

## MSc Building and Urban Design in Development Student Report

### Home in Yangon

Maintenance, mobilisation and  
consolidation of infrastructure as  
strategies of upgrading



In partnership with WFW, ACHR, CAN, YTU  
and AMA

fig 1. the fieldwork team ("family portrait")



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*fig 2. residents of section 10 constructing an awning*

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# Executive Summary

Myanmar is undergoing multiple transitional and transformational changes. The changes in political, economic and social institutional structures are having tremendous impacts on the day-to-day lives of residents. These changes are having an acute effect in the nation's former capital city, Yangon. Residents of this report's focus, Yangon's Hlaing Thar Yar Township and more specifically Ward 20, are at the forefront of the complex dynamics that are bringing about diverging urban trajectories.

This report sets out to analyse the urban environment, specifically through infrastructure and will provide insights into our group's methodological process, examine our experience completing fieldwork in Ward 20. As a response to the analysis of findings, we propose strategies of maintenance, mobilisation and consolidation as mechanisms to navigate infrastructural challenges in both Ward 20 and the larger scale of the Hlaing Thar Yar Township.

Departing from the below research question, our group employs an analytical framework of "home" with an exploration of its extended conceptual and physical boundaries. Infrastructure as a theme of investigation is engaged with through its multiple dimensions of the house, people and services. The analytical framework leads to a methodological approach that allows for a thoughtful and critical engagement with the research and fieldwork.

## **How can the notion of "home" be (re)conceptualised through the multiple dimensions of infrastructure as a strategy towards settlement upgrading?**

Primary research, through fieldwork in Ward 20, and secondary research completed prior to our time in the field underpins this report and its findings. After analysing our research findings through the methodology and framework, the findings are organised into three parts: current infrastructural conditions; housing typologies; and the "circuits" of access and upgrading. During the fieldwork, we identified drainage as the most effective entry point to understand and intervene in the infrastructure system. This rigorous approach allows us to respond to and leverage existing conditions in our design interventions.

The final section of this report proposes three strategies: Maintenance, Mobilisation and Consolidation; that each relate to three strategic mechanisms: Mechanism of Functionality, Mechanism of Upgrading and Mechanism of Collaboration. These strategies and mechanisms provide starting points for communities at multiple scales to collectively maintain, mobilise and consolidate the necessary infrastructures, resources and actors to upgrade their urban environment.

Each section is united by a vision of a more just Yangon where each resident achieves well-being, develops a feeling of ownership and identity, and engages in active citizenship.



fig 3. group mind mapping to conceptualise “home”

## Acknowledgements

This report is the product of four months of co-production. It is a living document that represents multiple actors, understandings and experiences.

We are deeply indebted to our partners in Yangon. An overwhelming thank you to Women for the World (WFW) which, under the leadership of Daw Vanlizar Aung, put a tremendous amount of work into managing and providing an excellent learning opportunity. This report would not be possible without our engagement in Ward 20. Our local community partners opened their doors and hearts, enriching our research and personal development.

A special thank you to the volunteers and student colleagues from Yangon Technical University and CBP who were invaluable in the field and have become lifelong friends: Hein Htet Aung, Thar Myint Myat, Suye Tar, Hae De Zue, Ei Mon Kyaw.

We, also, would like to thank our other institutional partners including the Association of Myanmar Architects (AMA), Community Bithukar Platform (CBP), Community Architects Network (CAN) and Asian Coalition for Housing Rights (ACHR), and the Asian Foundation.

We would like to express our gratitude to the Development Planning Unit (DPU) staff that made this trip possible: Giorgio Talocci, Giovanna Astolfo, Catalina Ortiz, Camillo Boano, Ricardo Marten and Azadeh Mashayekhi and of course our classmates (BUDDies) for making the trip both personally and academically fulfilling.

Thank you to all the residents of Yangon, from the staff at the Panorama Hotel to the people we had small interactions with while walking on the sidewalk, the welcome we received and lessons learned will forever be remembered and cherished.

# Acronyms

**ACCA:** Asian Coalition for Community Action  
**ACHR:** Asian Coalition for Housing Rights  
**AMA:** Association of Myanmar Architects  
**ASEAN:** Association of Southeast Asian Nations  
**AW:** Asia World  
**CAN:** Community Architect Network  
**CHDB:** Construction and Housing Development Bank  
**DAO:** Development Affairs Organization  
**DPU:** Development Planning Unit  
**DRRWG:** Disaster Risk Reduction Working Groups  
**DUHD:** Department of Urban and Housing Development  
**EU:** European Union  
**GAD:** General Administration Development  
**JICA:** JIca Japan International Cooperation Agency  
**MCEA:** Myanmar Construction Entrepreneurs Association  
**MDF:** Metta Development Foundation  
**MoC:** Ministry of Construction  
**MoH:** Ministry of Health  
**MoPF:** Ministry of Finance and Planning  
**NDPCC:** National Disaster Preparedness Central Committee  
**NLD:** National League for Democracy  
**SEM:** Spirit for Education Movement  
**SURA:** Singapore's Urban Redevelopment Authority  
**TMAC:** Township Municipal Affairs Committee  
**USDP:** Union Solidarity and Development Party  
**WFW:** Women for the World  
**UN:** United Nation  
**URDI:** Urban Research and Development Institute  
**YCDC:** Yangon City Development Committee  
**YCZC:** Yangon City Zoning Committee  
**YHT:** Yangon Heritage Trust  
**YTU:** Yangon Technological University

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# Team Introduction

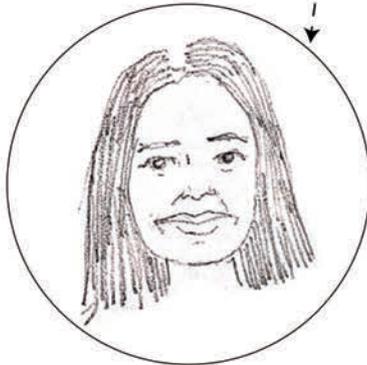
MARCUS PATRICK HUGHES  
from UNITED KINGDOM



JACOB DAVID MILLER  
from UNITED STATES



MARIA ROMINA GARCIA BISONO  
from DOMINICAN REPUBLIC



KAYLA HANNA BROWN  
from SOUTH AFRICA



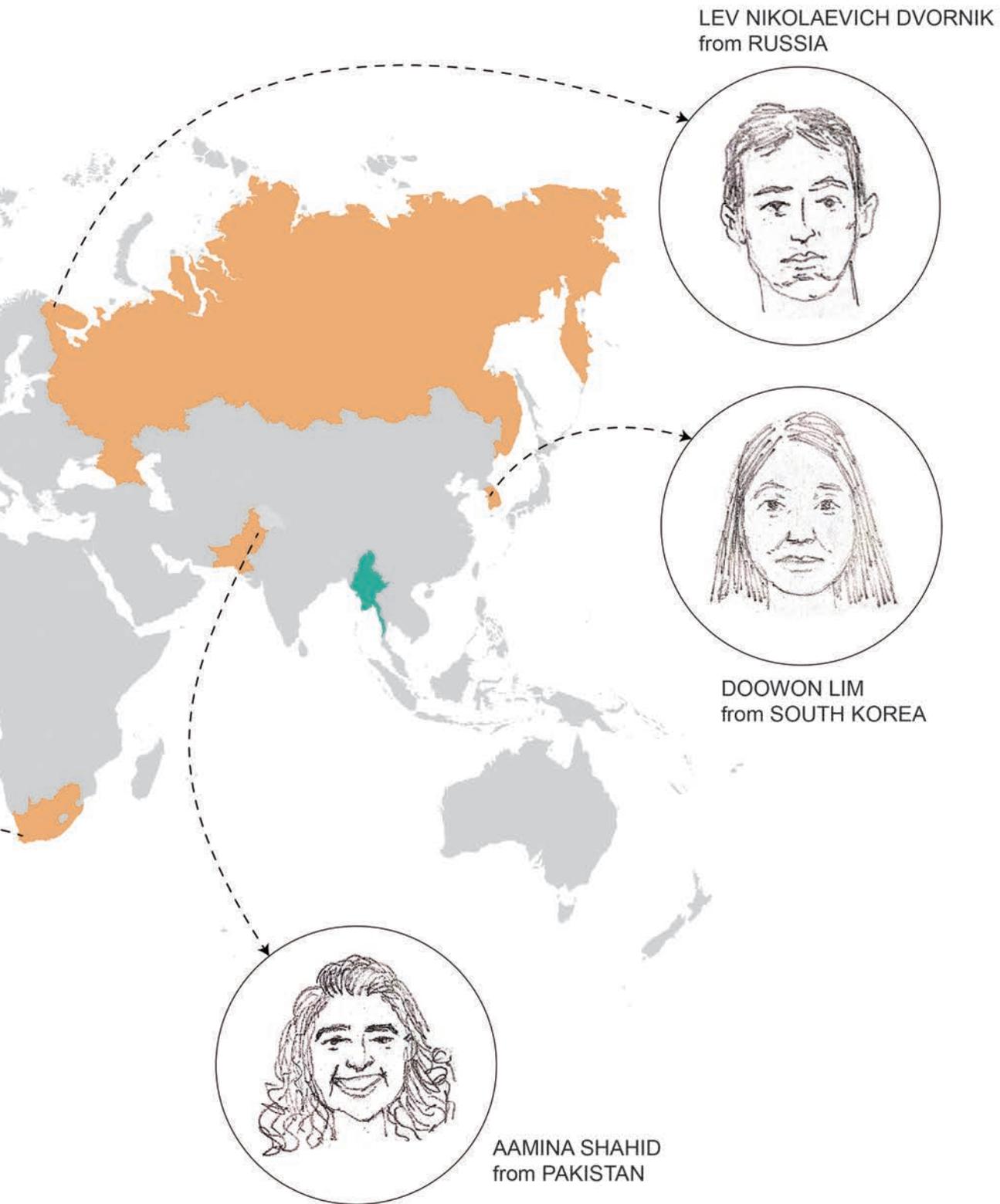


fig 4. where is home?

fig 5. children in Ward 20 construct a compacted earth platform using old clothes as binding



**PART 1:**  
**TRANSITION AND**  
**TRANSFORMATION IN**  
**YANGON**



# 1.1. Introduction

Myanmar is experiencing rapid change marked by numerous transitions and transformations in the nation's political, economic, social and environmental conditions. Each change in condition is amplified in Yangon, the former capital city.

Foreign direct investment, population increase, effects from climate change and weak governmental structures are causing tensions and providing opportunities. Upon "opening" to the world post-cyclone Nargis in 2008, Myanmar's economy has dramatically changed with growth as high as 8% (Farrelly, Holliday, Simpson 2018 pg. 3). Myanmar's government went through a structural change with the signing of a new constitution, despite this there still exists a tension and contestation between the former military power and the newly elected National League for Democracy.

These macro-conditions have dramatic effects on the day-to-day lives of Yangon's residents.

This report's research explores how this change is being navigated and negotiated by residents and proposes mechanisms to transform the trajectory of residents' urban experience. In a context of low state investment and high reliance on upstarting households, this report seeks to answer the following questions:

**How can the notion of "home" be (re) conceptualised through the multiple dimensions of infrastructure as a strategy towards settlement upgrading?**

This report departs from a rigorous four months of research and a dynamic two-week experience in Yangon's Ward 20. With a focus on multiple dimensions of infrastructure and an extensive analysis of drainage, which will be explored in detail throughout, we propose strategies of maintenance, consolidation, and mobilisation to produce a more just Yangon for its residents.



*fig 6. residents construct a drain*



*fig 7. residents construct a drain*

## 1.2. Transition & Transformation

The current pace and scale of change in Myanmar is far greater than most countries due to its recent political history. This change is defined by numerous transitions and transformations in the nation's political, economic and social conditions. Our group iterated definitions of transition and transformation and eventually defined the phenomena as:

**Transition:** a period of broad change from one state to another.

**Transformation:** a radical process of fundamental or holistic change that challenges hegemonic forces that uphold injustice, inequality or oppression.

Transitions are in the everyday negotiations and conversations between actors and accumulate toward transformation. These changes are inherently physical and spatial, Lefebvre (1991) argues, "To change the life we must first change space." For example, increased international industrial investment in Yangon has ushered in a new period of industrialisation with numerous factories emerging in the landscape. The prospect of jobs attracts individuals to the city and increases densification and strain on its limited

infrastructure. This oversimplified example illustrates the ecosystem relationships between finance, population, space, and provision.

The benefits of Myanmar's transitional and transformational process do not flow evenly. Nearly 70 percent of the population still lives in rural areas, while there is increased urban migration for jobs there is great inequality and distance between the rich and the poor (Farrelly, Holliday, Simpson 2018 pg. 5). Myanmar is now experiencing the global paradox of economic growth and growing inequality. While this brings increased challenges, the opportunities for intervention are plentiful. Graham and Thrift (2007, pg. 2) articulate the importance of the out of order, "Things only come into visible focus as things when they become inoperable – they break or stutter and they then become the object of attention. The background is thereby foregrounded."

Managing and navigating Myanmar's transitions and transformations towards a just and reformational future are this report's objects of attention and act as our entry point for proposing strategies of maintenance, consolidation, and mobilisation.

*fig 8. three young girls from Hlaing Tar Yar*



## 1.3. Context

### 1.3.1. Myanmar

#### Centralization to Decentralization

Myanmar's political history is marked by numerous regime changes. From an independent Buddhist Kingdom to a British administered colony to an independent military state, Myanmar underwent complex political changes before it achieved its current state of a new and fragile democracy.

As a new democracy, much of the institutional framework is still in the early phases of development. According to the Asian Foundation, "The 2008 Constitution is the basic, fundamental law in the framework for decentralisation and marks an important development, with the creation of 14 state/region governments" (2018, pg.iii). The devolved central government responsibility to regional and state governments include energy, industrial, social services, along

with transportation infrastructure (2018, pg. 15). To fund these responsibilities the regional governments are able to collect taxes on a wide range of economic activities along with negotiating with international developers and private interests to fund projects.

Moving away from strong centralised control is a critical national political transformation and is an asset to the strategies proposed in this report. While the sub-national governments have a responsibility to engage in these activities, there is no guarantee of action. Fieldwork findings, which will be explored further, suggest that much of the infrastructure and services are provided by hyper-local actors like homeowners mobilising to build and maintain roads.

## Historical Timeline

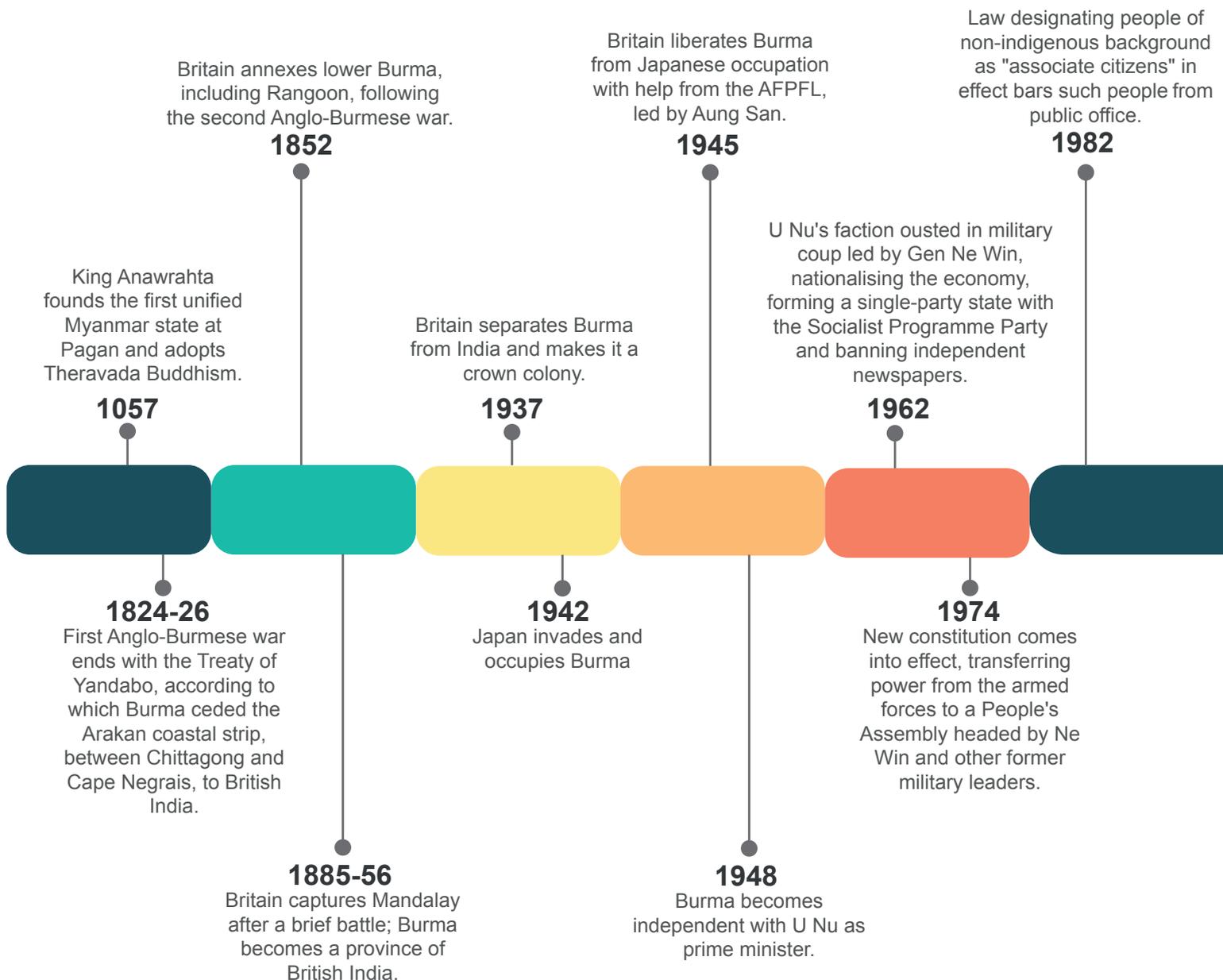
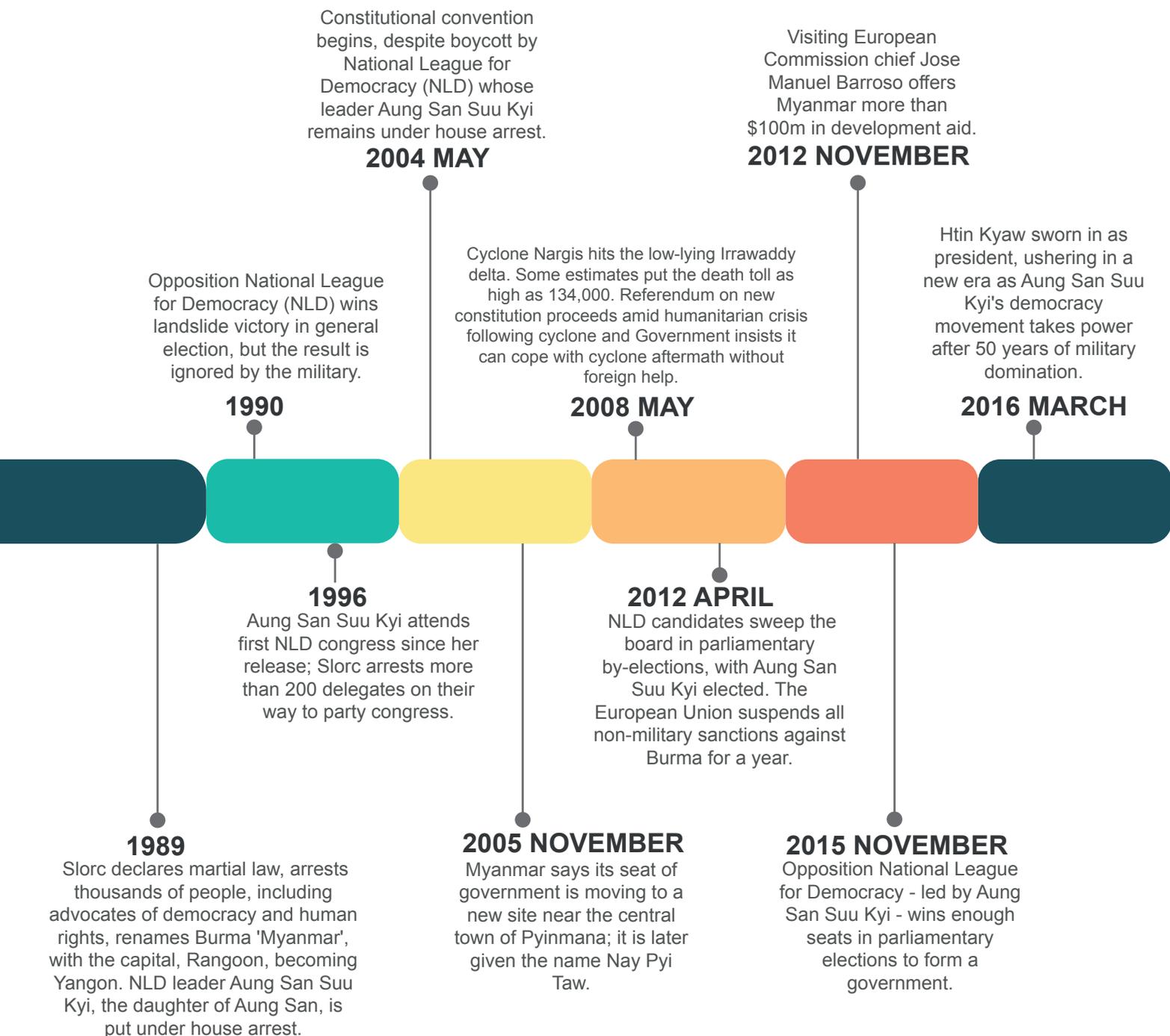


fig 9. the historical political transitions of Myanmar



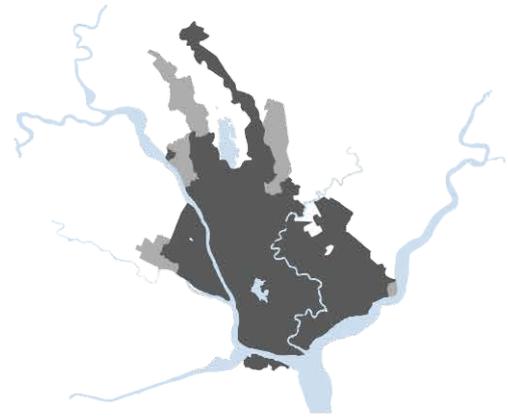
# Yangon Urban Growth Map

■ Developed Area  
■ Under developing Area

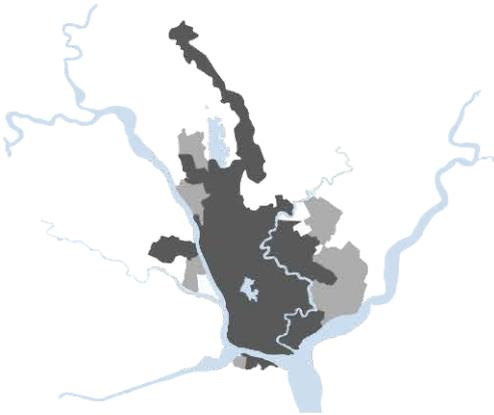
1985



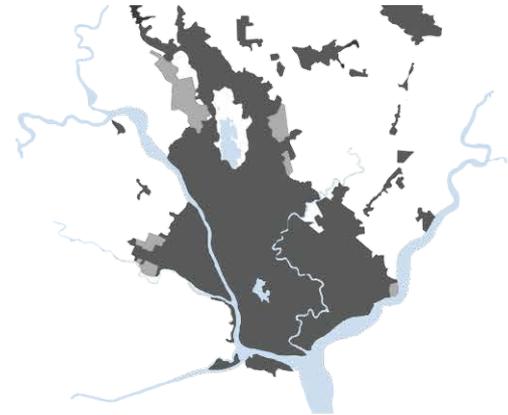
2010



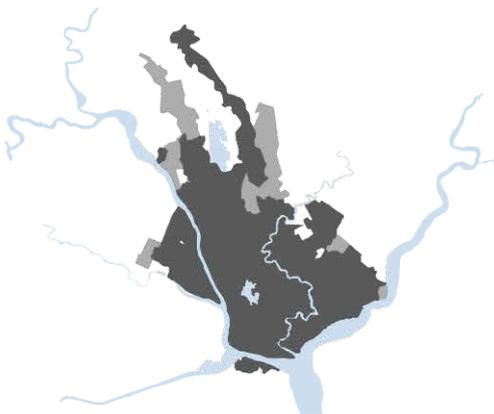
1995



2015



2005



2017



## 1.3. Context

### 1.3.2. Yangon

#### **Economic Powerhouse**

Yangon is the economic engine of Myanmar. Despite no longer being the political capital of Myanmar, Yangon has maintained and experienced growth in its economic capacity. Upon opening to international funders, actors like JICA began to heavily invest and define the future of development. Other actors in the redevelopment strategy include KOICA, France's Agence Française de Développement and the UK's Department for International Development (Nyein Aye 2017). JICA's 2040 plan for urban redevelopment seeks to address issues like increasing traffic and safety, as well as, dramatically shift housing policy.

Housing is positioned by the YCDC and NLD as a priority concern. Currently, home quality and provision varies. There are two main low-income housing trajectories: government provided and

communal provided (e.g. WFW). At the National Workshop: Housing by/for people – Towards a knowledge-sharing platform in Myanmar, a representative of the Asian Foundation noted a key distinction of housing policy in Myanmar. He noted that homelessness is not a real issue, rather the issues are with home quality and provisions.

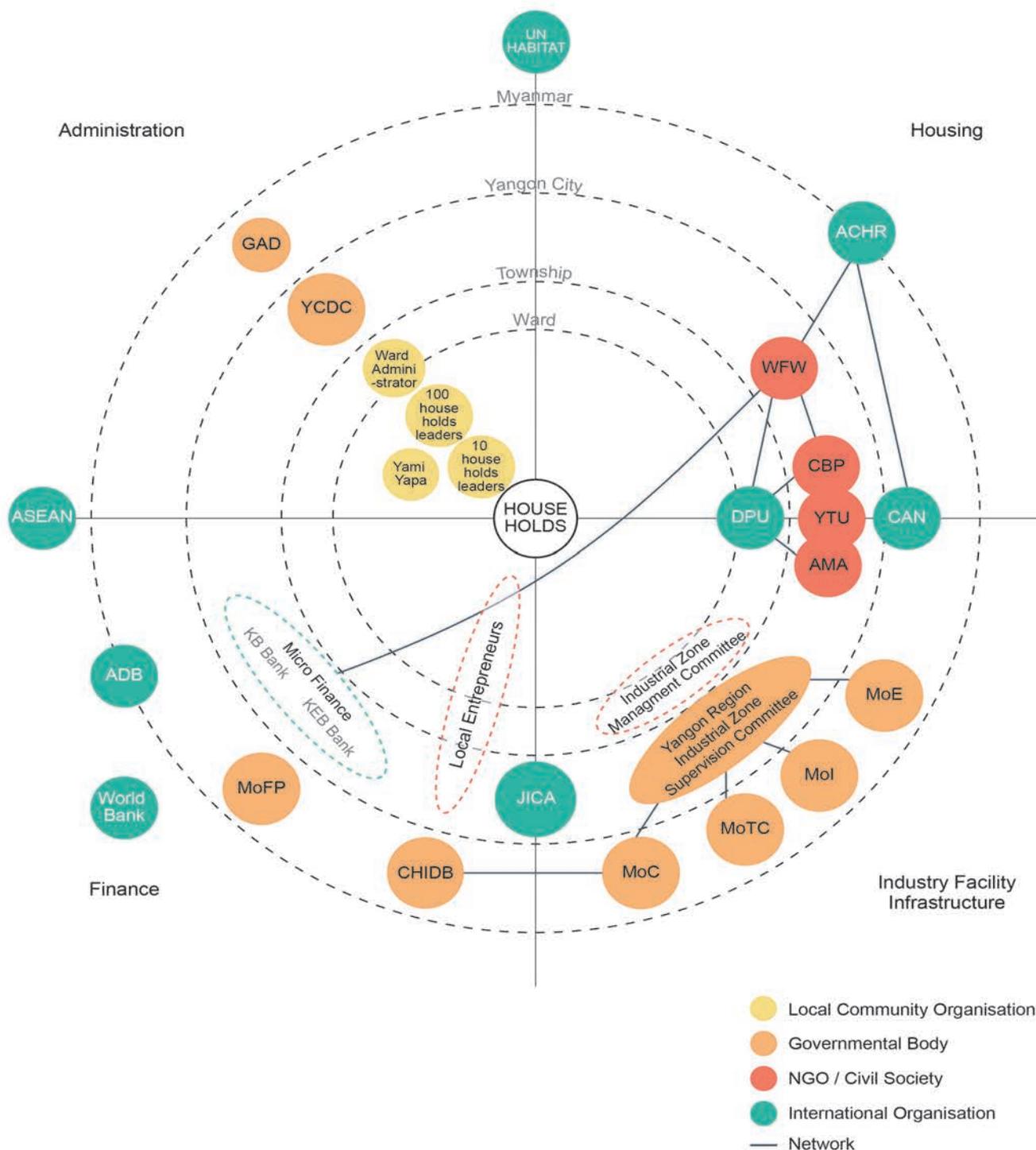
This industrial and business development has dynamic effects on peripheral areas. For example, during our fieldwork, there were numerous electrical cuts. Community members explained that the factories and city center take precedence for electricity. As the cities economy grows and the needs for basic services are outpaced, the trajectories of those in the periphery and those in the city center greatly diverge.

# Actor Mapping

The actor map is composed of the local, national and international organisations and institutions which shape the city and people's lives by impacting specifically on housing and infrastructure. WFW, a local NGO in Myanmar, and other professional architect groups, such as ACHR, CAN, YTU, CBP and DPU, are carrying out a bottom-up housing upgrading project with dwellers. WFW is also cooperating with private banks which provide low-interest

microfinance for the housing programme. In the industrial zones, the management committee comprising entrepreneur members is organised, but the zones were not managed well. Thus, the multiple ministries established 'Yangon Region Industrial Zone Supervision Committee', and it has regular meetings to solve general issues of infrastructure, such as road damage, a lack of clean water, electricity surcharges and informal houses.

fig 11. actors map

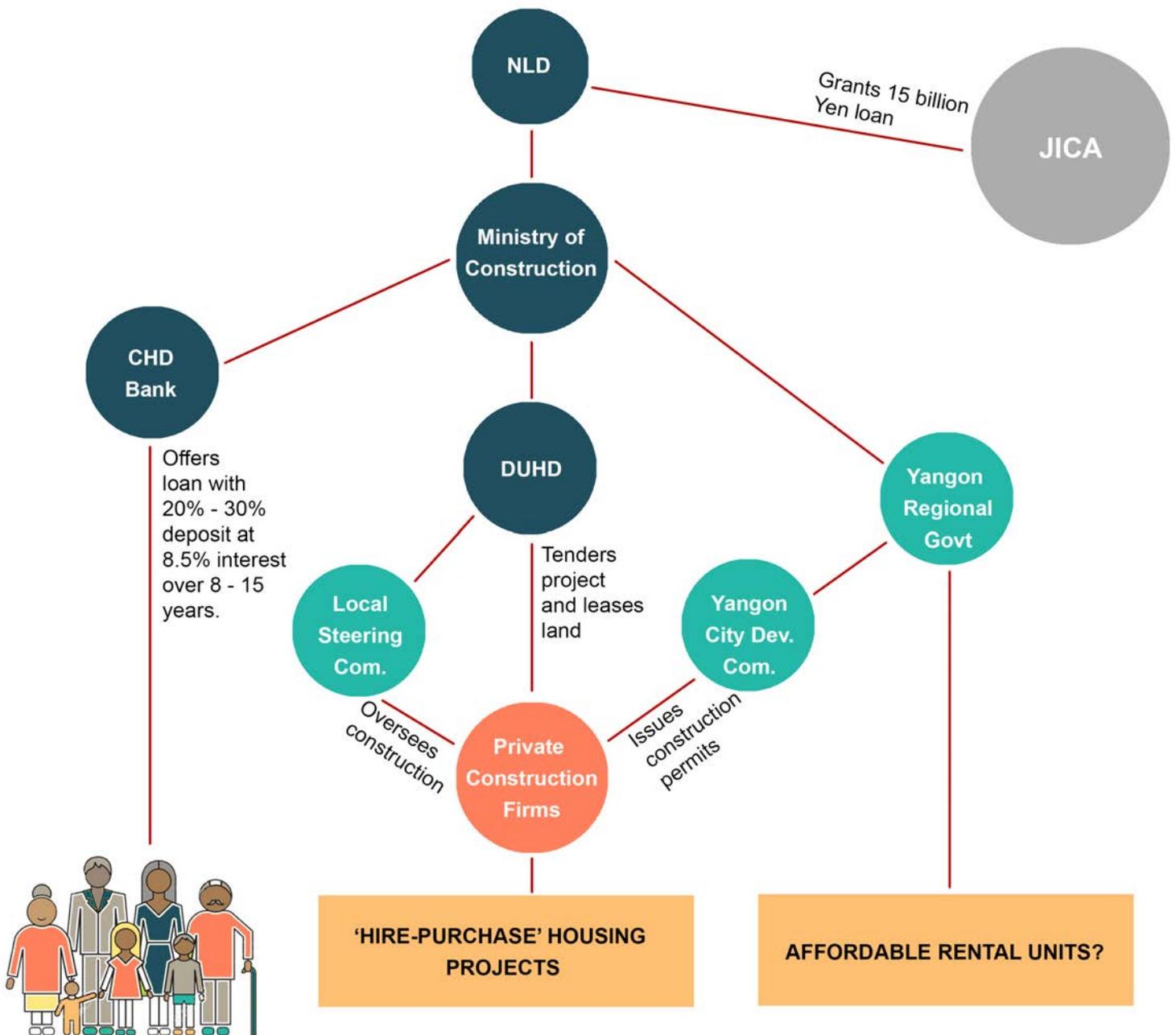


# Conflicting Notions of Home

The current affordable housing model by the NLD is based on a system of “hire-purchase” where interested households apply for a loan through the Construction Housing & Infrastructure Development Bank. If successful, applicants are granted a loan at a very high interest rate to be paid back relatively quickly. This model is accessible only to middle-income people and is highly unlikely to address the massive housing requirements of Yangon’s poorest residents.

It represents the conflicting notions of home where the NLD sees the delivery of houses as a technocratic top-down process that is inappropriate for the reality of peoples’ practices and economic situations. This housing model ignores the highly complex social collaborations that communities require to access housing opportunities.

fig 12. nLD's affordable housing model for Yangon

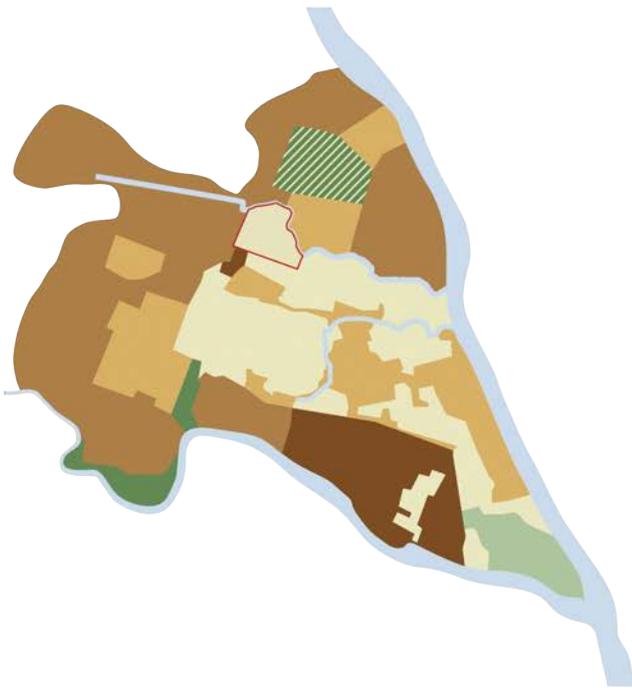


# Hlaing Thar Yar Township Land Use Map

fig 13. Hlaing Thar Yar Township land use

- Ward 20
- Residential Area
- Under Developing Area
- Cultivated Land
- Industrial Area
- Informal Settlement
- River and Creek
- Golf Club
- Sparse Forest
- Transportation Facilities
- Vacant Area

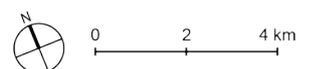
**2002**



**2019**



**2012**



## **1.3. Context**

### **1.3.3. Hlaing Thar Yar Township & Ward 20**

#### **Diverging Trajectories**

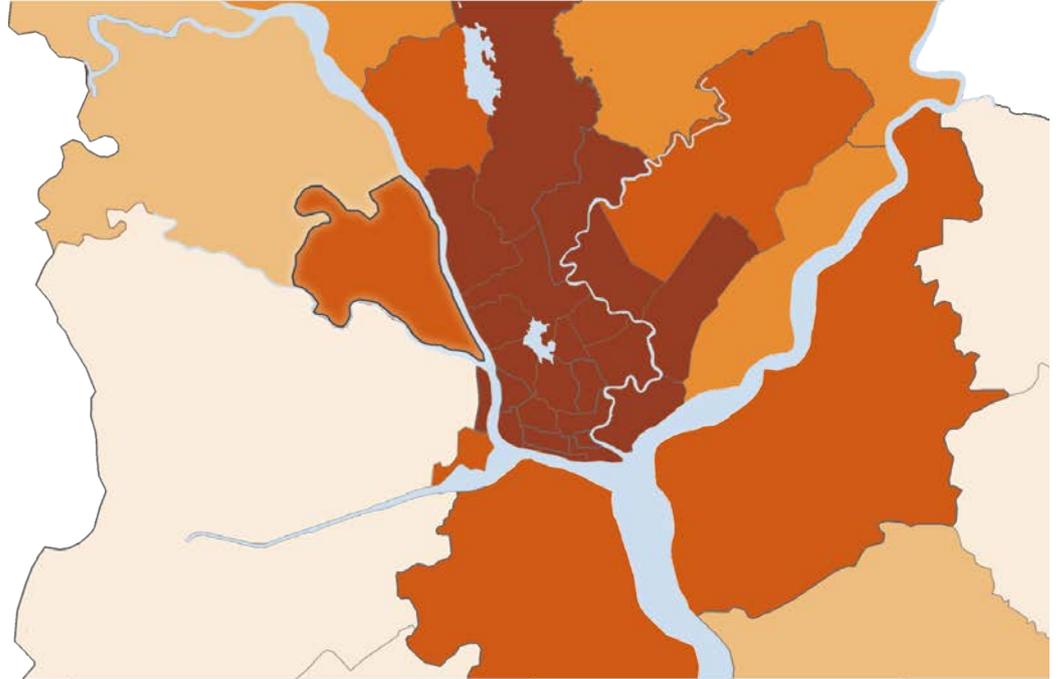
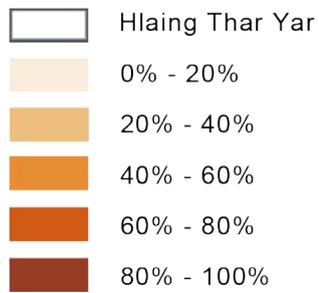
Decentralised governance and increased economic power in Yangon has brought about a divergence in the urban experience. Hlaing Thar Yar township was created by the military government in the 1990s as an industrial zone in Yangon's periphery. It is the site of Yangon's continually growing industrial sector and as such has experienced a substantial population growth with a population of 687,867 based on the 2014 official census (WFW 2019, pg. 16). It is, also, the township with the lowest level of owner-occupied housing and has an increasing amount of informality.

Increased population growth has ushered in a complex environment on the ground in Ward 20. The ward as designed by the General Administration Division (GAD) was planned as a grid with state dug drains and cleared roads. With the increase of population, due to the search for jobs and forced migration due to climate conditions, the ward has seen a blurring of the formal plan and its reality. This divergence of lived and planned experience serves as a critical entry point for the strategies proposed in this report.

# Hlaing Thar Yar Township Electricity Use Map

fig 14. Hlaing Thar Yar Township electricity use

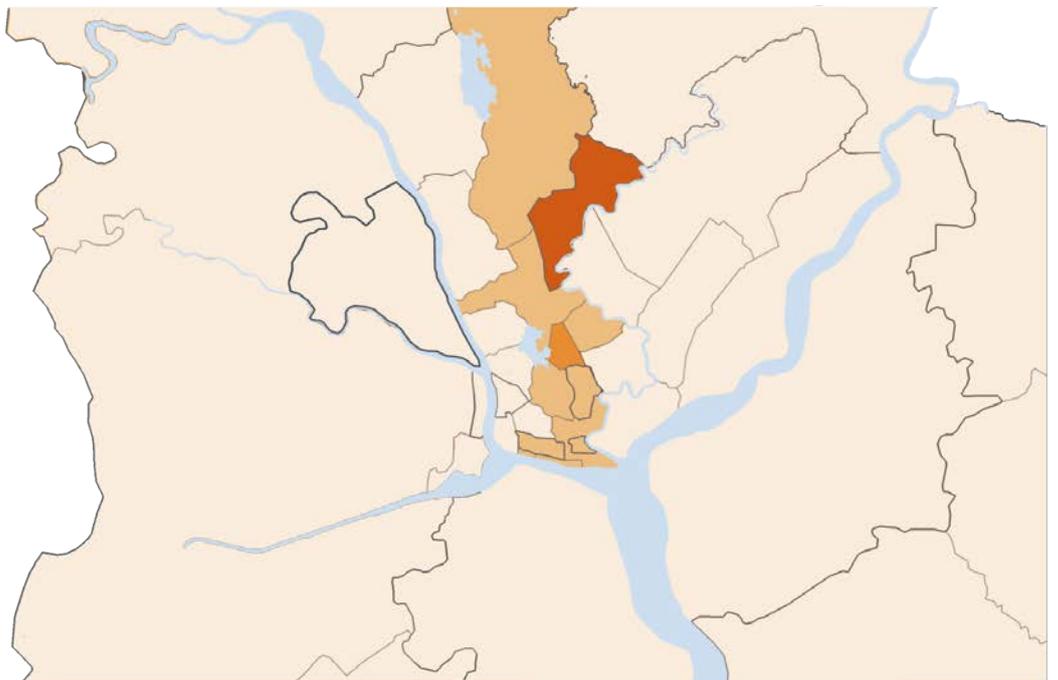
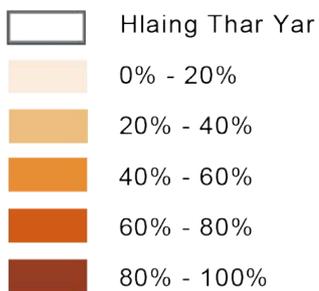
Light Connected to Main Power



# Hlaing Thar Yar Township Water Use Map

fig 15. Hlaing Thar Yar Township water use

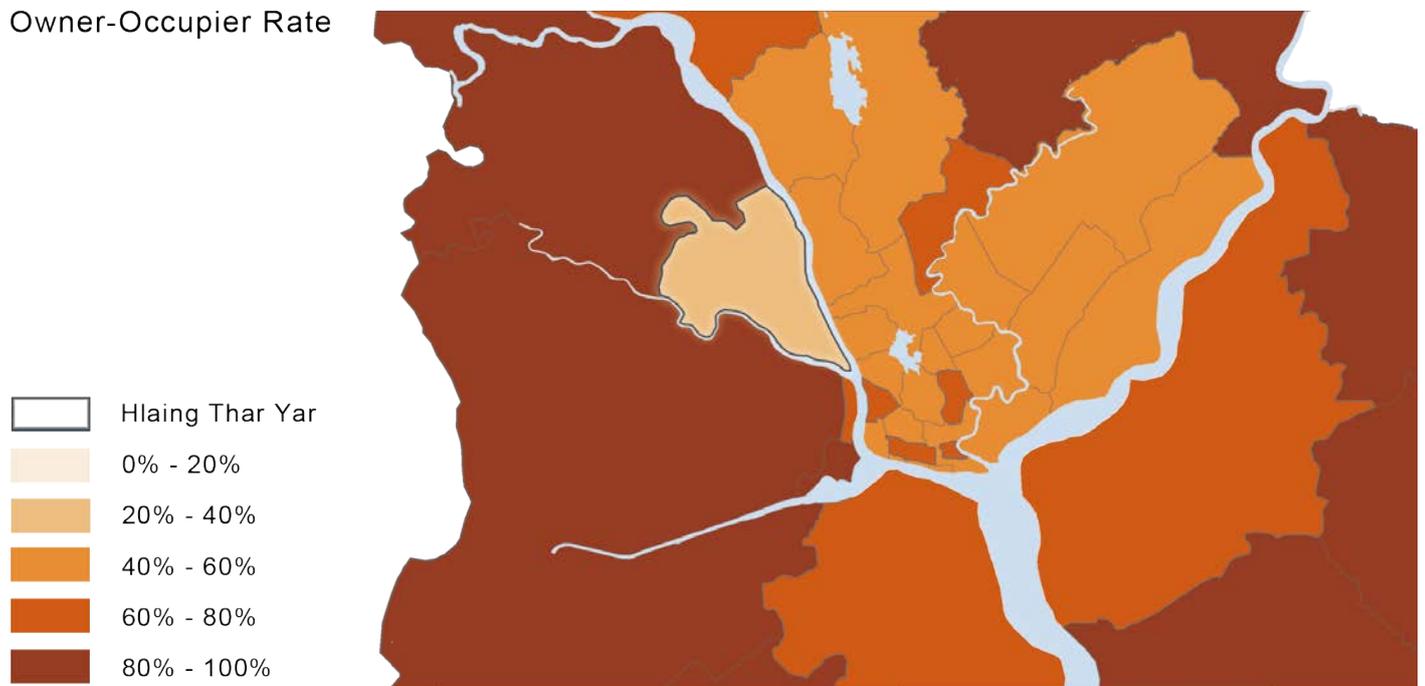
Tapped / Piped Drinking Water



# Hlaing Thar Yar Township Ownership Map

fig 16. Hlaing Thar Yar Township ownership

Owner-Occupier Rate



# 1.3. Context

## 1.3.4. Ward 20

### Ward 20 Informality Map

The below images of Section 6 in Ward 20 demonstrate the rate of growth of informality along the river bank. The 2013 image shows largely unoccupied agricultural land which quickly becomes housing by 2019.

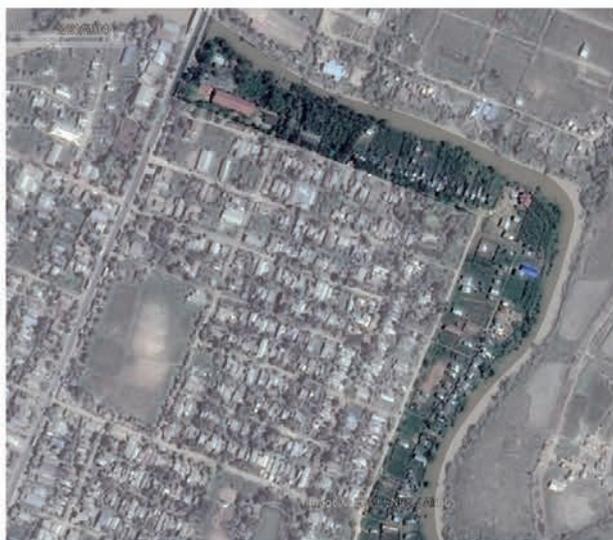


fig 17. growth of informal area in Ward 20

01.25.2013



02.21.2014



12.15.2016



01.28.2019



fig 18. the location of flood zones in relation to formal and informal houses



-  Informal Settlement
-  Formal Settlement Section Boundary
-  Serious Flood Zone



0 200 m



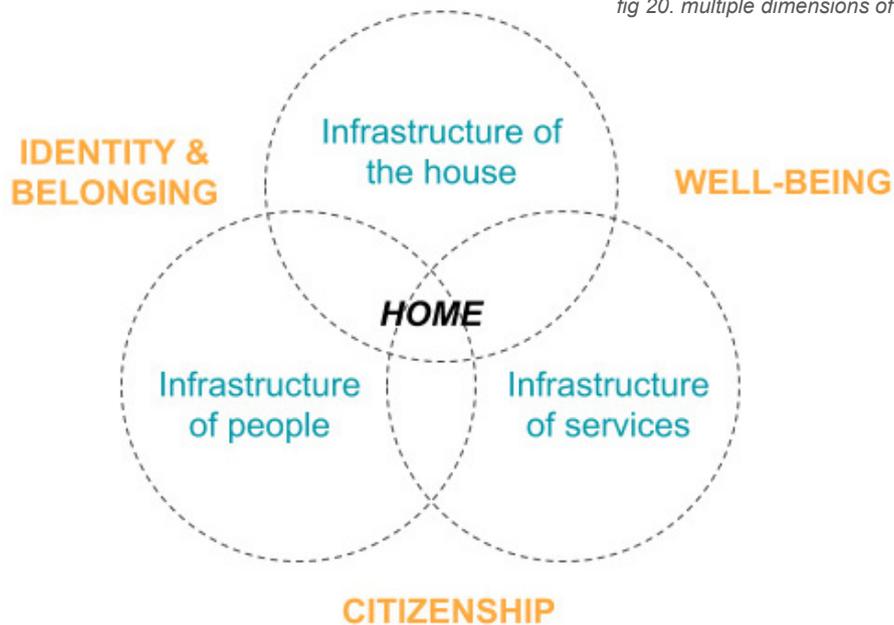
*fig 19. residents play a game of Dominoes on a front porch*

# **PART 2: FRAMEWORK**

## 2.1. Analytical Framework

# Home and Infrastructure

fig 20. multiple dimensions of infrastructure framework



To start exploring the topic of **transition** and **transformation** in Yangon, each group was given the lenses of citizenship, land, heritage, and finance, which could be refocused, adjusted or replaced as needed. For our group, these ideas are explored and connected using an additional lens of “**home**”. A notion of home is developed through these different dimensions that go beyond the physical, and into the realms of economy, law, gender, religion, rights, and social practice.

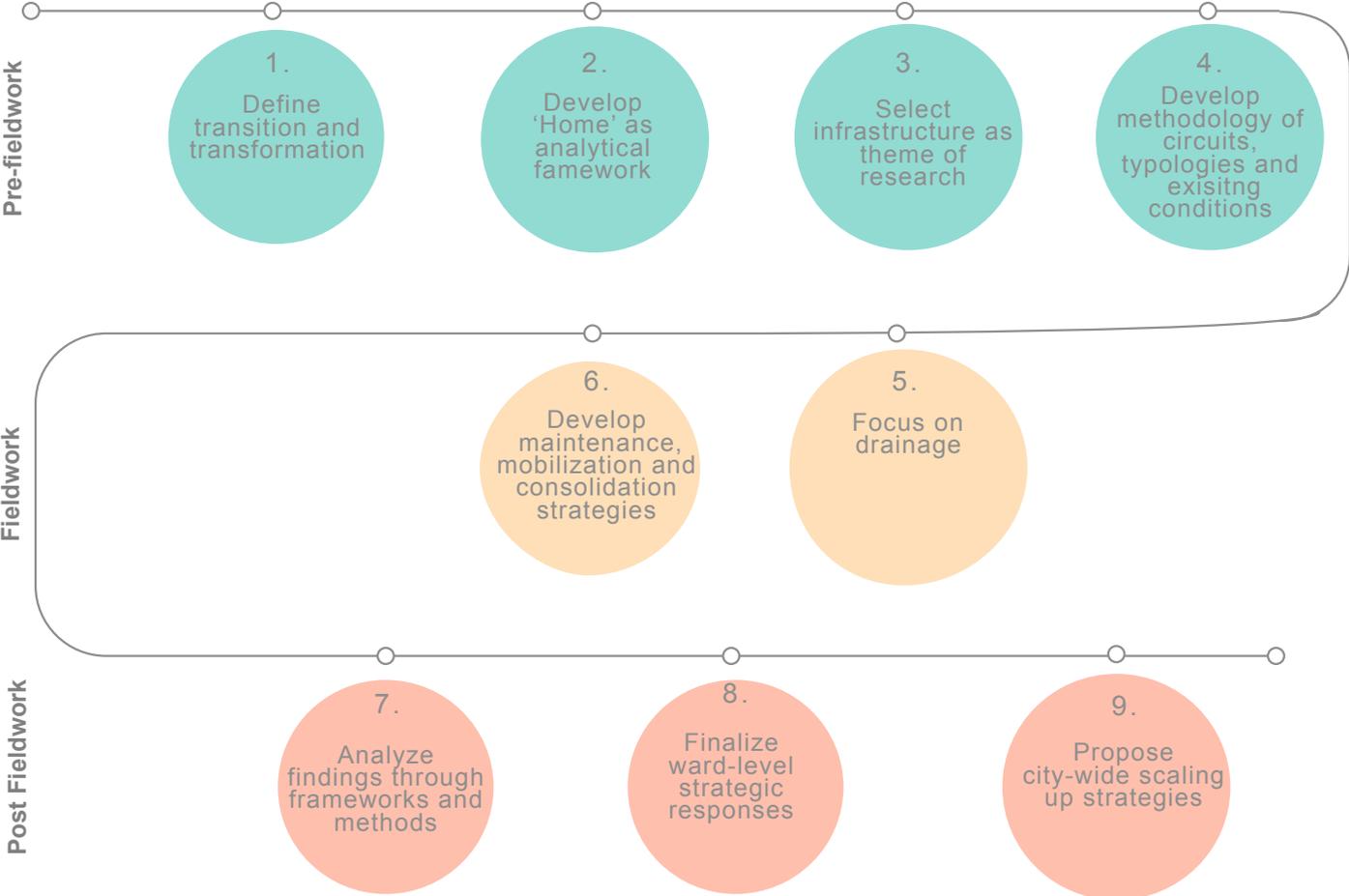
By approaching the idea of home in this multifaceted way, we can begin to understand how transformation in Yangon can take place. In contrast to this, is the very rigid approach to “**housing**” by the NLD, whose affordable housing projects are inaccessible to the majority of the urban poor and are unlikely to bring about transformation. Therefore, an important question becomes: how can we re-conceptualise the notion of “home” in order to work towards transformation through collective action?

Once the idea of home is positioned as a lens of analysis, the theme of infrastructure is selected as the focus of the research. Like the notion of home, infrastructure is also unpacked to develop an understanding that goes beyond

its physical definition. Here, multiple dimensions of infrastructure are conceptualised: the infrastructure of the house, the infrastructure of services and the infrastructure of people. These three dimensions are seen as interconnected and where they all overlap, produce a concept of home that has framed our research. Further realms of home emerge out of this framework that relate to identity and belonging; wellbeing; and citizenship.

In the context of the lacking or dysfunctional state-provision of services that has been explained in the previous section, the notions of home and infrastructure are interconnected through the informal ways that services are accessed and upgraded. Instead of services arriving inside individual properties, residents must venture outside to form collaborations necessary for access. Furthermore, the onus falls on residents to maintain the public infrastructure surrounding their properties. Thus, the externalisation of both access to and upgrading of different types of infrastructure creates an “**extended territory of home**” that physically and conceptually goes beyond the conventional boundaries of the house. The following section develops the theoretical framing for this understanding of home and infrastructure.

fig 21. evolution of framework and methodology



## 2.2. Theoretical Framework

In addition to the physical dimensions of the home, a more ontological understanding of home is needed. Heidegger's (1954) concept of "dwelling" is philosophically central to an understanding of "being," which positions the manner in which we dwell as an existential matter that is inseparable to notions of identity. For Heidegger, the physical house is of secondary importance to the act of dwelling. For this research piece, Heidegger's concept of dwelling is critical to our understanding of home as well as its connection to ontological issues.

Another important idea in relation to home is the act of "home-making" as explored by Bhan

(2019). Here, the notion of "dwelling" is seen as a simultaneous process with the physical making and remaking of home as an incremental and spontaneous act. In his quest to assign appropriate vocabulary to southern urban phenomena, Bhan refers to this process of home-making as "repair," rather than "construction" or "upgrading" in order to emphasise it as everyday incremental auto-construction that is different to state-led upgrading at the settlement or town level (2019, p. 8). Maintenance is a key term used in the report and encompasses Bhan's concept of repair when used in relation to the everyday upgrading and fixing of an extended territory of home.

These notions of home combined with a theoretical understanding of the multiplicity of infrastructure support our analytical framework. Simone's (2004) concept of "people as infrastructure" is fundamental in developing our understanding of infrastructure beyond service provision. For Simone, the infrastructure of people is "capable of facilitating the intersection of socialites so that expanded spaces of economic and cultural operation become available to residents of limited means" (2004, p. 407). This observation is particularly appropriate in contexts where the provision of functional and efficient infrastructure by the state is lacking. Instead of the common understanding of infrastructure as the physical objects such as roads, pipes, sewers or cables, "people as infrastructure" extends the definition to include people's urban activities, and specifically, the economic collaboration and mobilisation among urban residents.

The idea that people themselves can be seen as infrastructure, supports the work of Mitlin that sees "service provision as a process of social construction in which actors in self-organising systems negotiate rules, norms, and institutional frameworks" (2008, p. 339). She observes the multiple ways that services are accessed in the absence of state involvement, based on strategies such as trade, collective action, advocacy, and criminality. Mitlin argues that if urban residents are to achieve infrastructural access at scale, a certain level of engagement with the state is necessary to provide standards and investments that cannot be achieved through informal collaboration alone.

Bhan proposes a strategy of "consolidation" as a response to the observation that in southern contexts, access to services is made up of a range of informal "sociotechnical systems". This challenges northern norms of access as a uniform, stable, centrally-planned network (2019, p. 11). Rather than "networks", Bhan sees a system of "complex delivery configurations" based on co-production through collaboration and competition (2019, p. 11). Using the example of sanitation in India, he observes that different households use different modes (such as soak pits, septic tanks and pit latrines) which relate, not only to different material conditions, but also to tenure conditions.

Bhan suggests "consolidation" rather than "engineering" or "building" in order to move away from purely technical responses and instead to focus on the governance of multiple sociotechnical systems. His question around consolidation is, "what are the governance arrangements – institutions, processes and regulatory instruments – that can bring together these diverse existing systems to deliver the desired outcomes of universal access?" (2019, p. 12). Bhan's notion of consolidation as an assemblage of multiple modes and means of access to service is fundamental to our response in the context of Yangon.

By using an extended notion of home and the multiple dimensions of infrastructure, a particular methodology develops to structure our research in the field. This ultimately leads to a response based on strategies of maintenance, consolidation and mobilisation, which arrive both out of our findings in the field, as well as through the theoretical exploration.

## 2.3. Methodology

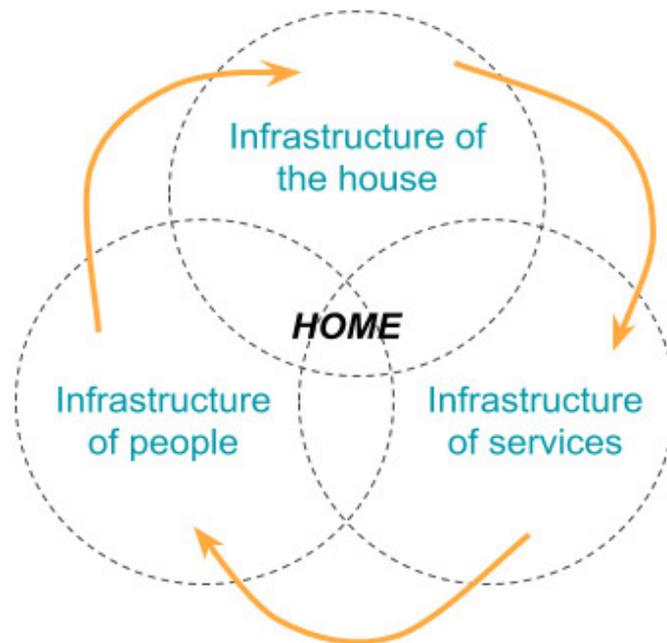


fig 22. the circuit of multiple dimensions of infrastructure

By thinking about home and infrastructure in an interconnected and multidimensional way as described above, we are led to a methodological approach that uses the spatial conceptualisation of home and infrastructure. Three methodological routes are used in parallel to explore the question “How can the notion of “home” be (re) conceptualised through the multiple dimensions of infrastructure as a strategy towards settlement upgrading?” These three routes can be defined as, firstly, the existing infrastructural challenges; secondly, the circuits of access and upgrading and thirdly, the typological conditions of housing.

The first approach to the research question is to determine what the major infrastructural challenges are with respect to electricity, roads, water, and drainage. These four aspects of infrastructure are identified by WFW to be the most critical and in need of attention. Through the fieldwork methods, we investigate what is understood to be focal issues of infrastructures according to the community residents and representatives. This approach is used to understand the situation from the perspective of residents as much as possible. The insight gathered can then establish whether the

framework of the research needs to be altered. Due to the findings once in the field, the issue of drainage is positioned as the focus of infrastructural conditions. A poor and inconsistent drainage system is found to be the most significant challenge for residents. Drainage is also found to be the aspect of infrastructure that has the biggest impact on the other types of infrastructure (ie. electricity, roads and water). Furthermore, the drainage conditions closely relate to the issues of the other groups’ themes (i.e. public space, disaster risk reduction and waste management).

Secondly, to explore what is meant by an “extended territory of home” and how this relates to the multiple dimensions of infrastructure, we use the idea of “circuits” to guide the methodology. Here, circuits refer to the sociotechnical networks that need to be mobilised in order for people to access and upgrade infrastructure. For Bahn, circuits would be the “complex delivery configurations” (2019, p. 11). This relates to the multiple dimensions of infrastructure by placing the infrastructure of the house, the infrastructure of people and the infrastructure of services within a circuit.

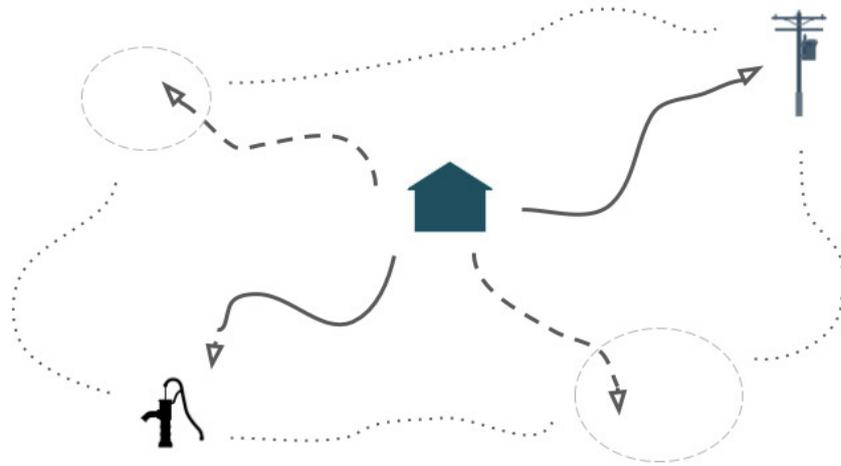


fig 23. extended territory of home for access and upgrading

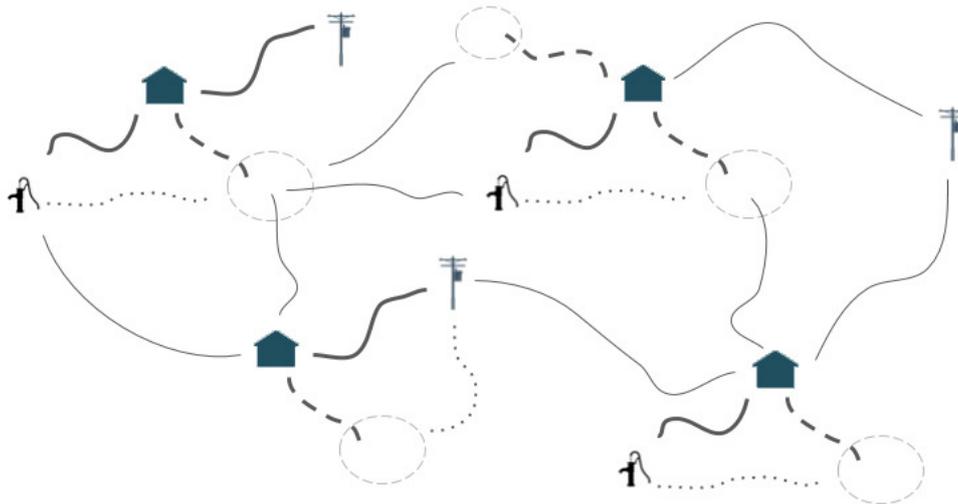


fig 24. systems of collaboration across the neighbourhood

Firstly, the infrastructure of the house is the entry point to the circuit and grounds the spatialisation of the circuit. Secondly, the infrastructure of the people is the social and economic collaboration and mobilisation that connects the house to external points of access. Thirdly, the infrastructure of services are the points of access and upgrading that tap into larger networks of private and public delivery.

Lastly, a typological study of different housing conditions is explored with respect to the physical configurations of the houses, tenure arrangements, material conditions and complexities around formality and informality. This is not done for the sake of it, but to relate it to the study around circuits. Here, we explore what Bhan (2019, p. 11) refers to as, the different modes of delivery configurations and their relation to tenure security.

Ultimately, the exploration of circuits is the guiding methodological approach that determines our fieldwork activities. Through a variety of research methods that will be described in the next section, the main objective of our fieldwork research is to explore these different circuits in order to determine how people are currently accessing and upgrading services, as well as to determine what the strengths and opportunities of these circuits are that could possibly lead to a strategic response. The combination of the three approaches sets us up to respond to the findings with appropriate and situated responses that address aspects of infrastructure that are most vital in order to be impactful in a context of highly constrained resources.

*fig 25. a community representative explains the area*



# **PART 3: FIELDWORK**

# 3.1. Methods of Research



fig 26. transect walk with residents and local students

## Transect walks

Conducted with guidance from members of the community who formed part of our field team, our team engaged in a number of detailed explorations through key areas of both sections 10 and 6. During which, community members indicated where possible specific areas of interest in relation to over-capacity drainage channels, other infrastructural challenges and possible solutions.

fig 27. infrastructure observations

## Observations

Throughout our time in Yangon and in Ward 20, observation and reconnaissance were heavily used by team members as a research gathering method, constant recordings through photographs, sketches and notes were taken of the various infrastructures along with the existence or lack of services. Along with these other recordings were made of the varying morphologies of the house, the materiality of the structure and where possible, interaction and overlap between the formal and informal.



fig 28. mapping concepts and activities



Mind Mapping



Mapping/ Spatialising

## Participatory Sessions

Key Activities:

**Mind Mapping** (What is home?)  
(Dream infrastructure)

**Mapping/ Spatialising** (Issues & Locations)

During our time in Ward 20, we completed a series of participatory sessions involving local residents. An example being mind mapping to establish what we all defined as or what we associated with 'home.' We then shifted the focus to the residents asking them to outline what were the most pressing issues and challenges regarding critical infrastructure and what their change priorities are. Additionally, we collectively **mapped** and **spatialised** the surrounding areas to establish where residents must travel to and how they access their basic needs.

fig 29. residents living in a hostel



## Interviews

On the second and third days of the fieldwork, we conducted 14 household interviews across both sections 6 and 10. These interviews took a variety of formats. All were conducted with the help of our student and local community teams. Our team approached households and asked for permission to speak with residents to ascertain how different types of infrastructure is accessed

fig 30. co-design process



## Co-designing a drainage intervention

This involved first understanding the drainage system, its strengths and weaknesses associated with numerous types of drains. We were also interested in the expenditure and procedures involved in their continual upkeep, upgrade and flow. Culminating in a mutually designed drainage cover system that could be easily introduced at short notice and in the longer term see a greater level of upgrading to the drainage network in Ward 20.

# Limitations

fig 31. in the field



Our presence in the field and our understanding of the contextual lived experience has a great effect on the shape of our experience and analysis. It is critical to note that each group member carries with them an intersectional set of invisible biases and understandings. We believe that acknowledging and searching for blind spots is a critical act in being an ethical practitioner.

Methodologically we found numerous limitations with our selected research activities. Data collection is challenging. At points, when we had divided ourselves into smaller groups for the interviews, a series of overlaps occurred between groups in the selection of interviewees. This limit was overcome with a tactical and iterative approach. We noticed this as a weak spot and found ways to improve the process.

It was clear, especially during this part of the research process that our presence had an impact on the research. In some areas, people seemed more forthcoming of information than in others, an indication of partial truths as well as

underlying hidden tensions that were kept from us, implicating the influence of power dynamics. Whether this skewed the data or not is unclear, but the fact that the community representatives were all from the formal sections of the ward more than likely has. We must acknowledge that one of our residential representatives headed the Section 10 security detail and quite literally opened doors for us. As practitioners, we must always accept the potential role of the observational effect.

Additionally, it must be noted that at points when in heavy discussion laterally between the whole group, responses to detailed questions were sometimes lost in translation or simply not heard due to the high level of concentration present during the exercise.

The fieldwork presented numerous challenges and opportunities, as intersectional practitioners with numerous blind spots, this report acknowledges these and humbly interprets findings to lead strategies for urban upgrading.

## 3.2. Findings

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### 3.2.1. Introduction

This section looks at synthesising the findings related to our group's chosen lens of research. Upon conducting further examination of the setting's conditions, we narrow our focus down to the issues of drainage, as it strongly impacts the functionality of other infrastructure elements and presents a good entry point for developing both ward-scale and township-scale intervention strategies. Other aspects of infrastructure (water supply, road networks, electricity provision) are extensively covered within this section as well. In addition to the aforementioned findings, we include the data regarding the household typologies, with the emphasis on the present kinds of tenure and ownership, materiality and the degrees of formality.

The fieldwork was conducted in Ward 20 of the Hlaing Thar Yar Township, mainly in the sections 10 and 6. These areas are of particular interest to our group due to their close proximity to the areas of informal settlements. These borders are unclearly defined, but we did manage to find specific indicators of whether the residents were living within the legal realm or not.

These determinants are linked to the existing infrastructure (i.e., if a household has electricity meter then it would be considered 'formal'), further highlighting the importance of the chosen topic.

All of the analysed information allows us to identify the existing circuits of cooperation and collaboration which are mobilised when access to the provision of certain forms of infrastructure is required. The complex relationships of actors involved in these exchanges often act as substitutes to the conventional methods of infrastructure access, giving us invaluable insight in how communities, where large portions of the population do not have direct and legal access to government-supplied resources, cope with their situation. These findings provide the groundwork for the response mechanisms that are proposed later in this report.

# Findings

## 3.2.2. Infrastructure: Current Conditions

fig 32. current conditions of infrastructure



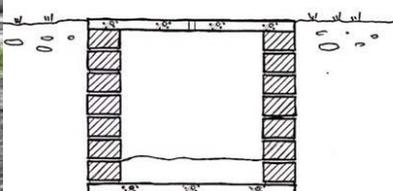
Understanding, documenting and mapping the current conditions of the infrastructure including roads, electricity, drains and water systems allow for a comprehensive understanding of the major challenges in the area. This process leads us to identify drainage as the primary infrastructural issue.

## Drainage Systems

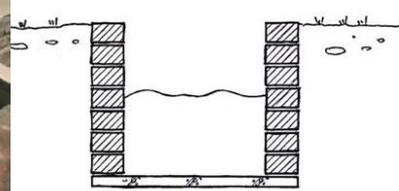
fig 33. types of drainage systems



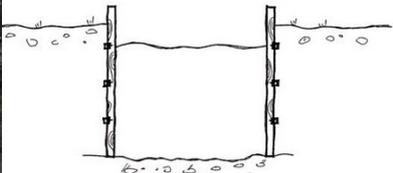
Concrete Drainage with lid



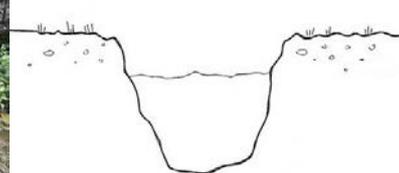
Concrete Drainage



Bamboo Drainage



Mud Drainage



## Water and Electricity Provision

fig 34. access to water and electricity



Manual Water Pump for Bathing



Delivered Gallons of Drinking Water



Generator for Electricity



Rechargable Battery used for Electricity

## Road Development

fig 35. types of road construction



Concrete Road



Mixed (Concrete & Sand) Road



Sand Road



Informal Mud Pathway

# Findings

## 3.2.3. Drainage

Through analysing the current conditions of infrastructure, we identify drainage as the primary infrastructural challenge and opportunity. There are numerous types of drains in the ward that all work to a varying degree. We aim to understand each type of drain and the corresponding impact on the whole ecosystem of the ward. We identify that drainage has a major impact on the other types of infrastructure and that by improving the drainage system, the other types of infrastructure will indirectly benefit. Furthermore, drainage has vast implications for the focus areas of the other groups, namely: public space, disaster risk reduction and waste management.

### Challenges and impact on other types of infrastructure



#### Roads

Roads become damaged due to drains overflowing and become unusable for pedestrians and vehicles during floods.

#### Electricity

Electricity cables are damaged when drains overflow and can cause electrocution.

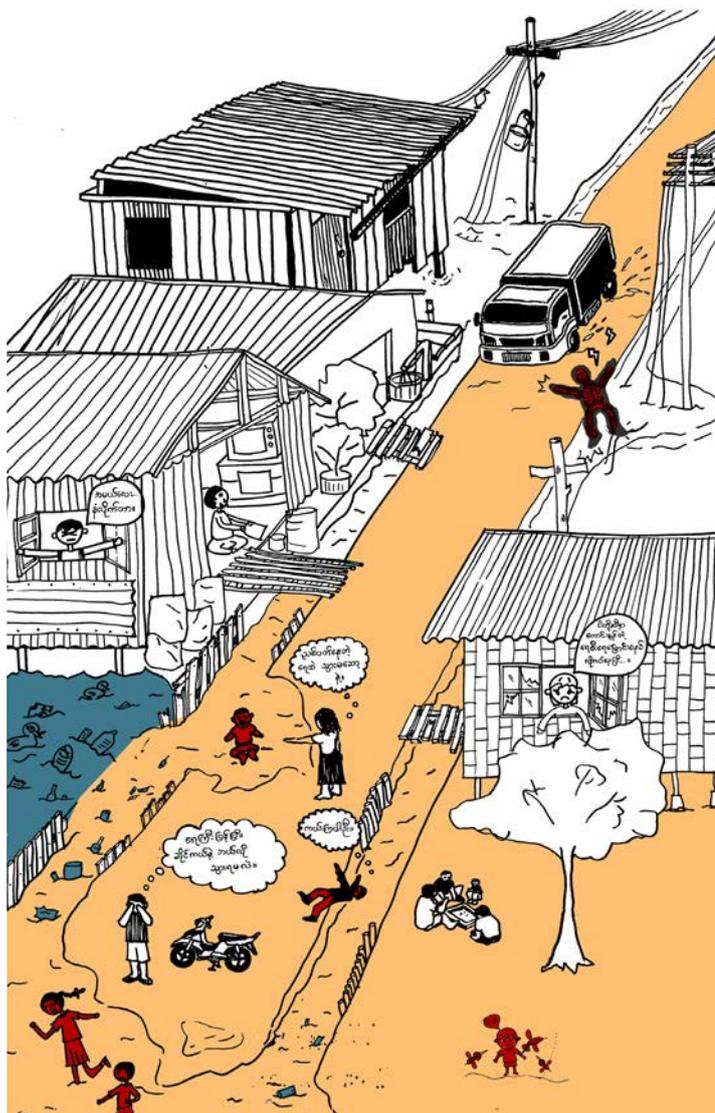
Electricity poles become unstable and can collapse when the drains erode.

#### Water

Polluted water from the drains seeps into the ground to pollute the ground water, making it undrinkable.

fig 36. the impact of drainage on other types of infrastructure

## Challenges and impact with connecting Issues



### Public Space

If drains are not well maintained the streets and sidewalks cannot be used as public space.

### Disaster Risk Reduction

Dysfunctional drains cause flooding which can lead to further risks.

Flooding increases the chance of drowning and electrocution through overloaded and faulty electric cables.

Stagnant water spreads water-borne diseases and increases the risk of malaria.

### Waste Management

Accumulation of waste inside the drains causes blockage which results in flooding.

fig 37. the impact of drainage on other groups' themes of research

# Findings

## 3.2.4. Interviews

fig 38. interview table

| No. | Type of house     | Formal / Informal | Materiality   | Tenure   | Access & Upgrading  |   |
|-----|-------------------|-------------------|---|--|---|---|
|     |                   |                   | Solid (block, concrete) / Lightweight (bamboo, metal sheet) | Rented Land (RL) / Rented House (RH) / Owned Land (OL)         | Electricity   | Water   |
| 1   | Hostels           | Formal.           | Lightweight / Solid.  | RH.  | Provided by YCDC.   | Tube well (domestic) and delivery (drinking). |
| 2   |                   | Informal.         | Solid.  | RH (10 households living in a hostel).                         | Generator (shared by hostel, cost included in rent), rechargeable lighting, solar panels (bought by tenants). | Tube well (domestic) and delivery (drinking). |
| 3   |                   | Informal.         | Solid.  | RH (8 households).   | Generator, candles (in case of power outages).  | Tube well (domestic) and delivery (drinking). |
| 4   | Block rentals     | Informal.         | Solid.  | RH (5 rooms, 7-ish family members per room, 30,000 per month). | Generator (neighbourhood service, at night time).   | Tube well (domestic) and delivery (drinking). |
| 5   | Shared houses     | Formal.           | Lightweight / Solid.  | OL (Daw Shwe and her partner bought the land in 1988).         | Generator (neighbourhood service, 100 Households).  | Tube well (domestic) and delivery (drinking). |
| 6   |                   | Informal.         | Lightweight.  | OH.  | Generator (neighbourhood service, at night time).   | Tube well (domestic) and delivery (drinking). |
| 8   | Individual houses | Formal.           | Solid.  | RH.  | Provided by YCDC (has meter and house number).  | Tube well (domestic) and delivery (drinking). |
| 9   |                   | Formal.           | Solid / Lightweight.  | RH (with self-invested extension).                             | Provided by YCDC (has meter).   | Tube well (domestic) and delivery (drinking). |
| 10  |                   | Formal.           | Solid / Lightweight.  | OL.  | Provided by YCDC (has meter).   | Tube well (domestic) and delivery (drinking). |
| 11  |                   | Informal.         | Lightweight.  | OH.  | Battery (motorcycle, collected by local driver daily).  | Delivery (domestic and drinking).             |
| 12  |                   | Formal.           | Lightweight.  | RL.  | Battery (motorcycle, collected by local driver daily).  | Tube well (domestic) and delivery (drinking). |
| 13  |                   | Informal.         | Lightweight.  | OH.  | Battery (motorcycle, collected by local driver daily).  | Delivery (domestic and drinking).             |
| 14  |                   | Formal.           | Lightweight.  | RH.  | Battery (motorcycle, collected by local driver daily).  | Tube well (domestic) and delivery (drinking). |

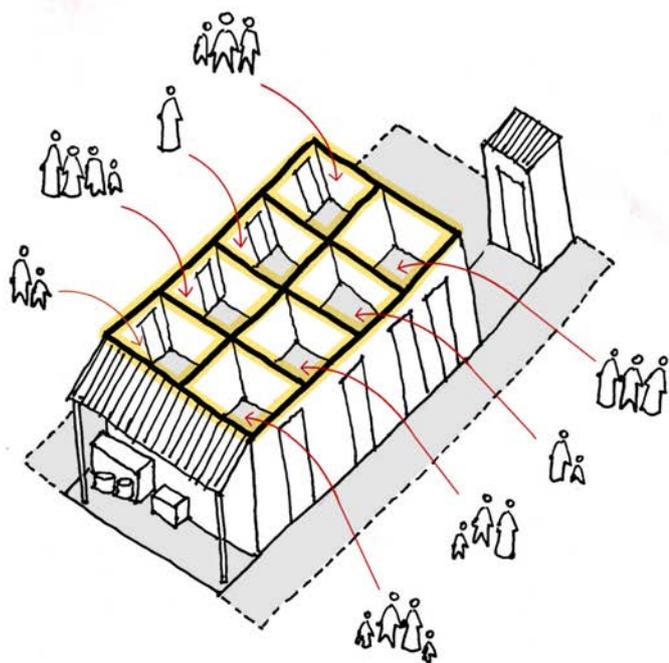
Numerous interviews were carried out in the field. These interviews gave nuance, context, scope and detail to our initial understanding, as well as, challenged preconceptions. The interviews informed each response and the cases and circuits that our group employs to bring the ideas to action.

| Access & Upgrading  |  |   | Challenges / Assets etc.   |
|---|--|---|--|
| Drainage  | Road   | Waste Management  |  |
| Concrete ( <i>owner of land upgraded drain around the entire property</i> ).                            | Paved ( <i>both side of the street mobilised to upgrade the road</i> ).                      | N/A.  | Active relationship to landlord. Street is mobilised by the 10 Household Leader to collectively upgrade the road.  |
| Not reinforced ( <i>landlord connected drainage to concrete drainage of household #1</i> ).             | Unpaved ( <i>both side of the street mobilised to upgrade the road</i> ).                    | Rubbish collection ( <i>regular</i> ), septic waste disposal ( <i>in the creek</i> ). | Active relationship to landlord. Street is empowered to mobilise their individual landlords to provide building materials while tenants provide labour.                                  |
| Not reinforced.   | Paved ( <i>both side of the street mobilised to upgrade the road</i> ).                      | N/A.  | Week relationship with the neighbours.   |
| Concrete ( <i>landlord manages the drain maintenance</i> ).   | Paved ( <i>upgraded by the street and the local monastery</i> ).                             | N/A.  | Organised sharing of kitchen and toilet. Well-managed waste. Active relationship with landlord.  |
| Bamboo ( <i>self-built and regularly self-maintained</i> ).   | Unpaved ( <i>in need of attention, no upgrading process</i> ).                               | N/A.  | Sharing of toilet / sanitation facilities and water pump among the tenants (trust). Several generations under one roof - low comfort / life quality, but high potential of mobilisation. |
| Bamboo ( <i>badly maintained, filled with waste and grey water, disconnected</i> ).                     | Paved ( <i>higher than house land, built and maintained by formal settlement dwellers</i> ). | No rubbish collection, no septic waste collection ( <i>emptied in the drain</i> ).    | Sanitation problem and constant grey water and flooding. Lack of general maintenance.  |
| Concrete ( <i>individually self-maintained, part of the ward clean-up</i> ).                            | Paved ( <i>main road is maintained by YCDC, collectively maintained by the street</i> ).     | N/A.  | YCDC investment. Part of the road-upgrading network. Very little contact with land-lord.   |
| Bamboo ( <i>overflowing under extension, lined with sandbags by tenants</i> ).                          | Paved.   | N/A.  | Unsure contract with owner who claims to upgrade drain next year. Building skills as an asset - reconstructing whole floor themselves. Land filled with sandbags                         |
| Bamboo ( <i>overflowed in whole plot, with meshes</i> ).  | Paying labourers personally to extend road onto the plot.                                    | Rubbish and septic waste collection.  | Community laborers are constructing the road. Lack of community organisation to solve the overflow problem.  |
| Not reinforced ( <i>mud canal running under/between houses</i> ).                                       | Unpaved ( <i>mud road</i> ).   | N/A.  | Self-cleaning of drain with forks. No community network  |
| Bamboo ( <i>disconnected, soon to be overflowed</i> ).  | Paved ( <i>upgraded by the street and the local monastery</i> ).                             | N/A.  | Very well collectively-maintained concrete road. Drain is almost overflowing.  |
| Nor reinforced ( <i>self-constructing compacted earth drain, soon to be concrete, being extended</i> ). | Paved ( <i>unmaintained and untraversable by vehicles</i> ).                                 | N/A.  | An informal household in a formal area. Tensions with neighbours, no involvement in the community network.   |
| Not reinforced ( <i>currently overflowed</i> ).   | N/A.   | No rubbish collection, no septic waste collection ( <i>emptied in the drain</i> ).    | Major health-related and financial issues ( <i>overflow of the drain, improper septic waste disposal</i> ). Weak relationship with the neighbours.                                       |

# Findings

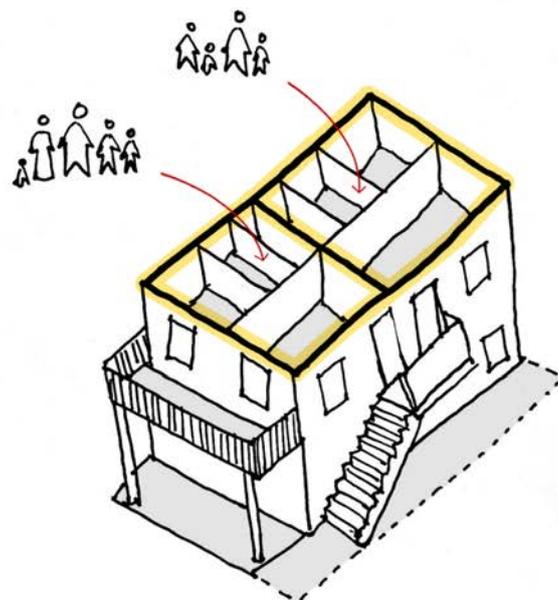
## 3.2.5. Typological Conditions

fig 39. typological conditions of housing



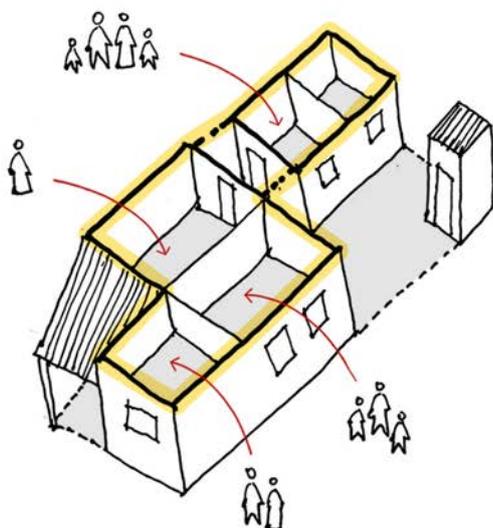
### 1. Hostel

Rented rooms in a shared building with shared kitchen and toilet



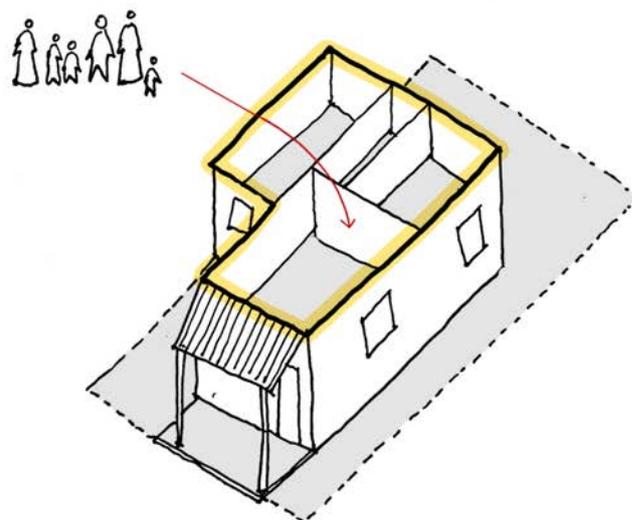
### 2. Flats

Rented units in a shared building with private or shared kitchen and toilet



### 3. Shared House

Rented or owned house with multiple households sharing the rent/cost



### 4. Individual House

Rented or owned house for a single household

There is a wide variation of living conditions in the ward, yet we identified numerous patterns through a typological study of housing conditions. We establish, perhaps surprisingly, that the materiality of housing and structures does not relate in any discernible way to formality or mode

of tenure. We identified that formality within the ward exists somewhat on a spectrum, with the most formal being what is legally recognised by YCDC. We also established that there are multiple modes of tenure varying in complexity and configuration.

fig 40. material, legal and tenure conditions of housing

## Materiality



Solid structure (concrete, blocks).



Lightweight structure (wood, bamboo).



Hybrid structure.

## Formality



Legally formal according to YCDC (has electricity meter and house number).



Legally unregistered property (no electricity connection).



Legally unregistered extension to a formal property.

## Ownership



Owned house on rented/occupied land.



Owned house and owned land.



Rented house or room from landlord.

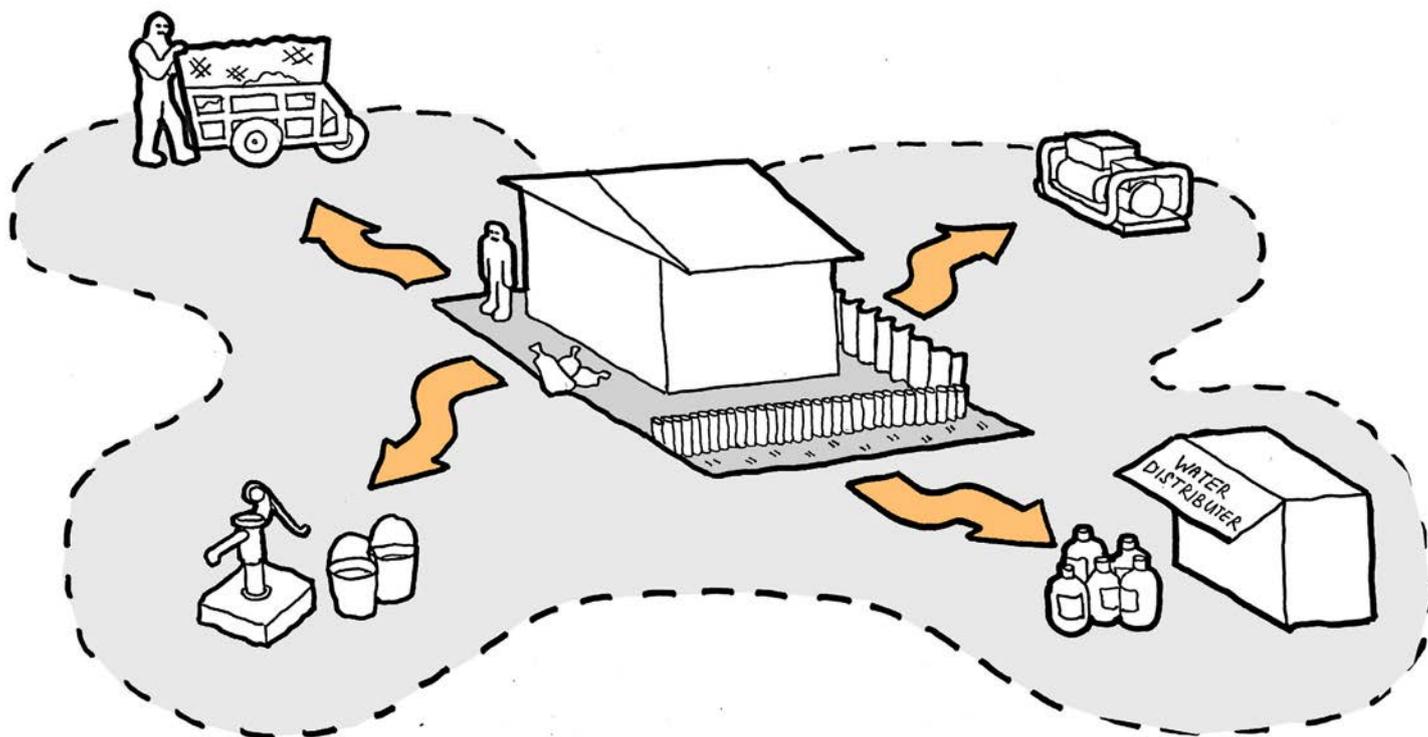
*fig 41. a local trash collection business*



# Findings

## 3.2.6. Cases and Circuits

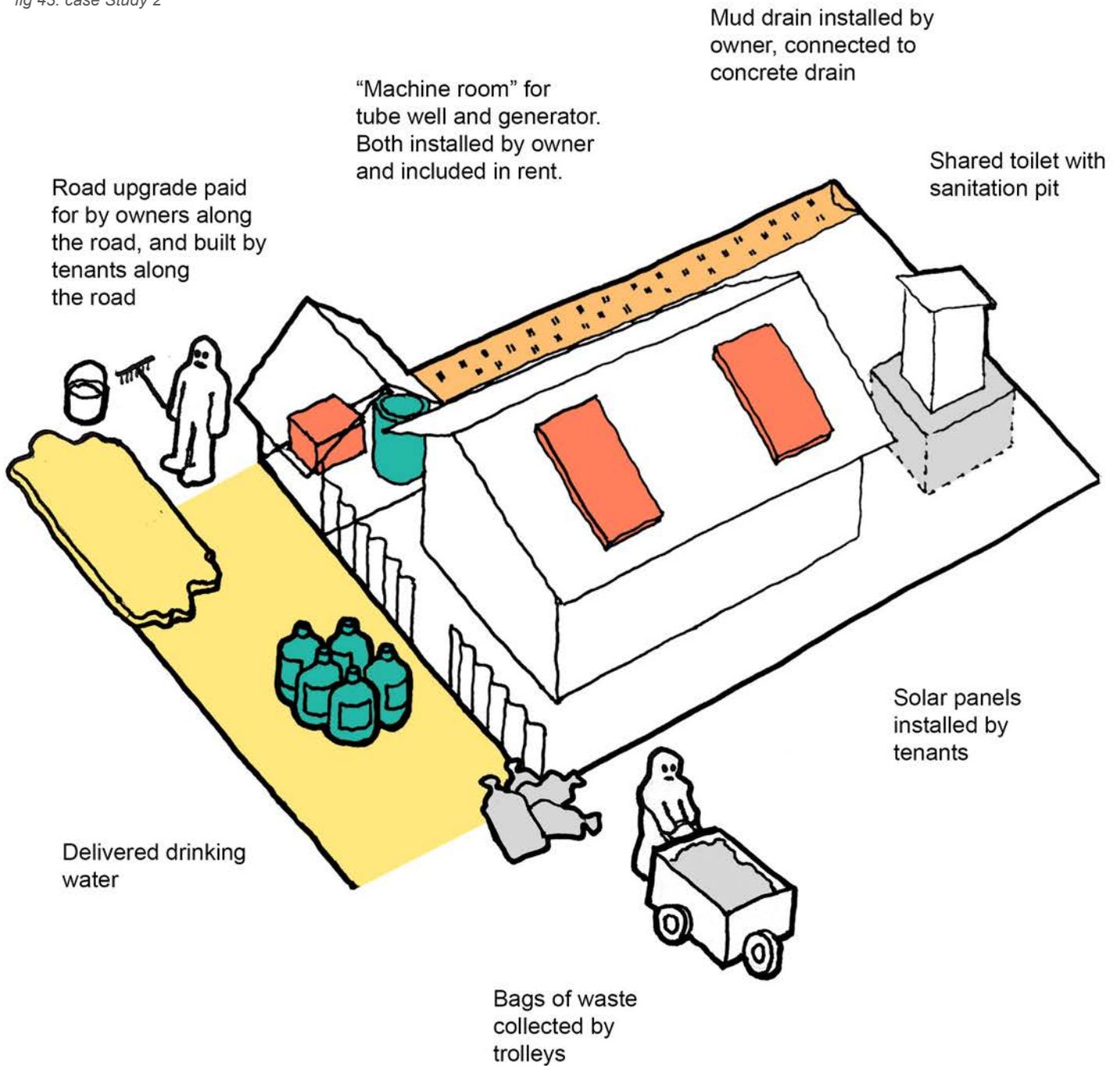
fig 42. circuits of access and upgrading



Four cases are selected from the interview list to be expanded into a detailed analysis of how services are upgraded and accessed. We selected the given case studies as they accurately represent the breadth of examples found across the interviews and demonstrate a variety of typological conditions. Methodologically, this approach is developed from our understanding

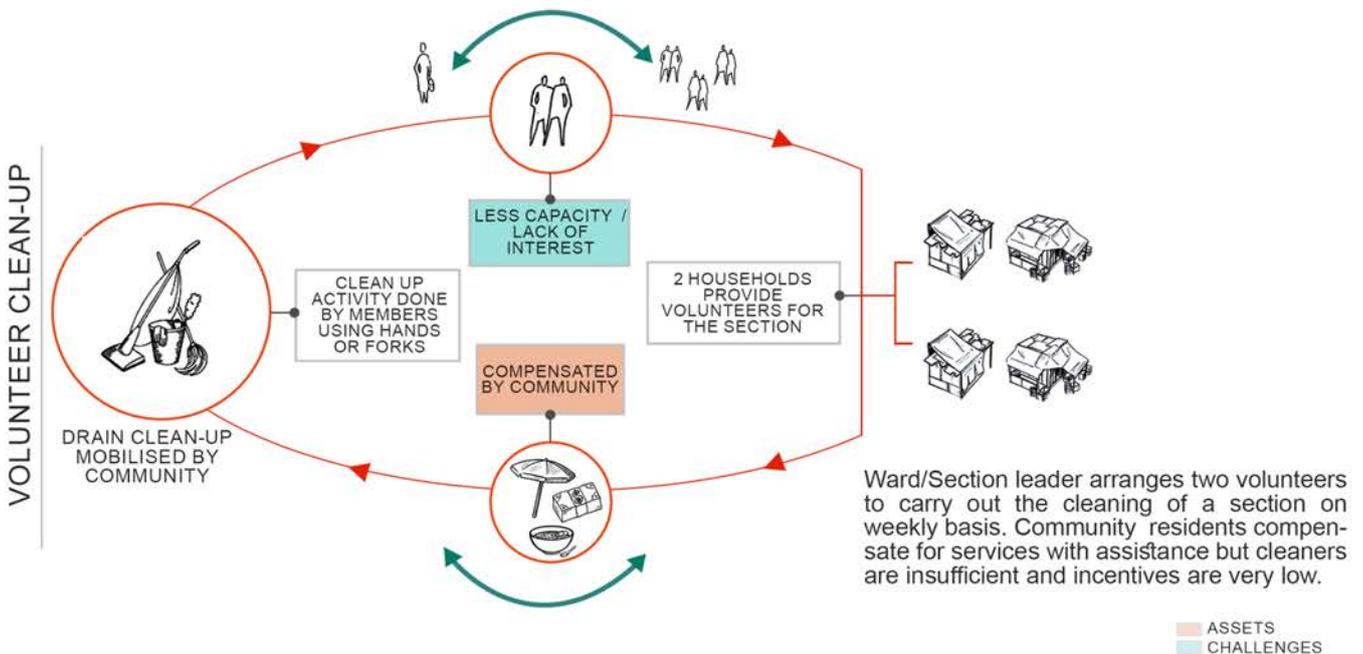
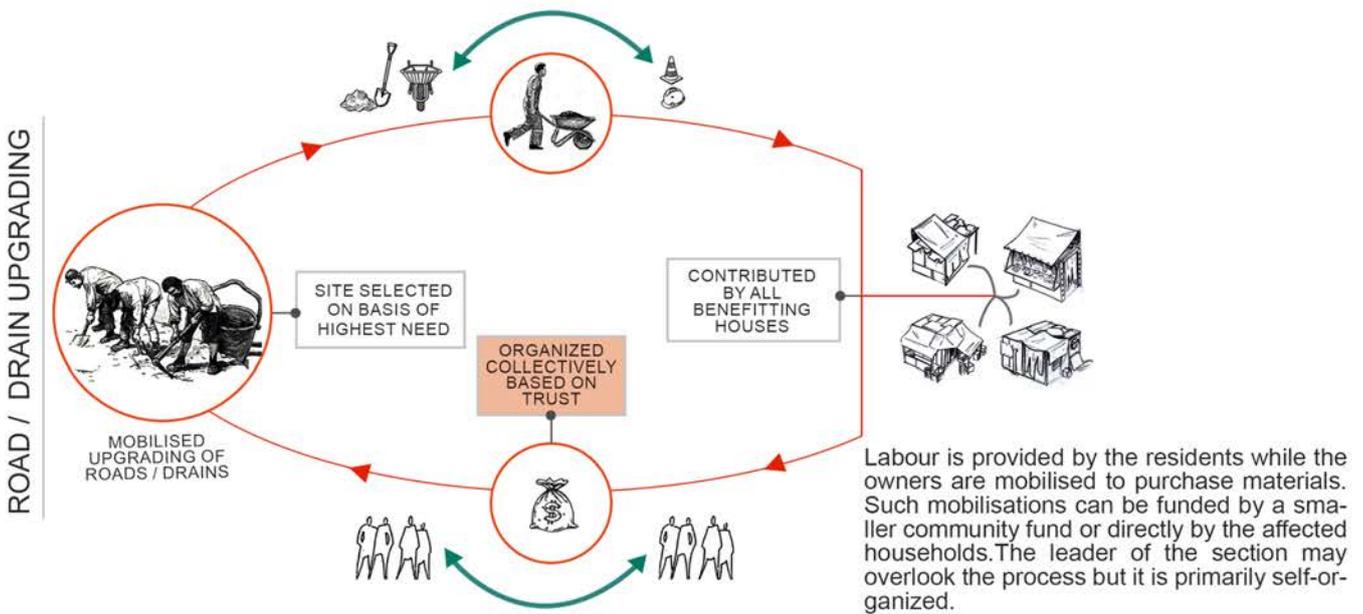
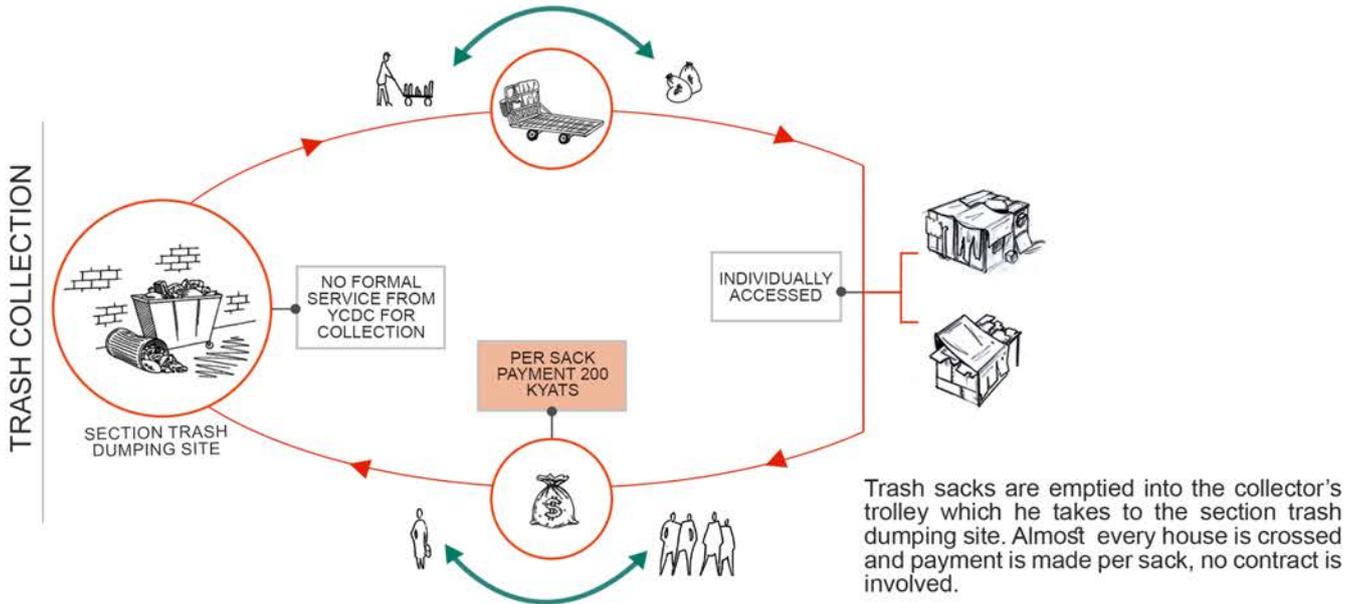
of the extended territory of home where residents must collaborate and negotiate with a number of external actors in order to access services. In each case, residents tap into existing circuits of infrastructure, which are elaborated on for each case. Here, the multiple dimensions of infrastructure (the house, people and services) make up each circuit.

fig 43. case Study 2



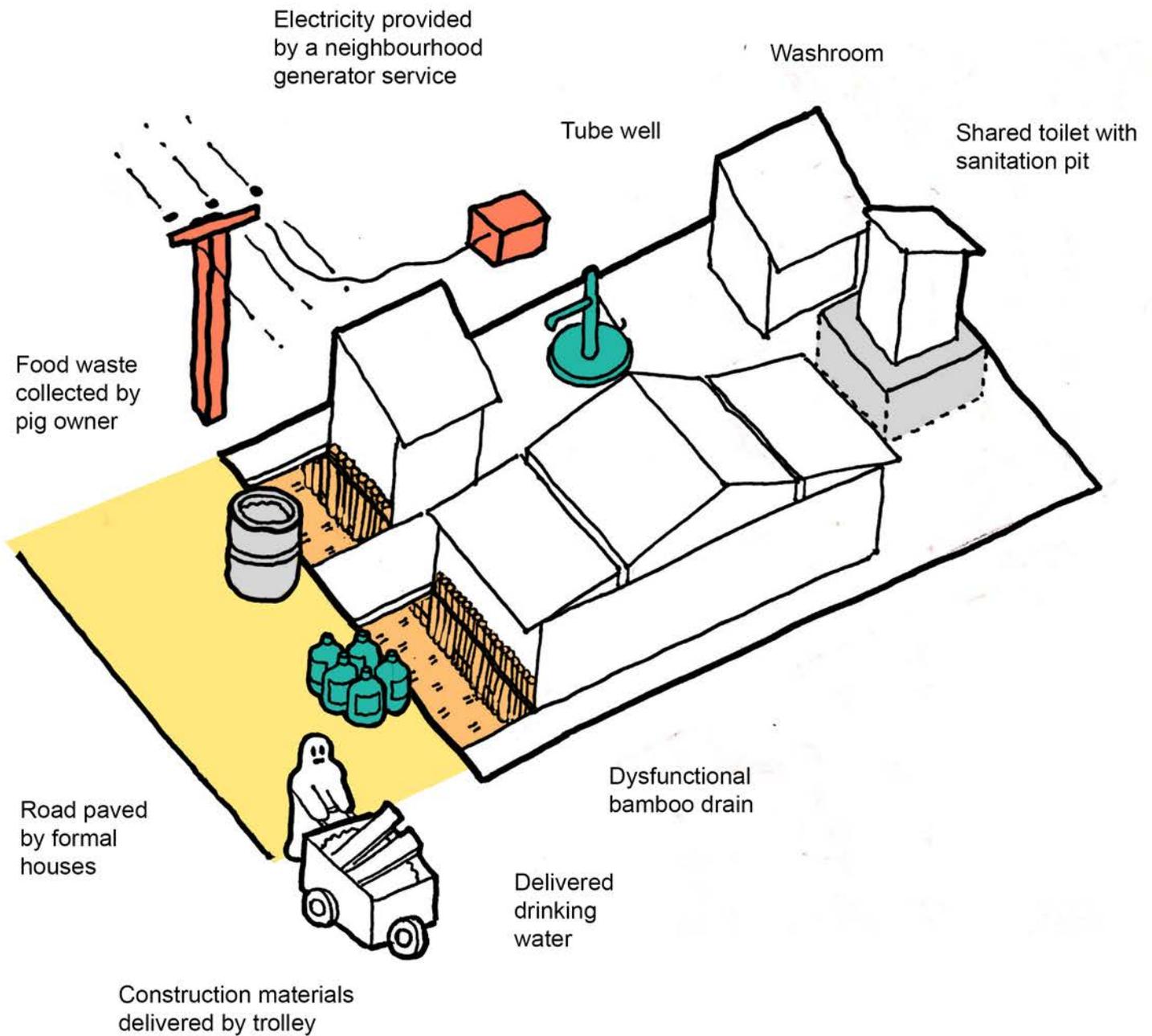
## CASE 2

Hostel (10 households)  
Informal  
Solid structure  
Rented rooms



ASSETS  
CHALLENGES

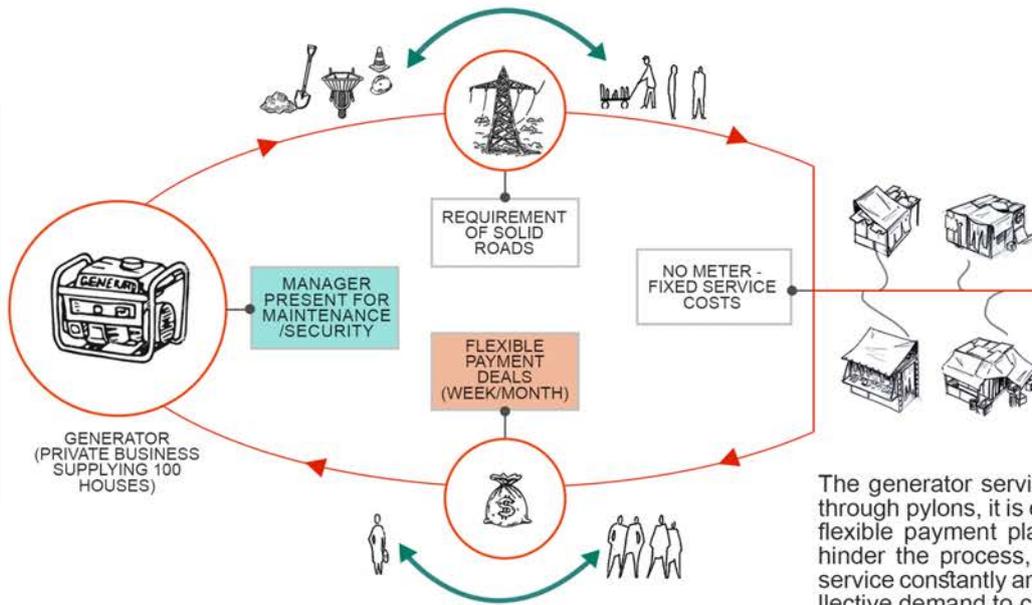
fig 45. case Study 6



## CASE 6

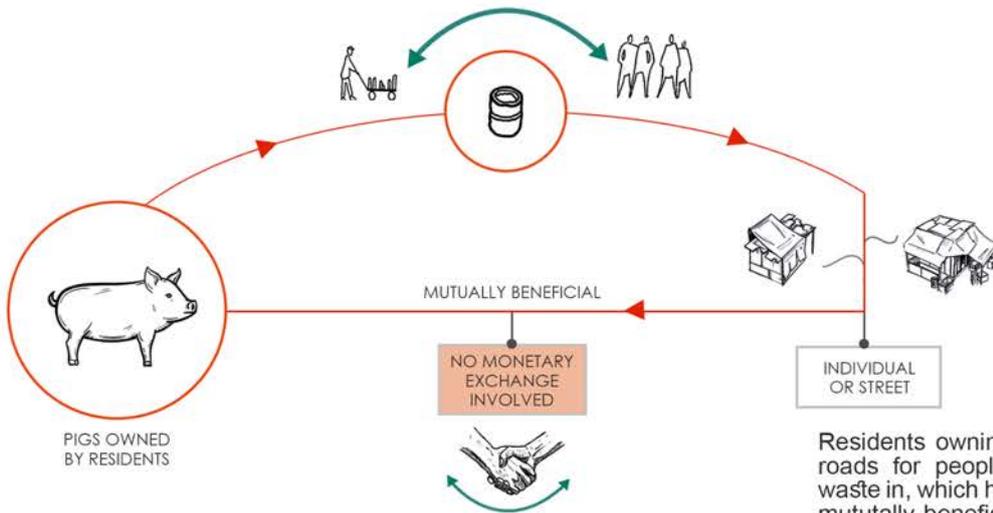
**Shared house**  
**Informal**  
**Lightweight structure**  
**Owned house**

GENERATOR SERVICE



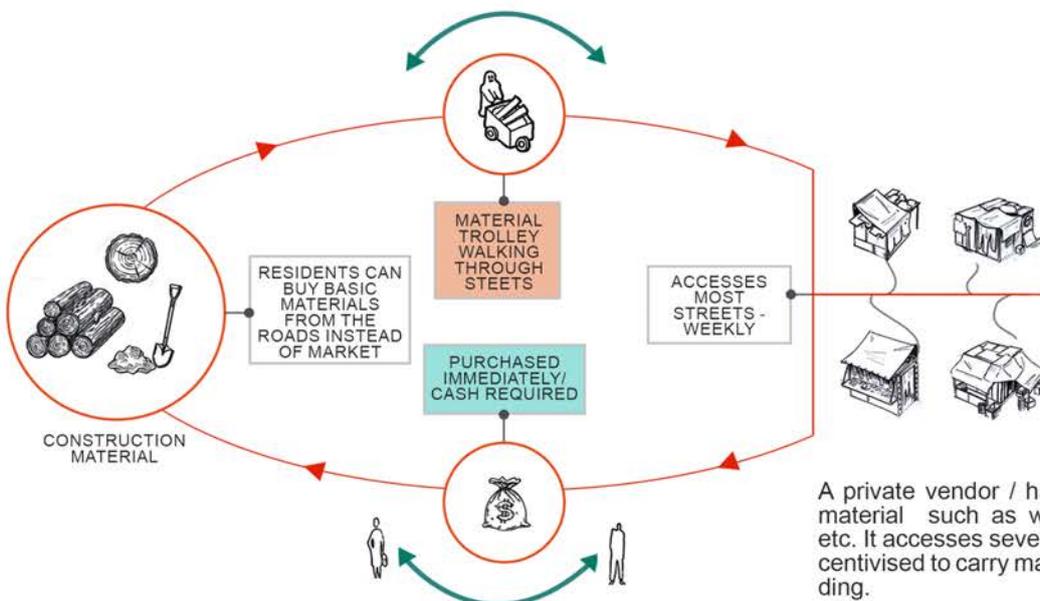
The generator service is provided to houses through pylons, it is collectively managed with flexible payment plans. Poor road conditions hinder the process, 1-2 people manage the service constantly and the system relies on collective demand to continue running.

FOOD WASTE



Residents owning pigs have placed bins on roads for people to dispose off their food waste in, which he/they collect as feed. This is mutually beneficial as the people don't have to pay for waste disposal while they need not buy extra animal feed.

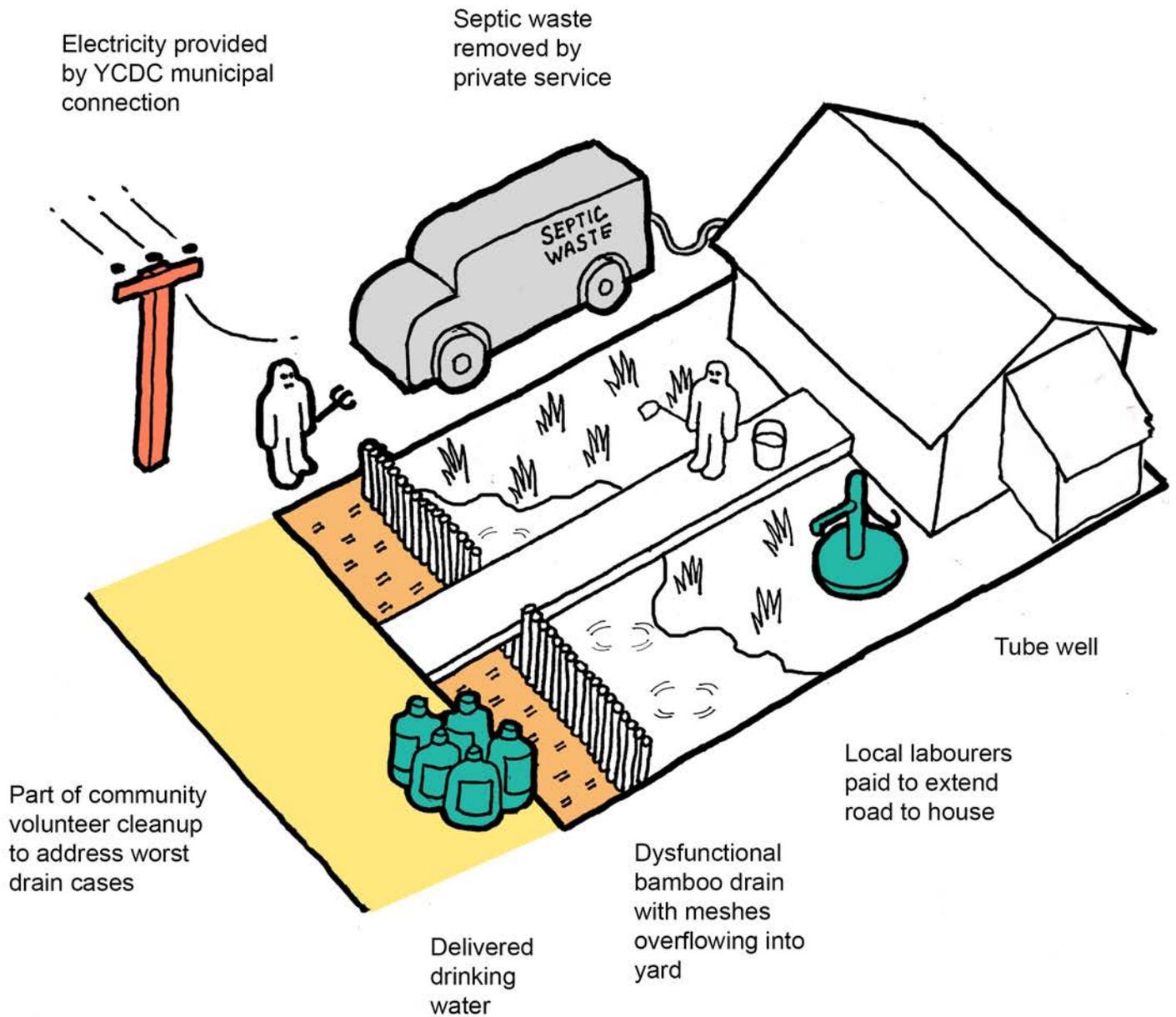
MATERIAL TROLLEY



A private vendor / hawker sells construction material such as wooden planks, bamboo etc. It accesses several streets and can be incentivised to carry material required for upgrading.

ASSETS  
CHALLENGES

fig 47. case Study 10



## CASE 10

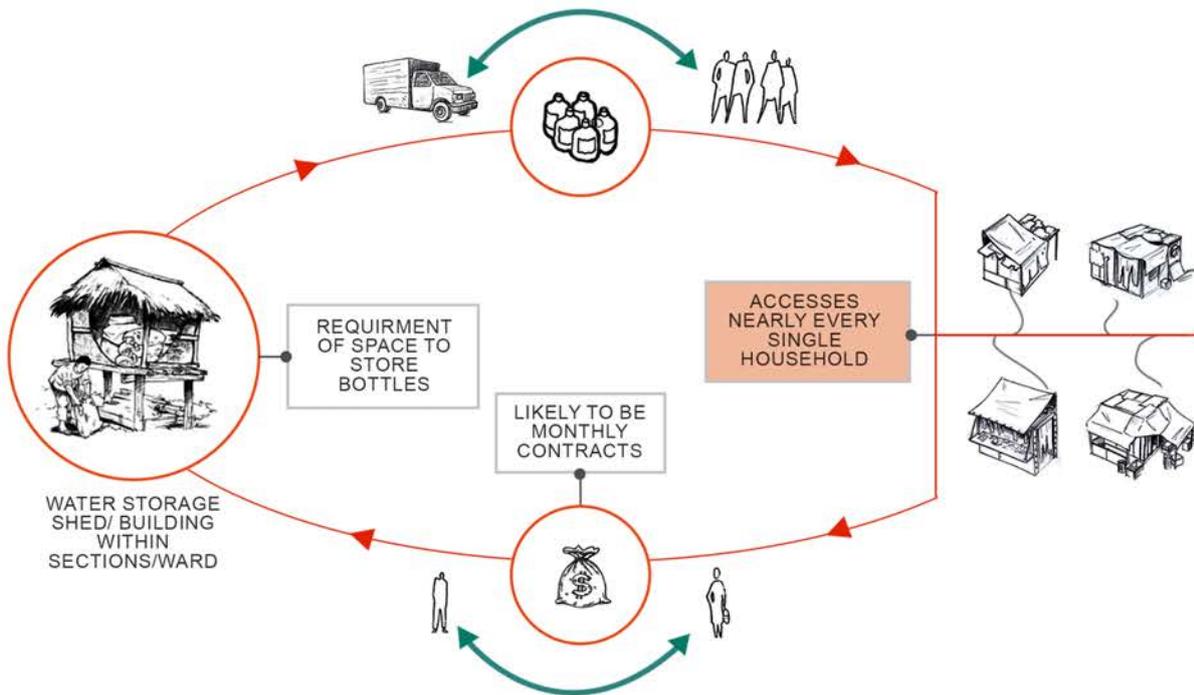
Individual house

Formal

Hybrid structure

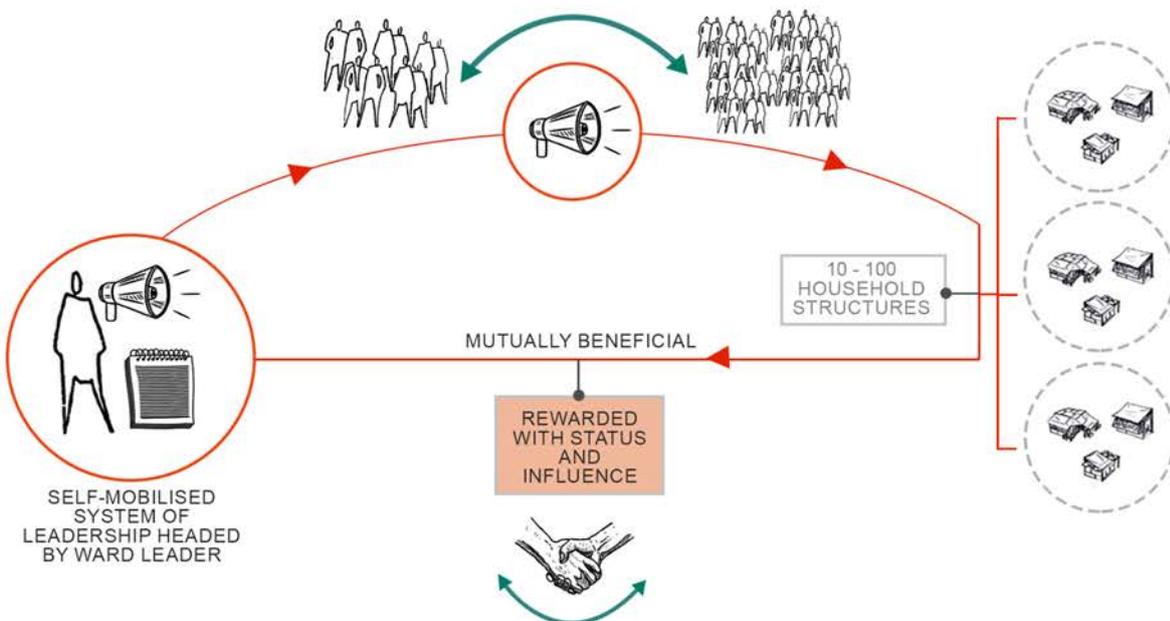
Owned land and house

WATER DELIVERY SERVICE



The water delivery is a private business which is probably the only circuit touching each household. Water bottles are exchanged for empty ones and the contracts are monthly or paid per bottle 200 kyats.

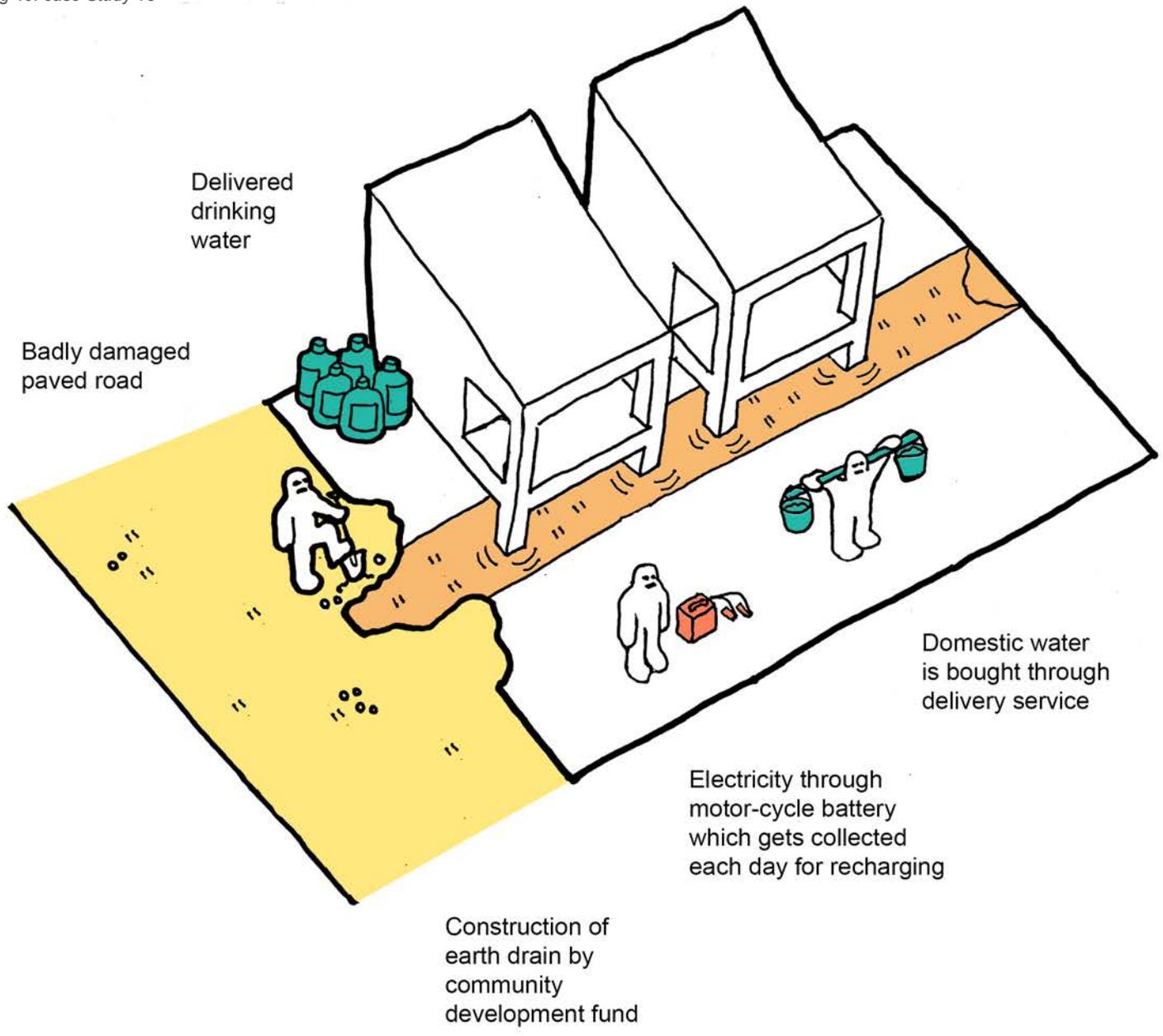
LEADERSHIP STRUCTURE



10-100 household units are arranged for local leadership scales leading to a section head, and finally a ward leader who is affiliated with the Town Development Authority. The leadership structure maintains influence and order in the sections through mobilisation and collective systems such as committee fund, meetings, volunteers etc.

ASSETS  
CHALLENGES

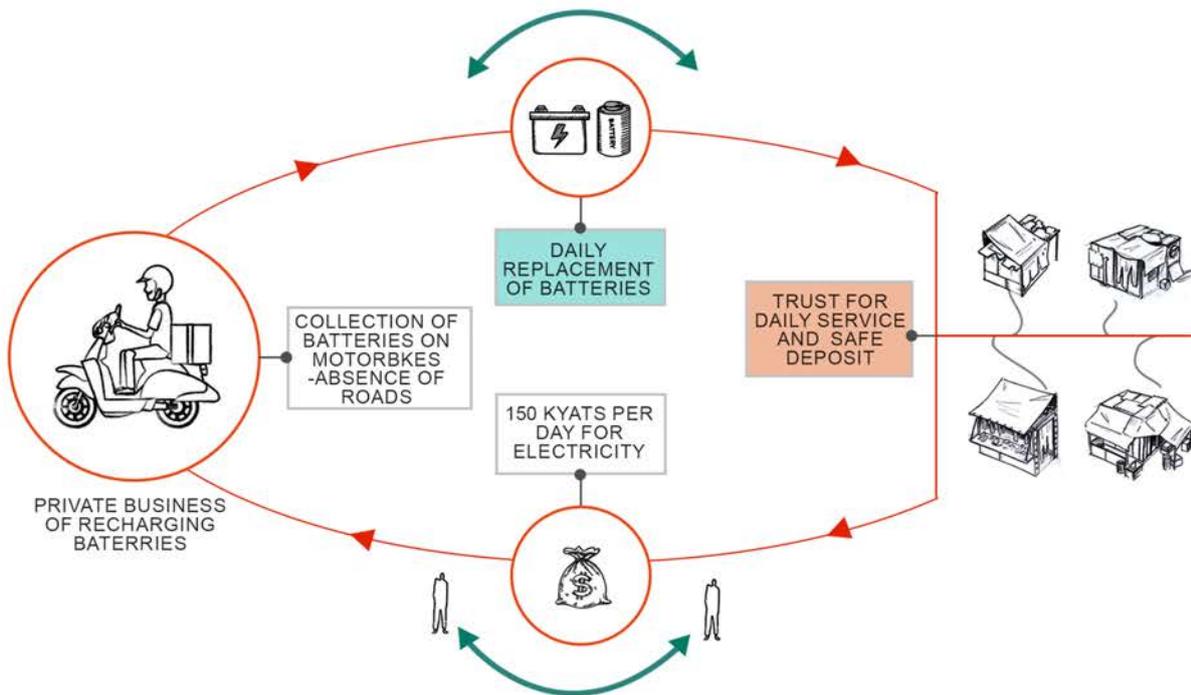
fig 49. case Study 13



## CASE 13

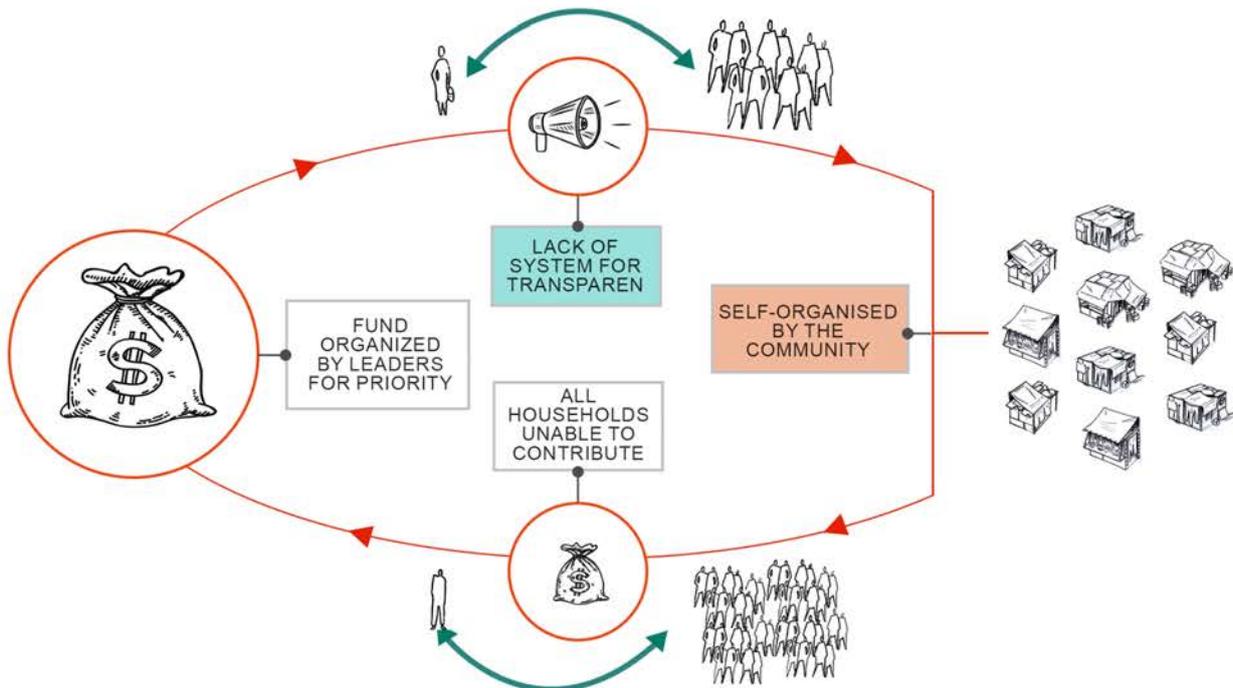
- Individual house
- Informal house in formal area
- Lightweight structure
- Owned house on occupied land

BATTERY RECHARGING SERVICE



The battery recharging is a private business running through a vendor accessing houses on motorbike, collecting used batteries for charging. Houses which have no formal supply or generator service use this service for 150 kyats per night.

COMITTEE FUND



Section leaders mobilise people to contribute required amounts for any upgrading projects. Donations can vary with affordability and spending decisions are based on priority areas. Lack of transparency and information may hinder this process.

ASSETS  
CHALLENGES



*fig 51. residents play cards in the shade*

## 3.3. Conclusion

Yangon is in a period of rapid transition and transformation. This report is the product of a collective learning and co-production process. It is a contribution to a wider discussion of the multiple trajectories of change in Yangon. The ultimate vision and goal of each response is to improve the lives of the city's residents.

In our analytical framework, we have established the definition of 'home' as the overlap of different layers of infrastructure, namely the infrastructure of people, the infrastructure of services and the infrastructure of a household. This conceptualisation of 'home' guides our fieldwork and the subsequent data analysis that was carried out in this section. Following it is a set of strategies, which is presented at both ward and city scales.

Our methods of research involved transect walks, observation, participatory sessions, interviews and co-designing, each of which were tied together to produce our findings. No piece of information could be constructed from a singular method of research as the variety of sources were used for triangulation through extensive discussions and cross-checking. The methods chosen also allowed us to combine active community involvement with phases of passive/fly-on-the-wall techniques in order to analyse the gathered data more critically.

As described in the limitations section, the weakness of one approach was at times patched with benefits of another and, as we confess, at times not patched at all thus leaving gaps in the research which we accept as an inevitable

outcome of such a complex process. We tried, to our best however, to negotiate maximum blind spots with the help of community members despite our personal distances from the context.

The research in the field was focused onto the aspect of drainage much earlier in the process due to reasons elaborated in this section. Close proximity of the diverse conditions in place, as shown on the map, along with details of existing provisions, lead to greater understanding of the cross-cutting issues. The understanding of drainage being an overlapping problem across Public Space, Waste Management and Disaster Risk studies was also vital to design the strategies in an overarching manner.

The cases selected from our in-depth interviews gave us the opportunity to explore a diversity of access networks pertaining to all the infrastructure provisions. The complexity of actors and access-circuits, and their relationships to the Typological Conditions including aspects of Materiality, Formality, and Ownership, allowed us to draw the strengths and constraints of existing coping mechanisms which greatly helped to design and enrich our strategies.

The identification of the existing circuits of access and upgrading along with the other findings lay the groundwork for the proposals of intervention mechanisms. Through the strategic responses, we aim to recognise and enhance the aforementioned circuits and build upon the existing co-production mechanisms in order to improve access to infrastructure and increase the quality of urban life for all residents.

fig 52. a family shares lunch



# **PART 4: RESPONSE**

## 4.1. Vision

*We envision a more just Yangon where each resident achieves well-being, develops a feeling of ownership and identity, and engages in active citizenship.*

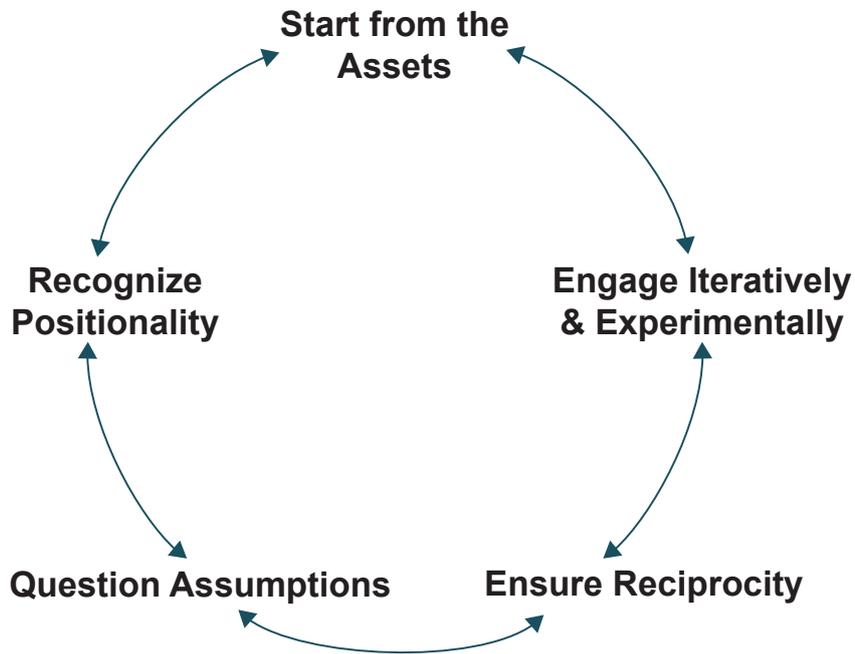
*The strategies of maintenance, mobilisation and consolidation will ground this vision by leveraging existing circuits to create mechanisms of functionality, upgrading and collaboration. Each will be explored in detail below.*

*Each strategy and mechanism departs from drainage. We believe that with functioning drains, as a starting point for total infrastructural upgrading, Ward 20 can build the foundation for a successful infrastructure and a just city.*

# 4.2. Principles & Guidelines

## Principles

fig 53. principles and guidelines



## Guidelines

Initiate community-led infrastructural upgrading based on appropriate local practice

Challenge binaries of formality/informality and normative practices

Understand infrastructural challenges and priorities to develop maximum impact with limited resources

Develop secure connections and partnerships between the ward level and city level

Ensure practices and strategies are sustainable and promote well-being and environmental care

# 4.3. Strategies: Maintenance, Mobilisation & Consolidation

The strategies of Maintenance, Mobilisation and Consolidation guide the three proposed mechanisms, each of which develops a coherent system based on the community's existing circuits. Through the systems, the circuits are

acknowledged, strengthened and expanded, creating contextually grounded, sensitive and sustainable means for upgrading the settlement starting from section scale up to the town level.

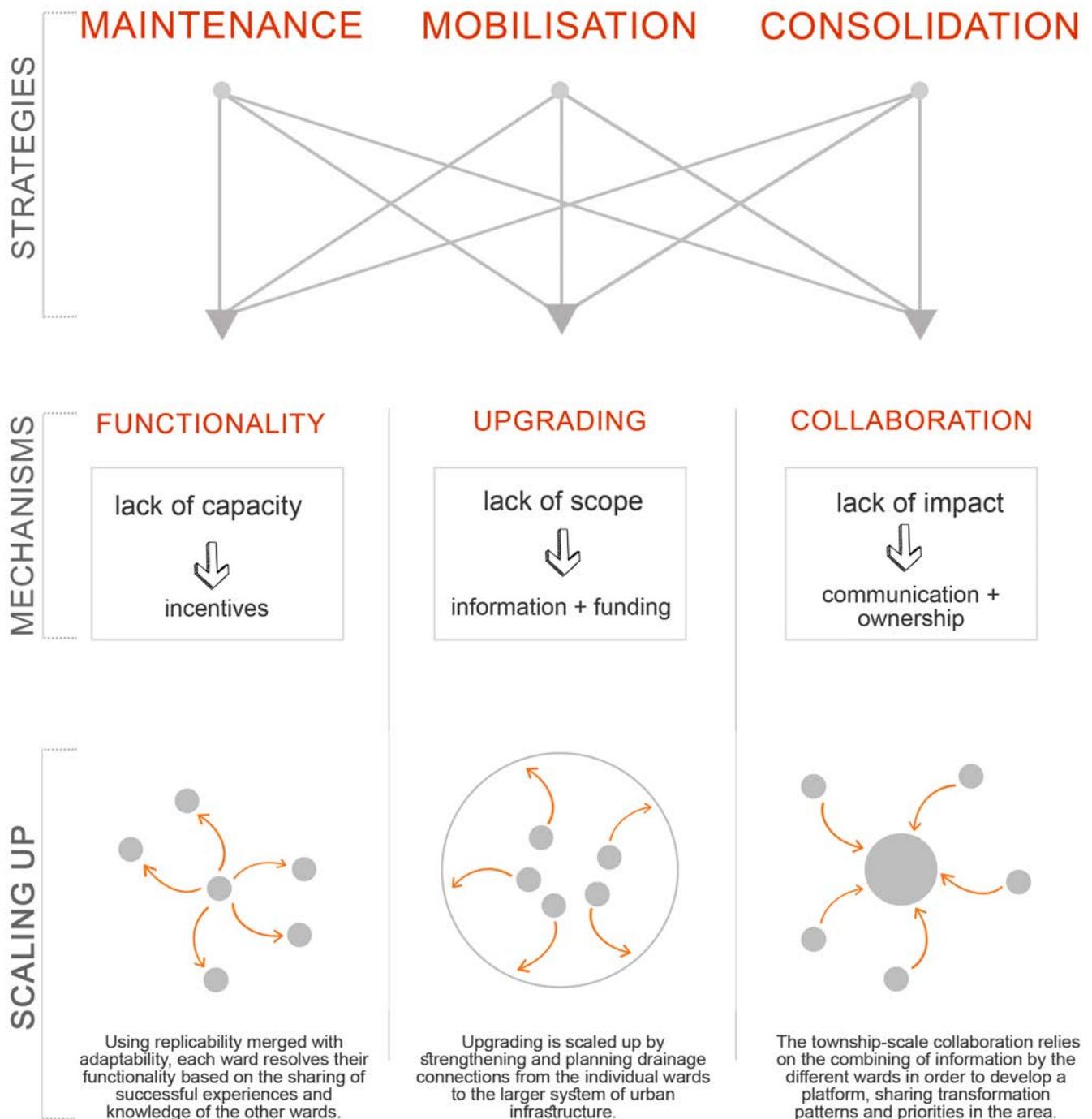
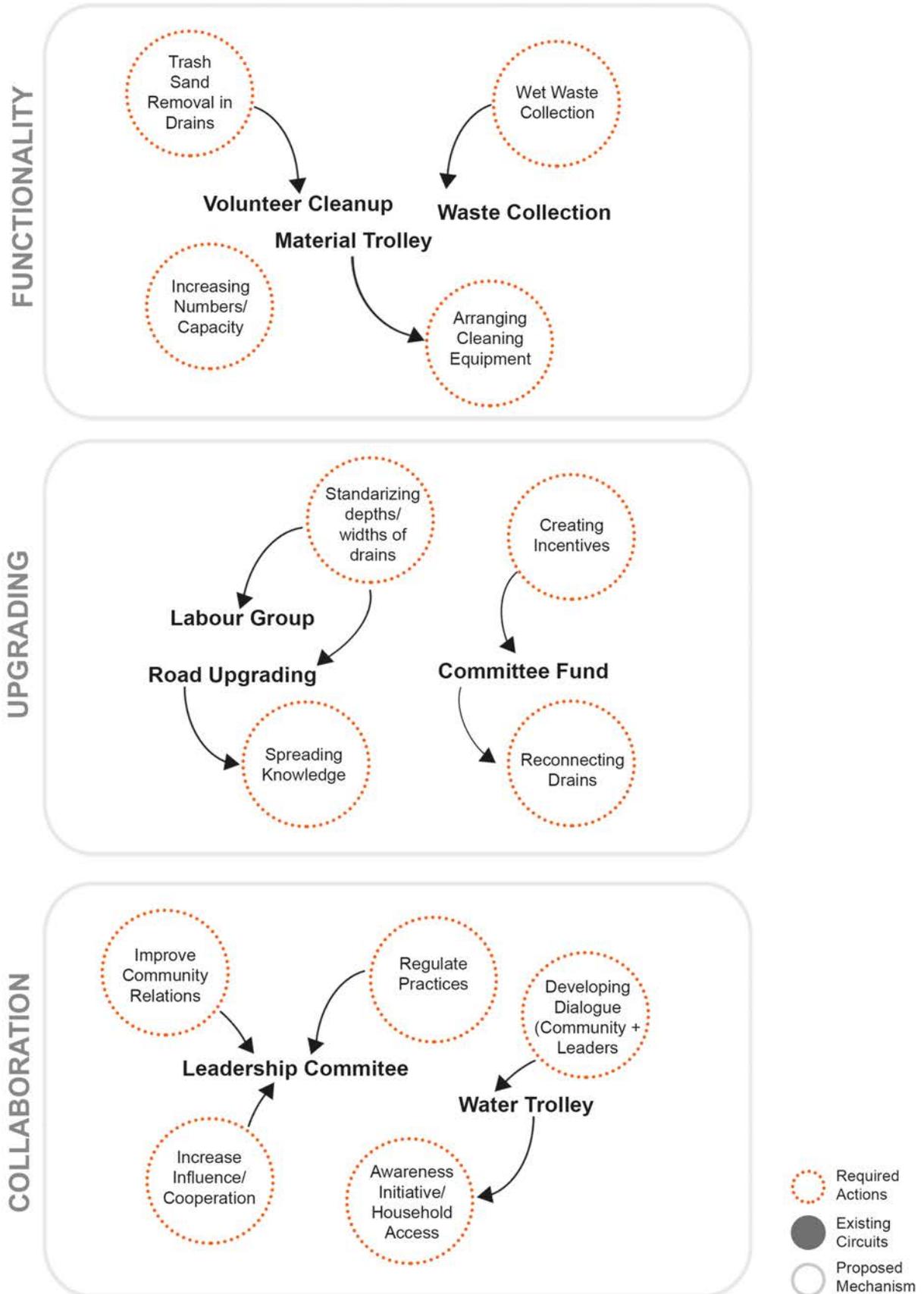


fig 54. overview of strategies and mechanisms

fig 55. grouping required actions with relevant existing circuits



# 4.4.1. Mechanism of Functionality

**Actors:** Community Members, Leaders, YCDC  
**Circuits:** Volunteer Clean-up, Community Fund, Trash Collection  
**Funds:** Community Fund, YCDC allocation

The mechanism of functionality is primarily inspired from the **Volunteer Clean-Up** circuit which is already in place, involving the mobilization of residents by the leaders to clear blocked drains section by section. Our study of the ward shows that the main challenge for this circuit is the **CAPACITY** of cleaners being unable to meet the required numbers. Building on the strength of organized collective effort, the mechanism aims to resolve the challenge of lacking **INCENTIVES** by introducing four main elements: **Trash Collection** circuit to incorporate the disposal of wet waste; money sourced from **Community Fund** to be directed towards cooking food which we propose as a compensation/courtesy for the volunteer cleaners; **Compensation** in other forms negotiated by the leader; the provisions of **Equipment** required

for cleaning drains. The premise behind rewarding the workers with food rather than money lies in the collective spirit of food being cooked by other members and then eaten collectively, promoting appreciation and attachment to the place. The incentives and appreciation encourage more people to volunteer for the clean-up activities, helping to make the drains functional again and reducing the multiple hazards which arise from the flooding.

**Who:** YCDC provides a capital cost which funds the purchase of equipment. The **Section Leader** allocates a portion of the money collected for Committee Fund to food preparation for the **Volunteers** which is a donation based running cost. The compensation from the **community** acknowledges the various capacities of people to contribute and thus has flexible options such as money, uncooked food, offering time to look after children or watching another's house in their absence.

fig 56. visualisation of Mechanism of Functionality



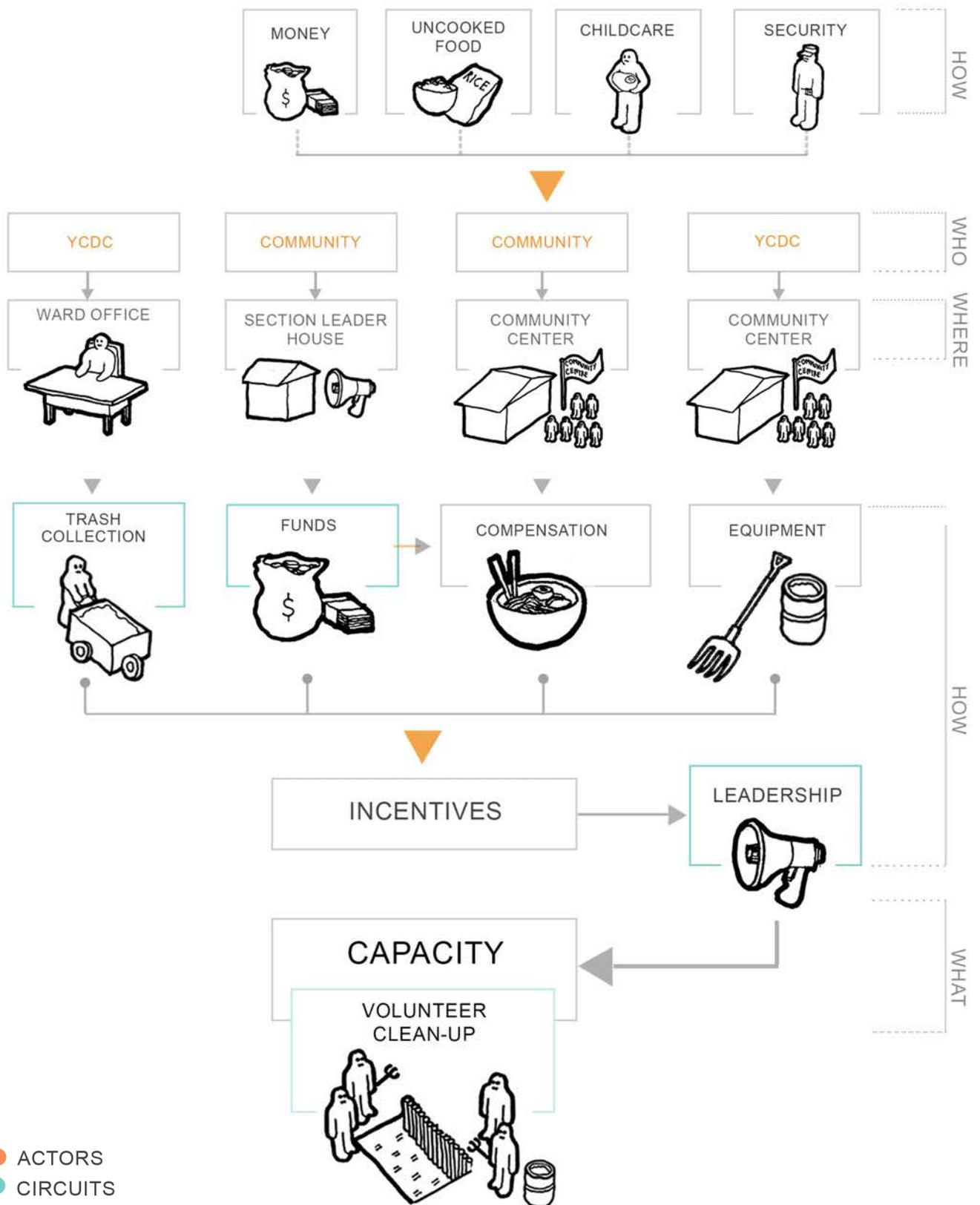
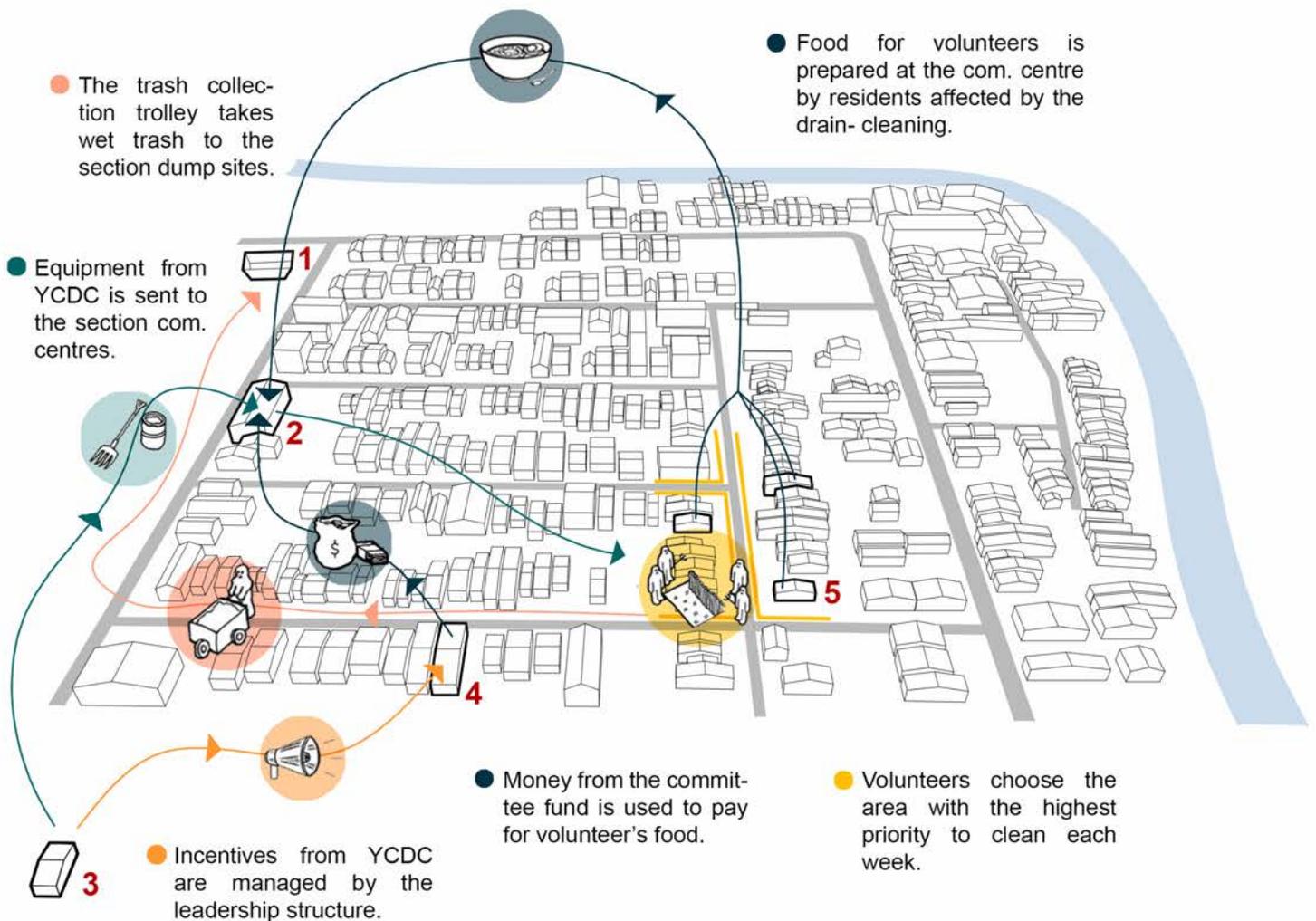


fig 57. mechanism of Functionality

# 4.4.1. Mechanism of Functionality

## Spatialisation: Ward



- 1 Garbage Dump
- 2 Community Centre
- 3 Ward 20 Office
- 4 Section Leader House
- 5 Community Houses

fig 58. spatialisation at the ward level

# Spatialisation: Township

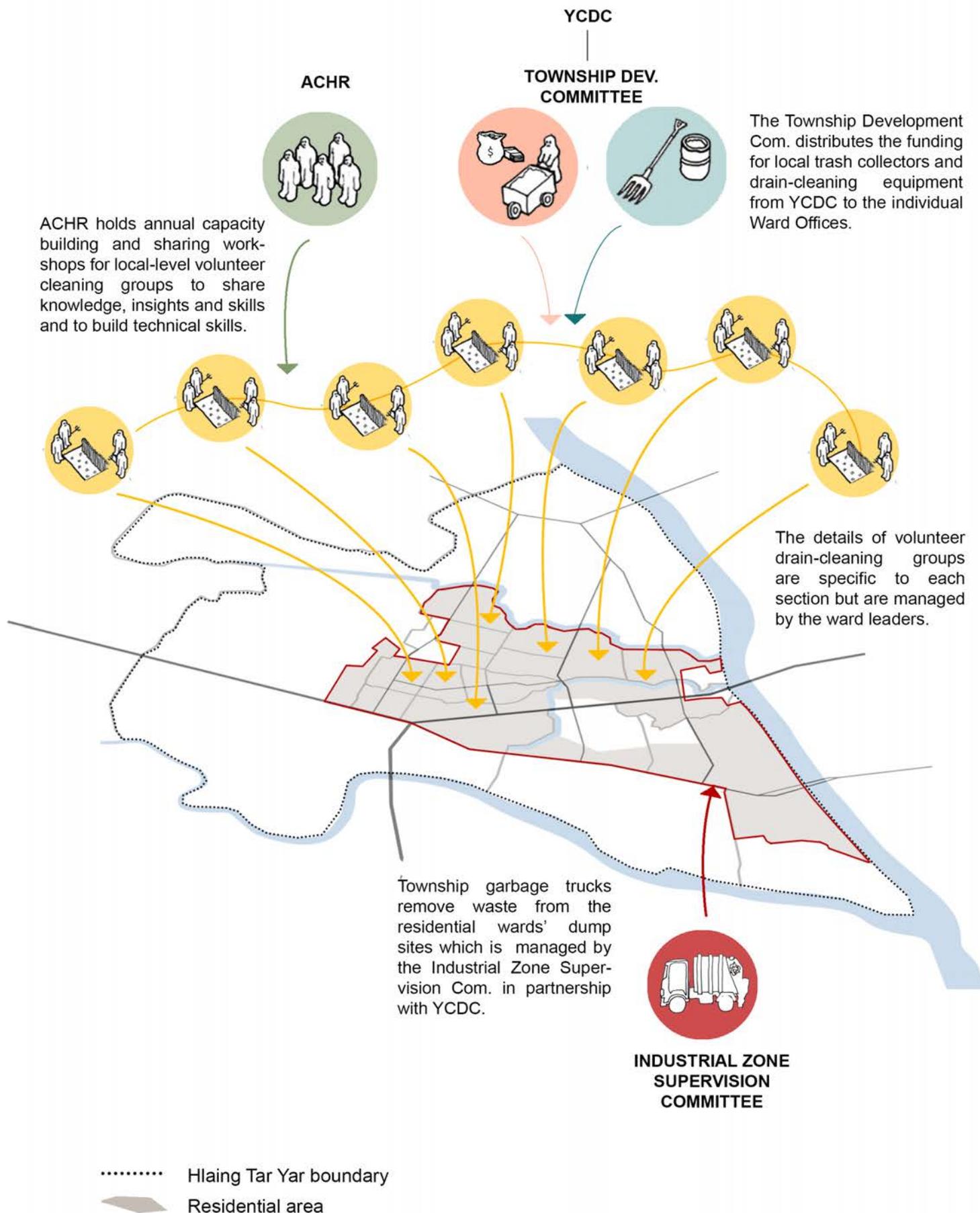


fig 59. spatialisation at the township level

## 4.4.2. Mechanism of Upgrading

**Actors:** Community Members, Leaders, YTU/ CAN/ WFW, NGO/International Org.

**Circuits:** Road upgrading, Material Trolley

**Funds:** NGOs provide funds through the funding platform

The problem with the existing **Road Upgrading** circuit is primarily of the **SCOPE** which it covers, meaning that it covers selected roads but rarely extends to drains, and also that the participation by community is hindered due to lack of **INFORMATION** and **FUNDING**. The given mechanism addresses the gap in information in two ways - firstly it generates information about priority areas through community walks for **Mapping**, and secondly seeks the assistance of professional organisations to propose the **Standards of Practice** which the residents need to abide by. This process makes the spending of the funds, both from the community and organisations, transparent and inclusive because it promotes collective decision-making while also providing people with a set of practices which they should aim to achieve over time. The **Material Trolley** circuit is a useful actor who can carry

notices/ posters for the SOP while also benefiting by selling relevant materials. The decisions for these exercises can be collectively agreed upon during Section Meetings headed by the household leaders. The interested **FUNDING** providers such as NGOs which are already operating in the township can then access the information from the meetings through the Funding Platform. This is to be managed by the section leaders and ward administrator and would serve as a form of dialogue with the NGOs, making them better aware of the amount and use of required funding.

### Who

Students from **YTU**, volunteer architects from **AMA** and workers from **WFW** can study the requirements of the sections and propose standards of practice which are published as regulations. **Leaders** arrange the walks and meeting with the community members for mapping.

fig 60. visualisation of Mechanism of Upgrading



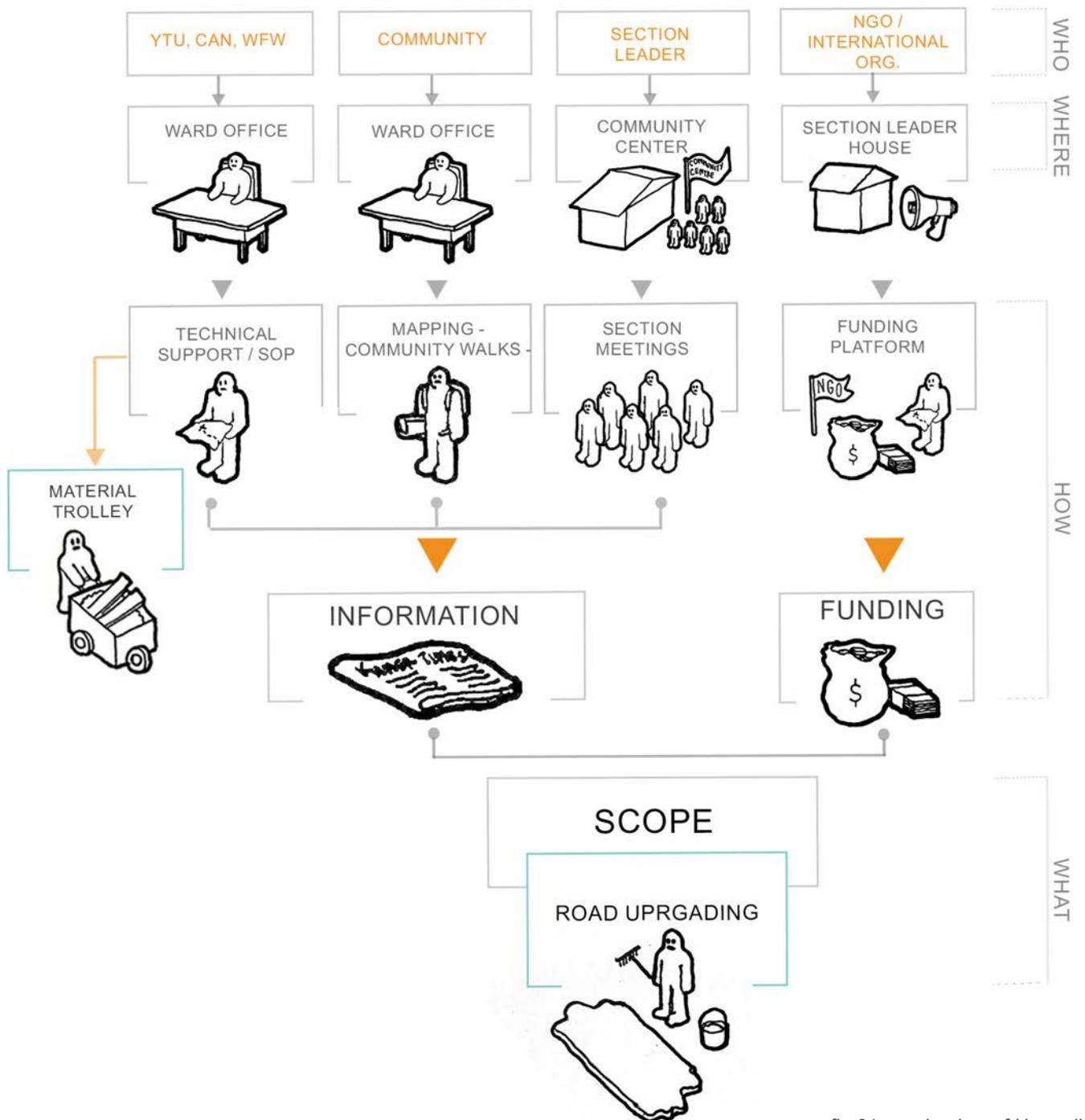
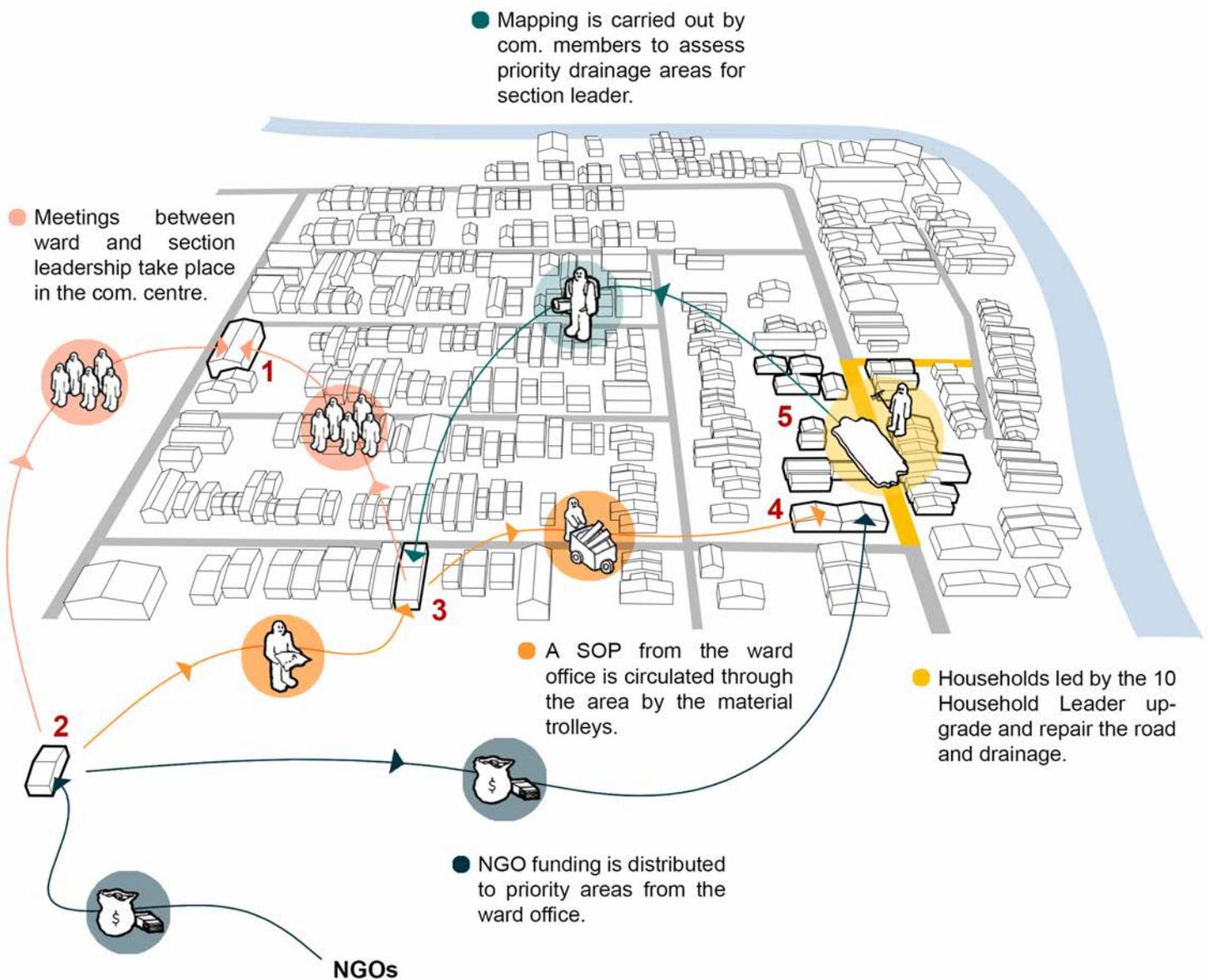


fig 61. mechanism of Upgrading

- ACTORS
- CIRCUITS

## 4.4.2. Mechanism of Upgrading Spatialisation: Ward



- 1 Community Centre
- 2 Ward 20 Office
- 3 Section Leader House
- 4 10 Household Leader
- 5 Community Houses

fig 62. spatialisation at the ward level

# Spatialisation: Township

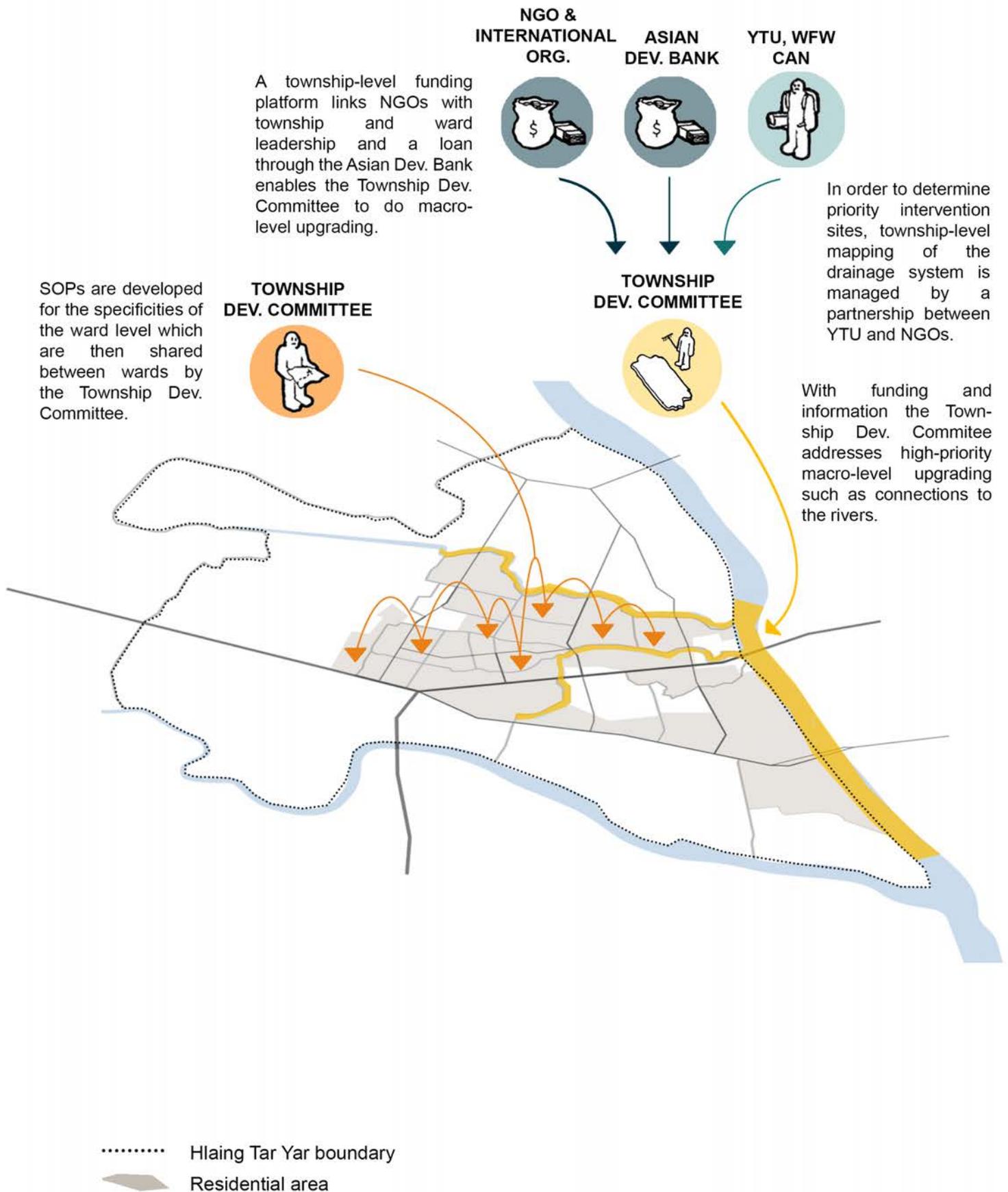


fig 63. spatialisation at the township level

# 4.4.3. Mechanism of Collaboration

**Actors:** Section Leader, Community Members, YCDC

**Circuits:** Leadership, Water Delivery

**Funds:** NGOs provide funds through the funding platform

This mechanism aims to develop more collaboration within the community by promoting empathy and reciprocity between the people themselves, as well as between people and the **Leadership**. While the existing circuit of Leadership is a commendable mode of organization, the issue of **IMPACT** hinders its efficiency and reach. We read impact as increased influence, cooperation and reciprocity between the leaders and community members **COMMUNICATION** and **OWNERSHIP** are used as two entry points to strengthen impact, the first by developing dialogue between the people through a **Notice Board** and **Flyers** distribution, and the second by a **Rewards Program**. The notice board is to be installed in the community center for people to share their requests and problems while the flyers are used by the leaders to circulate news and updates such as ongoing projects, required donations, budgeting

information etc. The **Water Delivery**, being the only circuit which accesses almost every household, can be paid to assist in collecting notices from houses and leaving them at the community center to be pinned up. This way the different requests can reach the leader easily and they can respond more effectively by grouping similar interests and deciding priorities. The second action is a Rewards Program which serves as a form of motivation for any section which has successfully mobilized themselves to upgrade a portion of their roads, drains or other services. This program helps set examples for other residents interested in managing a self-organized upgrading process and instills the desire to match the emerging standards.

**Who:**

**YCDC** funds the rewards program from their revenue, channeling it through the ward office to the section leader who then organizes its dissemination. The **leaders** in the community arrange and circulate flyers regarding ongoing efforts while the **community members** participate by voicing their concerns and requests towards the public notice board.

fig 64. visualisation of Mechanism of Collaboration



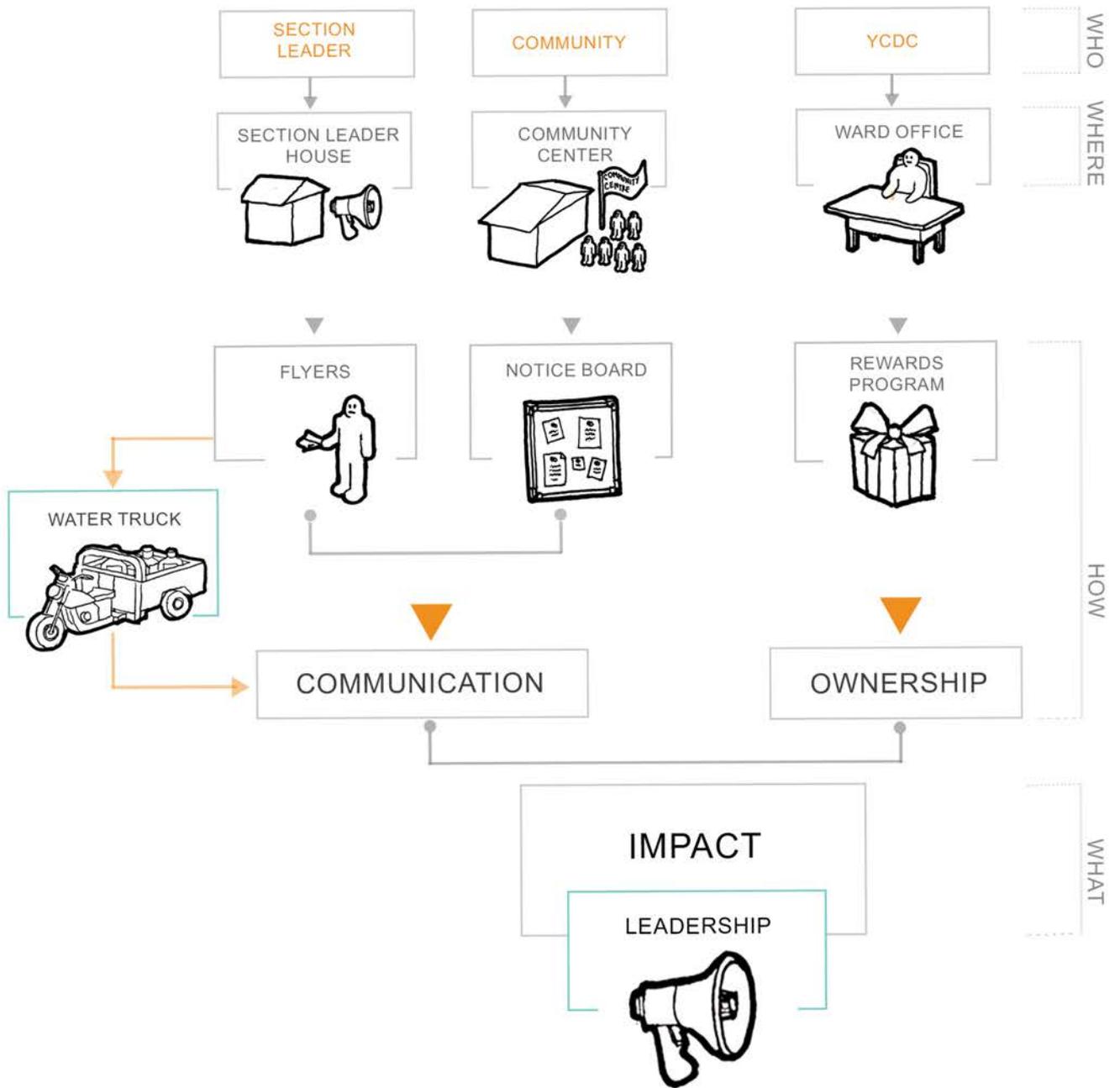
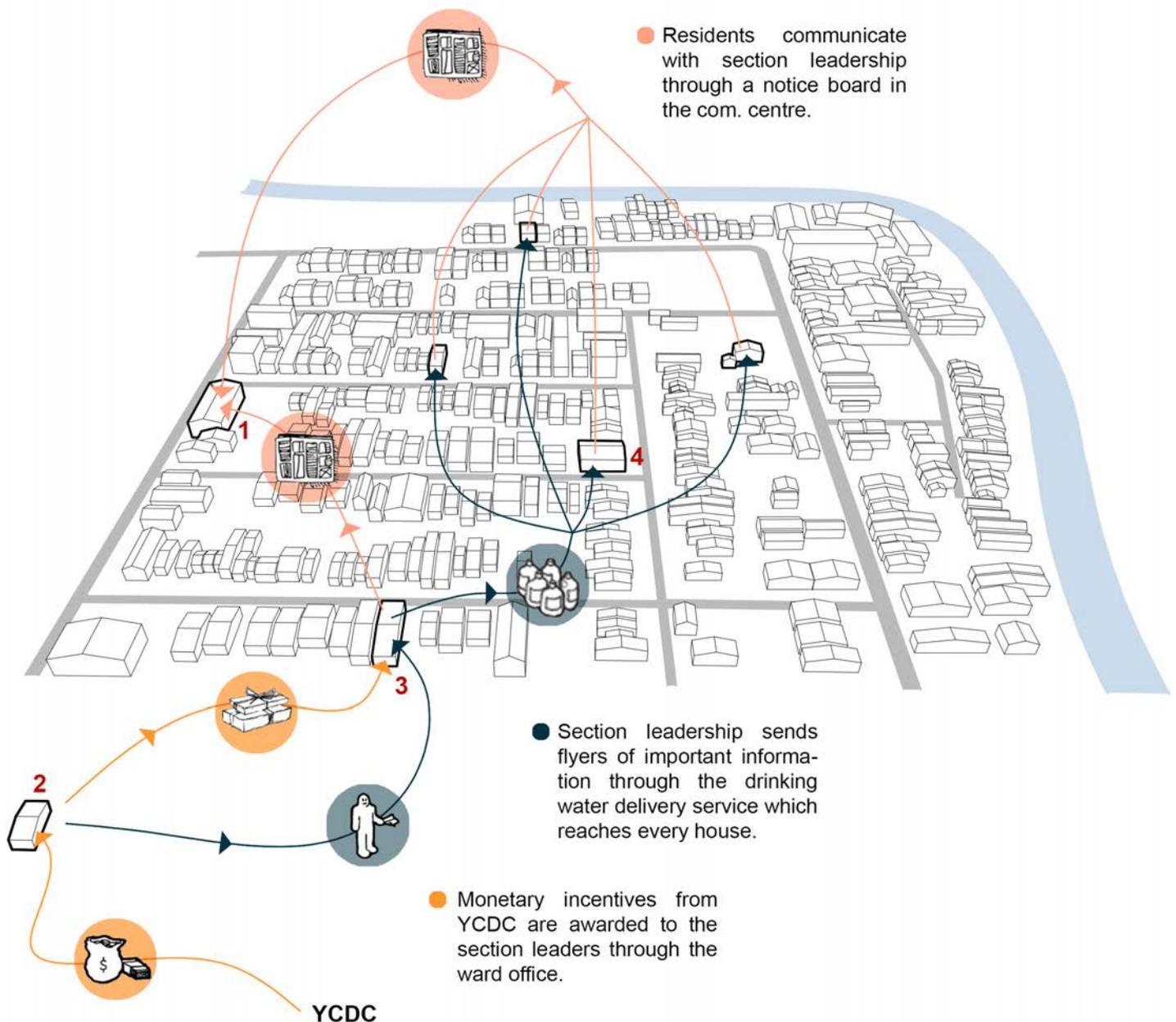


fig 65. mechanism of Collaboration

- ACTORS
- CIRCUITS

## 4.4.3. Mechanism of Collaboration

# Spatialisation: Ward



- 1 Community Centre
- 2 Ward 20 Office
- 3 Section Leader House
- 4 Community Houses

fig 66. spatialisation at the ward level

# Spatialisation: Township

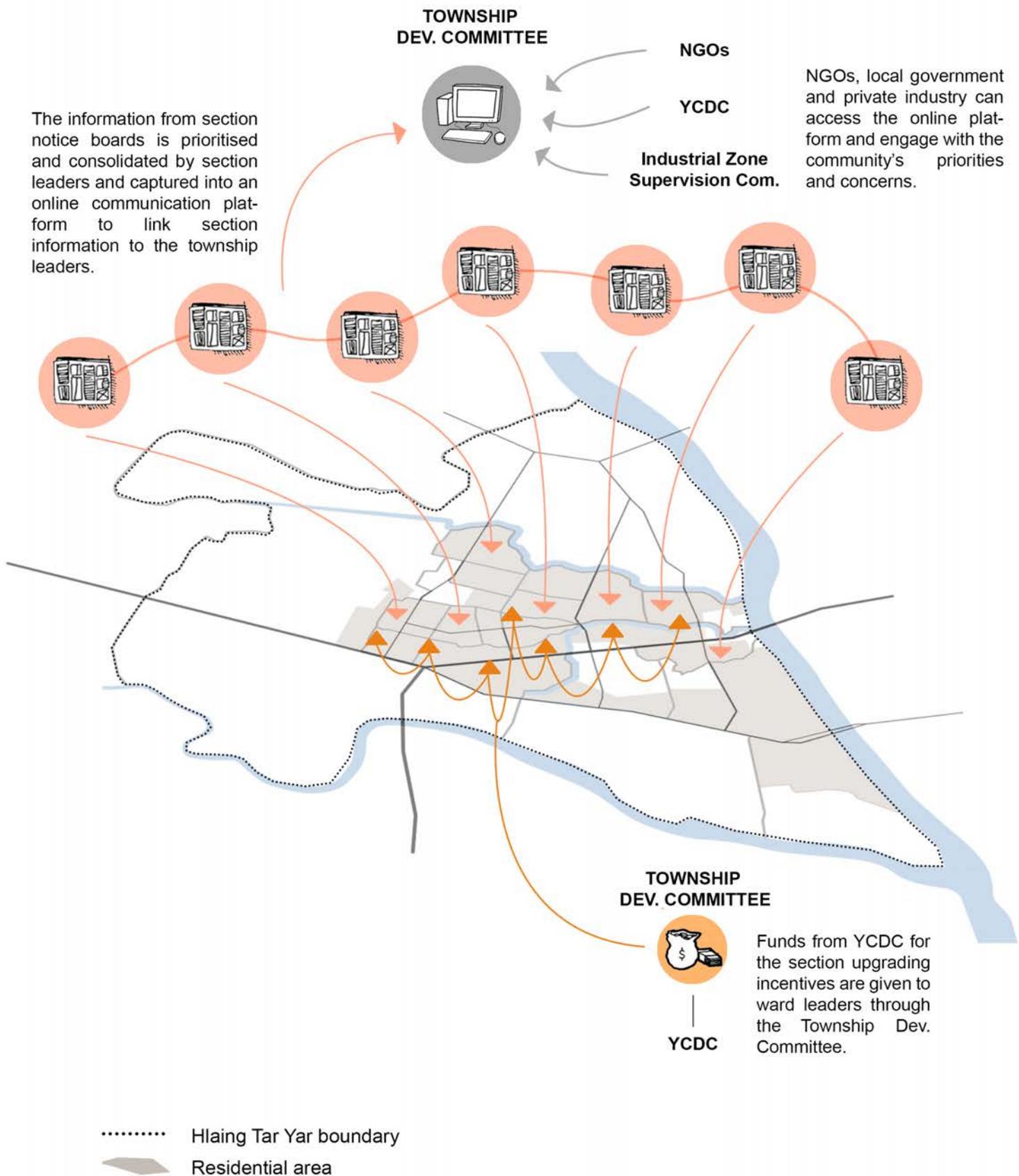


fig 67. spatialisation at the township level

# Timeline for Mechanism Development

The timeline represents that while the mechanisms build upon each other, they overlap in their materialization as different wards develop at their respective paces. The efforts start with the community and gradually integrate local and national actors to strategically upgrade the township.

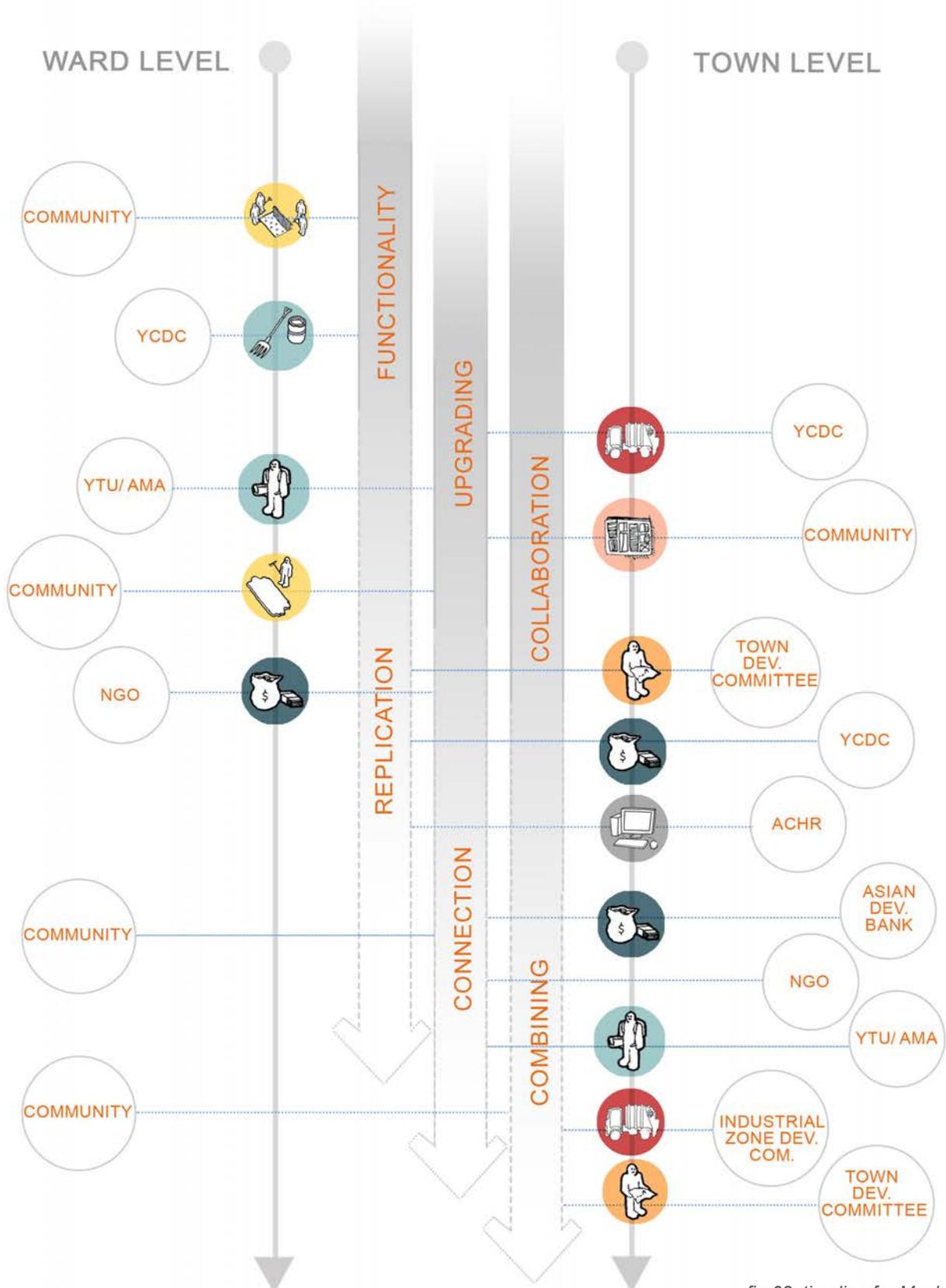


fig 68. timeline for Mechanisms

# **PART 5: CONCLUSION**



*fig 68. timber houses raised on stilts in section 10*

This report engages in a living and ever-changing discourse. The intention of this work is to provoke thought and conversation that will ideally lead to substantial transformation for the residents of Ward 20 and beyond.

By systematically and rigorously researching and analysing the real-life experience of residents, this report provides a method of engaging with the divergence of urban trajectories in Yangon. We began this process by defining our understanding of transition and transformation to frame the complex context. From the context, we created an analytical and theoretical framework that extended the boundaries of home and grappled with the multiplicities of infrastructure. Each theoretical frame shaped our fieldwork, findings and responses.

The strategies of maintenance, mobilisation, and consolidation, along with their corresponding mechanisms of functionality, upgrading, and collective action all work together to achieve

our vision of a more just Yangon, where the divergences of urban trajectories are limited and each resident achieves well-being, develops a feeling of ownership and identity, and engages in active citizenship.

The situation on the ground is dynamic. Every day following the printing of this report, Yangon will see continual change with the introduction of new actors, problems, solutions and understandings. Thus, this report should not be seen as a static act of academic research. It must be viewed in the perpetual conversation about our shared future. Furthermore, it is critical to note that this report has imperfect and partial information. Ideas are lost in translation, observations are biased and multiple forms of knowledge exist. We are fully aware of these limitations, yet hopeful that this report will add value by engaging and contributing to the never-ending conversation about the future of Yangon and its residents.

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# **PART 6: APPENDIX**

# Breaking down a day in the field

## Yangon Day 3



### Initial insight - Team talk on way to field site (Ward 20)

**Infrastructure translates to basic needs**

**How do we enquire about basic needs**

**What do they do for work**

**How do they get to work**

What are some things that are harder to access

How do they access them (as in what constitutes basic needs)?

-Keep eyes open and use intuition

-First presentation (provided by WFW)

- Community centre

**Issues in ward 20:**

-Power cables

-Waste

-Road conditions

-Drainage

-Traffic

-Road conditions and traffic could be related

Data cultivation (How WFW operate)

**Technicalities:**

-Community led survey system is used to collect data

-No designs are made from the office the process is developed together in sync with the thoughts of the community

Use of condor sessions - urban safety, team building, safety, information exchange

Technical input sharing - how to use and triangulate GPS

Group discussions on survey data - reciprocity\*

**Methods:**

Action planning for field survey(s)

Interviews using a questionnaire sheet is used as a primary data source

Geotagging using photos is also a useful method  
Community led urban safety audit(s) = data - real voice, awareness, unity (mutual trust)



**Advantages:**

The data gathered cannot be disputed by the government when presented as it is concrete  
Through data collection, they mobilise themselves to be more comfortable and build trust

**Takeaway:**

All infrastructure is currently at a critical level and dangerously in need of change.  
Drainage, roads and flooding are all very much related all issues seem to be systemic  
This learning is not just for us, it is also for them

**What do we need?**

- Tangible output to encourage small changes
- Data should identify gaps and opportunities
- Qualitative and quantitative data
- Stories & narratives
- Communities voice
- Case studies
- Approaches to scaling up
- Feasibility at the immediate scale



**Observations - Transect walk (Section 10):**

Drainage is already at full capacity  
 It is clear that there are blockages as the water is black from being static for long periods of time meaning the drainage system is effectively redundant  
 Power cables are very low in the event of a storm, falling/ swaying trees are incredibly dangerous  
 They are also scattered extensively creating a large problem area over a densely inhabited area that sees consistent foot and vehicle traffic  
 This is also exacerbated by some trees being utilised as pylons  
 YCDC/AMP are neglecting the maintenance,

locals have made several repairs to pylons and makeshift hanging masts which indicates the lack of support from the municipal organisation  
 There is a lack of adequate drainage at the roadside in most places  
 It is of note that there are several telecoms masts scattered throughout the ward - it is a sign of plans for city expansion if they are prepared to instal these but neglect neighbourhood  
 Locals have installed their own entrenched flood defence systems due to the lack of effective drainage  
 There are no connections from the power grid to the informal areas of the settlement

Group discussion with residents about the concept of home: what is home to them? - Community centre

**Residents:**

- Children
- Security
- To live
- Comfort
- Protection from weather
- Good environment
- Good transportation
- Repairing and upgrading
- For a family to live together - unity
- Services close at hand, hospital/ clinic / fire station / market - infrastructure of services

Issues:

- Living in a place long enough to have a good standing in the social hierarchy
- Concern over vulnerability to natural disaster
- Smell from drainage
- Really hot weather dries up the well(s)

**Us:**

- Family
- Family and neighbours
- No judgement/ lack of acceptance/ understanding
- My books + tea plates + pillow
- Familiarity

Physical things:

- Good food
- know routes by heart
- Public transportation to go to work

**Students:**

- acceptance
- Fort
- Individuality
- Peaceful / less interaction/ quiet

Dream infrastructure or capacities of infrastructure

**Residents**

- upgrade of roads to concrete
- Proper drainage : ditch/ concrete + wide and suitably deep
- Fixed, secure and safe electricity lines so there is no longer the risk of being electrified
- Solar panels - but they are too expensive
- Currently, informal housing occupies drainage areas in a number of places

Side note: Pagodas as public space

**Us:**

- Being able to walk to work with usable sidewalks/ pavement
- Public space
- Factories/ work provide transport

**Students:**

- More rooms and protection from seepage of water through walls (watertight materials and construction)

# Breaking down a day in the field

## Yangon Day 4



### **Preliminary thoughts - Leave van out to research site**

There could be a cross-over between formal and informal in the use or access of water (wells and boreholes) and sanitation residents can't afford to hire trucks to come in and empty tanks so instead they dig deep holes like them with concrete, fill them, seal them off and replicate the process.

#### **Group discussions/ debrief - Community centre**

It is about strategy more than a solution. The problem is an opportunity for change. There is already a lot of innovation present in the ward, the fact that residents manage the maintenance of existing infrastructure (electricity pylons) due a lack of support from YCDC (roads) and AMP (mains power) highlights that residents are well versed in making things work.

Important:

1. Social connections,
2. Linking the infrastructures of people, house, and services through the former.

It is clear that residents know what they need in terms of infrastructure and that these play an important role in their conceptualisation of the home and what they think defines it as safety

and security to name but two relate to a reliable and safe provision of the infrastructures of the home.

Start thinking about identifying focus area (s)? We've already kind of established this from the work with residents today and in-kind with the point made above drainage, roads and a safe electricity network are the main priorities.

#### **Focus shifted to thinking about identifying focus area(s).**

We've already kind of established this from the work with residents today and in-kind with the point made above drainage, roads and a safe electricity network are the main priorities

#### **Objectives created**

How do social networks and the existing hierarchy relate to situations like this?

Are access to sanitation and the provision of electricity ranked higher than connection to the water supply?

Power dynamics between the informal and formal need to be explored

As well as within the formal itself (social hierarchy touched upon yesterday).



## Group meeting - Whilst in the field, prior to interviews

### Split into (3) groups -

Kayla, Lev, Taung, Haede, Daw ye, Chat Romina, Marcus, Suye, Kokolay, Aamina, Doowon, Jacob, Kiino, Ei ei Lou

**Aim:** To understand how the informal and the formal work in relation to each other.

### Preliminary conversation with group residents:

Even if they wanted too, formal residents couldn't share or distribute services or use of infrastructures with or to the informal.

### Structure:

30 minutes per household.  
Will be visiting the formal and then the informal.

### Basic question set:

How and where are they accessing certain infrastructure?

For example, in order to run electricity in the house, in many circumstances, they need a battery pack?

Where are they getting the battery pack?

Who is charging the battery pack for them - someone connected to the mains power grid?

How much do they have to pay and with what

regularity must they be charged?

What form of tenure do you currently live by? (renter/ occupier)

What is the status of you're drainage system?

How do you access sanitation?

How do you dispose of septic waste?

How do you access both drinking and domestic water?

### Method:

The idea is to establish what the network is and strengthen it; working with what is there and enhancing, over changing the system of operation.

Residents could suggest a strategy for how we could understand the network.

We chose specific routes with which the formal and informal are close together or interlinked, it was established that we would explore and analyse sector 7 as well as 6 due to a better spread of the specifics we wish to look for.

Each group consists of two locals and a student along with members of the team this is done in order to maximise the potential for analysis of different housing types as well as social/ power relations and dynamics between the formal and informal.

## **Excerpt from Interview transcript (conducted by Group 1) - Section 6**

### **HI - Home Interview**

#### **HI 1**

##### **Wooden structure**

##### **Three generations sharing space.**

##### **Tenants (3,000 MMK per month).**

When it comes to water provision, the residents are not supplied by the government. The domestic water is extracted by a pump. The drinkable water is bought on a daily basis, 20-litre canisters for 400 MMK. The residents live across from the local shop where they happen to be sold. If they can't purchase the water there (which does not seem to happen often) they can organize a delivery. Drinking water is distributed by a private, local company.

The household does not have any access to government-supplied electricity, the deposit price for government-provided electricity is 400,000 MMK, which is unaffordable. So they utilise a battery service, which they buy daily: each one costs 150 MMK and is delivered from another ward indicated the reach of the service.

The house is connected to the government drainage system. However, while the authorities have set it up, the residents are the ones who maintain it. The excavations are not reinforced by either bricks or bamboo (government-recommender materials). The water in the drainage surrounding the house is filled with waste and poses many hazards. The family themselves dump into the drain on a regular basis: according to one participant, once their

septic tanks are full, they are discharged in the drains, since the family cannot afford any other options of disposing waste (60,000 MMK for collection). From what was gathered in the interview, such practice is not uncommon. Most neighbors clear out their waste in a similar manner. The residents purchase a new septic tank every two years from a private company. Children are instructed to avoid playing with/ around the drains.

During the rainy season, floods become a regular occurrence, with the water rising up to 2 feet. These floods pose an additional danger due to its aforementioned hazardous nature. Participants do not have any medications apart from paracetamol and when in need of medical attention, the family seeks help from the local hospital, where they usually pay 5,000 MMK. Among the health-related problems that they face are the reoccurring headaches. One of the interviewees theorized that the potential cause could be mosquito bites.

The road that the house is connected to does not have any concrete paving nor street lights. In the rainy season, the roads turn into bogs which causes multiple issues for the residents.

No community activities are conducted in the area. The relationships between the neighbours are not particularly close. However, the residents mentioned that they maintain better contact with tenants rather than with the household that owns their property.





## Excerpt from Interview transcript (conducted by Group 1) - Section 6

HI 2.

**Hybrid (wood/ concrete) structure  
Hostel with 8 households  
Informal area.  
Wife, husband and several kids.**

The household does not have access to the government-provided electricity and hence resort to using the generator (200 MMK per night). Power outages are common, especially during the rainy season. The family often resorts to candles when there's no access to electricity.

With the use of a water pump, the families in the hostel get access to the groundwater, which is then used for domestic purposes. The drinking water is purchased from the private distributor

(20 litres - 400 MMK).

There are three toilets set up for the families in the buildings. The waste is discharged in the creek nearby. The interviewed residents do not have any medicine. In case of injuries or health-related problems, they go to the local clinic. According to their testament, the prices range from 5,000 MMK to 40,000 MMK.

There is no drainage set up - possibly because the residents/the building are fairly recent. The people living there do not have any form of identification documents, nor HRC. Unlike many of the informal residents, the family came to Ward 20 after the cyclone had destroyed their previous house.



## Collecting stories and building narratives

Key case studies: The electricity generator maintenance/ security man  
Remaining unnamed, the man said of his generator that It breaks down sometimes and it up to him to keep it running, it is clear aside from his maintenance roll that he is on hand to secure the premise and equipment also. People can pay for their electricity from him daily, weekly and monthly which is actually quite a range considering the informal nature of his energy supply. The generator itself serves over 100 houses in the surrounding area, which is nearly a third of the 350 overall standard household allocation for the section he is located within (6). Clearly, he is providing quite an important service to the area. It is from this particular individual that the notion of the circuit originally emerged.

## Summary of Post-Interview discussion - Community centre

After returning for lunch we linked up as a group to reflect on and discuss our plan of action moving forward and post-interviews. We started thinking about the spatial connections that could be mapped out following the interviews and the data that was collected. There were some inconsistencies in the data as residents weren't aware of some of the details we required such as where specifically they get the motorcycle batteries from or indeed where they go to be charged.

We established that connections could be made between those who acquire their electrical means informally, whether it be from the above or from the man who runs his own electrical generator (supplying locally around 100 homes). Connections could also be drawn between those collaborating on the construction of sanitation pits, usually neighbours would do so in order to make the process more efficient and are mostly informal.

However, formal occupants it would appear in some cases are adding to issues with drainage by dumping their septic tanks into the drainage system that flows into the river - a contrast with the safer option taken by mostly informal residents. Similarly, connections could also be made between residents extracting water from the water table through the use of wells and pumps as well as those who have to buy bottled water for consumption which would be most if not all residents. Connections could also be drawn between those connected to the formal drainage system that runs parallel the

road leading to the monastery. There is also the potential for connections to be made between residents who funded the road leading to the monastery if this is to be the case and it is not a government funded project. After establishing that a multitude of connections could be made we realised that we needed to narrow down our focus in order to strengthen the spatial as well as qualitative analysis that could be made.

We settled on roads and drainage as links could be made with the issues of electricity and the quality of the road network, without viable road systems in place it is very difficult to install high-grade electrical systems which also happen to be safe.

Similarly, without a well-designed road network, it is difficult to instal efficient and effective drainage systems but also without an effective drainage system that can incorporate sanitation (sewage) there is not much point in installing high-quality roads.

It was decided that by focusing on these we can elaborate upon other infrastructures they can very much be considered the key to understanding the situation on the ground here in Ward 20 and specifically sector 6 & 10.

**Side note:** Better drainage would have vastly greater benefits to the health and well-being of local residents and a redesigned road network would greatly ease congestion and commuting between areas for the community.



## Roads- Infrastructural Profile

Muddy roads become a serious problem raining season. The community comes together to collectively upgrade the roads. Labour is provided by the community themselves, funds are given out by government or by other organizations (different parties, religious institutions). The damaged roads were filled with sand and then eventually turned into concrete roads.

### Process 1 (slow):

The residents reach ward administrator who organizes ward development committee. The funds are then directed towards the road upgrading.

### Process 2 (quick):

Residents who are directly affected assemble and choose an informal leader (not household leaders - slow). They then proceed to fund the process themselves, with each household contributing. Other institutions can also be involved.

### Process 3 (minor changes):

Whenever the road is not heavily damaged it can be upgraded by the regional (for eg, YCDC) authorities: the ward administrator can reach out and request the works. Only light maintenance

is conducted.

### Process 4 (annual upgrading, 5-10):

Ministry of construction gets in touch with the ward representative and asks him/her to point out the roads which require upgrading. This is done on an annual basis and in such cases from 5 to 10 roads are upgraded.

### Some other facts regarding the road situation:

Wealthier people donate the materials when the process begins.

Religious events for fundraising purposes take place.

### Reasons as to why roads do not get upgraded:

They're part of the informal area.

Financial issues/reluctance to mobilize finances.

Authorities might be satisfied with the current status of the roads.



## Drainage- Infrastructural Profile

**The government set up the drainage system, yet do not provide any materials.**

Excavations in sizes of 3 by 3 feet were done and when the residents want to expand drainage further, these measurements have to be followed.

Since no materials were given by the authorities, residents had to reinforce the drainage with bamboo or bricks/concrete, while others abstained from doing any works. This partially explains the poor state of the drainage systems in the ward.

**Maintenance is fully done by the residents.**

According to the current plan, two leaders are selected from each section (not to be confused with household leaders) by the ward administrator.

They then proceed to organize their communities to manually clean the drainage systems. This is done once per week, and the present state of drains suggests that they are in need of more frequent cleaning.

**There are two possible reasons behind that:**

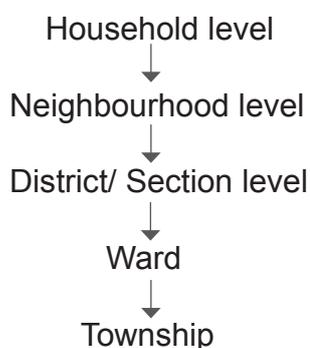
The residents do not seem to be too concerned with the issue with other problems holding a higher priority for them.

There appears to be no place for the waste to be stored.

## Group discussion with residents on the connections between road and drainage upgrading - Community centre

### The context:

How improvements are made, how agreements are made, how things happen



### Done individually:

Upgrading drainage and road in front of the house.

### Situation Representative with Kokolay:

Group member and Section 10 leader - Community centre.

He has proposed on a number of occasions to the government (at the ward level) that roads here and there need refurbishment and they have acknowledged this but have been incredibly slow to act if not none existent in their actions. Unfortunately, it is very difficult to take action higher than at the ward. It usually leads to actions being taken by the community and often led by Kokolay to make upgrades and changes themselves.

### Current issues:

#### Drainage:

Health issues from:

1. Rain

2. Sewage and waste

3. Mosquitos

Difficulties with getting and indeed keeping steel for drainage covers

### Road:

Ineffective for cars, mostly used by motorcycles. Highly effect real estate prices.

Materials have to be obtained from outside the ward (sandstone and cement)

There are no good roads - "they will only be good if I become president" - Kokolay.

**Side note:** In both respects, residents do not want to do a money collection to fund projects, because they don't know the full extent of road/drainage and there is a lack of trust amongst the community(s), there is also a lack of trust with local government.

Head of districts/sectors is responsible for the delegation of all jobs.

Kokolay proposed a system where it is better if there is a collective composed of a:

1. Treasurer
2. Buyer
3. Workers

However, didn't work due to the lack of trust.

### Potential strategy that emerged from the days research:

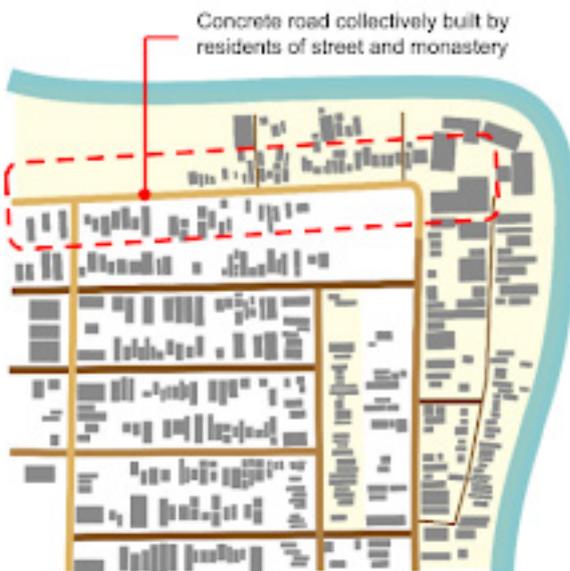
Bamboo drain covers (inexpensive as opposed to steel) stop kids falling into drainage systems as well as stop rubbish and waste entering. Through this strategy, fire protection would also be assumed since, the water in the drains would be accesible and ready to use in case of fire.

## Infrastructural Conditions Water & Electricity

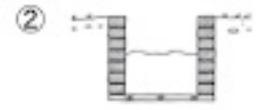
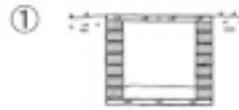
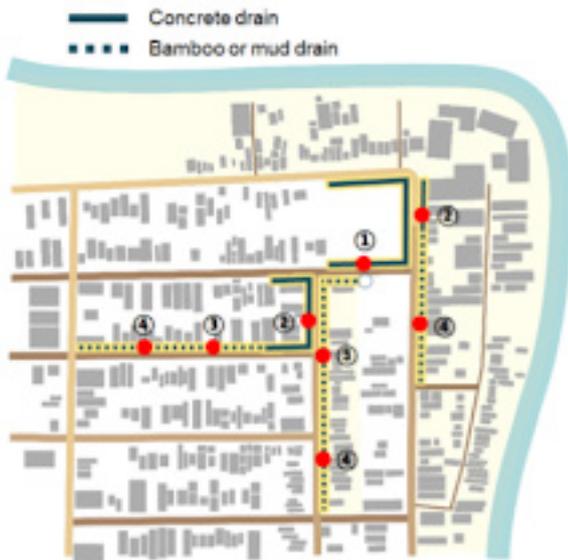


|             | Formal settlement   | Informal settlement   |
|-------------|---|---|
| Electricity | <p>Electricity provided by YCDC with meter and house number</p> | <p>Power provided by private generator</p> <p>Private motorcycle battery charging service</p> |
| Water       | <p>Domestic tube well, water pump</p>                           | <p>Delivery drinking water</p> <p>Delivery domestic water</p>                                 |

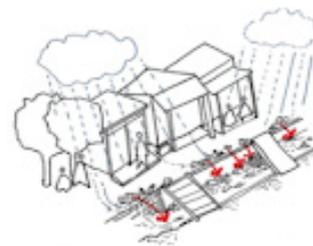
## Infrastructural Conditions Roads



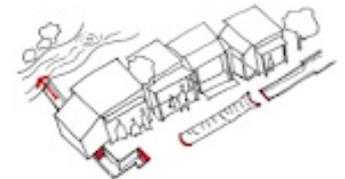
## Infrastructural Conditions Drainage



## Identified Challenges with Drainage



Blockage of drainage



Disconnection of drainage



Inconsistency of drainage

## Findings

### Typologies

Various typologies were found of the home and the housing unit across our investigations whilst in the Ward

#### -Hostels

In which the unit is constituted of one room, sharing amenities outside the reach of the unit.

#### -Apartment blocks

Composed of a series of flats, one room studios were common in which amenities are also shared, but there is also an even spread present of units with a kitchen and toilet within the confines.

#### -Shared houses

The unit of ownership is the whole house, multiple households share the rent/ cost.

#### -Individual houses

Rented or owned by a single household.

### Materiality

We established that the materiality of housing and structures does not relate in any discernible way to formality or mode of tenure.

With most structures identified as a hybrid of solid and lightweight materials.

However there was still a hugely diverse range of materials and methods of construction, with building materials from Bamboo, plywood and high tensile fabrics. Through to Concrete, breeze blocks, plaster and traditional red brick

### Formality

We identified that formality within the ward exists somewhat on a spectrum, with the most formal being what is legally recognised by YCDC.

This being indicated, for the most part, by the existence of an electricity metre and a house number.

Situated at the opposite end of this spectrum of formality, reside legally unregistered properties, without official electrical connections and devoid of any standardised property identification

Between the two sits a grey area, occupied by properties that are associated with the formal, but consisting of legally unregistered extensions

### Ownership

We also established that there are differing modes of tenure:

-Owned house on rented or occupied land.

-Owned house on owned land.

-Rented land, house or room from a landlord.

With regard to the latter, it is interesting to note that whilst it may have been the most common mode of tenure, the hostel structures themselves seem to be the most solid structures and coincidentally, very well serviced.

## Synthesis of Fieldwork

Provided are a selection of scans from the presentation to and with the community, upon completion of our third day in the field. Outlining our understanding of what we saw in the field and how it can be channelled to form a number of physical interventions that have the capacity to occur incrementally, but immediately, at the ward level.

# အခြေခံလိုအပ်ချက် (ရေဆုတ်မြောင်းဖျား)

# DRAINAGE AS A BASIC NEED

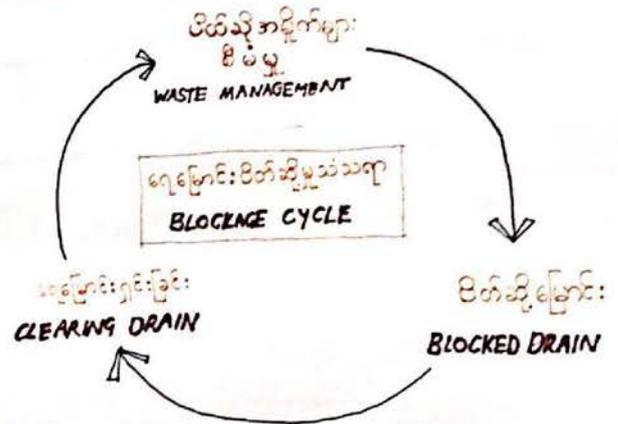
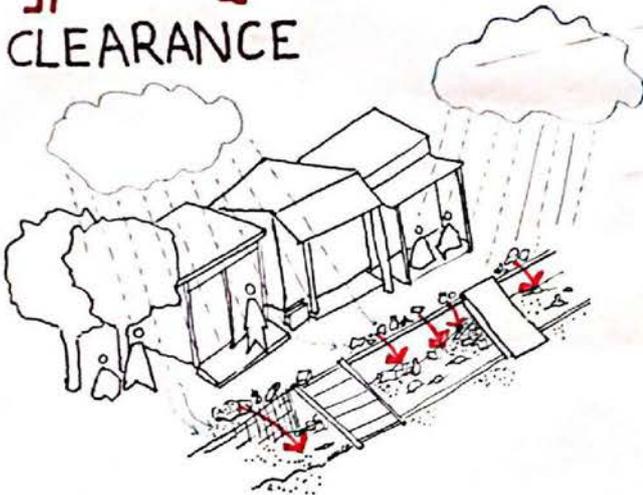


- 1 ကျန်းမာရေး  
HEALTH
- 2 လုံခြုံသော  
လျှပ်စစ်မီးလှိုင်း  
SAFE ELECTRICITY  
LINES
- 3 လုံခြုံစေးကင်းမှု  
SAFETY FROM  
DROWNING
- 4 ရေကြီးရေဖျှံမှု  
FLOODING
- 5 လမ်း  
ROAD PROTECTION

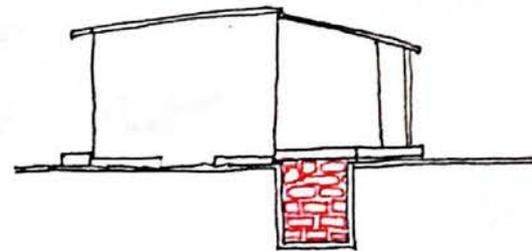
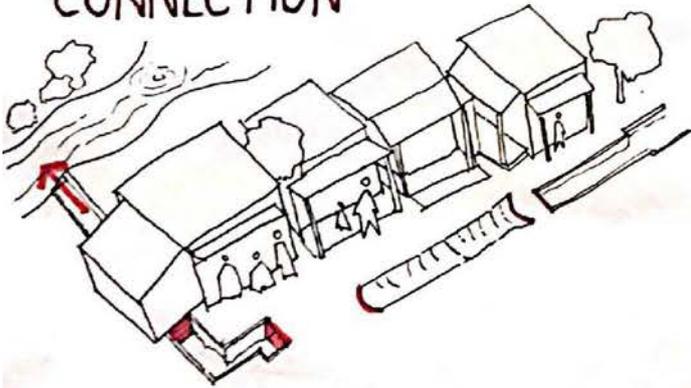
# ပျူဟာများ

# DRAINAGE STRATEGIES

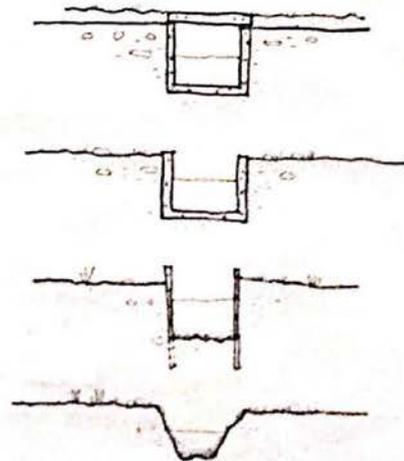
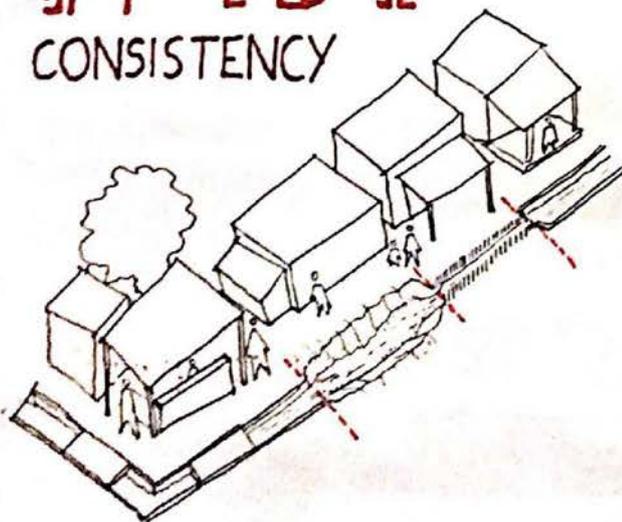
## ရှင်းလင်းခြင်း CLEARANCE



## ဆက်သွယ်မှု CONNECTION



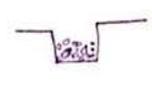
## ရှေ့နောက်ညီညွတ်မှု CONSISTENCY

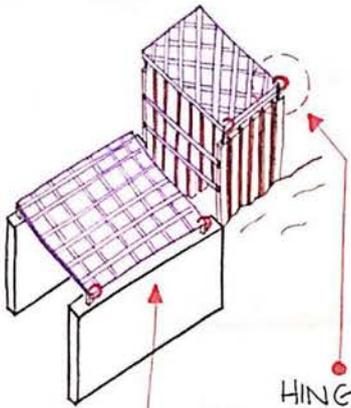
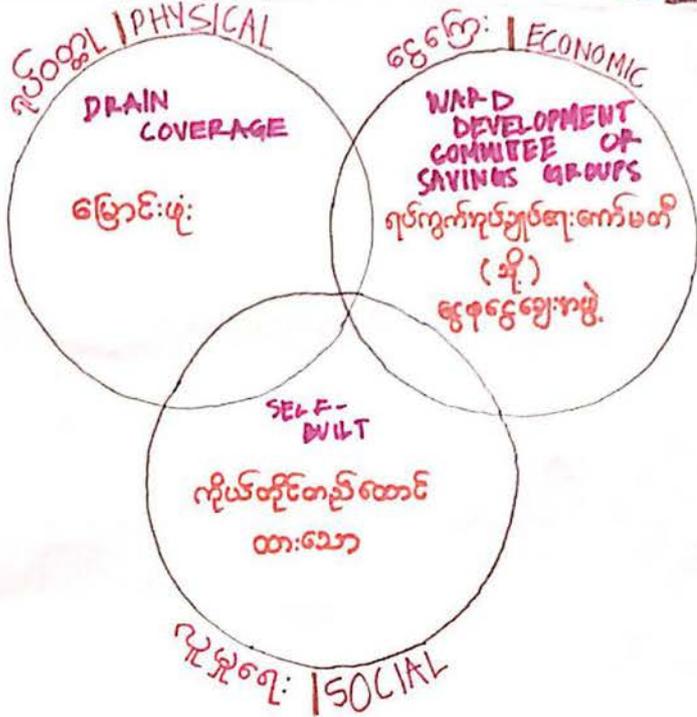


# ရှင်းလင်းခြင်း

# CLEARANCE

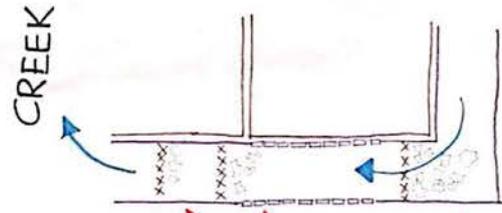
## အကြောင်းအရင်းများ CAUSES

- အမှိုက် 
- ရွှံ့/စွန်း 
- TRASH
- MUD/SAND



ADAPTABLE COVERS TO DIFFERENT TYPES  
မြောင်းအမျိုးအစားအလိုက် လိုက်ဖက်သောမြောင်းဖုံးများ

HINGING ELEMENT FOR COVER REMOVAL  
မြောင်းဖုံးများကို ဖွင့်ပိတ်ရ လွယ်ကူစေရန် ပစ္စည်းအသုံးပြုခြင်း



ACCOUNTABILITY MECHANISM  
တာဝန်ခံမှုရှိခြင်း

SEPERATION OF DRAINS FOR EASY MAINTAINENCE  
ပြုပြင်ရလွယ်ကူစေရန် မြောင်းကို အပိုင်းခွဲထားခြင်း

PREVENTING BLOCKAGE TOWARDS URBAN DRAINS  
ချောင်းတွင်းသို့ အမှိုက်များ မျောပါ မသွားစေရန် ကာကွယ်ခြင်း

⇒ CLEARANCE BREAKS BLOCKAGE CYCLE  
အမှိုက်ရှင်းဆေးခြင်းဟာ ရေမြောင်းပိတ်ဆို့မှုသံသရာကို ဖြတ်တောက်ပေးနိုင်တယ်။

# ဆက်သွယ်မှု - CONNECTION

## ကြောင်းအရင်းမြစ် CAUSES

- ကင်းမဲ့ခြင်း
- အတားအဆီး
- ABSENCE 
- OBSTRUCTION 

### ပုံစံဆိုင်ရာ | PHYSICAL

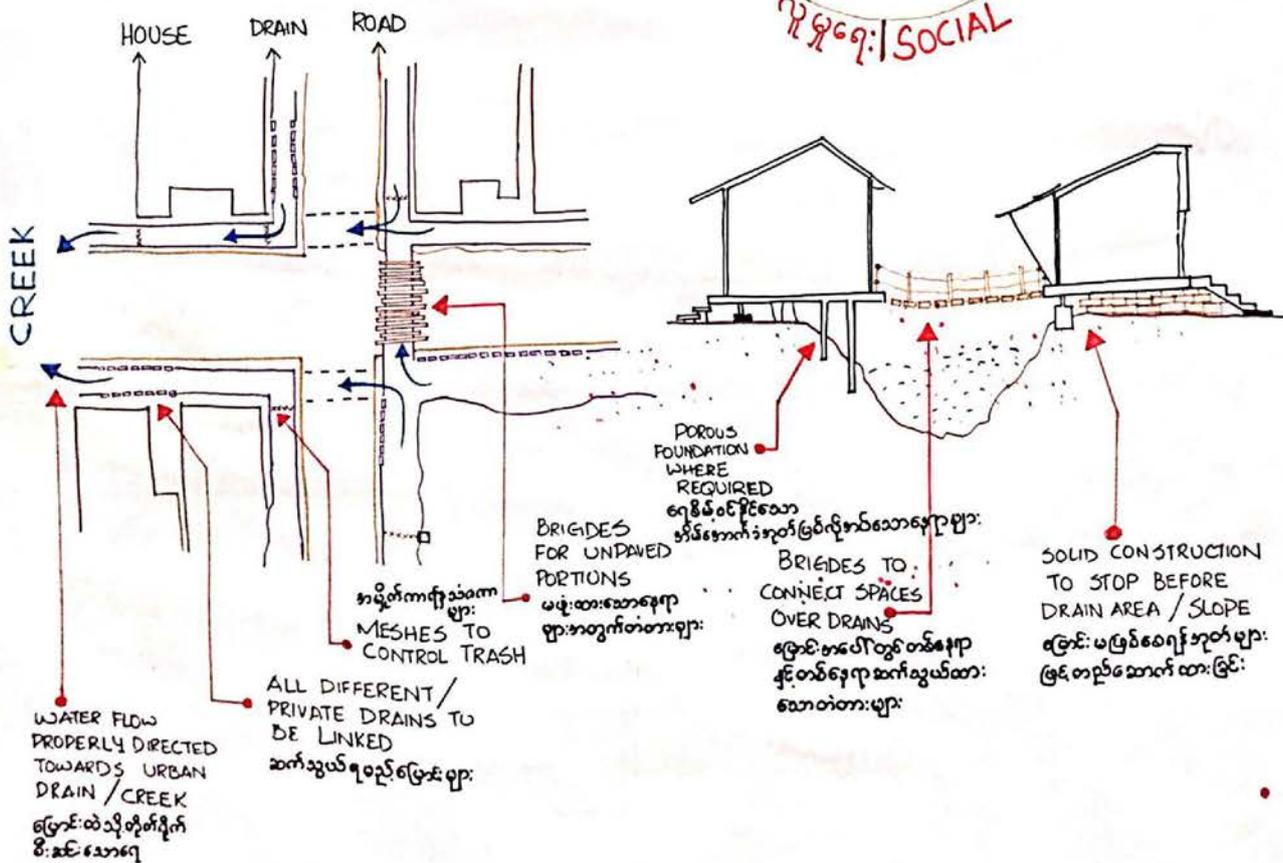
- မြောင်းအတွင်း၌ ဆက်သွယ်မှု
- ရွာပင်း၌ ဆက်သွယ်မှု
- ENSURING LINKAGES
- CONNECTING TO RIVER

### ငွေကြေး | ECONOMIC

- ငွေကြေးအဖွဲ့အစည်း
- ဝန်ပိုင်မှုပိုင်ဆိုင်မှု
- အဖွဲ့အစည်းတို့၏ အဖွဲ့အစည်းများ
- SAVINGS GROUPS
- WARD DEVELOPMENT COMMITTEE + 4CDC
- NGOs (UNHAB)

- ဆယ်စဉ်မြား၊ ရာစုစဉ်မြားများ၊ ရပ်ကွက်အုပ်ချုပ်ရေးအဖွဲ့များ
- 10-100 HOUSES WARD DEVELOPMENT AUTHORITY

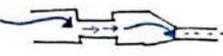
### အဖွဲ့အစည်း | SOCIAL

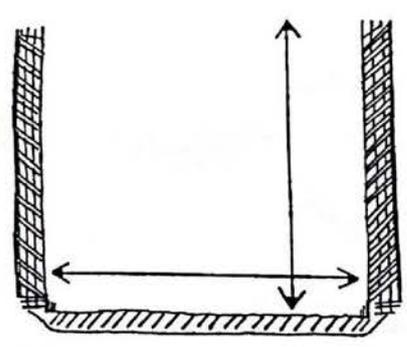
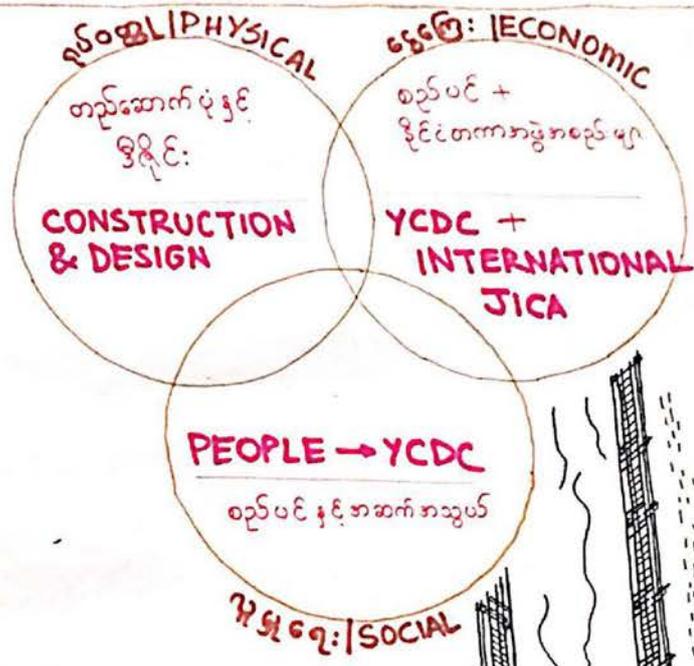


⇒ CONNECTIONS ENSURE LINKED FLOW  
 မြောင်းတစ်ခုနှင့်တစ်ခု ဆက်သွယ်မှု ဖြစ်ခြင်းဟာ ရေစီးရေလာ ကောင်းစေတယ်။

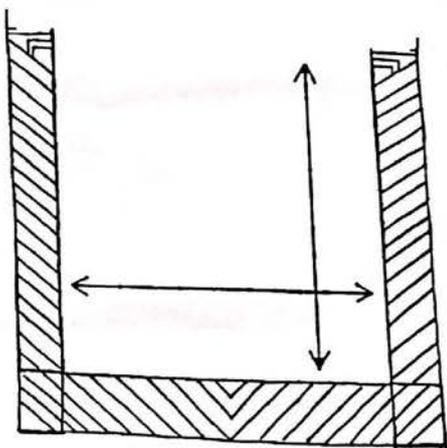
# CONSISTENCY

အကြောင်းအရင်းများ: **CAUSES**

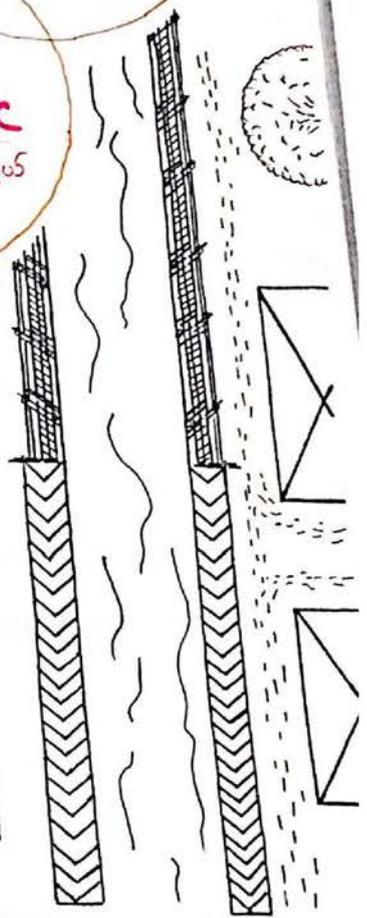
- ဖြောင်းအကျယ်
- ရေရှည်ထိန်းသိမ်းမှု
- WIDTH 
- MAINTAINENCE



BAMBOO DRAIN  
ဝါးကပ်ဖြောင်း



CEMENTED DRAIN  
ကွန်ကရစ်ဖြောင်း



CONSISTENT DIMENSIONS ACROSS ALL MATERIALS  
တူညီသောအတိုင်းအတာ

⇒ **CONSISTENT DIMENSIONS MAXIMIZE FLOW AND REDUCE FLOODING**

ဖြောင်းအကျယ်/အနက် တူညီခြင်းဟာ ရေစီးရေယာကောင်းမွန်စေပြီး ရေကြီးရေဖျံမှုကို ကျော့ချပေးတယ်။





