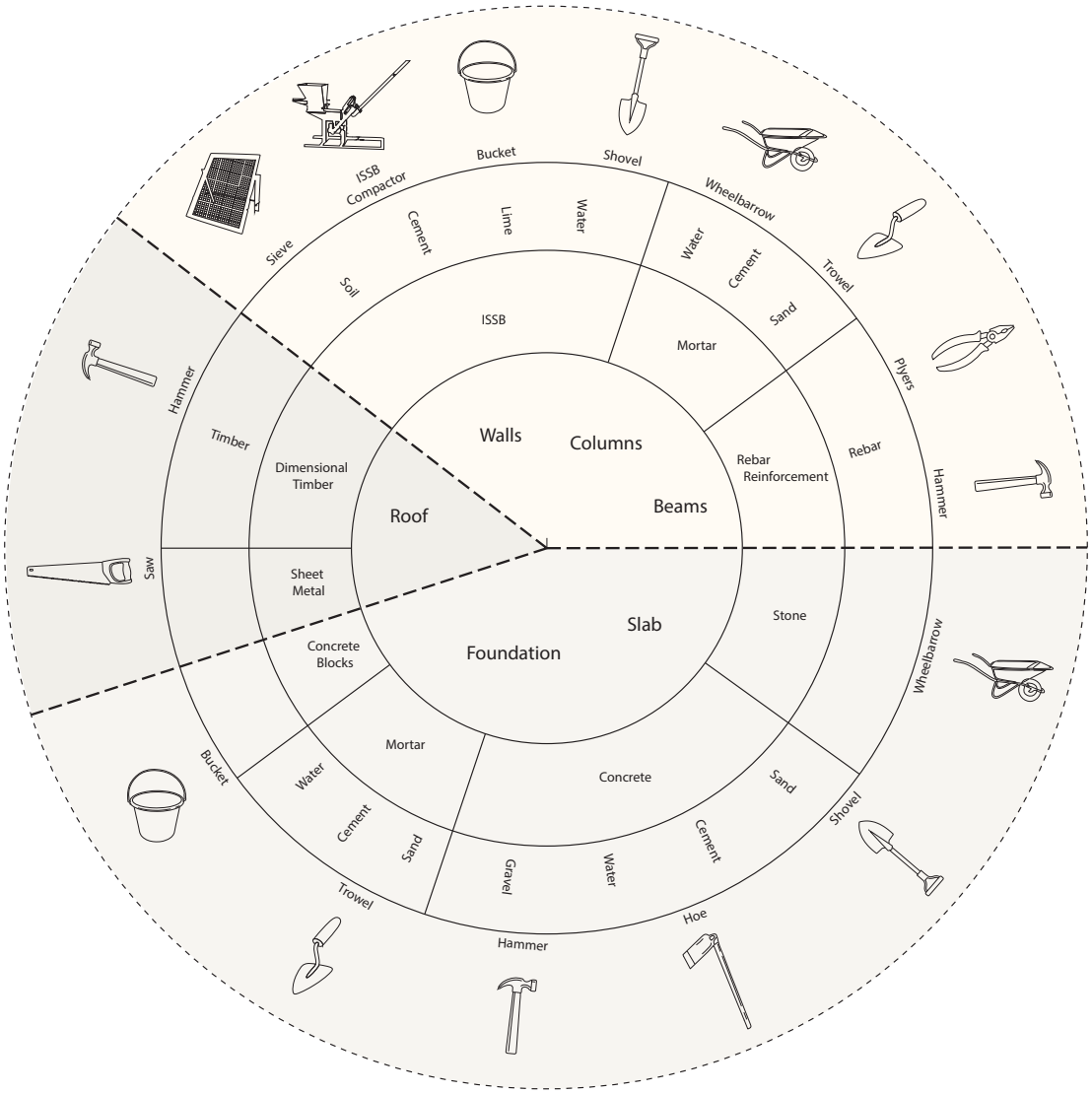


Diagram illustrating the tools, raw materials, building materials and architectural components to be used in the construction process.

Chapter 5: Pre-Design

Design Principles

The design component of this project serves as a pilot project, imagined to be the interpretation of how an overall upgrading project might begin. Through carefully considering the existing context, the project focuses on key components of life within the settlement that can be bolstered through architectural spaces.

While the primary driver behind the design is the spread of education through creating a designated space for it, the design goes beyond this one notion and experiments with different ideas on how to give informal dwellers a space of their own.

Instead of focusing on solving the entire issue of informality, the project will look at how a single space can be designed for the benefit of the community. Particular focus will be placed on those who are isolated and pushed further into areas that remain disconnected from the broader community due to a lack of access ways and scarce communal space. The goal is to bridge this connection and provide opportunities for the people who might be struggling due to their location within the settlement.

Several design principles which serve as a backbone to this design have been developed, giving it the possibility of being adapted into various informal settlements throughout Mombasa.

Self-Built Construction

The design should consist of processes and outcomes that can be achieved by people residing in the informal

settlement. The materials and tools used should be easy to acquire and use with minimal reliance on external sources. The most challenging part here is acquiring the ISSB machine, but beyond that, the rest of the tools are readily available from local hardware stores or found within the settlement itself. The project itself can also play a role in acquiring tools. Since tools would typically be used on a need-to-build basis, they can be acquired over time and rented to the locals, reducing the cost of procurement for a single-use scenario.

Ease of Use

The construction should be achieved with minimal knowledge of the construction field. Here, the ISSBs and kit of parts would play a large role in allowing people to build efficiently, guided by the interlocking component of the block. Understanding the construction methods of the ISSB would also allow the transfer of knowledge to occur easily due to its simplicity.

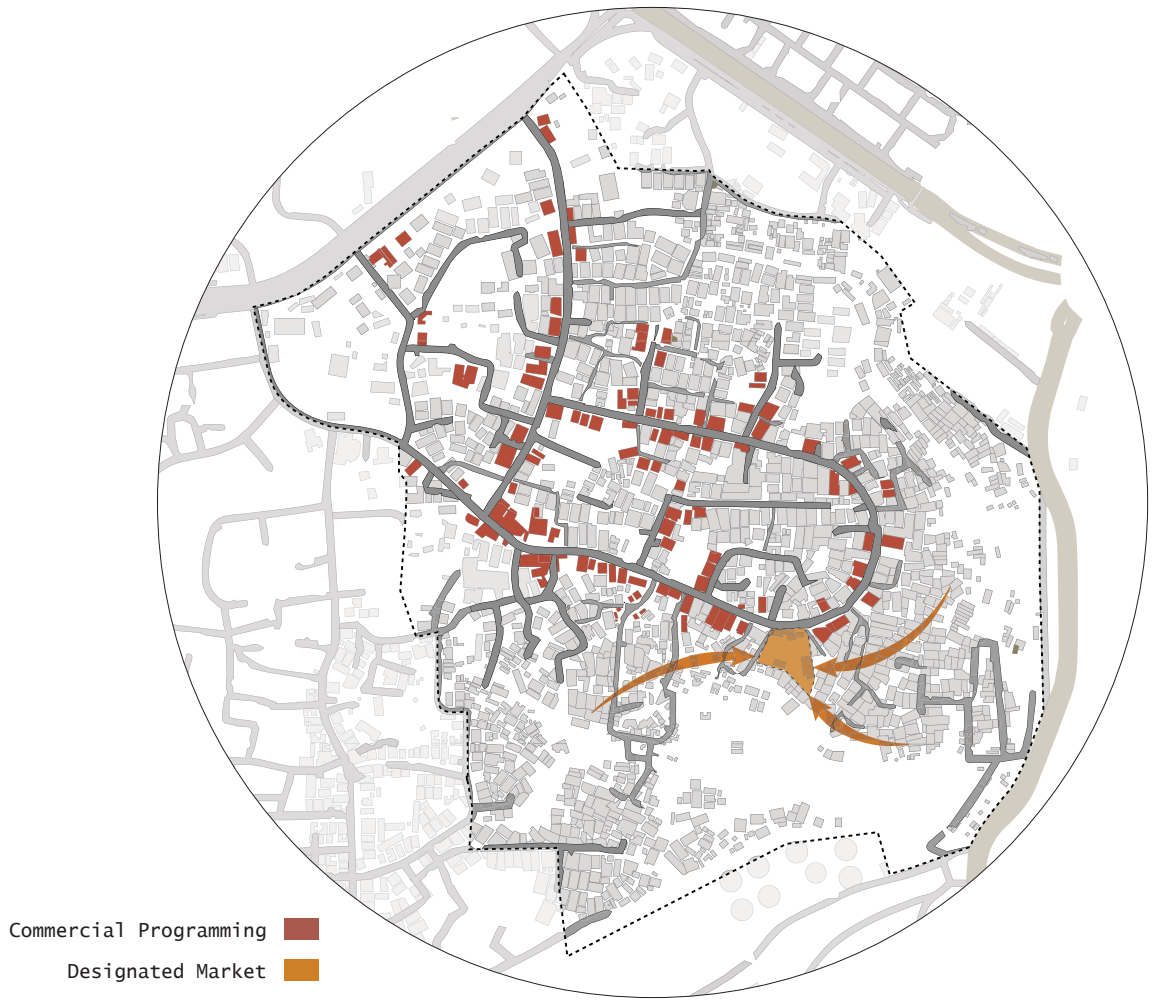
Flexibility

Informal settlements are constantly in flux, where the current needs of the residents determine what associative value a space will hold (Mehrotra 2008, 212). The resulting design must abide by this characteristic, building a space that is not defined by a single use, but instead works in a multifaceted fashion to support residents in more than one aspect.

Income Generation

With the majority of commercial programming taking place within individual stalls and shops adjacent to the central loop road, those living farther east and south are having an increasingly difficult time finding space to set up stalls in order

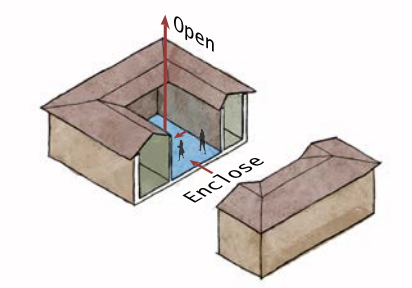
to generate an income. A particular issue hindering these residents is the lack of access to where they reside within the settlement. Ideally, this would be resolved by providing adequate access to all portions of the settlement; however, this process would also bring along many complications and is not within the scope of this thesis. An alternative option would be the provision of a designated market space along the central loop road that people from all over the settlement could utilize to earn an income.



Commercial activity in Chaani: Primarily located along the central loop road, it is difficult for people living further away to obtain space here among the densely packed streets. Providing a dedicated market space would help serve people who lack access toward their parts of the settlement.

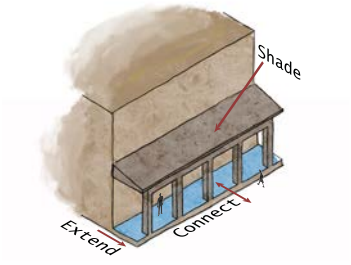
Support Existing Culture and Interests

It is beneficial to integrate local vernacular architecture into such settlements to help support the existing culture, as demonstrated by Hassan Fathy in Egypt. Through this thesis, three architectural languages found in Mombasa will be explored in terms of their uses and the social and climactic advantages they possess. Using these architectural styles, the identity held by informal settlements will also be reinforced, particularly catering the design towards adaptability and flexibility.



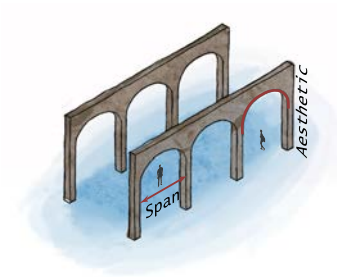
Swahili influenced courtyards.

The courtyard, regularly used by the Swahilis themselves, hosts a variety of functions from cooking to cleaning and doing laundry to socializing with close neighbours (Steyn 2005, 116). The kitchen is often half-open to the courtyard, where they can play a supportive role in cooking. The project will utilize courtyards to support the market's needs and delineate space for various programs while retaining connectivity to the other spaces within the project.



British influenced verandas.

The veranda, brought about by British colonialization and quickly adopted by the locals of Mombasa, provides shade and an extension to the built space. Verandas are commonly found attached to stores, where the additional space is used to display goods. However, they are not limited to stores and can be found integrated into traditional houses, where they extend living space and allow interaction with the public.



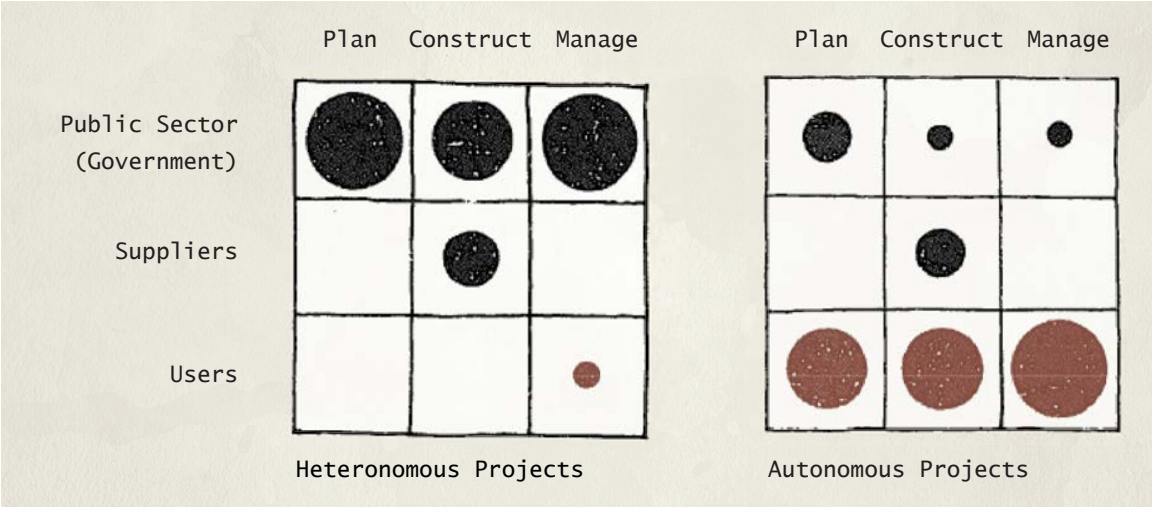
Omani influenced arches.

The arches, which the Omanis combined with traditional materials to allow for larger spans, increased structural capability, and provide a pleasant curvature aesthetic to their fenestrations. Here, they will be used to allow large spans without the need for large reinforced beams, which can be challenging to construct.

Ownership

In the Chaani settlement, people have banded together to form communal groups, such as the women's group known as Kilume. The group's main objective is for members to assist each other, mainly in building houses through self-help efforts. These women also operate numerous commercial activities that include the sale of groceries, retail trade and dancing (Magutu 1997, 311).

Instead of being run by a central agency, it would be ideal for a cooperative, such as the one mentioned above, to take ownership of the project. Since the project is built by the community, they will have the people's best interests in mind to ensure the project succeeds and serves the community in the most appropriate manner. This would also allow for increased dialogue between the people, as stated by Turner. He found that when the people building for themselves have a claim over the project, there is plenty of room for genuine relationships between the people brought together by the activity and, therefore, for creativity, pride, and satisfaction from the work itself (Turner and Fichter 1972, 145).



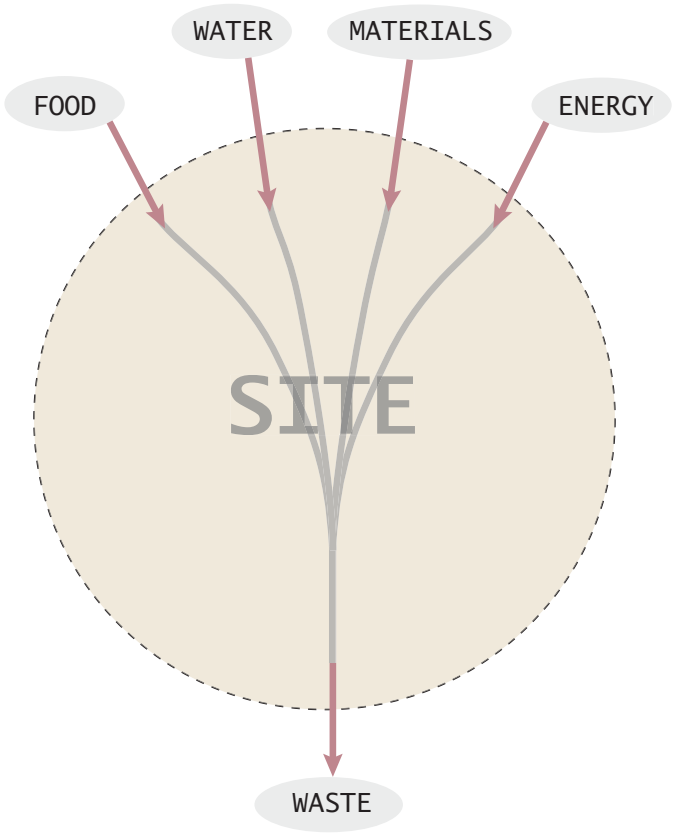
Turner's diagram illustrating the patterns of decision and control comparing a government controlled initiative (left) to a user centred approach (Turner 1977, 27).

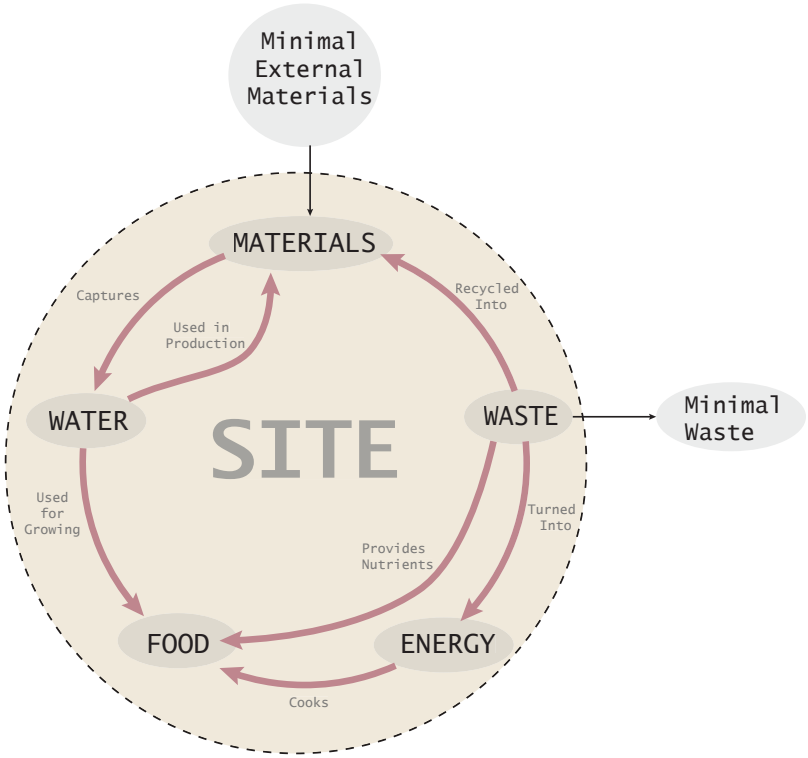
Cyclical Flows

The needs of architecture projects in the formal sector are usually accommodated for by their connection to the greater city. For example, materials are imported from warehouses, just as water and electricity are brought in from a connection to the city grid. On the other hand, informal settlements remain disconnected from such processes and do not share the same luxury as their formal counterparts.

However, there is an opportunity for these settlements to become more resilient by utilizing what they have within and limiting reliance on external sources. Since the project lacks the appropriate funding, it is important to create opportunities from the surrounding context. The idea of informal design pertains to the reuse of materials in imaginative ways, wasting as little as possible (Mehrotra 2008, 212). Here, the idea of creating a cyclical flow of materials and products will be used to contain the project within the settlement as much as possible. Unfortunately, it is difficult to procure every construction material needed from within the settlement, since materials such as rebar and cement are not easily obtainable here. However, the idea is to limit these materials as much as possible, making the project more affordable and accessible than alternative methods of construction.

In addition to materials, food and water are also brought into the community from local wholesale markets and water trucks, increasing reliance on external sources and bringing the living costs up. Creating sustainable methods of food production and water capture would help empower the residents and give them an opportunity to generate an additional income.





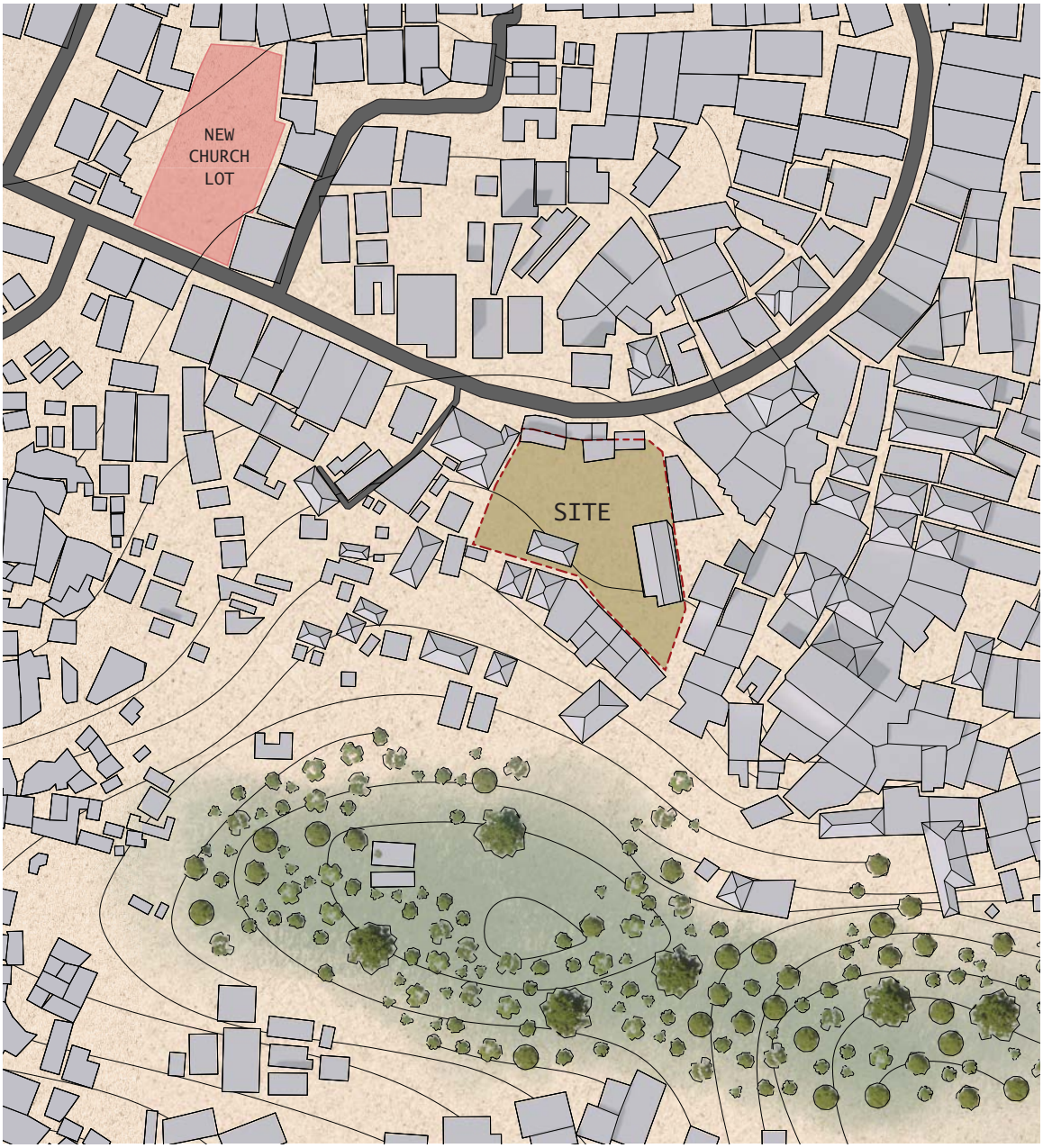
Procurement of elements in a formal project which has connections to the greater city and its amenities compared to that of an informal project which utilizes cyclical flows to limit reliance on external sources.

Site Analysis: Existing Conditions

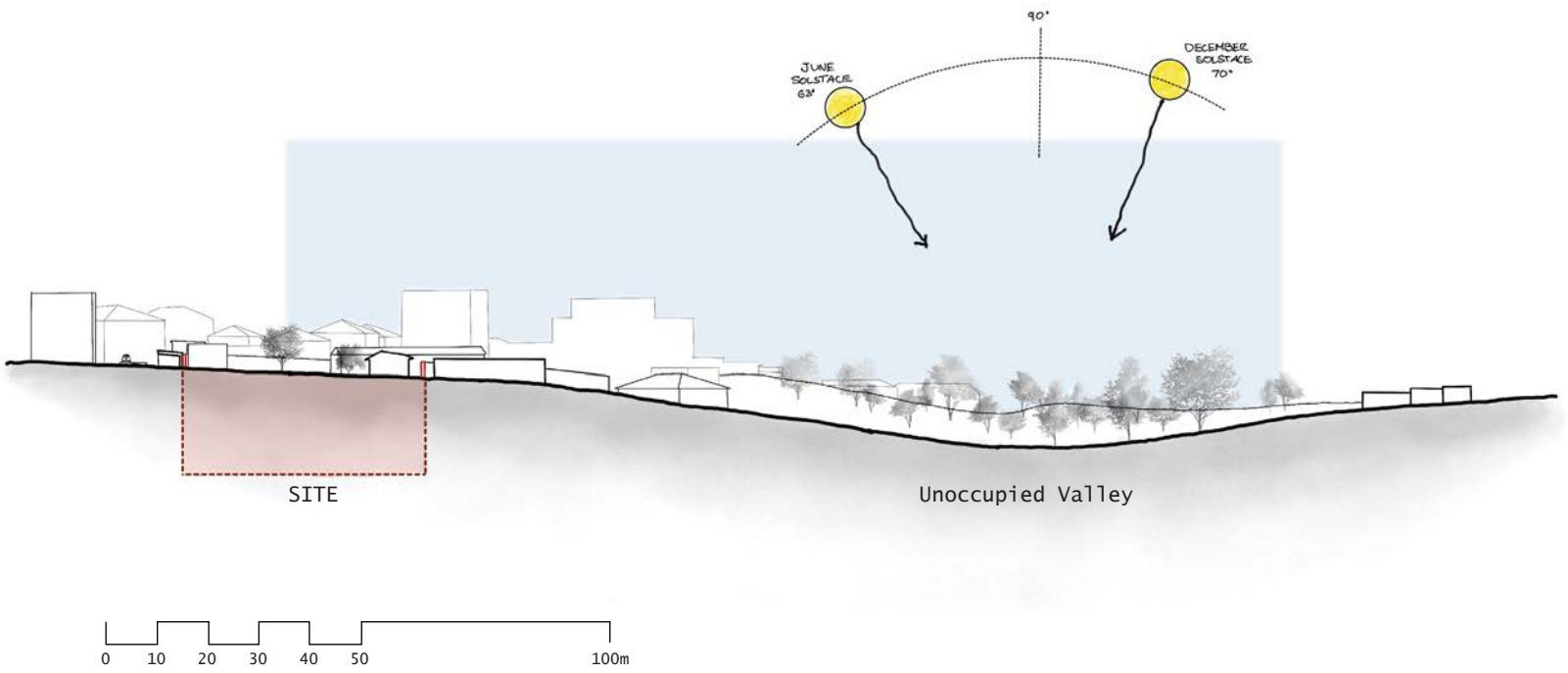
The site chosen for this thesis is an old church lot located on the main looped road, but outside the zone where the initial sites and services scheme took place. The P.C.E.A (Presbyterian Church of East Africa) has now been relocated to a new destination within the central loop. Due to the scarcity of official records or information available, the reasons behind the church's relocation are unknown, however, they have seemingly left the structures which once existed to serve religious functions mostly intact.

Observing surrounding sites, we can see a trend of multi-level apartment buildings being erected during recent years, which tend to disconnect the inhabitants further away from the main road, giving us an idea of the possibility that awaits the site. Regardless of its final outcome, it can be safe to assume that it is unlikely to serve the community. In a densely packed community already suffering from a lack of public space, the loss of this land will only exacerbate the diminishing community ties within. Despite it having been restricted, albeit not officially but instead religiously, the fact that it served a public use should be acknowledged in the decision of the next stage of the space, in addition to the fact that it is one of the few preserved usable spaces within the settlement.

This thesis will serve as a theoretical argument for the preservation of this space as a part of the public realm. By making it a space for the people of the settlement, it will be used as an opportunity to showcase how the people themselves could build a space which simultaneously serves the community and contributes to the resiliency and future development of the settlement.



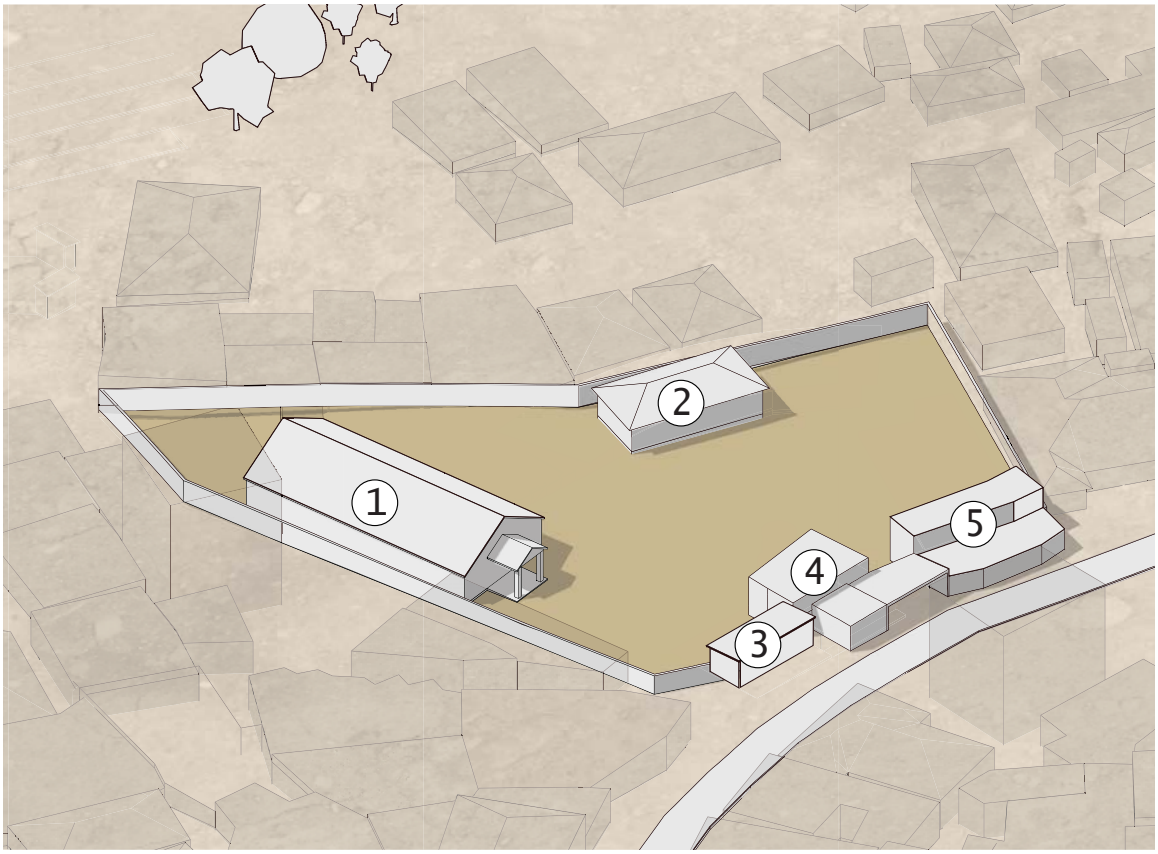
Site plan showing the location of the site along the central loop road.



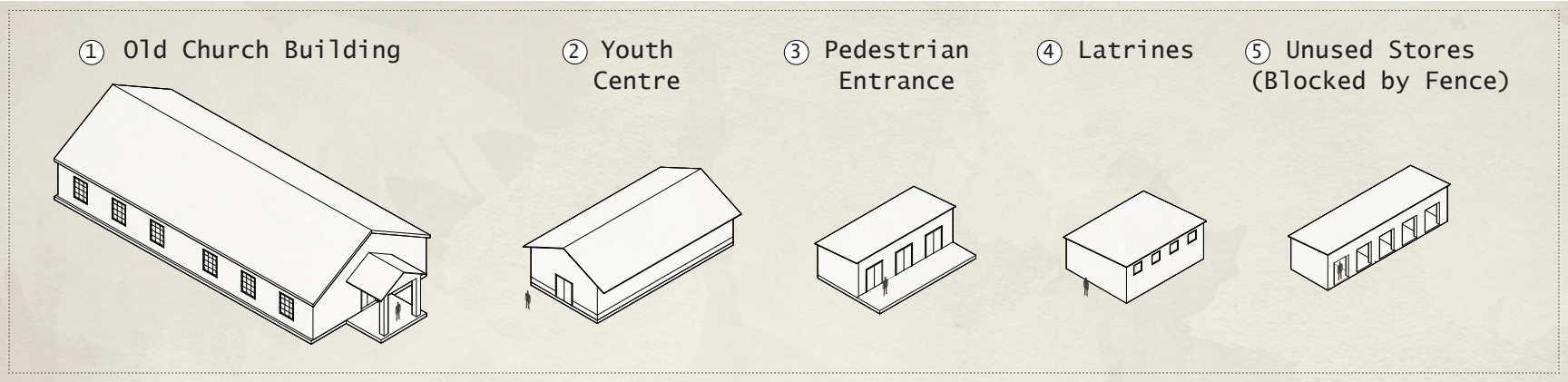
Site section

Existing Buildings

With the church no longer in use, several buildings remain on the site set to be demolished to accommodate the new development. However, rather than tear these buildings down, this design applies Mehrotra's notion of informal space, in that informal architecture is less about the architecture itself but more about how residents associate values to these spaces, giving them meaning (Mehrotra 2008, 212). Therefore, this project will seek methodologies of reuse for these threatened structures, generating alternate programs they can serve in their new life.



Existing structures on site.



Existing structures on site.

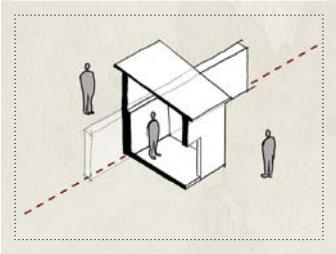
Collage using showing the frontage of the site onto the main road (base images from Google Street View n.d.).

Fencing

The church lot, analogous to any lot containing open space, has been enclosed by a stone fence to distinguish its space from land free for residents to occupy. However, as people continued setting up houses on paths adjacent to the lot, the stone fence became a barrier not only from entry, but also from accessing people's houses farther south.

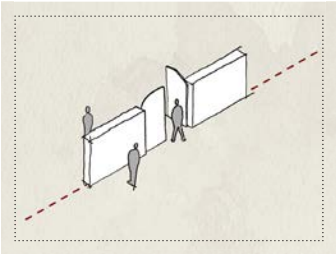
The role of this fence brings about a dilemma. On the one hand, it demarcates the space from one that is freely available for occupation. While on the other hand, the fence presents severe restrictions to those living south of the church. Several conceptual ideas were considered for how to best proceed with the fence. These ideas ranged from entirely eradicating the fence and any demarcation that came along with it, to reinforcing the fence and its role in separating spaces within the informal settlement.

Reinforcing or Retaining the Fence

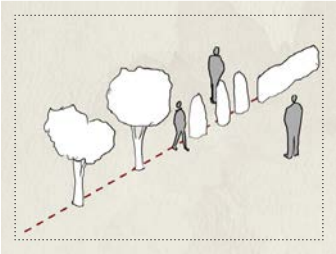


Reinforcing the fence by inhabiting it.

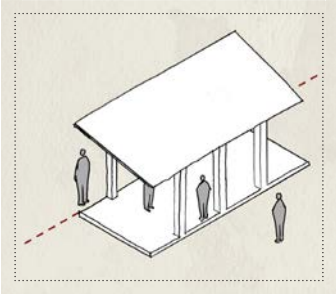
Reinforcing the role of the fence by making it inhabitable would heighten the sense of separation between the public realm and the site. While a delineation would be achieved, preventing people from settling on the site, it would be a harsh disengagement between the public realm and the site, which is meant to serve the public. This delineation could discourage people from freely entering and using the site. Even just retaining the fence carries issues similar to those mentioned above. An additional problem faced by either option presented here is the loss of visual sightlines that could give people passing by glimpses into activities occurring within the site. While this option was considered, it seems more beneficial in this circumstance to remove the fence in place for another form of delineation.



Retaining the fence and the gate.



A soft separation using vegetation.



A soft separation using a series of columns.

Soft Separations and Porosity

It is undeniably important to create some form of boundary indicating the site from unprogrammed open space. To keep porosity and visual cues through the site, porous boundaries which mark a form of delineation yet do not restrict entry have been considered. Either planting vegetation to mark this boundary or creating a series of columns around the site would achieve this.

The latter option holds more favour in this regard since the boundary can also serve its own particular function whilst simultaneously acting as a separator between freely available public space and the programmed space of the site.

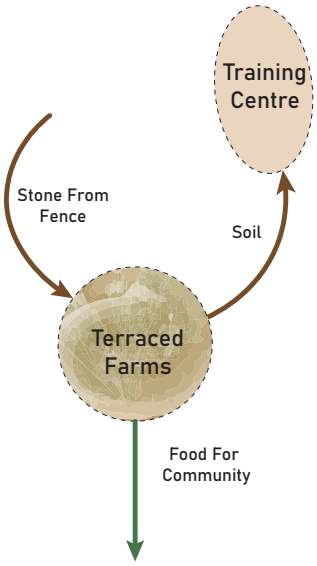
Chapter 6: Design

Part 1: Reusing Existing Elements

The process of this project has been envisioned in two distinct parts which build on each other. The first part focuses on establishing cyclical flows through adapting and reusing the existing buildings and materials on site.

Access and Food Production

The process begins by tearing down portions of the fence surrounding the block to allow movement through the site. Adjacent pathways are expanded, reconnecting the houses behind to the main road. In turn, this increases access and allows residents behind the lot to attain an address, something many people here lack due to the lack of appropriated wayfinding such as designated roads and pathways. Rather than dispose of the stone fencing, it can be reclaimed in the form of retaining walls to create a terraced farm in the valley further south.



Cyclical flow: By reusing the fence to create a terraced farm, the soil can be used for construction and the food to feed the community.

The terraced farms take advantage of Mombasa's temperate climate to grow all kinds of fruits and vegetables year-round. The excavated marrum soil can be used in the construction process later on. Replenishing the top layer of terraces with the vegetative topsoil would help in preserving growing capabilities. Terracing the land helps conserve soil and water, reducing the effects of erosion and allowing for more intensive cropping than would be possible on the existing slope (Deng et al. 2021). Food is currently obtained from outside the settlement for both consumption and selling, but having a dedicated farm space would allow residents to grow their own food, which they could also sell, reducing the reliance on external sources and increasing profits.

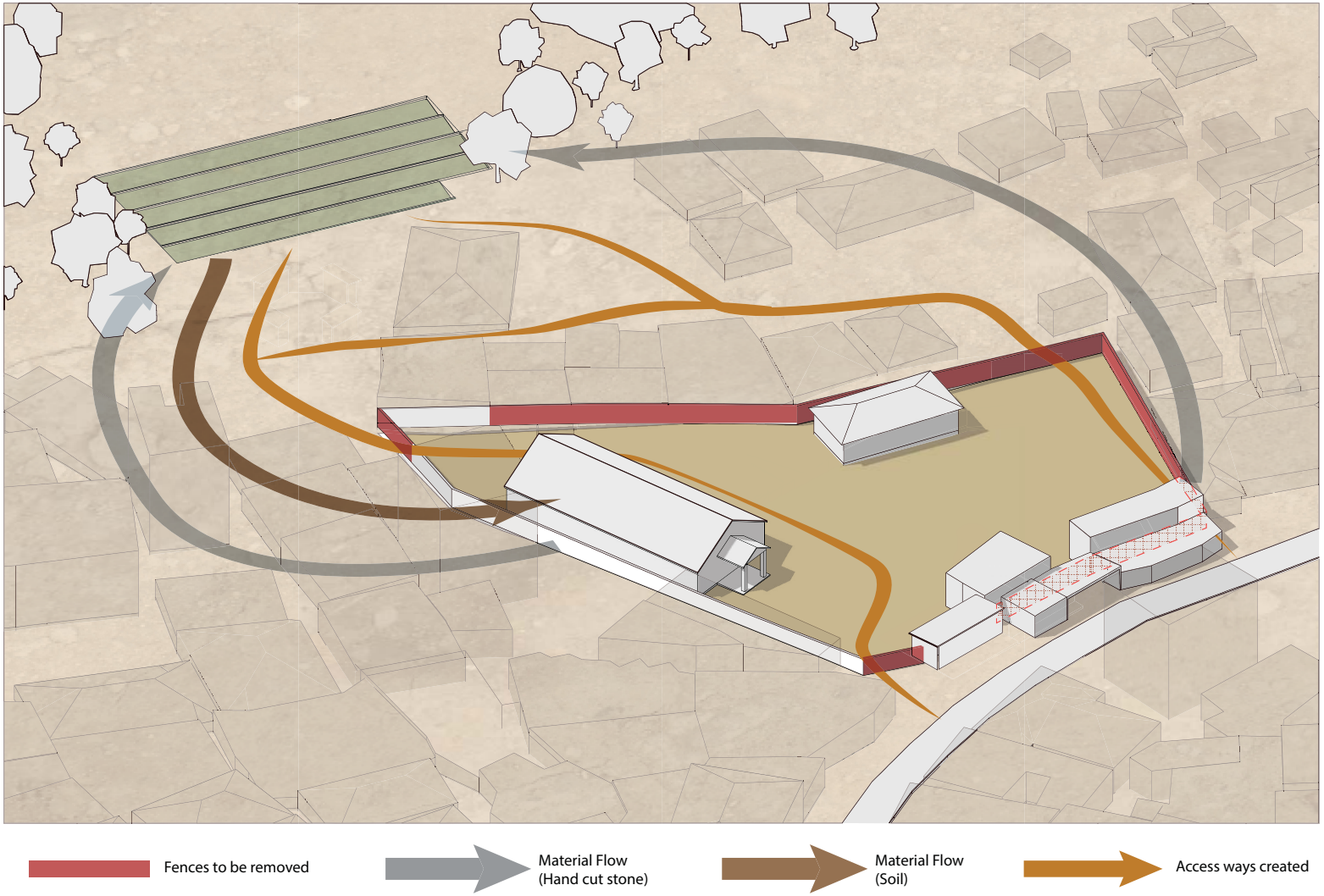
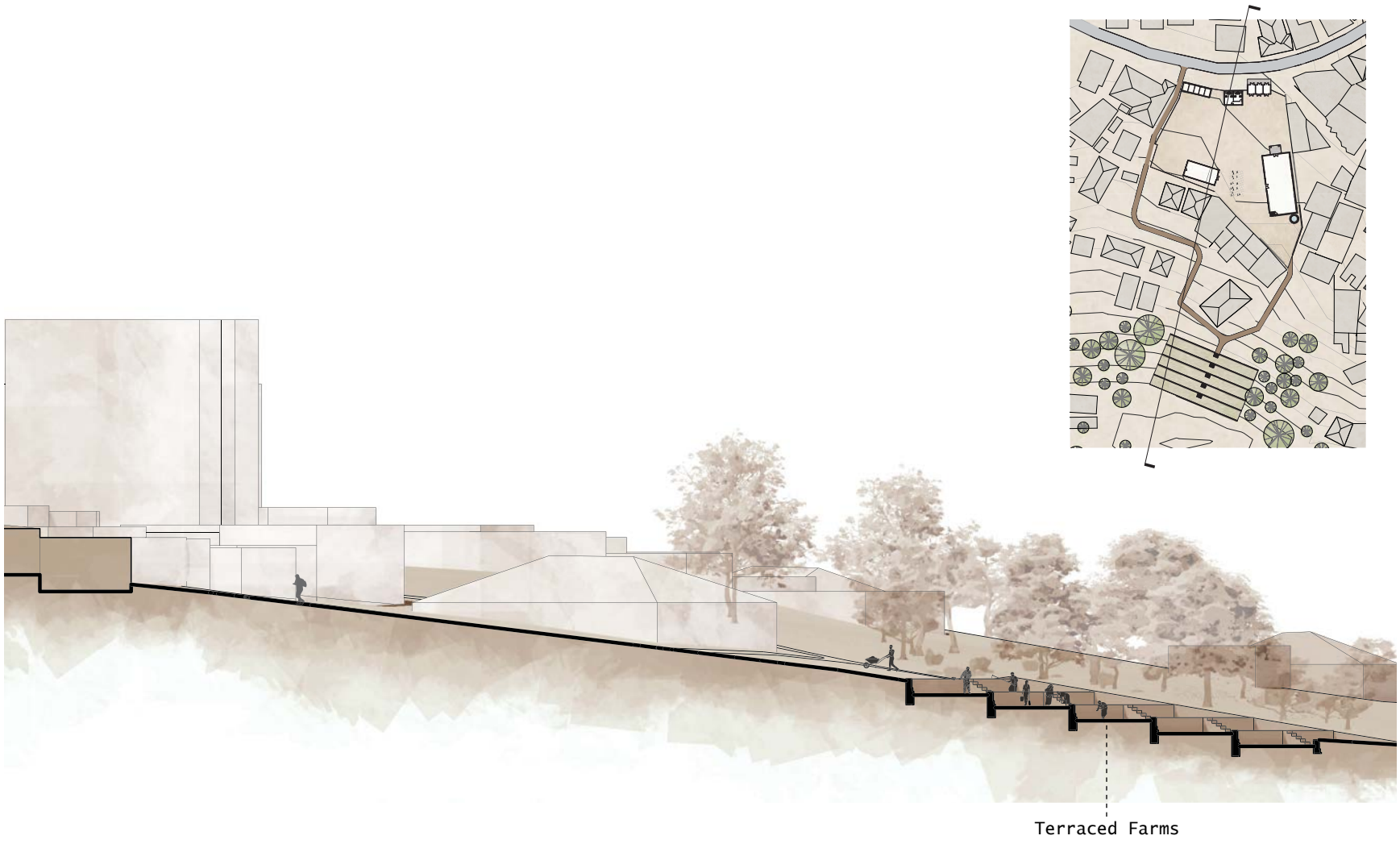
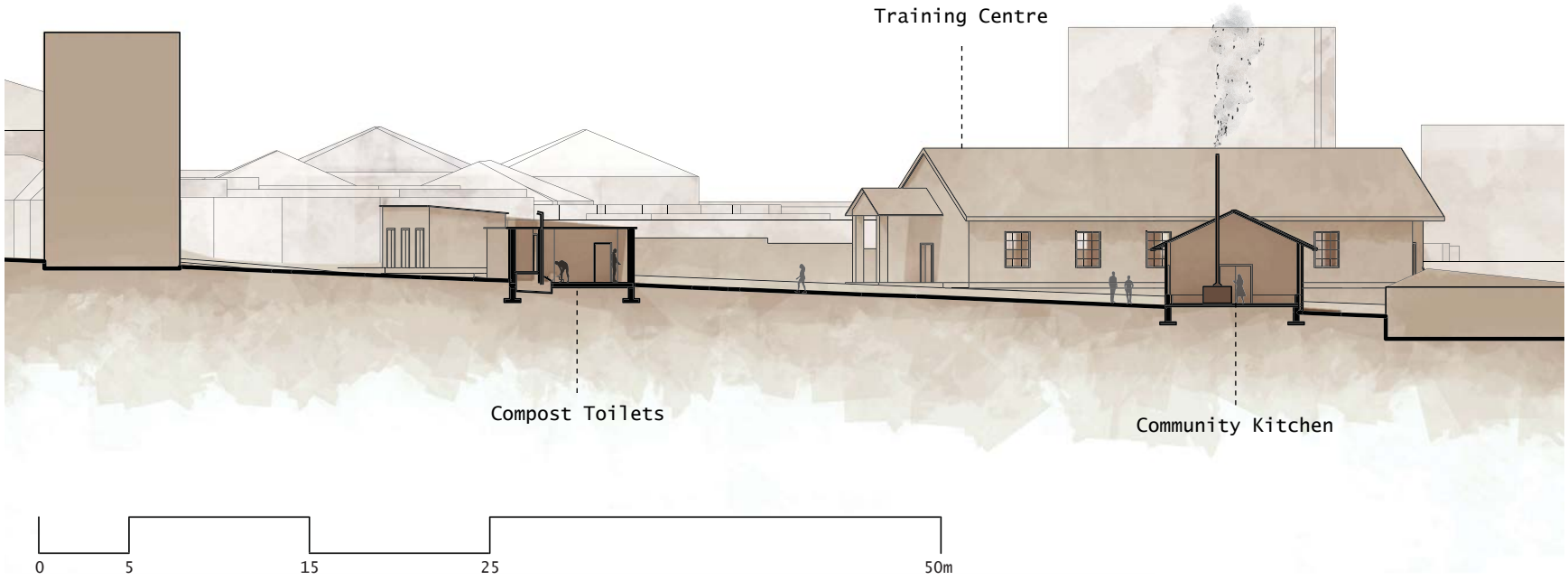


Diagram showing material flow and access ways created through the tearing down of the fence.

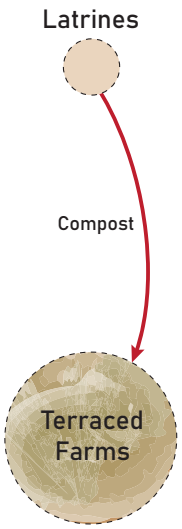


Existing site section (2/2)



Existing site section (1/2)

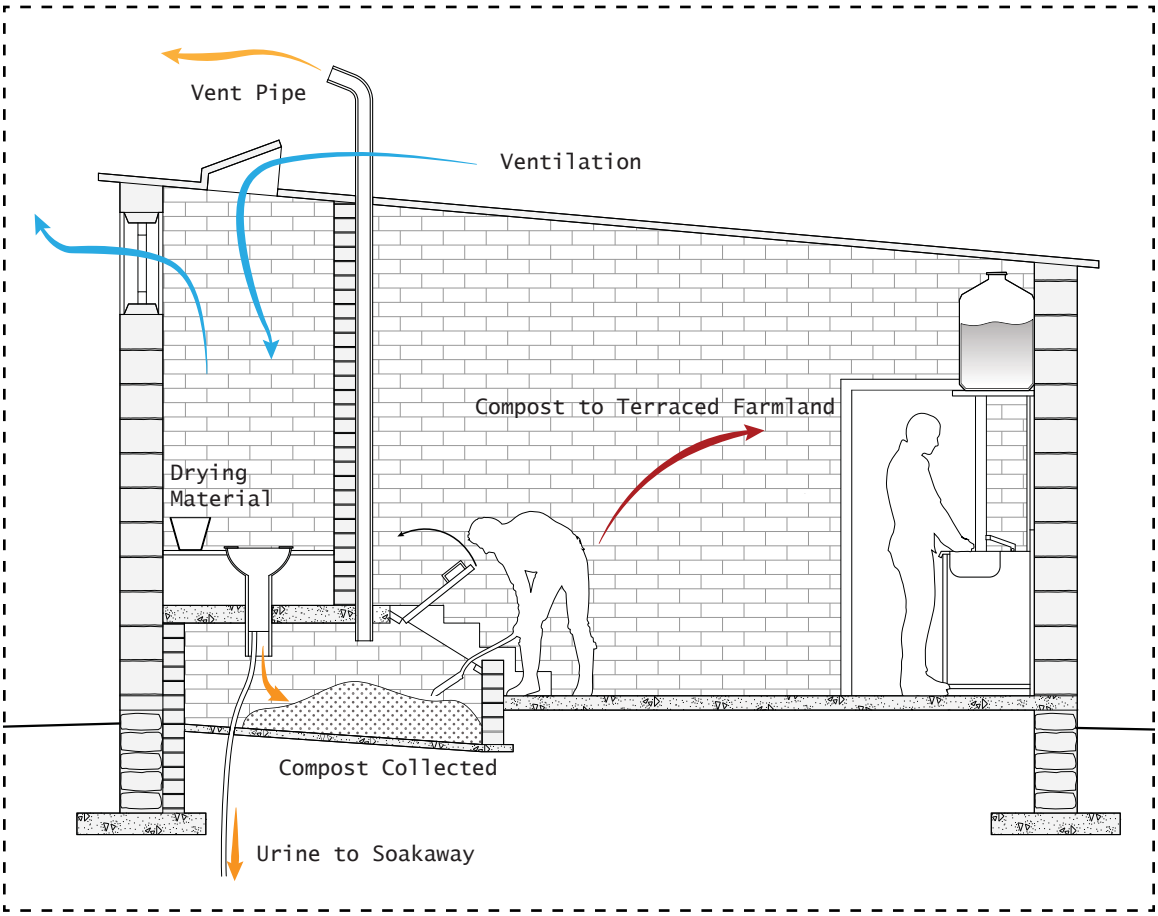
The farms will use the fence wall blocks to create retaining walls. Here, a more intense cropping can occur to provide a large amount of food for selling and eating.



Cyclical flow: Waste from the compost toilets is used in the terraced farms.

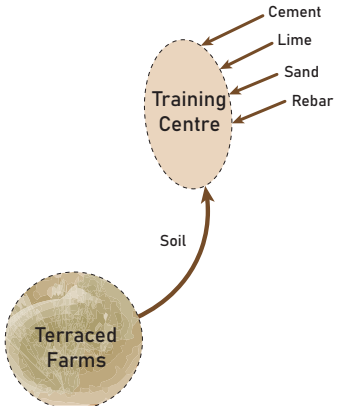
Sanitation

With a lack of an appropriate sewage system, waste is either trucked out or disposed of in the trunk sewer east of the settlement. The site currently has a structure dedicated to housing pit latrines. Upgrading the existing latrines into compost toilets would help turn an otherwise wasteful product into nutrition for the plants on the terraced farms. Compared to a pit latrines where all waste is disposed of in a single hole, dug quite deep, composting toilets separate dry and wet waste to speed up the drying process. Additionally, a drying material such as dried leaves is added after each use to speed this process up. This simple yet effective method allows waste to dry quicker and be handled by people safely.



Sections showing the upgraded latrines into compost toilets.

Training and Manufacturing

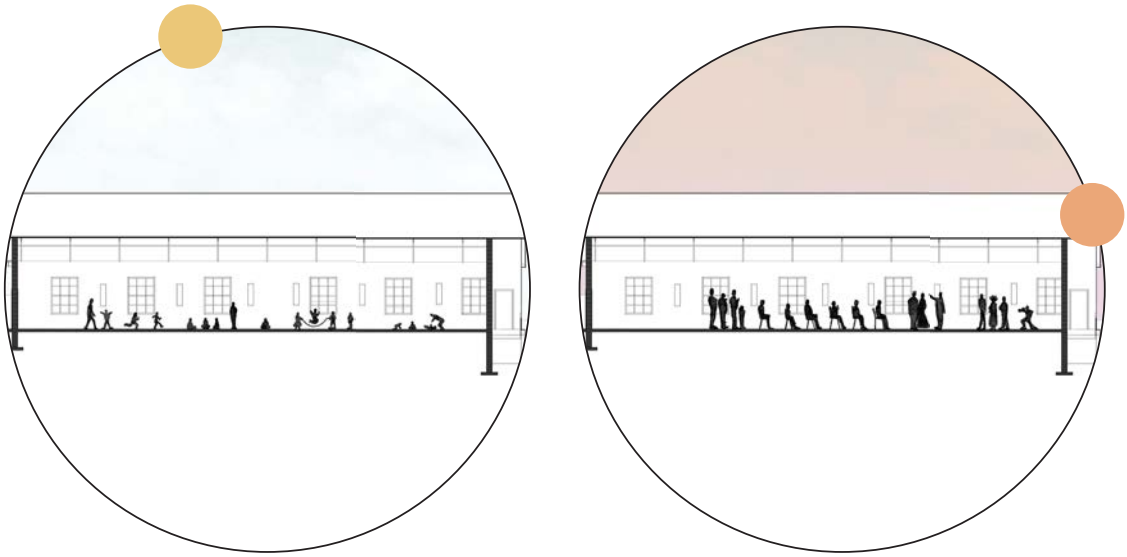


Cyclical flow: Soil, which is the main component of construction is received from within the site. While the remaining materials must be acquired from outside, the quantities required are far less than a project utilizing concrete.

The old church building can serve as a flexible space, functioning primarily as a training centre where residents can learn basic building techniques and store the equipment needed for manufacturing.

To accommodate flexibility, it was decided that the building should not be altered in order to maintain its large spatial capacity. This provides a much-needed designated gathering space. In its new life, the building could take on a variety of functions such as hosting community events, neighbourhood meetings or operating as a daycare with ease. The choice of how it is used is left up to the residents.

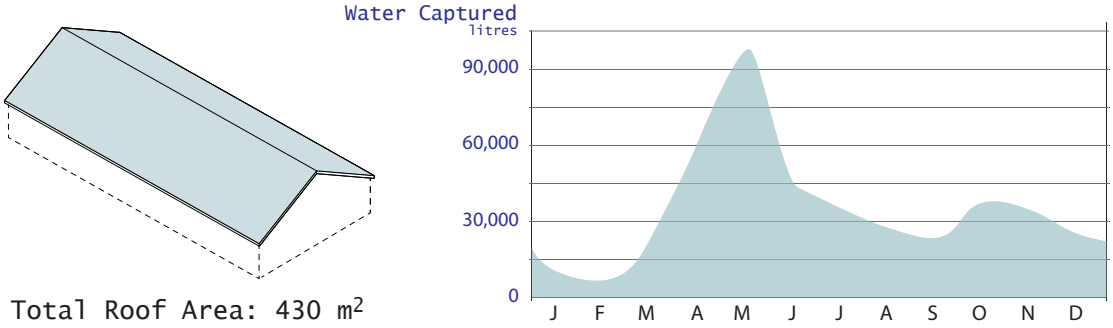
Outside, a water tank will be built to take advantage of the large roof, capturing the water needed for block manufacturing. Here, the production and drying of the ISSBs can take place, showcasing the simple process to those passing by through the site.



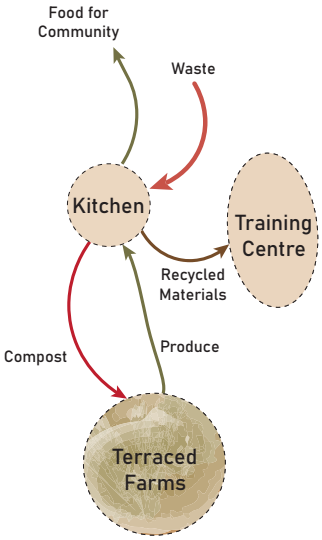
Flexibility of the training centre to fit the role of multiple programs as needed by the community. Various activities from training to community meetings to weddings will be able to occur here due to its size.

A training session taking place within the repurposed church building.

Block manufacturing taking place outside of the training centre using water captured by its roof. The blocks will be dried close by where the entire process is visible to the public.



Water capture potential of the training centre roof during an average year of precipitation.



Cyclical flow: The community kitchen reuses waste to cook food and provide compost for the terraced farms.

Community Kitchen

The old youth centre can be repurposed as a community kitchen, utilizing the community cooker developed by James Archer (WDO n.d.). This type of cooker is already in use in informal settlements throughout Kenya and works as an incinerator, eliminating garbage that is abundant in the settlement and using the resulting heat for cooking food. There is also a recycling aspect where garbage is sorted prior to burning, retaining anything useful and using biodegradable scraps and ash as compost for the terraced farms.

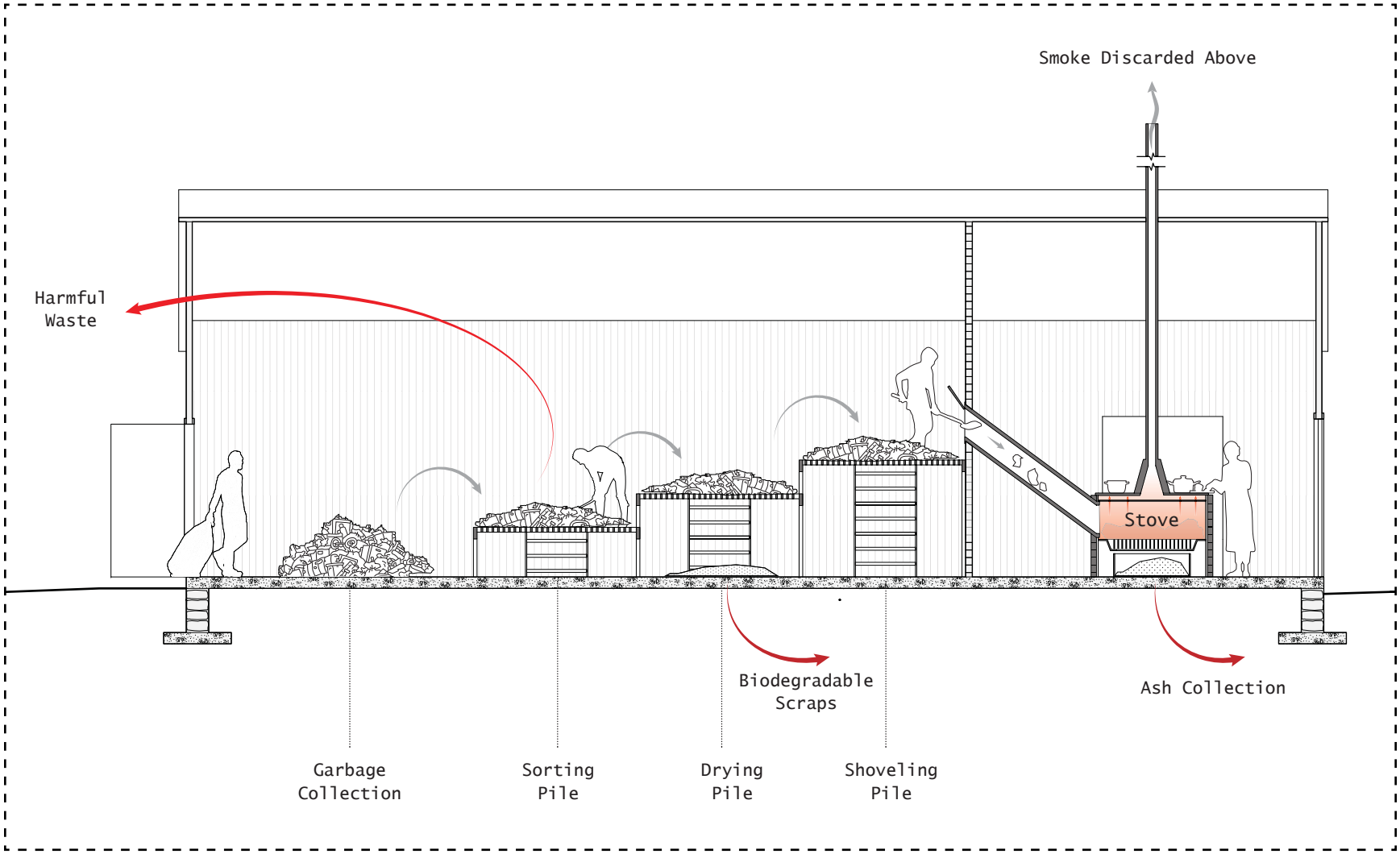
Here, an exchange of garbage for meals could occur, simultaneously cleaning and feeding the community. Additionally, the food produced could also help feed the volunteers of the project during the construction process.

Sorting Pile

Chute

Stove

The Community cooker has been used in several informal settlements and works as an incinerator which simultaneously cooks food and heats water (images retrieved from Community Cooker Facebook Page n.d.)



Section depicting the simple process of the community cooker.

Part 2: Market Design

The second part of this project utilizes the ISSB to allow residents to build new spaces which support their way of life and livelihood. In the case of this project, the new spaces will offer a market design allowing residents who previously lacked the ability to reliably generate income due to their location to come and set up shop.

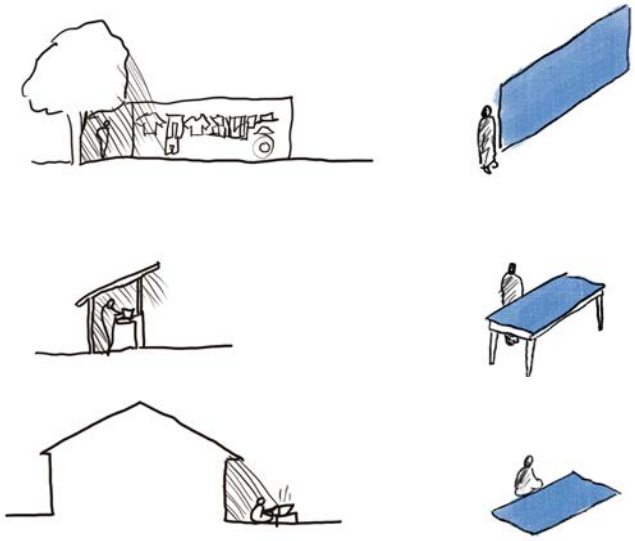
Informal Market Types

Commercial activity in Chaani is typically divided into two types: Firstly, the market stall type is used by people who sell food or a small arrangement of items that can easily be packed up and taken back home at the end of each day. Secondly, the enclosed commercial type is used by sellers for various reasons. These can include butchers who require higher sanitation needs, people who sell more varied goods such as convenience stores or pharmacies and people whose businesses benefit from an enclosed space such as salons. Providing opportunities for both types of merchants help encompass a greater range of job opportunities.

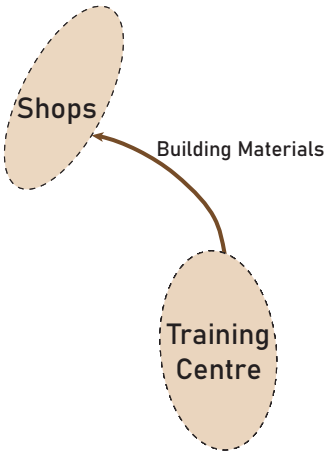
Types of informal market spaces requiring different elements to function (Google Street View n.d.).

Shades and Surfaces

In informal settlements, income can often be difficult to obtain, requiring residents to come up with creative ways to sell their goods. By finding a surface on which they can display their goods and a space that is shaded, they are able to conduct their business and earn an income. Providing these two key components in the market design will be important for allowing flexible market activities to take place.



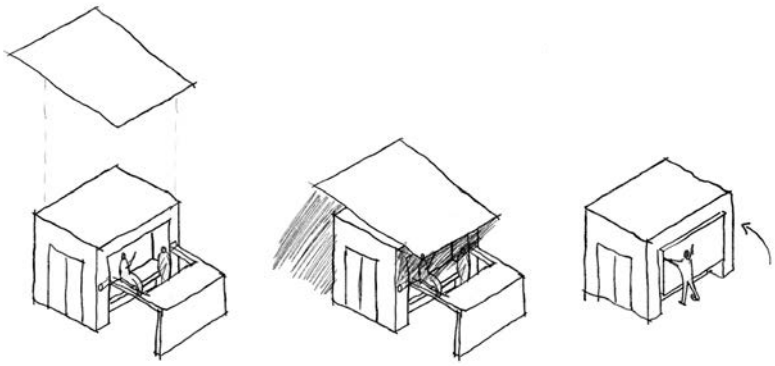
Key elements for informal commerce to take place, shading and a surface on which to display goods.



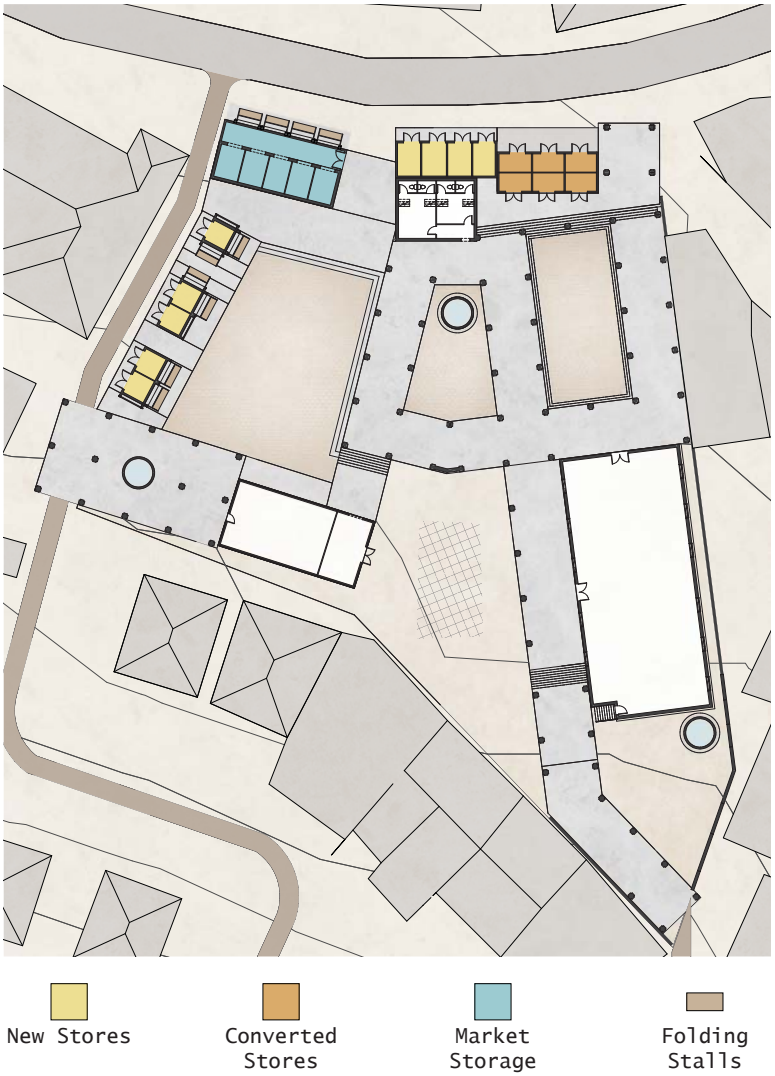
Cyclical flow: Once manufactured, residents can use the ISSBs to construct stores.

Stores

Along the widened west pathway and fronting the main road, enclosed shops will be created and a storage facility repurposed from the previously unused stores, allowing people to store their goods rather than carry them home at the end of each day. The shops are outlined with foldable stalls which can be enclosed to securely store goods when not in use. The large roof shading these stalls sits on perforated bricks allowing the store inside to be passively ventilated through the day.

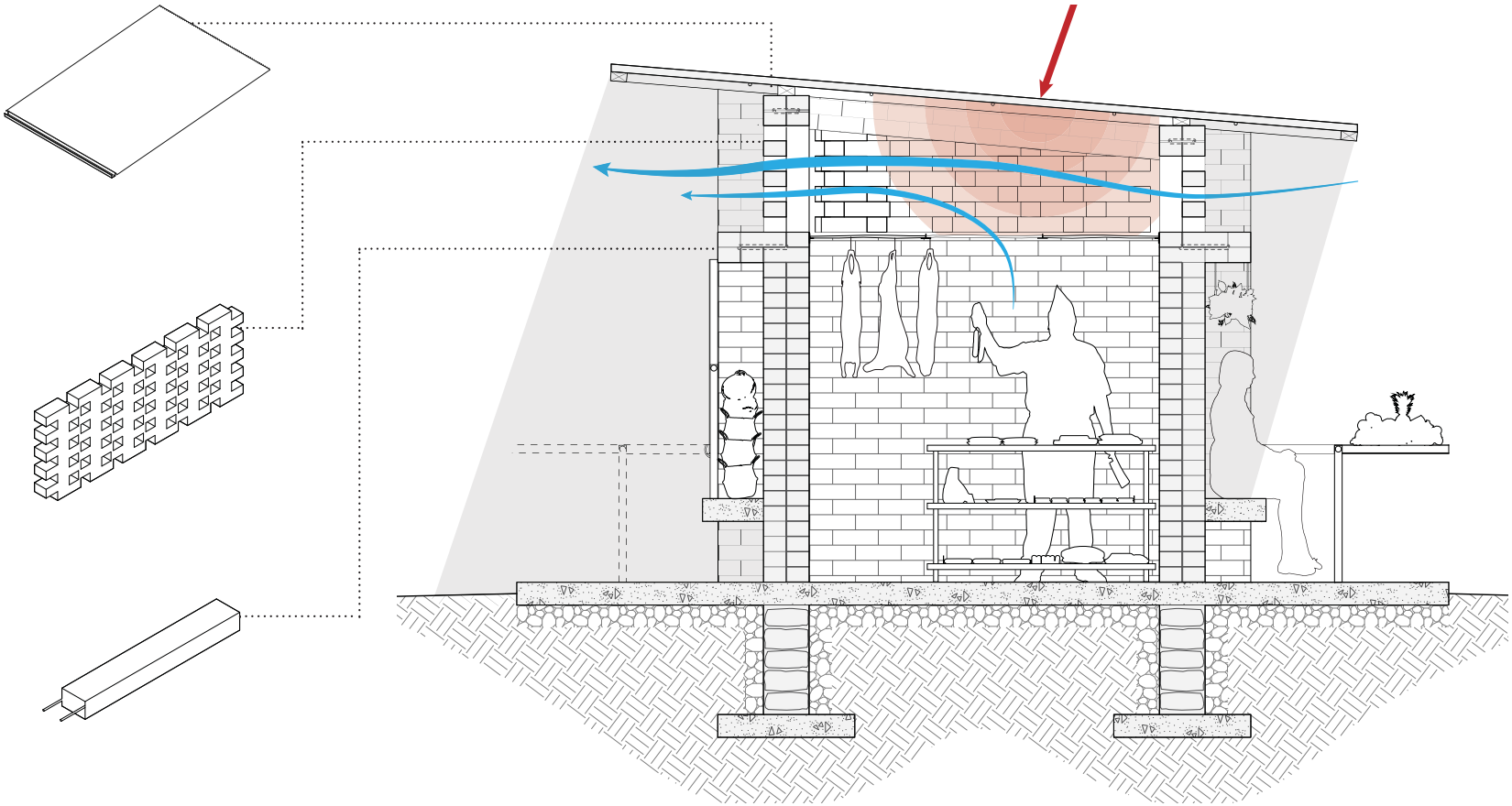


Store design with foldable stalls which incorporates street vendors, giving them a space to safely and securely store their goods rather than transport them home at the end of each day.



Plan showing the location of the stores adjacent to the new path and main road.

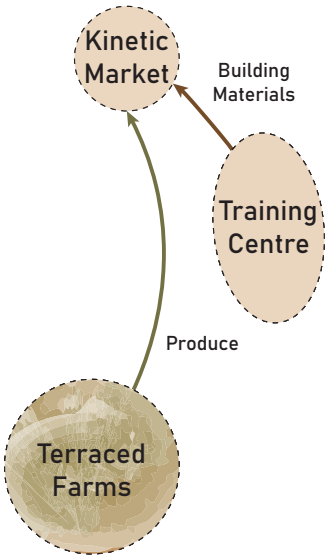
KIT OF PARTS



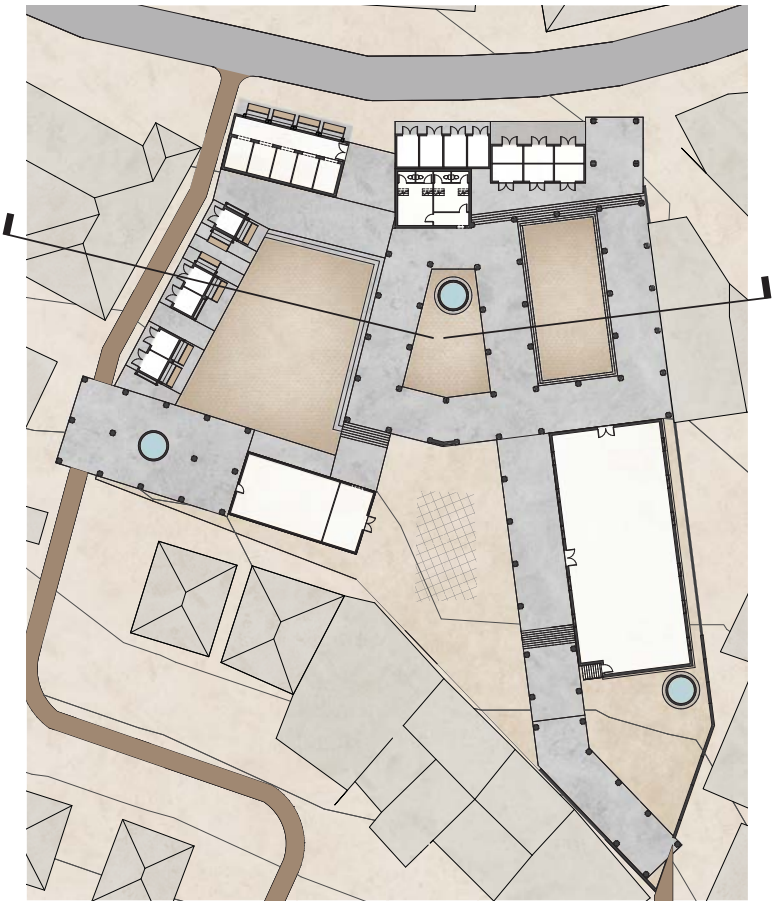
A section through a typical store and the corresponding kit of parts used to construct it.

Kinetic Market

A series of corridors will wrap around the training centre to create the open market space, spreading throughout the site. This would maintain the porosity through the site, while distinguishing its program from an open space for people to settle on. These spaces will function as flexible markets, shaded by an expansive roof and supported by arches and existing structures such as the training centre. Here, they function as verandas, creating a connection between interior and exterior activities and extending the space within. These large roofs can also be used for water capture as additional tanks are built on-site to aid the existing programs.

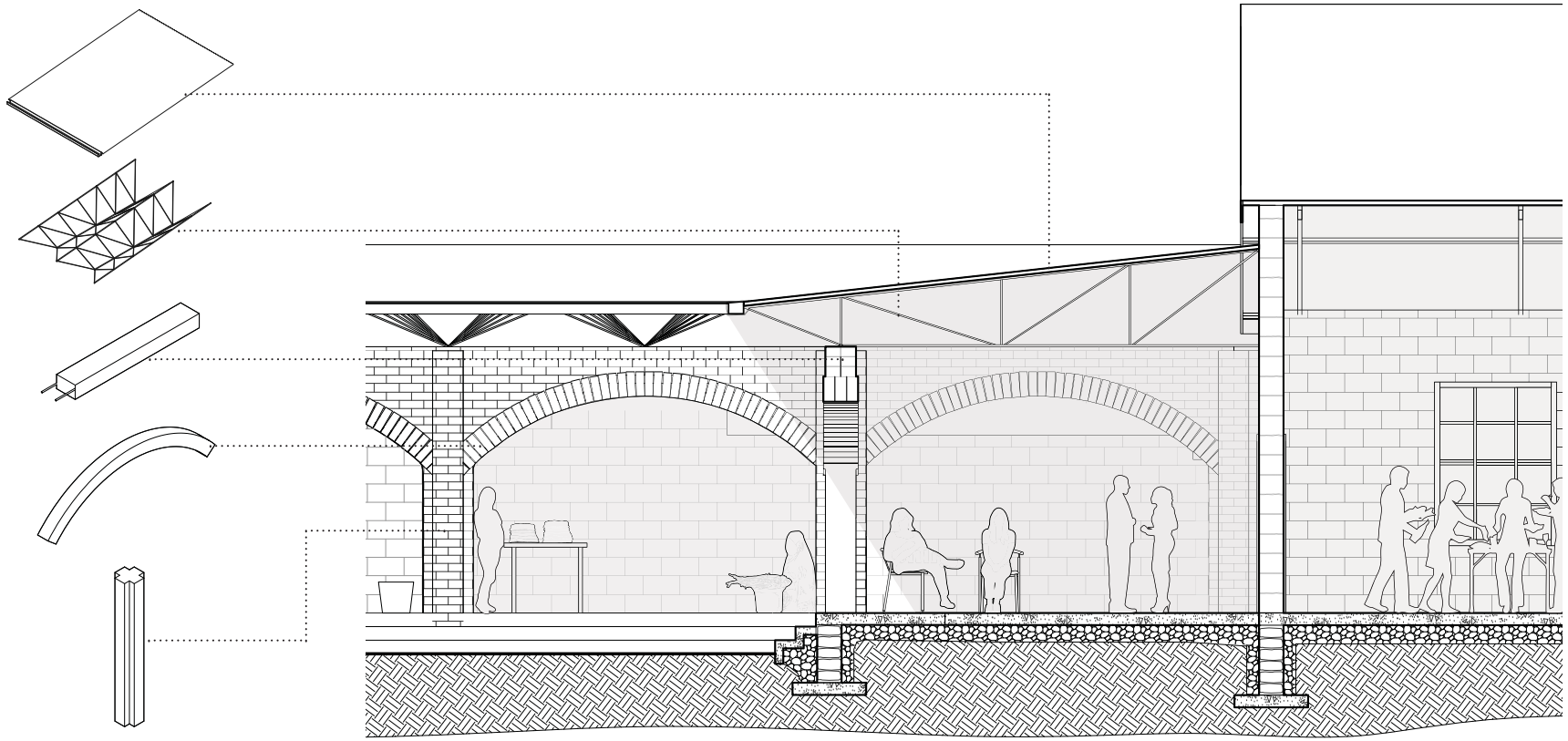


Cyclical flow: Building materials from the training centre will be used for construction. Once built, residents can sell produce grown in the terraced farms.



Colonnades allow for porosity through the market space while maintaining a delineation of programming.

KIT OF PARTS



Some market corridors will act as verandas, using the training centre structure and columns to support the roof and extending the space of the training centre, allowing activities to flow between interior and exterior spaces.

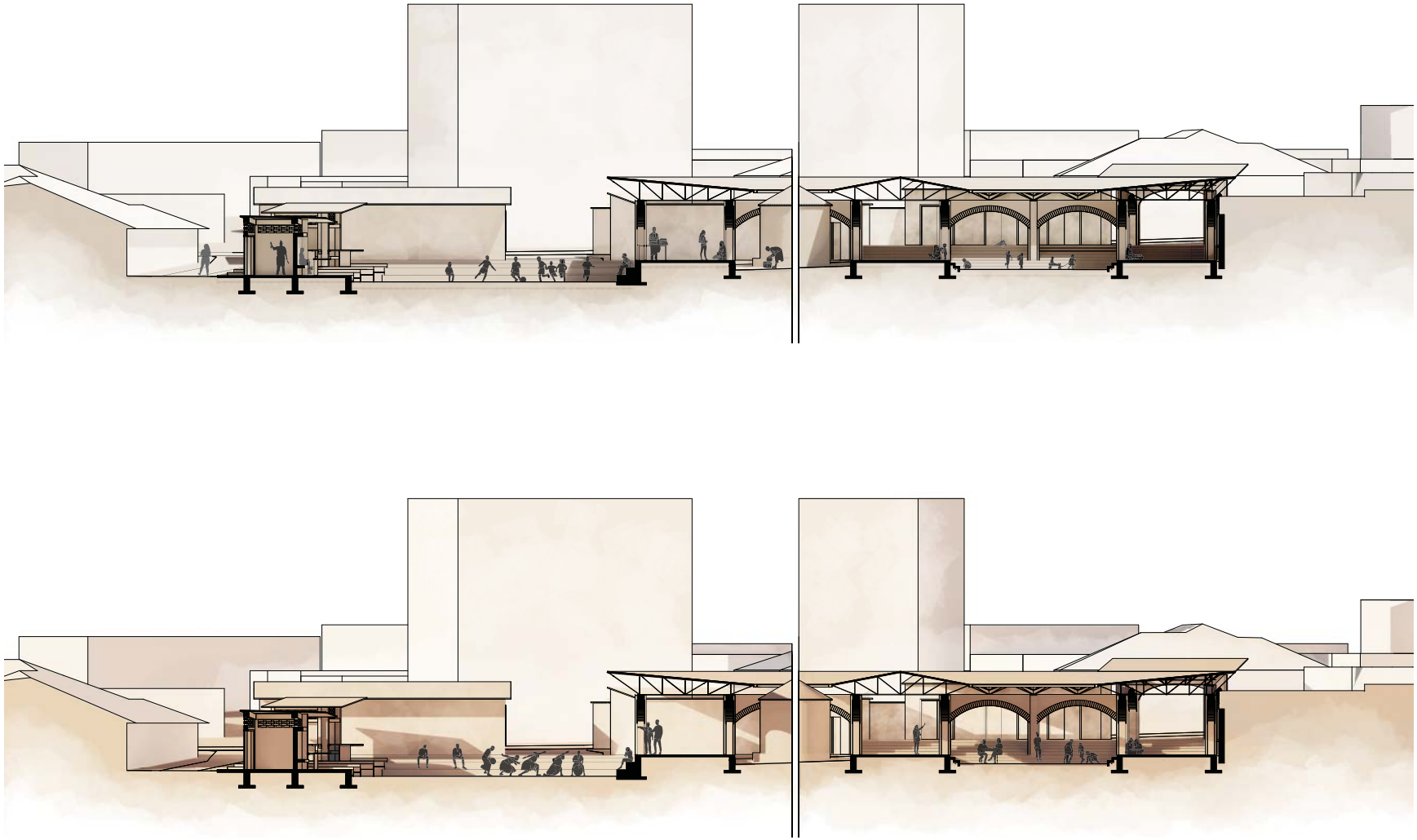
The corridors are wide enough to accept merchants on either side, leaving enough space for circulation in the middle. They are designed to create a series of courtyards adjacent to the market spaces which support the activities taking place within the market. For example, the central courtyard could be utilized to clean and prep goods for use during working hours.

Flexibility

The space used as a market in the daytime can host multiple functions at different times of the day, where it can help facilitate new endeavours and create economic opportunities for Chaani's residents. For example, the women's craft cooperative Kilume would now have a designated meeting space where the women can learn different types of crafts and create items that they can sell. The idea is that the design does not restrict itself to the single function of the market, but instead creates a public space able to be used flexibly by residents from all backgrounds within the settlement, where the programming is best decided by the residents themselves.

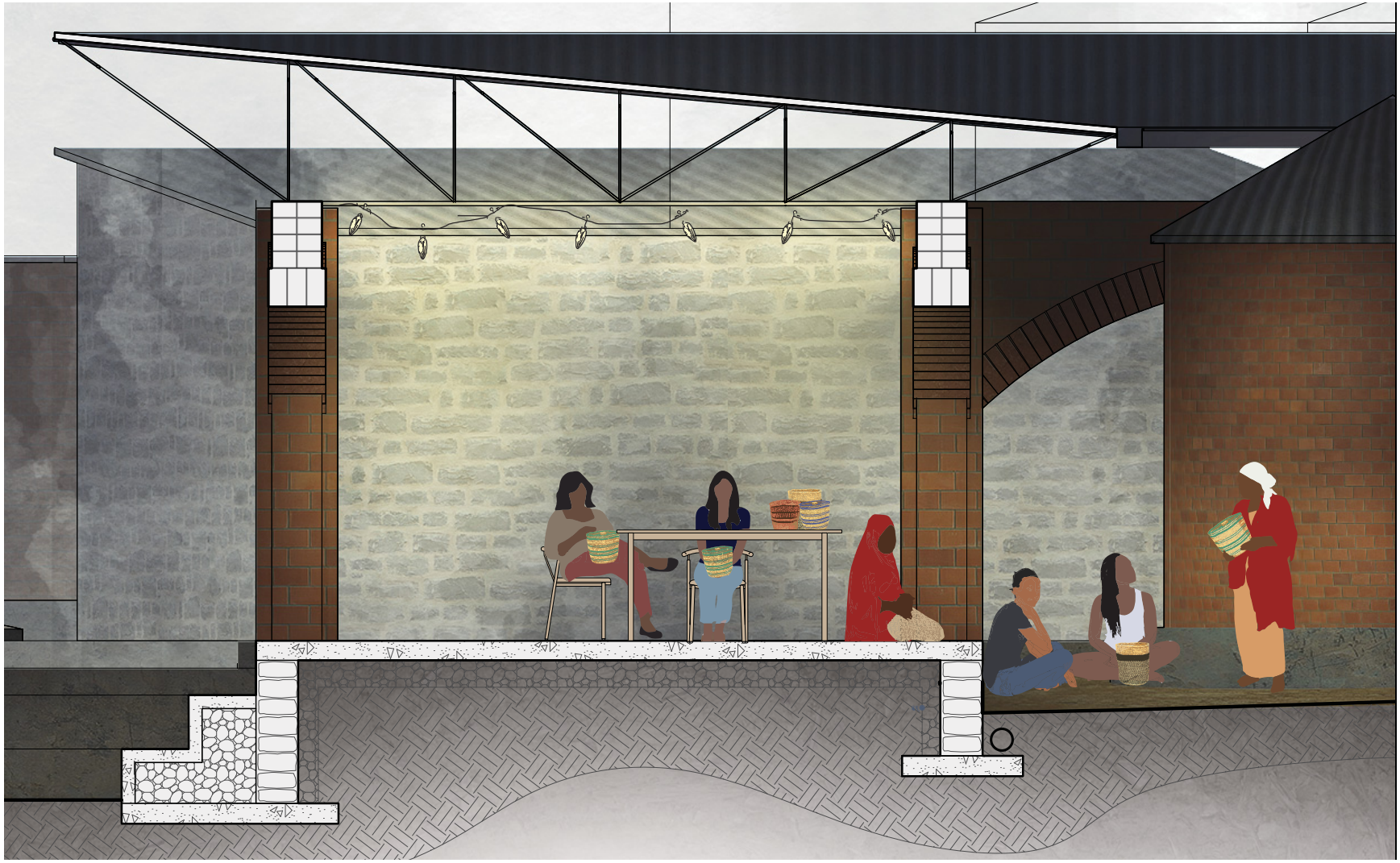
Courtyards

With a lack of designated public space, it is hard for a strong community bond to form without the ability to gather and partake in activities. In addition to supporting the market, the courtyards of varying sizes are able to host different activities throughout the day. By providing sufficient open space, they encourage social activity with the goal of creating bonds between the residents. Some of the many uses depicted in this project imagine the courtyards utilized as a safe space for activities such as soccer or as a playground for children. Additionally, they can bring people together through music and dance or provide people with the space to gather.



Sections showing the various activities taking place in the kinetic market and its adjacent courtyards during different times of the day.

Market activities taking place on a regular day. Here, the courtyards support the role of the market by serving as spaces to clean and organize goods.



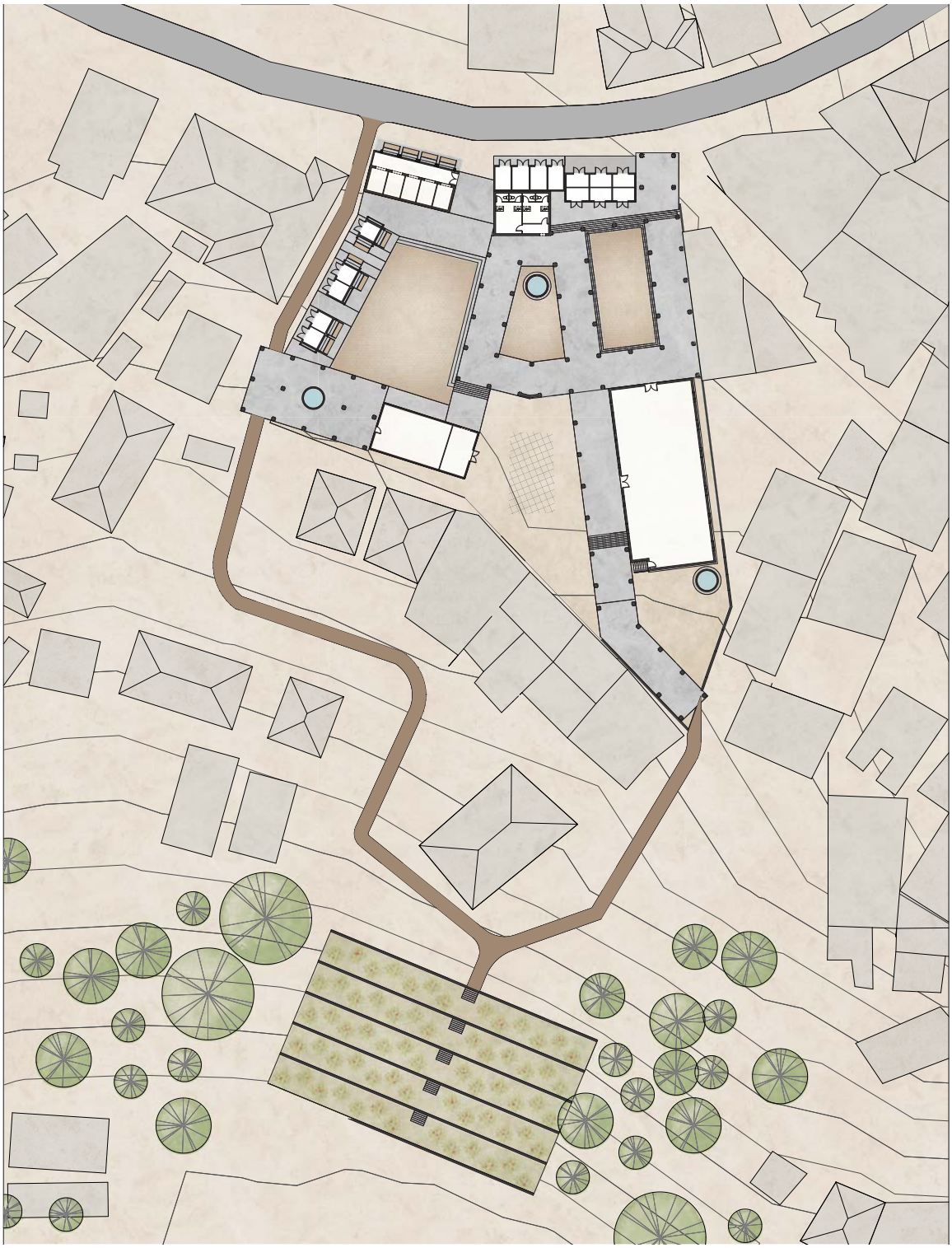
The role of the market is to host various activities that support the community, such as providing space for a craft cooperative. Depicted here are women weaving traditional Jora baskets, made from sisal plants which could be grown on the terraced farms.

The varying sizes of the courtyards allows them to accommodate different programs. The larger courtyard can be utilized as a safe space for activities such as soccer, Kenya's most popular sport.

At different times, the size of the courtyard allows for communal activities such as celebrations through music and dance to bring the community together.

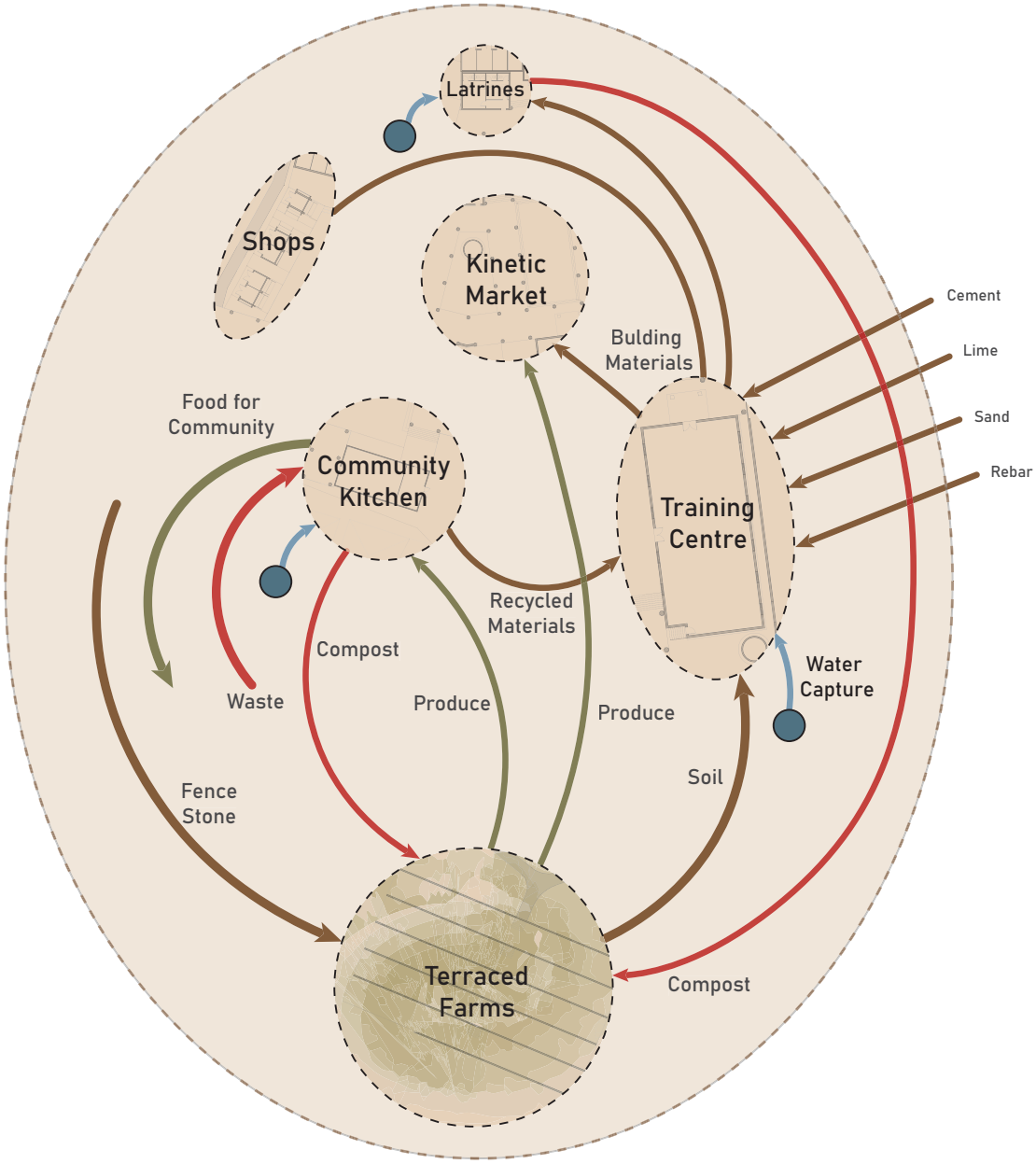
The courtyards could also support the market and community by granting children a safe space to play while their parents work.

Alternatively, the courtyard could be used to provide people with the space to gather in the evenings while they grab a bite from the food stalls in the market.



1. Training Centre
2. Terraced Farmland
3. Community Kitchen
4. Latrines
5. Kinetic Market
6. Enclosed Shops
7. Market Storage
8. Foldable Stalls
9. Courtyards
10. ISSB Drying Space

Overall site plan.



Overall cyclical flow of materials, food and water.

Chapter 7: Conclusion

This thesis has worked with its existing context. By reimagining the role of architecture within an informal settlement, cyclical flows have been realized to make the settlement more self-reliant. Additionally, using the kit of parts, a system of construction has been developed to facilitate the creation of a flexible public space by the residents. The egalitarian space is meant to bolster a sense of community and create economic opportunity within Chaani, Mombasa.

It has been made evident that for any project considering informality, the residents themselves must play a central role in the decision-making process. Were this project progressed beyond a theoretical thesis, numerous workshops would be held to get the residents' opinions on what would best serve them. Here, attempts were made to extrapolate such needs from articles, interviews, and surveys, but it is important to consider that with actual workshops, the design could be different from the one presented as part of this research paper. In reality, the design ideas explored in this thesis would serve as suggestions to be included or discarded at the residents' discretion. This disclaimer by no means invalidates the project, since at its heart, the project is more about creating a process than anything else.

The project began with optimistic notions and was initially centred on solving informal housing issues through a participatory upgrading methodology. However, realizing the complex combination of factors required to make such a process possible, the direction was shifted towards a single component, which focused mainly on the initial stages of creating community involvement and stable income generation.

This thesis does not look to solve the issue of informality, nor is it meant to infer that those living in informal settlements are not capable of building for themselves. Informal dwellers have proved themselves to be some of the most resilient and resourceful people on the planet, creating methods of dwelling in the most unexpected areas. Instead, it hopes to build on these factors, showcasing the potential of such settlements when people are given an appropriate opportunity and encouraged to work together.

The main issue afflicting Chaani today is the lack of community organization, partially due to the lack of designated gathering space, something central to the development of this project. In recognizing that big changes come through small continuous increments within such settlements, the project intends to serve as a seedling meant to grow in time within the community. By creating an opportunity for communal gathering, cooperation and utilizing knowledge mobilization facilitated by the training centre, it is implied that the project could have ripple effects and allow people to improve their own living conditions father down the line, potentially allowing people to obtain tenure under Chaani's upgrading policy.

The design uses familiar architectural language prevalent in Mombasa to create spaces that allow for flexible use. The colonnades, shops and their adjacent courtyards are designed to support the temporal use residents decide upon. While it might be conceived as a market space, whether it remains that way or is perhaps enclosed into a community centre, erected as housing units or demolished to give way for another structure is entirely up to the residents. The key proponent here is that decisions made by residents should take precedent in the outcome of this space.

The design and process presented here are just the foundation of ideas that must be developed, particularly when it comes to people's conception of informality and how architects can approach the topic. Here, we have to support the existing culture and help facilitate new endeavours to help make such settlements as self-reliant as possible. It is essential to understand that in projects such as this, the process is just as important as the design itself.

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