CHANGE BY DESIGN

Building communities through participatory design

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SUMMARY

This book documents a two-week action research workshop, Change by Design, undertaken in Nairobi, Kenya from 19th June – 1st July 2011. The workshop was developed and coordinated under the banner of Architecture Sans Frontieres (ASF), in partnership with the Pamoja Trust, a Kenyan NGO, and the Housing Policy Section of UN-HABITAT.

The principal focus underpinning the workshop was an exploration of the opportunities and limitations of integrated community-led participatory design for responsive slum upgrading in Kenya, and the degree to which this community-led approach could not only build an improved physical environment but also recognise the social production of space; empower slum dwellers to be active agents of change; and build socially, economically, and environmentally sustainable communities.

In total over 65 participants were involved on a daily basis for the duration of the workshop. Workshop participants comprised 22 international ASF participants (students, and practitioners from a wide range of disciplines such as architecture, engineering, economics, and sociology); 25 local participants (mostly students associated with the Pamoja Trust); 15 'key' residents of Mashimoni, the workshop case site; and 3 workshop coordinators.

Through investigations in Mashimoni, one village in the Mathare Valley, the workshop findings demonstrate the immense complexity of slum upgrading in Kenya, in particular the tension between individual priorities and needs, and those of the collective. Through analysis at the macro institutional scale, the meso neighbourhood scale, and the micro dwelling scale, the workshop highlighted the benefits of undertaking participatory design at these three scales, concurrently, and linking them together for residents to make trade-offs.

Furthermore, this synchronised analysis facilitated negotiations and consensus building using the spatial dimensions as a medium to facilitate dialogue, which was successfully

done in the final 'portfolio of options' exercise undertaken at the end of the workshop.

Local stakeholders (such as the Pamoja Trust, local NGOs, government officials, and Mashimoni residents) reflected that the workshop methodology was extremely positive and offers immense promise for improving current slum upgrading practice. The use of cardboard models, the consideration of the community/neighbourhood scale, and the responsiveness to diversity were all able to be explored through this approach, something that other approaches often ignore in searching for consensus, only involving 'dominant voices', and only focusing on building houses.

Therefore, as upgrading programmes continue to be implemented in Kenya in line with the new constitution there are high hopes that the tools and methodologies utilised and refined in this workshop will be mainstreamed to make a wider positive impact on slum upgrading in Kenya and help realise the right to adequate housing for all.

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PREFACE

As I sit down to write this Preface a large part of the Sinai slum located in the Lunga Lunga industrial area of Nairobi lays in ruins, with smoldering, charred remains of people and property due to a devastating fuel explosion. It is the evening of Monday September 12th, 2011, and details are still emerging as to the cause and extent of the tragedy that has shocked the Kenyan capital.

At around 08:30 this morning Sinai residents were hurriedly collecting fuel that was overflowing from a broken underground fuel pipe that runs through the slum. A bucket of fuel could pay the rent of a shack for a month or more. While some fuel was indeed collected, much of it streamed downhill through the narrow alleyways and unpaved streets towards the river, aided by the heavy rain. The alleyways and streets were filled with workers coming home from night shift to their timber and iron shacks, and many women and children departing for their day of work and school.

Tragically, the fuel was ignited—some say by a cigarette butt thrown into the river; others say by sparks from cooking outside using the common open-fire. The fuel exploded. A fireball engulfed residents and their tinder shacks. A plume of thick black smoke rose from the densely packed settlement. A fire raged through the slum. Residents stumbled, dazed, and with skin peeling off their faces, searched for their wives, husbands, and children, their friends, and their neighbours.

A definitive death toll is still unknown, but over 100 are feared dead, and over 100 more are in hospital critically injured.

The Sinai fire tragedy reinforces the gravity of the challenge that this publication addresses: the need to urgently improve inadequate slum settlements, realise the universal right to adequate housing, and develop ways to address poverty and socio-economic marginality to build inclusive and safe cities for all.

There is no denying that residents' poverty contributed to the deaths: collecting fuel in their desperate attempt for cash to pay rent in their informal, high-priced shacks placed them at the centre of the fire. Yet more pronounced than this, their socio-economic marginality leads them to live in slums that are characterised by inadequate physical living conditions: cramped, unplanned, poorly built conditions, which exacerbate the effects of disasters and constrain rescue attempts.

The incident reinforces that the right to adequate housing – in particular the dimension of habitability – remains to be realised for the majority of urban households who find themselves in poverty. And, most clearly, it strengthens the widely held conviction that slums

throughout the world require urgent upgrading; that it is simply morally, legally, and ethically unacceptable that slum dwellers bear the brunt of environmental hazards and disasters, and socio-economic inequalities.

Improving slum areas through addressing both the root causes of poverty as well as the physical environmental conditions was the focus of the two-week action research workshop in Mashimoni, a slum in Mathare Valley, Nairobi, the outcomes and documentation of which form the basis for this publication.

The workshop built on slum upgrading work that Isis Nunez Ferrera, Naomi Shinkins, Alex Apsan Frediani, and myself have been doing over the last three years. We have been developing and piloting what has become to be referred to as the 'Integrated Participatory Slum Upgrading' approach; or more commonly: 'Change by Design: Building Communities'.

We undertook the first comprehensive pilot of this approach in a squatter settlement, Paraiso, in the Brazilian city of Salvador da Bahia in 2010 (figure two and figure three), although many of the theoretical and methodological ideas stemmed from a workshop we conducted in the same city a year prior, and another shorter workshop in another settlement, Escada (figure four).

In late-2010 I relocated to Nairobi to undertake an internship with the United Nations Human Settlements Programme (UN-HABITAT), as well as to undertake an independent ethnographic research project supported by the Royal Institute of British Architects (RIBA) which examined sustainability dimensions of informal slum housing in Nairobi.

Through this work I became increasingly aware that existing projects were repeating many of the past mistakes of slum upgrading – mass produced, expensive, 'top-down', turn-key housing solutions into which slum dwellers were relocated, and where life became more difficult for the people that the projects were supposed to serve. Where it existed, 'participation' in these projects was essentially nothing more than consultation of previously made professional upgrading plans and decisions.

During the course of my research I came across the community-led incremental slum upgrading work undertaken by the Pamoja Trust in the Huruma slum of Nairobi. There seemed to be many synergies between the work we had done in Brazil and that which Pamoja Trust was doing throughout Kenya. After several meetings we agreed to partner, along with the Housing Policy Section of UN-HABITAT, in undertaking a similar workshop as we had done in Brazil.

Methodologically, Kenya provided a fitting setting to further test and refine the approach, in a markedly different socio-cultural, economic, and political context. Substantively, it provided fertile ground for work around realising housing rights in the context of the newly adopted and very progressive Kenyan constitution. Operationally, it provided the opportunity to support the existing activities of Pamoja Trust and address the demand by local students and professionals for alternative models that placed people at the centre of development and which could recognise the social production of space.

One lesson from the Brazil workshops was the need to impact beyond the one focus settlement. In particular, to network local housing sector stakeholders and to dialogue about necessary changes to policy and institutional frameworks that, in the end, set the opportunities and limitations for action on the ground. For that reason we held a symposium, hosted by UN-HABITAT at their global headquarters in Nairobi, which fulfilled these objectives, brought international participants 'up to speed' with the context, and acted as the 'theoretical' precursor to the subsequent field activities.

Overall, the symposium and workshop proved more successful than any of us had imagined. We were fortunate to have experienced and knowledgeable international participants, engaged and pro-active community members, and committed and perceptive local students. The success must be attributed to all participants and the respectful and constructive working relationship that characterised the workshop.

In light of the success, we have endeavoured to document, review, and report the workshop in a fitting manner. This professional and richly illustrated publication is the result.

I believe that this publication represents a considerable body of action research with important substantive and methodological value. The approach that underpins the work is certainly not a panacea to the challenge of slums. Nor is it a guarantee for achieving the full realisation of the right to adequate housing. It does, however, go some way in defining a philosophy of slum upgrading that is not based on abstract models or theoretical representations of urban phenomena but on the complexities and contradictions of in-depth field settings.

It is a terrible reality that slums only attract serious attention when disastrous events like the Sinai fire occur. Publishing this work has certainly provided us an opportunity to rigorously reflect on the workshop, its findings, and the key issues regarding participatory slum upgrading

in Nairobi. More importantly, however, publishing will allow us to disseminate the work more widely and advocate for greater attention towards upgrading slums in a truly participatory manner.

I believe this is where the strength of our work rests. To some extent it is a manifesto for people-centred slum upgrading that can be scaled-up and replicated. Yet it is and will continue to be underpinned and continually informed by spatial tools and methods that can engage slum dwellers and build their capacity to understand, negotiate, and reach consensus on upgrading plans that fit their needs, wants and aspirations.

The spirit of our work was best captured by Waimatha, a middle-aged woman living in Mashimoni who, at the end of the final group exercise on the last day of the workshop, gently but proudly said: "this experience has been good for me. I have learnt it's OK to dream". I sincerely hope that the work undertaken in the Change by Design workshop and documented herein not only offers a set of methodological tools and substantive lessons, but also, more importantly, empowers others to dream of a more equitable, inclusive, and safe urban future for all.

Matthew French
Nairobi, Kenya
September 2011

two

three

four

FOREWORD

The importance of the work contained in this publication is at least threefold. First, it makes a clear contribution to improving our understanding of the complexity of urban informal settlements and of how and when it is best to intervene. The work gives definition to a new kind of practice that is guided as much by the moral obligation to protect and fulfill rights, remove discrimination and reduce vulnerabilities, as by the need to solve problems in practical ways. The value that the workshop at Mashimoni delivered to local people, ASF partners and participants is incontestable.

Second, what we see in this publication is further evidence of the social value of design and the imperative of participation beyond self- help. Participatory design (and planning) is key to achieving equity and efficiency when formulating plans and in urban governance. Together, design and participation unlock the resourcefulness of place and maximise opportunities for discovery in which all participate. Part Five of this publication, the 'Portfolio of Options', demonstrates the value of design as a process of enablement, cultivating choice and opportunity, and encouraging improvisation in search for order – the kind that liberates rather than confines, based on difference and not sameness. All of this challenges conventional disciplinary boundaries, explores new partnerships, and demands new skills and new tools.

Third, this and other ASF workshops I have been part of open new opportunities for educating students of architecture and for the continuing education of young professionals. They bring together two often conflicting objectives; on the one hand the need to be rigorous to the discipline of architecture and to the core of what it takes to be an architect; on the other hand, the desire to be relevant in dealing with some of the big issues we face today. The workshop in Mashimoni rightly converges these objectives. The question it implicitly asks is: how to be rigorous in a way that is relevant.

The ASF workshops offer a number of opportunities in this respect. First, they offer a diversity of settings in which to explore and develop not just skills and talents, but also the extensive resources and worth which architects can deploy. Working often as they do in complex settings, through gatekeepers and in a climate of optimal uncertainty, these settings challenge what one takes for granted in studio-based learning. They set new parameters for what it takes to be rigorous and relevant.

Second, field-based work engages one with a multiplicity of client bodies, not all of whom are on your side and some

of whom may be in open conflict. One must work out how to converge interests, negotiate priorities and resolve conflict. All this demands a very different toolkit which some of the examples in this publication explore.

Third, ASF field-based workshops and the examples presented here engage people in dealing not just with the symptoms of problems (bad housing) but also some of the primary causes (insecurity, poverty, unemployment, and social exclusion). In so doing they demand that we re-draw the boundaries to our responsibilities.

Finally, implicit in all the chapters to this publication is the search for a new kind of professionalism given the complexities of urban informal settlements, and given the new ethics it demands. My own premise is that there are at least four integrally related activities, each of which demands differing roles, responsibilities, relationships and tools. I call this my PEAS principles – providing, enabling, adapting and sustaining. What should we provide to enable people to provide for themselves and sustain their livelihoods. How do we encourage progressive and often incremental adaptations to ensure good fit between people and place both now and over time. How will it all be sustained?

It is in all these respects that I value the ASF field based workshops and indeed the worth of this publication.

Nabeel Hamdi
Oxford, UK
October 2011

ACKNOWLEDGEMENTS

The workshop coordinators would like to thank the following people and organisations for their support in making this workshop so enriching and rewarding.

Our local partners played a very important role in helping this workshop 'get off the ground' and operational: Steve Ouma, Diana Kinya, Sophia Kamweru, Margaret Matheka, and Salma Sheba from the Pamoja Trust; Claudio Acioly, Christophe Lalande, and Helen Musoke from the Housing Policy Section of UN-HABITAT; and Denis Isenya, Elizabeth Nyambura, and Ezekiel Rema from Mashimoni Muungano.

Thank you to the international ASF participants who not only took time away from their study and work to attend, but also contributed so much to the workshop both professionally and personally: Afra van 't Land, Heather Midgorden, Whitney Burdge, Caroline Cage, Stephanie Butcher, Kate Terriere, Christian Halsted, Charlotte Moe, Joanna Hansford, Imogen Humphris, Marina Gutierrez, Beatrice De Carli, Melissa Kinnear, Aleksandra Dudziak, Flavia Scognamillo, Francesca Pegorer, Teres Selberg, Caroline Dewast, Rubbina Karruna, Philip Roy, Barbara Dovarch, and Nick Leckie. The local students and participants played a vital role in the workshop, and offered their friendship and support to us during our time in Kenya: Sam Odhiambo, Chris Sunday Otieno, Steve Gome, Chris Vundi Mwanzia, Stanley Madadi, Priscilla Magara, Mary Mshai Mkonji, Daniel Wamalwa, Paul Ochieng, Dickson Gathu Njunge, Purity Mulwa, Brenda Kaloki, Peter Nyamu, Mary Wangui, Patrick Matata, Tom Mumo, Judy Kawira, Justus Wambai, Margret Njeri Kinyanjui, and David Kimathi.

The workshop was coordinated by Naomi Shinkins, Isis Nunez Ferrera, Alex Apsan Frediani, and Matthew French. Being based in Kenya, Matthew was the 'lead' coordinator. Naomi made a considerable contribution in the initial planning and organisational phase, in particular dealing with participant communication and applications. Isis, Alex and Matthew implemented the workshop in Kenya. The workshop was fortunate to have Nabeel Hamdi for the first three days and his contribution, drawing from his wealth of experience, is gratefully appreciated. Matthew French would like to acknowledge the Royal Institute of British Architects for a Research Trust Award, without which this workshop would not have taken place, and which facilitated much of the substantive and organisational work for the workshop. We would also like to thank the Development Planning Unit of University College London for the support in the ASF-UK workshops, by enabling the engagement

of Alexandre Apsan Frediani and the transfer of crucial methodological skills. We are thankful to Mama Stella, Profina, Kadee, and Dennis at Rosslyn Studios who looked after us so well during our stay in Nairobi. Thank you to Peter and Joseph for their superb driving in their fashionably decorated Matatus; Sadique Bilal from the Kilimanjaro Initiative for helping with the city visit, in particular to Kibera; and Map Mathare for their support.

This publication is a joint effort by many people. Drafts of Part Two, Three, and Four were developed with inputs by ASF participants at the end of the workshop. Alex Apsan Frediani edited Part Two, Isis Nunez Ferrera Part Three and Matthew French Part Four. Matthew French prepared Part One and Part Five, and compiled and edited the book as a whole. The specific contributors of the institutional, community and dwelling Parts are as follows. *Part Two: Institutional p. 32-47:* Stephanie Butcher, Caroline Cage, Alex Aspan Frediani, Christian Halsted, Imogen Humphris, Rubbina Karruna, Heather Midgorden, and Kate Terriere. *Part Three: Community, p. 48-95:* Whitney Burdge, Caroline Dewast, Beatrice De Carli, Barbara Dovarch, Joanna Hansford, Melissa Kinnear, Isis Nunez Ferrera, Flavia Scognamillo, Teres Selberg, and Afra van 't Land. *Part Four: Dwelling, p. 96-143:* Aleksandra Dudziak, Matthew French, Marina Gutierrez, Charlotte Moe, Francesca Pegorer, Philip Roy, and Nick Leckie.

Last, but certainly not least, we would like to extend a heart-felt thank you to the residents of Mashimoni who welcomed us into their neighbourhood and shared their stories, their hopes, and their dreams. To the residents we would like to express that while we certainly did not resolve all the challenges you face, we hope that we contributed to supporting you in your struggle to live the future you dream of.

Workshop lead partners:

Pamoja Trust
Creating Voice and Space for the Urban Poor

architecture sans frontières
UNITED KINGDOM

UN HABITAT
FOR A BETTER URBAN FUTURE

Supporters:

RIBA

dpu
Development Planning Unit

SCIBE
SCARCITY AND CREATIVITY IN THE BUILT ENVIRONMENT

ONE

INTRODUCTION

PART ONE
INTRODUCTION

1.1
Participatory design as community building

Like many developing countries, Kenya faces a considerable challenge of slums, a challenge that is growing by the day. In Nairobi, the capital, millions of people live in small, unhealthy, relatively expensive, tin and iron shacks with little or no tenure security. These precarious living conditions exacerbate their poverty and increase their socio-political marginality.

While slum upgrading programmes which aim to improve the social, economic, and environmental conditions are currently being undertaken in Kenya, they provide little to no opportunity for slum dweller participation.

Participation is commonly taken to mean the involvement of a wide range of stakeholders in development decisions: government officials, NGOs, international organisations, local neighbourhood organisations, and business and small-enterprise groups to name but a few – the list of stakeholders is long.

Proponents of participation primarily argue that it produces superior results, that is, in terms of built environment upgrading, participation improves the responsiveness, the 'fit', between the resulting environment and the needs and wants of the people it is supposed to serve.

Proponents of participation also argue that participation improves project implementation. By involving stakeholders in upgrading proposals and plans they are less likely to oppose developments and more likely to help ensure a smooth execution of building works, which reduces risk and helps ensure timely project completion.

But participation is also socially advantageous. Whist both the 'good fit' argument and 'trouble-free implementation' argument are valid reasons for participation, another incentive which is potentially more transformative is the role of participation in building the capacity and empowering the vulnerable and marginalised who are typically excluded from city building processes. In the case of slum upgrading, participation gives a voice to slum dwellers and offers the opportunity for them to be involved in the decisions that will greatly affect their lives, livelihoods, and wellbeing.

Participation in slum upgrading

Participation is in fashion. Around the world, the majority of urban development and slum upgrading projects are touted as participatory. They are touted as involving local residents in development decisions—as 'bottom-up', as 'community-led' projects—which is advantageous because 'participatory'

projects have a greater chance of attracting national and international funding, and they are politically profitable with mayors and ministers harnessing their positive marketing potential.

Yet 'participation' can mean many things and often participation is no more than consultation of professionally developed upgrading plans. Seldom are slum dwellers involved in defining and making the development decisions. Their involvement is limited to providing feedback or voicing their objections long after the project has been defined by officials, designed by architects, engineered by engineers, costed by surveyors, and put out to tender by building contractors.

It is easy to criticize the status quo yet what are superior participatory slum upgrading approaches? Do they exist? In practice how can people in power better involve slum dwellers in upgrading projects? Where is the balance between the needs and values of slum dwellers and those of other stakeholders?

1.2
Change by Design

It is within this context of searching for more responsive participatory approaches to slum upgrading that the ASF Kenya 2011 workshop was held in Nairobi. Through an action research methodology the workshop sought to explore the opportunities and limitations of participatory design for slum upgrading in Kenya.

The workshop questioned how slum dwellers can be meaningfully involved in slum upgrading as active agents of change, rather than beneficiaries of top-down 'improvement' projects. It investigated the potential for building urban environments that are not only more responsive to slum dwellers' tangible built environment needs and aspirations but that can also reduce their socio-economic vulnerability and empower them to claim their right to the city.

ASF partnered with the Pamoja Trust, a local NGO that has been working for over 15 years in supporting slum dwellers in Kenya to resist forced evictions and fight for their right to adequate housing. In addition to the Pamoja Trust, UN-HABITAT was also a local partner, having their headquarters located in Nairobi and being a long-time advocate for participation in slum upgrading projects and programmes.

The workshop 'case settlement' was Mashimoni, one village in the Mathare Valley located to the north of the Nairobi central business district (CBD). Mashimoni occupies 9 acres of land and has 3,500 residents in 1,500 houses. 65

five

six

seven

five
Aerial view of Mashimoni and the surrounding area demonstrating the regular although strikingly dense urban layout

six
View from the cliff over Mashimoni

seven
An overview of Muungano Mashimoni's vision, mission and aims and objectives painted as a mural on the outside of their community room

per cent of residents are tenants. The land is owned by the government (Department of Defence). It has a Slum Dwellers' Federation (Muungano) which has 365 active members, and a committee, advocacy team, map and enumerations team, welfare team and savings team, each roughly comprising 7 people.

1.2.1
Workshop aims and objectives

The objective of the workshop was to support the Pamoja Trusts' work in slum settlements in Nairobi and develop the integrated community-led upgrading methodology first developed and tested in the ASF Brazil workshop.

The workshop had the following aims:

1) Support the Pamoja Trust in developing a settlement upgrading plan for Mashimoni;

2) Support the Pamoja Trust by building their capacity to use integrated participatory design in their slum upgrading work;

3) Provide international students and practitioners with a workshop experience from which they can learn about another context, develop their skills in integrated participatory design, and question the role of the professional in such contexts and projects;

4) Further develop the integrated participatory design methodology by 'testing' it in a different context to Salvador, Brazil where it was used in 2010;

5) Act as a catalyst for wider debate in Kenya on inequality, slum proliferation, and participation at the broader level than just one settlement.

1.2.2
Key themes and questions

The following were the key themes for the workshop:

1) How can we build on the social capital that exist in Nairobi's informal settlements with their strong savings groups; how can we build on this with integrated participatory design?

2) How can we move from enumeration to design: how can you use participatory enumeration information and make it accessible to all as a positive element of design/upgrading practice?

3) Is the aim to reach consensus and merge everyone into the same type of house and settlement; how can participation of residents in upgrading plans improve the responsiveness of their environment to their needs, wants, and aspirations and, furthermore, act as a catalyst for positive change beyond addressing their physical setting?

1.2.3
Workshop structure

The workshop was based on an 'integrated community-led participatory design' approach which had been developed for, and tested during in the ASF workshop in Brazil. The integrated methodology seeks to explore slum upgrading by undertaking analysis at a range of scales: the institutional, regulatory scale; the neighbourhood, community scale; and the household, dwelling scale.

Underpinning the approach is a belief that all these scales need to be explored concurrently and in an integrated (interwoven) way. Doing so offers the opportunity for truly responsive and transformative slum upgrading programmes and projects compared with focusing on only one scale alone.

For instance, upgrading projects often only focus on housing, to the detriment of discussions and provisions for community and neighbourhood needs, functions, and spaces, as well as existing commercial activities and households' livelihoods strategies which typically play a fundamental socio-economic role and often must also be accommodated in settlement upgrading plans.

ASF worked closely with our local partners, the Pamoja Trust and UN-HABITAT. In addition to the 25 international ASF participants there were 25 local participants (mostly students associated with the Pamoja Trust) and 15 'key' residents of Mashimoni who Pamoja Trust had organised to participate every day throughout the workshop.

City visit and Symposium

The workshop started with a one-day 'city visit' which gave an insight into the challenging existing slum conditions and contemporary upgrading approaches such as government-led upgrading in the large slum of Kibera and incremental self-build upgrading in villages in Mathare Valley.

Following this, a well-attended Symposium was held at UN-HABITAT that provided the more 'academic' setting for workshop participants to understand the local setting in Kenya and to network with a wide range local stakeholders. This event was attended by over 120 people: international and local workshop participants, local practitioners, policy makers, academics, UN-HABITAT staff, slum dwellers' organisations, among other people and organisations involved in slum housing issues in Kenya.

The symposium involved keynote presentations on such topics as history and theory of slum upgrading and participation, slums and inequality in Kenya, spatial aspects of Kenyan slum

and the urban and regional setting, and political and regulatory frameworks that govern local built environment development (Box 1).

The symposium had three main objectives:

1) Bring international participants 'up to speed' with the context so they have a base understanding to use when working in this context;

2) Network symposium delegates (NGOs, policy makers, slum dwellers, etc) in an effort to move beyond the specific slum and to engage in larger discussion about the challenge of slums and inequality in Kenya;

3) Create interest in the workshop, The Pamoja Trust and ASF-UK's work.

Workshop – Week One

After the city visit and symposium, participants were divided into three groups: Institutional, Community, and Dwelling. While each group used different specific methods, they followed the same approach in the first week where the current situation was diagnosed and then residents were encouraged to dream of how they wanted Mashimoni upgraded.

The institutional group used the 'Web of Institutionalisation' as a basis for investigating the current policies, delivery and organisational mechanisms, and modes of citizen representation in slum upgrading programmes in Kenya. The community group utilised a wide range of field tools to involve a spectrum of Mashimoni residents - the youth, women, and elderly, with a focus on community space and infrastructure. The dwelling group 'walked and talked' to familiarise themselves with the current situation, then sought to highlight residents' dreams through a combination of participatory drawing and modelling tools.

Workshop – Week Two

After the first week the groups were joined and all the rich information and findings were united. A game - 'Portfolio of Options 'was developed which provided a range of upgrading options (different housing types, tenure modalities, community spaces, etc) which, through on-site focus groups, residents considered, negotiated, debated, and reflected on to reach a potential upgrading plan. The game sought to highlight to the residents the complexity and intricacies of upgrading as well as illuminate diversity, which necessitates negotiation, consensus building and compromise if upgrading is to take place in a manner than is inclusive rather than divisive. Figure eight outlines the workshop structure, flow and content - illustrating how the group work of the first week connected into the portfolio of options exercise in the second week.

DIAGNOSING
the current context

DREAMING
of a better future

Cross-cutting issues - Livelihoods, affordability, and gender and diversity

CITY VISIT: Kibera projects, KENSUP decanting site, Mabatini, and Huruma

Change by Design Symposium - UN-HABITAT

Institutional

- Identifying local networks
- Uncovering stakeholders
- Policy analysis
- Finding the room for manoeuvre

Community

- Deconstructing realities
- New imaginaries for my neighbourhood
  - Vulnerable group: children
  - Key space: riverside
  - Key issue: Garbage and sanitation

Dwelling

- 'Walking and talking'
- Dreaming through drawing
- Dreaming through modelling

DEVELOPING
alternatives and consensus

DEFINING
a way forward

Sharing: revisiting and consolidating issues and dreams

Dreaming through typologies: prioritising values, searching for consensus, and making trade-offs

Group collaboration and linking of findings

Portfolio of Options game development

Implementing exercise through focus group sessions in Mashimoni

Analysis of Portfolio of Options exercise

First stages of action planning for Mashimoni

Reflection on the social production of space in this context

Preparing an exhibition as a way to communicate workshop findings and outcomes locally

EXHIBITION - Presentation to local stakeholders, including the Mashimoni community

BOX ONE

Change by Design symposium programme

Welcome and Introductions - Christophe Lalande, UN-HABITAT; Matthew French (ASF-UK); and Steve Ouma, Pamoja Trust

1. Opening remarks - Mr. Tirop Kosgey (PS Ministry of Housing), remarks by Said Athman-Housing Secretary, Ministry of Housing, Kenya

Session One: The context of urbanization and participatory design

2. Urbanization and the challenge of slums - Christophe Lalande, UN-HABITAT
3. Provision and management of urban services-The role of stakeholders in development - Prof Winnie Mitullah, IDS, University of Nairobi
4. Fundamentals of participatory design - Nabeel Hamdi, Oxford Brookes University, UK.

Session One panel discussion/speakers questions - All speakers from this session

Session Two: Addressing the Challenge

5. Kenya Urban planning policies and regulations - Prof. P. Ngau, University of Nairobi
6. Kenya Slum Upgrading Programme (KEN-SUP) - Leah Muraguri, Director KENSUP; Ministry of Housing
7. UN-HABITAT Participatory Slum Upgrading Programme (PSUP) - Kerstin Sommer, Regional Office for Africa and Arab States (ROAAS)
8. 'Peoples Plans into Action' - Paul Chege, Practical Action.

Session Two panel discussion/speakers questions - All speakers from this session

Session Three: Pamoja Trust and Mashimoni

9. The Pamoja Trust: Approaches and challenges - Salma Sheba, Pamoja Trust
10. The Physical Context and Current Design/Planning Approaches - Diana Kinya, Pamoja Trust
11. Residents' voices - Mr. Denis Isenya, Representative from Mathare

Session Three panel discussion/speakers questions - All speakers from this session

Session Four: Looking forward for action

12. An outline of the two-week Workshop in Mashimoni - Isis Nunez, Matthew French, Alex Frediani
13. Round-table discussion: "The challenges and opportunities of Participation, Power and the Social Production of Space"
    Round-table panel: Mr. Cassius Kusienya, Ministry of Housing; Mr. George Wasonga, Civil Society Urban Development Program (CSUDP); Mr. Odindo Opiata, Haki Jamii; Dr. Rosa Flores, French Institute for Research in Africa (IFRA); Ms. Elizabeth Nyambura, Resident's representative; Mr Nabeel Hamdi, Oxford Brookes University, UK.

Closing remarks - Matthew French

eight
Workshop structure, flow, and content

nine
Session One at the Change by Design Symposium, held in Conference Room Three at UN-HABITAT headquarters, Nairobi

ten
Change by Design participants at the end of the symposium

nine

ten

eleven

twelve

eleven - thirteen

The first stop on the city visit was Kibera, one of Nairobi's—and indeed Africa's—largest slums. Apart from being immersed in the streets of Kibera (*thirteen*), participants were shown four initiatives currently being implemented to improve sanitation and public spaces: 'PeePoo', a human waste disposal system; a football pitch (*eleven*); a community centre under construction (*twelve*); and urban agriculture where produce is grown in bags.

thirteen

fourteen

fifteen

fourteen - sixteen

The Kibera 'decanting site' was developed as part of a government-led slum upgrading programme: The Kenya Slum Upgrading Programme (KENSUP). The units were built by the government over three years ago as Stage One of the Kibera upgrade, with no design or planning participation by residents. Decanting site residents are originally from Kibera, and the plan is for them to move back to their previous location in housing of a similar design as this at the decanting site.

sixteen

There have been a multitude of approaches to slum upgrading in Nairobi — contemporary projects need to understand their origins, successes, and failures to build on the wealth of experience and to avoid repeating past mistakes

seventeen

eighteen

seventeen and eighteen

Mabatini, the third stop on the city visit, is in the early stages of incremental upgrading with the support of the Pamoja Trust. The process involves clearing several houses, 'structures', at a time and building 'core houses' that can be added to later as families needs dictate and finances allow. Labour comes from the community, house finance from personal savings, and urban services and infrastructure from international and local donors/funding bodies.

nineteen - twenty-one

Huruma, an incremental upgrading project, was started over a decade ago and is now largely complete. Residents have developed micro-enterprises that produce construction elements for the modular housing, namely reinforced concrete beams and floor slabs. Although the footprint of the houses is small, households can extend their house vertically. Huruma attracts considerable attention from community-based organisations wanting to learn the lessons of incremental upgrading.

nineteen

twenty

twenty-one

NAVY PIER
CHICAGO

TWO

INSTITUTIONAL

PART TWO
INSTITUTIONAL

2.1
Introduction and approach

The institutional group examined policies and planning procedures shaping the opportunities for a participatory upgrading process in Mashimoni. The group was also concerned with how a participatory design initiative in Mashimoni is related to a wider strategic process of claiming for housing rights in Nairobi.

To achieve these two objectives, the methodology of the group was guided by Caren Levy's Web of Institutionalisation. The web outlines a set of interconnected planning elements and provides a structure to examine the opportunities and challenges to institutionalise new approaches/concerns in this case participatory slum upgrading. The web unpacks four spheres of institutionalisation of change: citizen, policy, organizational and delivery spheres.

2.2
Methods

The work of the institutional group was divided in the following four stages:

Identifying local networks:

In this first stage of the workshop, the team identified existing groups in Mashimoni and carried out focus group activities with their representatives to understand their motivations and assess the networks they have with other groups/institutions. This activity allowed the group to examine existing and potential local processes of representation in Mashimoni.

Uncovering stakeholders:

A series of interviews were conducted with key informants from relevant institutions (i.e. Civil Society Urban Development Programme (CSUDP), Kenya Slum Upgrading Programme (KENSUP), etc). The questions were guided by the elements in the web of institutionalisation, therefore unpacking how citizens are represented, analyzing policies, assessing organizational capacities and examining how projects and programmes are delivered.

Policy analysis:

Key policy documents were analysed in reference to the new constitution. Topics of policy analysis were related to land tenure regularization, land ownership, housing rights and building regulations.

Finding the room for manoeuvre:

The information collected by the group were collated according to the elements of the web of institutionalisation and divided into opportunities or challenges. The group carried out an analysis with the objective to identify the opportunities to implement a participatory slum upgrading programme in Mashimoni.

twenty-two

twenty-three

twenty-four

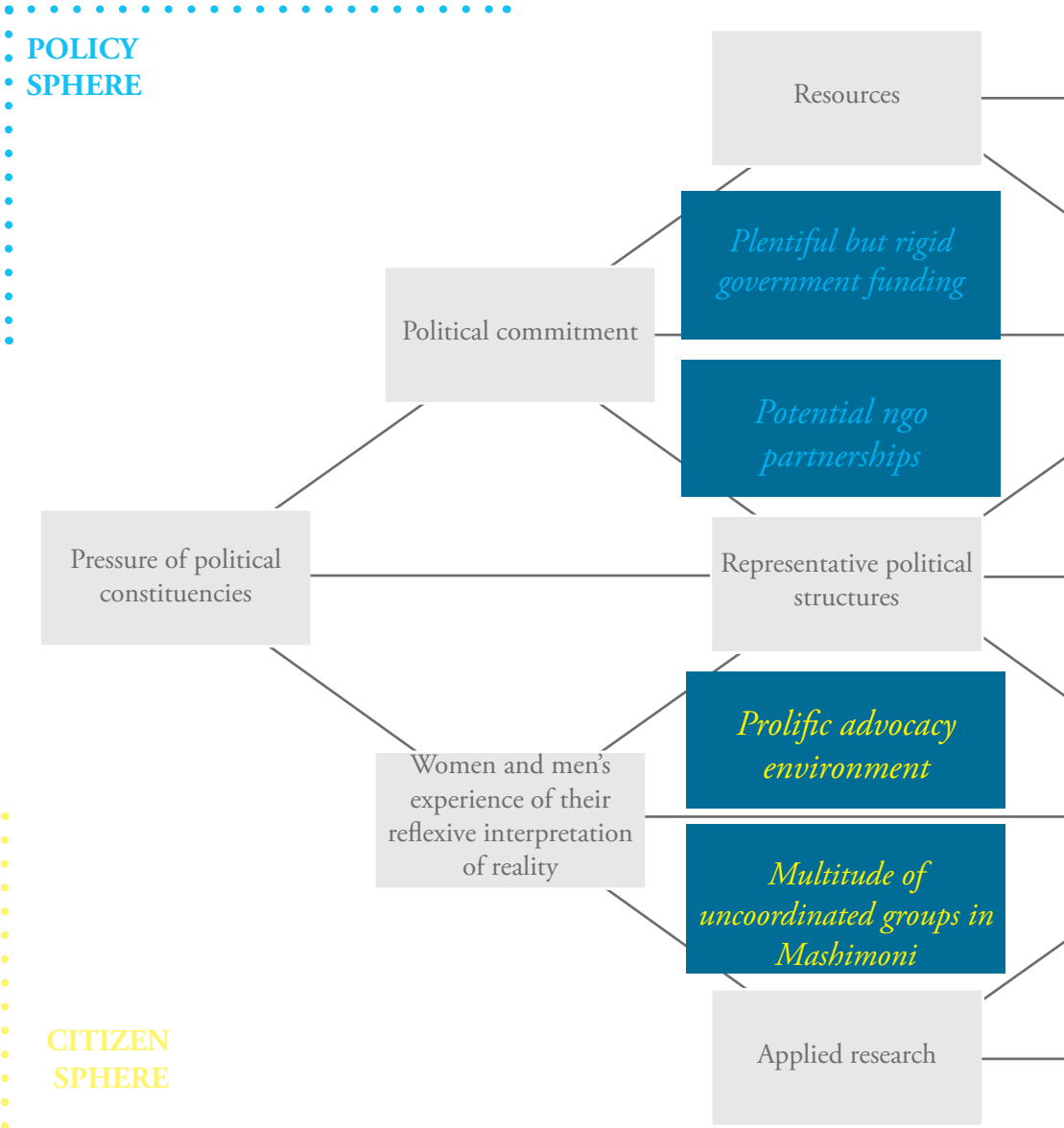
twenty-two
Meeting stakeholders at Pamoja Trust

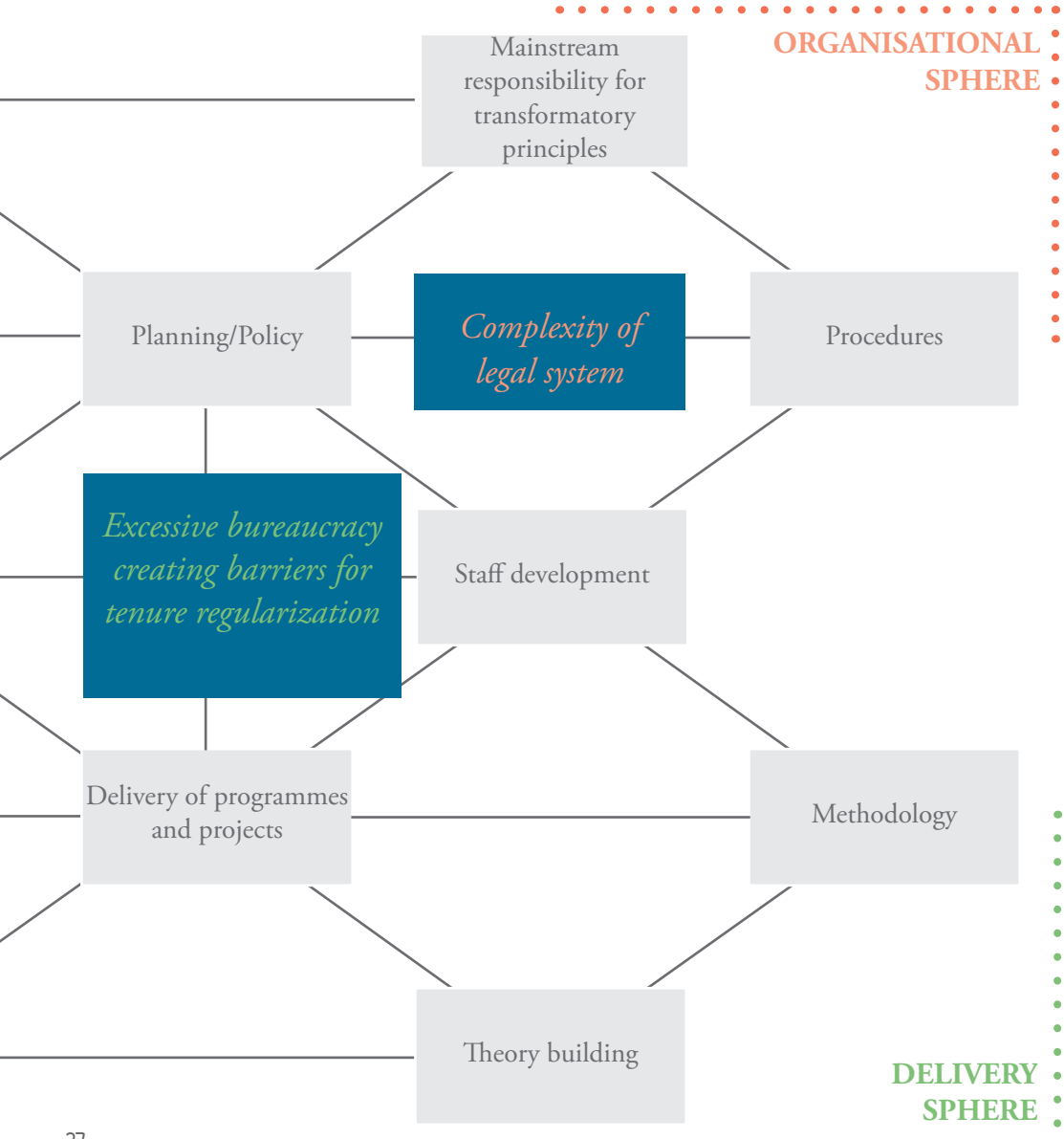
twenty-three
Identifying groups and organisations working in Mashimoni

twenty-four
Workshop with residents in Mashimoni

twenty-five
The 'Web of Institutionalisation' and summary of findings

Interviews were conducted with relevant institutions; Questions were guided by elements of the web of institutionalisation: citizen representation, policy analysis, organizational capacities, and project and programme delivery




ORGANISATIONAL SPHERE
Mainstream responsibility for transformatory principles
Planning/Policy
Complexity of legal system
Procedures
Excessive bureaucracy creating barriers for tenure regularization
Staff development
Delivery of programmes and projects
Methodology
Theory building
DELIVERY SPHERE

2.3
Findings

The findings of the institutional team is outlined according to these four spheres and summarised in figure twenty-five.

2.3.1
Citizen Sphere

Multitude of uncoordinated groups in Mashimoni

Within Mashimoni there are many organised community groups representing a variety of interests. The largest and most prolific is Muungano, a savings group that has a membership of not more than 20 per cent of Mashimoni's population (it was difficult to get an accurate figure of the percentage of residents who were members of Muungano, but it was generally agreed to be between 10 and 20 per cent). However, this does not represent the only savings group activity, and there are also a number of smaller more informal savings groups.

The groups have different methods of governance and approaches to managing their money, though decisions on where and when to use savings are made collectively. Many have small joining fees, and a requirement to contribute weekly or monthly savings.

Some also operate a 'merry-go-round' system where individual members receive a fixed amount on a rotational basis – usually monthly.

While Muungano is interested in acting as the voice of Mashimoni, our research found that this organisation clearly does not represent the majority of the community. There are also issues regarding the economic accessibility of this group, as the most vulnerable members of Mashimoni may not be able to afford participation in this group. Moreover, beyond savings groups there are also a plethora of other community organisations that are involved in a range of activities. These include groups related to the church, women, youth, or businesses.

In short, it is clear that whilst there are a number of groups within the community (both formal and informal) there is an uneven distribution of power amongst them. There is also a real lack of coordination between these actors within the community. This limited collaboration weakens their potential to achieve change.

There is thus a need to bridge the gap between these various actors to create a fully inclusive representational system. One potential way of ensuring community representation is by establishing a Settlement Executive Committee (SEC).

This is a representational structure originally created by the Government's Kenya Slum Upgrading Programme (KENSUP). As outlined by KENSUP, the SEC might comprise 16 elected members which might include representatives of: tenants; structure owners; youth; widows; people with disabilities; local CBOs; NGOs; Government Officials (such as the District Officer and Chief).

For Mashimoni, the formation of such a committee offers a significant opportunity to expand upon the representative structure already created by Muungano, and further incorporate a plurality of voices to increase community solidarity.

How a SEC is formed and governed will need careful consideration, but as a representative body it provides an opportunity to drive forward the upgrading of Mashimoni with the inclusion of a wider range of voices than one organisation alone. Ultimately, the issue of community representation, mobilisation and organisation is key to accessing external finance and land tenure security and therefore the delivery of upgrading Mashimoni.

Prolific advocacy environment

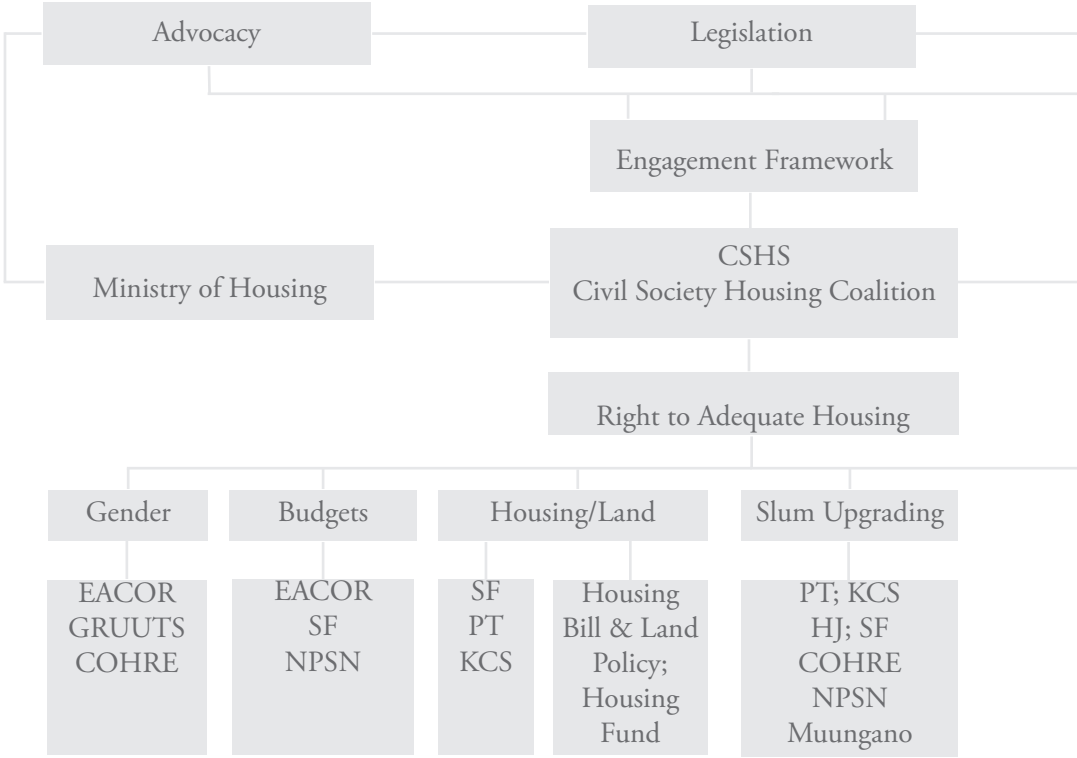
Within Nairobi there are a number of Civil Society Organisations (CSOs) and Non-Governmental Organisations (NGOs) operating in the policy and development sphere. These groups play different roles but it is apparent that there is a large focus on advocacy in their work.

Many CSOs 'coordinate' the efforts of others together with local community groups. For example, the Civil Society of Urban Development Programme (CSUDP) is a facility for extending ground support for CSOs in urban areas. It also seeks to influence government policy to engineer change at all levels.

Another organisation operating in Kenya is the Centre on Housing Rights and Evictions (COHRE), an international NGO focusing on economic and social rights, public interest litigation, research, and training. COHRE is also part of the Civil Society Housing Commission (CSHC), comprising a number of other similar CSOs working on housing and land, slum upgrading, evictions, gender, water and sanitation, and community mobilisation (figure twenty-seven).

Whilst advocacy is an important aspect of supporting and facilitating slum upgrading, there also must be some focus on implementation. This bias must be addressed if upgrading projects are to be efficiently delivered. Implementation strategies also need to giver greater consideration to the staging on projects, and their impacts on the livelihoods and lifestyles of residents.

twenty-six



twenty-seven

Whilst advocacy is an important aspect of facilitating slum upgrading, there also must be some focus on implementation. This bias must be addressed if upgrading projects are to be efficiently delivered

twenty-six
Finding the 'room for manoeuvre', an exercise undertaken on site with Mashimoni residents

twenty-seven
Civil Society Housing Coalition Network

twenty-eight
Mapping local actors from the 'bottom up'

twenty-eight

Policy

Revolving Leadership:
COHRE current char

Evictions	Water/Sanitation	Community Mobilization
Amnesty COHRE PT SF NPSN	UMANDE MN GK HJ	NPSN Muungano KOPI

2.3.2
Policy Sphere

Sizeable but rigid governmental funding

The bureaucracy and complexity of Kenya's legal system is reflected in the challenges of obtaining government funding for upgrading processes. This is further exacerbated by the disconnect between local and national government. However, if these obstacles can be navigated there are significant sources of funding available for upgrading.

Funds take the form of KENSUP, the World Bank-financed upgrading programme, the Kenya Slum Improvement programme (KISIP), local area funds such as the Community Development Fund (CDF) and LATF, and a host of sectoral trust funds.

While these avenues offer significant financial resources, there is a narrow ability for Mashimoni residents to manage the use of these funds. For example, in the case of LATF, participation is limited to committees that discuss the allocation of funds.

If programs stall during the implementation phase, such as is the case in the construction of the stairs in Mashimoni, there is limited recourse to call government actors to account.

In addition, government-funded programs have historically been less participatory and flexible. For example, the limited resident input in the design of the KENSUP Kibera decanting site has created issues of affordability, and has hindered livelihoods strategies.

The conditionality, complexity, and lack of transparency and accountability have spurred feelings of distrust on the part of Mashimoni residents towards government-led programmes.

However, the passing and implementation of the new Constitution, and introduction of devolved sources of funding should offer new opportunities for citizen participation.

Potential NGO partnerships

In contrast to the bureaucratic government streams, NGO funding allows for more accessibility, flexibility, and participation. Grants and loans from these sources are often accompanied by support and training, expanding the capabilities of residents to access rights beyond the provision of housing.

In Mashimoni, the proliferation of savings groups offers a further opportunity for community-NGO partnerships. These savings allow groups to leverage additional funding from NGOs, allowing communities to play an active role in their upgrading process.

2.3.3
Organisational Sphere

The complexity of the legal system

As previously mentioned, the Kenyan legal system is currently undergoing major changes due to the new constitution, passed in 2010. While the new constitution offers many opportunities within land and housing securities for the Kenyan people (including informal settlements), it is, however, a complex web of drafts, bills and policies all in need of updated formulations.

Our key findings within the current policy situation highlight the existing lack of policies and strategies for informal settlements and more particularly settlements located on land either leased or owned by private companies or Government Ministries (as is the case with Mashimoni). See Box 2 for key policies in relation to land tenure regulations, housing rights and building regulations for Mashimoni and Nairobi as a whole.

2.3.4
Delivery Sphere

Excessive bureaucracy creates barriers for tenure regularisation

Ultimately the sustainable delivery of Mashimoni upgrading relies upon access to secure land tenure. At present the land where Mashimoni is located is owned by the Department of Defence (DoD). The current tenure options enshrined in law are leaseholds, whether individual or communal.

Gaining tenure can be achieved through a variety of different types of processes that must be followed and some of these can be lengthy and expensive. For example to get an individual or community lease with government recognition it requires following the Registered Land Act route which can be expensive. However there is an option to follow the less formal Registered Document Act route; figure twenty-nine outlines the process.

Within Mashimoni there are issues of absentee structure owners and land and housing speculation. Therefore, it has been recognised that a communal form of lease for Mashimoni would be the most appropriate and this has been supported both within the community and with various key stakeholders.

As stated above, the only tenure options are leasehold as currently in the city of Nairobi; there does not exist an option for freehold land tenure. However, through the new constitution, the option of community title has been introduced. This creates the potential for a new system under which groups are able to manage a communal freehold. This is, however, yet to be in enshrined in law.

DOCUMENTING

- Boundary Plan
- Outline development plan
- Enumeration
- Topographical survey

ORGANISATION

- Outline of community group
- List of beneficiaries
- Organisation/governance:
- Members
- Decision making
- Sign-off

APPLICATION

- Letter from DOD
- Pack of documentation
- Letter of support from Pamoja Trust (and other organisations?)

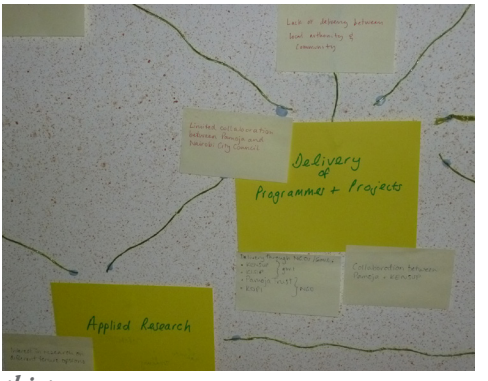
APPROVAL

twenty-nine

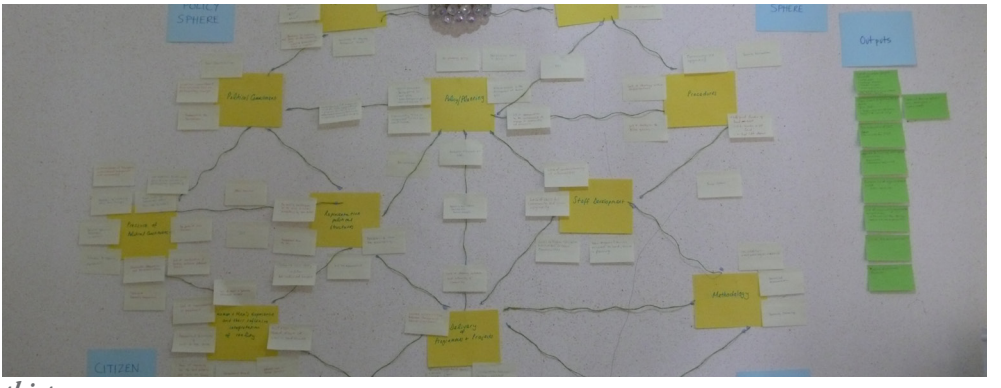
Process of land regularisation through Registered Document Act route

thirty and thirty-one

The findings for the web of institutionalisation were progressively posted to a wall with small handwritten notes, which allowed findings to be changed, removed, and new findings to be added as new information came to light



thirty



thirty-one

BOX TWO

Key policies in relation to land, housing and building regulations

Land Policy Draft:

In 2009, a Land Policy Draft was proposed, addressing informal settlements and other vulnerable groups. It was formulated in association with stakeholders from public, private and civil society through regional workshops and thematic groups. In relation to the situation of Mashimoni, it proposed the following opportunities: a legal framework for transference of un-utilised land; and to create a regime of secondary land rights.

The policy, however, is invalid and is in need of re-formulation according to the new constitution. Delays in the passing of this policy underlines the already existing limitations within the policy processes which could be exacerbated through the passing of the new constitution.

The Land Act:

The Land Act also addresses informal settlements. If the residents of Mashimoni wish to own or lease a plot of land, all of Mashimoni's residents need to be represented through a community entity. While this is obviously an opportunity for Mashimoni to secure land rights, the representative group could potentially abuse this recognition and favour themselves or certain members of the community.

Housing Policy Draft Bill:

The housing situation is somewhat similar to the current land situation, though still more undefined. A housing policy draft bill recognises the need for slum upgrading by proposing: building codes; affordable housing; a national housing authority.

However, as with the land situation, the policy is in need of re-formulation to fit the new constitution and there is in general a lack of information regarding the future of a potential housing policy. This delays the process and makes any implementation difficult due to a lack of legal frameworks for any slum upgrading.

Physical Planning Act:

Similarly, the Physical Planning Act is still based on a rigid planning scheme, with no acknowledgement of informal settlements and structures that are not in compliance with the current land requirements.

On a positive note, it is likely that this will change with the new urban development policy. This is still only in a stage of concept proposal but it suggests bringing more structure to the development of Kenyan cities and proposes the need to address informal settlements and make sure that informal dwellers are informed of relevant policy implications.

BOX THREE

Success stories of project development and implementation

Within a community there are likely to be a number of stories of successfully securing funding for a project or setting up a business which demonstrates the ability of the community to organise, manage money and invest in their livelihoods. Therefore we talked to a small group of community members to hear their 'success stories'.

The first story we were told was of a group coming together to provide water for their community. This involved them selling water within the community. They had gained the knowledge to do this through training at an external, European Union sponsored, seminar about how to locate the water mains and implement a water project. The successful implementation of this project over the last two years has helped to finance group activities, such as hiring transport so that they can attend more events.

Dennis and Paul from the Muungano savings group mentioned some of the success stories that can come out of collective savings groups and proceeded to illustrate this with an anecdote of one of the Muungano members. This member had a small business but wanted to expand it. As he had started saving with the group he was able to take out a loan to buy a motorbike, enabling him to go out and sell his products. He is currently building his business with this motorbike and if it is successful he'll return and ask for another loan to buy a pick up van enabling him to further expand his business.

Female members of the community gave two examples of urban agriculture projects that had led to successful businesses. The Poultry and Horticulture Farming group and the Community Evangelism group had used their savings to grow produce to sell. The former were provided with the foundations for the business from Solidarate International who gave them seeds. The ladies who ran this project were proud to say that it was doing well and through the income they were generating were able to re-invest and so see their business expand. The Community Evangelism group were working on a smaller scale and had been provided training from the Hope Foundation which was providing them with an income that they hoped would facilitate future business expansion.

As part of this discussion we talked about learning from other communities and sharing best practice with other people within Mashimoni and beyond to help everyone achieve 'success stories' like theirs. They gave the example of a water kiosk project they wished to implement within Mashimoni. They had learnt how to undertake this from neighbouring settlements in Mathare and were keen to continue these types of knowledge exchange.

Finally we heard about how they were looking for future opportunities to skill up and improve their livelihoods. For example Dennis informed us that they were going to receive training in financial management from the Equity Bank. This was seen as important for running savings groups so that members could improve their skills in savings, loan repayment and re-investment. These stories, even through small in number, indicates a precedence for managing projects and money within Mashimoni, signalling the credibility of the community in being able to successfully manage funding to improve their livelihoods. *Rubbina Karruna*

2.4
Conclusion

The institutional reforms taking place in Kenya is fostering a positive environment that is opening up new opportunities to address the housing deficit of the country. The right to adequate housing is recognised as a national priority and informal settlement upgrading is included in key policy documents.

Furthermore, proposed bills are emphasising the need to partner with various stakeholders, including community representatives.

These institutional reforms have been followed by an increased budget to invest in the upgrading of slums in Kenya, as well as new avenues for land tenure regularisation. For Mashimoni, this institutional scenario is opening up opportunities to facilitate the transference of land ownership from the DoD to a form of ownership/lease that would benefit residents of the community.

Additionally, the linkages with Pamoja Trust and other NGOs could bridge the financial gap for housing in an affordable and flexible manner. However, all these benefits are underpinned by the need to have a strong, inclusive and representative community entity. Box 3 highlights that there are a number of success stories that highlight the ability of Mashimoni residents to 'help themselves', and these experiences need to be replicated and 'scaled-up' to ensure wider, positive change.

Muungano is a well-established social movement present in Mashimoni, with extensive networks linked to key players outside the community. However, Muungano has not been able to connect with a large proportion of Mashimoni residents.

Therefore alternative options of representation should be considered as this poses a threat to community cohesion. If Mashimoni residents are able to unite in a cohesive and inclusive fashion, the community will be able to take advantage of these newfound opportunities for change.

thirty-two
Working with Mashimoni residents to identify elements of the web of institutionalisation

thirty-two

adidas

THREE
COMMUNITY

PART THREE
COMMUNITY

3.1
Introduction

The community group was concerned with the neighbourhood scale focusing on community dynamics in relation to neighbourhood spaces (streets, community spaces and surrounding areas) and infrastructure (water, sanitation, and energy). The group sought to explore the current condition of these features as well as the needs and aspirations that the residents attach to each of them. Subsequently, and drawing from this analysis, the group assessed the limitations and opportunities of the existing situation to inform the future development plans for Mashimoni.

One of the objectives of this integrated approach to participatory design is to bridge societal processes with the morphological characteristics of space, hence the community group sought to map the physical conditions of the area while unpacking the values and perceptions the residents attach to it. Moreover, it was important for the group to gain a clearer understanding of how these socio-spatial processes are shaped by everyday life activities and vice-versa.

Equally important for the group, was to explore the meaning of community. Communities are far from homogeneous. Nonetheless, slum-upgrading programmes often tend to pack all residents under the same interests and opinions often ignoring power relations and in detriment of the weakest voices and most vulnerable groups.

Taking this approach into account, the community group had the following objectives:

- To explore particularities for design, focusing on needs and aspirations from different groups within the community;

- To facilitate new avenues of representation and community cohesion;

- To facilitate the articulation and sharing of values and perceptions, from individual to collective (i.e. other children, adults and community organisations);

- To build knowledge on and reinforce existing community initiatives and networks.

3.2
Approach

During the first week the group utilised a variety of mapping techniques and participatory tools to investigate current neighbourhood conditions and its relation to the everyday life of its residents, as well as the dreams attached to the future of their community. Each method was developed and adapted accordingly in order to reach different groups within the community

and be able to include women, men, youth and children in discussions about their built environment. For this purpose, the methodology was divided into three stages: Diagnosis, Dreaming and Sharing. Each stage involved a combination of the following research tools:

Observation techniques

Mapping techniques

Interviews

3D model elicitation

Drawing elicitation

Interactive street installation

Mapping games

thirty-three

thirty-four

The exercise encouraged participants to go beyond first impressions and try to read space by observing, listening and actively discussing the different elements that compose everyday life in the settlement, always regarding space as a combination of physical attributes, social activities and perceptions

thirty-five
The division of Mashimoni according to the four groups

thirty-six — thirty-eight
Participants using the participatory action research tools; talking with children and youth, undertaking a focus group meeting with residents, and observing the marketplace

3.2.1
Deconstructing Realities

Day 1: Diagnosis - Karibu Mashimoni!

The aim of the first day was to start exploring the neighbourhood and meeting its residents through a socio-spatial mapping exercise. The group participants were divided into smaller groups in order to cover both the boundaries and inner corridors of the settlement.

The exercise encouraged participants to go beyond first impressions and try to read space by observing, listening and actively discussing the different elements that compose everyday life in the settlement, always regarding space as a combination of physical attributes, social activities and perceptions.

For this purpose, transect walks were undertaken accompanied by community members, conversations were held with residents to capture stories of life in Mashimoni, and observation techniques were used to capture physical characteristics of the area as well as use and appropriation of space. Participants recorded information through sketches, maps, notes and videos.

thirty-six

thirty-seven

thirty-eight

Day 2: Diagnosis - Semi-structured interviews and in-depth mapping

With more information and familiarity with the neighbourhood, the mapping exercise became more in-depth and focused. Participants formulated open questions for semi-structured interviews with residents and to further map the area. Each group covered specific areas, divided by their geographical boundaries and features. The semi-structured interviews facilitated a more in-depth discussion with regards to community life, networks, and dynamics; the use and appropriation of spaces; and the main built environment issues. The intention was to build a preliminary picture of key issues affecting residents in their neighbourhood, the vulnerable groups or unheard voices in Mashimoni and the existing opportunities that had potential for further development (i.e. spaces, networks, community initiatives etc.).

thirty-nine

forty

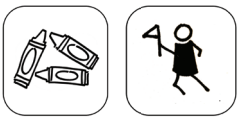
forty-one

thirty-nine
Mapping key issues relating to community and infrastructure

forty and forty-one
Working with residents on-site to understand their settlement

forty-two
Mapping interviews and findings

water pipe worker
women brewing
Image © 2011 GeoEye
© 2011 Europe Technologies
Cook for School from Mombatini
Joseph
Lillian
Naomi
Beatrice
Kevin, Brad, & Sarah?
toilet workers
toilet
bridge
bridge
VERONICA
council public toilet not finished



3.2.2
Dreaming: New imaginaries for my neighbourhood

After a preliminary analysis of the findings collected through interviews, observation and mapping exercises, the participants identified recurrent themes, including vulnerable groups, key spaces and pressing issues. A variety of tools were used to address each of the themes, including interactive games, drawing workshops, sketching and drawing elicitation.

a) Vulnerable groups:

The observation and mapping exercises, as well as the interviews undertaken with families during the diagnosis stage, all indicated that children are vastly affected by the current conditions of the neighbourhood as they are active users of the open space in Mashimoni. Nonetheless, little to none data exists that addresses their use of space in the settlement and the needs and aspirations they attach to it. For this purpose, the participants utilised two methods to explore the spatial experience of children in Mashimoni: The Drawing Workshop and Exploring my Neighbourhood.

The drawing workshop

This method consists of a group activity where children make drawings to answer specific questions related to their community. In this context, the tool was used to associate places with feelings and perceptions and to understand how children see and experience their neighbourhood. In order to reach as many children as possible and from different areas of the settlement, the participants undertook two different workshops: one with students in a school adjacent to the riverside, and another one in the main road with children randomly selected for the activity. The workshop consists of four steps, including introduction, facilitation, sharing and analysis.

Exploring my Neighbourhood

This method consists of an interactive game of exploration where children map relevant spaces in their neighbourhood and discuss their characteristics according to specific questions. A game-set made of cardboard (origami or a big dice) is given to the child containing different symbols representing tasks he/she needs to perform. These tasks will require the child taking all the participants and facilitators around the neighbourhood trying to find the places that answer the questions posed in the game. Once the child has identified the space with the coloured flag, the facilitator enquires further on the perceptions and feelings associated with it.

forty-three — forty-five

The interactive game involved children exploring their neighbourhood and responding to questions as a way to understand their relationship with, and perceptions of various spaces

forty-six and forty-seven

The drawing workshop underway, and with the final drawings being discussed by children

forty-three

forty-four

forty-six

forty-seven

forty-five

forty-eight
The riverside was a key space investigated by the community group

forty-nine — fifty-one
Residents sketching and discussing their dreams of potential improvements to the riverside

b) Key spaces: The Riverside

Dreaming through drawing:

This drawing exercise aimed at engaging residents in discussions about the riverside as a key space of their community. Residents were asked to draw how their 'dream riverside' would look like and how they would change the area in order to improve community life.

The drawing part is followed by a series of questions enquiring on the motivation behind the spatial arrangement and the features depicted in the drawings. The exercise was undertaken in both the riverside and other locations of the settlement.

This was done as a way to enquire the views of other residents that may not use the space actively but may have issues and aspirations attached to it.

forty-eight

c) Key Issues: Garbage and sanitation

Sketching Dreams:

This exercise had two objectives. Firstly, our aim was to further enquire and map the infrastructure reality of Mashimoni (in terms of garbage and sanitation) beyond its physical condition and location and more focused on its impact in the everyday life of the residents. Secondly, we aimed at engaging the residents in discussions about their dreams and how the existing infrastructure conditions could be improved.

The team from Map Mathare kindly provided us with detailed maps of the current condition of community toilets and sewage infrastructure, as well as the location of the main dumping sites and open defecation areas. The exercise started with semi-structured interviews related to the existing conditions of sanitation and garbage in the community and how it relates to their everyday activities. After enquiring further, we asked them to take us to the key spaces where poor infrastructure conditions affect them the most. Once in the location, we use rough sketches of the specific space as a canvas, where residents could draw how they would change the area in order to improve their life in the neighbourhood. The exercise was followed by a detailed conversation on the dreams depicted in the sketch.

forty-nine

fifty

fifty-one

3.2.3
Sharing: Revisiting and consolidating issues and dreams with the wider community

After analysing the findings from the diagnosis and dreaming stage, the group aimed at sharing and consolidating the data collected by organising two community events: a 3D model elicitation and an interactive street installation named 'The Dream Wall'. Both activities took place in Mau Mau Road, the main and busiest road of Mashimoni, in order to reach as many residents as possible. The objective of these methods were the following:
- To disseminate and consolidate the preliminary findings
- To elicit more specific information from a wider sector of the community
- To encourage discussion about the main issues and how people envision these to be solved.
- To explore the potential of the existing opportunities for change in Mashimoni.

The dream wall

The Dream Wall consisted of an interactive street installation containing the preliminary findings, using the material gathered during the previous stages (drawings, pictures, quotes and maps made by both the participants and the residents). Everything was translated to Swahili in order to make the information accessible to the whole community. The wall also contained envelopes where people could write their thoughts and ideas and, if desired by the resident, remaining anonymous by only recording the age and gender. The interaction between the residents and the wall was always facilitated by the participants who encouraged discussions to elicit further about resident's thoughts and dreams about their neighbourhood. At the end of day, the envelopes and notes on discussions were collected and the information was analysed and used to triangulate with the previous stages.

The 3D elicitation

A 3D model of the neighbourhood was elaborated in order to facilitate the visualisation of the main issues. Small flags with symbols were allocated to each issue and colours were use to differentiate according to gender and age. The model was used as a vehicle for discussion and as a way to further unpack the issues affecting women, men and children with regards to their neighbourhood spaces and infrastructure. Two participants facilitated the use of the model and recorded the information gathered during the discussions with residents.

NDOTO YANGU KATIKA KUJINI CHETU
toilets

3.3.1
Findings: Mashimoni - a brief introduction

Mashimoni No. 10 was formed on a former quarrying site. The name is derived from a kiswahili word "shimo" which means a pit. Number 10 refers to the bus station through which the area is accessed from the city centre through Juja road.

The 'village' sits over a cliff edge, which creates a distinct divide between the lower and upper area. All the open sewerage runs through the alleyways down the slope to the river, which marks the northern boundary of the village. The top of the site (Juja Road) is almost 20m higher than the river, and the cliff itself -next to one of the few open spaces in the area- creates an 8m high boundary between bottom and top.

Mashimoni is connected to wider Nairobi by Juja Road. About two years ago, Mau Mau Road was built, creating invaluable social space and improving security of the neighbourhood. Most other access routes are through small alleys which are only accessible by foot, and usually double up as open sewerage. They also double up as workspace for laundry, washing dishes or cooking. The land below the cliff provides one of the few open spaces for football and other games.

Nairobi River, which determines the northern boundary currently operates as its sewerage and waste disposal channel. Its banks, because the area is prone to flooding, are not occupied with housing and can therefore accommodate a market and urban agriculture sites. Sewage from the settlement above, which comes all the way from the Air Force grounds across Juja road, runs into the river in open channels and create obstructions and divisions along the bank.

fifty-three — fifty-five
The three thematic focus groups, from top to bottom: vulnerable groups (children), key spaces (riverside), and key issues (garbage and sanitation)

fifty-six
A visual representation of the transect walks illustrating the geographical features and key areas, for example Mau Mau road and the football field

fifty-three

Mashimoni has a large number of small businesses operating within it. The market by the river provides an income to many men and women, while some residents enjoy a profitable business on the main Juja Road. Mau Mau road also provides a crucial space for business and small enterprises. Within the smaller alley-ways one can also find many houses fitted with similar hatches to sell groceries.

The findings explore community life in Mashimoni, the current spatial conditions at the settlement scale and their impact on the everyday life of the residents. The findings also depict the dreams and aspirations that residents shared with us. Based on the diagnosis, the findings are structured in three thematic areas: vulnerable groups, key spaces and key issues.

fifty-four

fifty-five

The findings explore community life in Mashimoni, the current spatial conditions at the settlement scale and their impact on the everyday life of the residents. Based on the diagnosis, the findings are structured in three thematic areas: vulnerable groups, key spaces and key issues

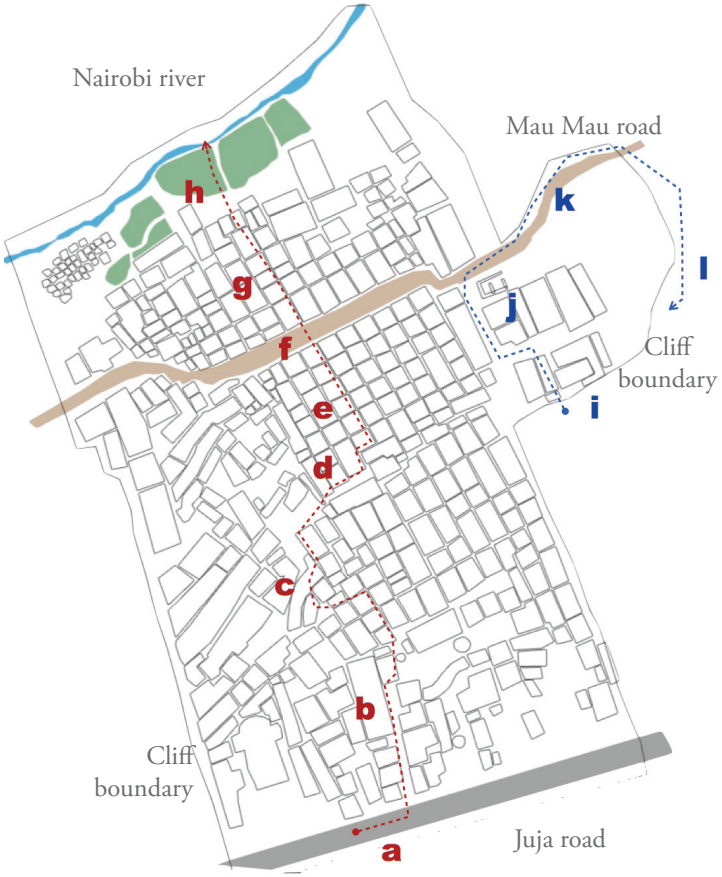
Juja road | secondary axis road | inner corridor above cliff | inner corridor going down cliff

a

b

c

d



View of the cliff

i

inner corridor below cliff | Mau Mau road | inner corridor lower section | riverside

20m difference from Juja road to the riverside

e

f

g

h

usinesses below the cliff | Mau Mau road towards Mashimoni | View of the football field from cliff

l

k

j

3.3.2
Vulnerable group - Children's experience of Mashimoni - Use and appropriation of space

Mashimoni is a dense settlement with very few open spaces available for social interaction. Furthermore, when it comes to children, there are no officially designated and maintained play areas. Nonetheless, based on findings from the research activities, children manage to appropriate and use space in many ways and for various activities.

Informal play areas:

Children take advantage of vacant land and residual spaces and establish their play area in a spontaneous way, even when sometimes the land remains vacant only for a short time. This is the case when houses have been burn or land has been cleared to make way for streets or alleys. In other cases, the characteristics of the space make it appealing to establish it as a play area. For example, a compost area with banana leaves in the riverside provides a good spot for jumping and more acrobatic games, specially for boys.

The main area where the majority of children play, though, is the field below the cliff, which is just outside Mashimoni boundary. This is where many of the children congregate, meet their friends and engage in football and other organised games. The location and spatial characteristics of the space makes it appealing and the most adequate area for play within the settlement so far. Its prime location, just in the entrance to Mashimoni, makes it highly transited increasing the feeling of safety during the day. The cliff also forms a type of 'observation platform', as many adults and children use it as a place to rest or just observe what is taking place in the areas below.

fifty-seven — fifty-nine
These pictures show a variety of residual spaces children use frequently for social and play activities: a) A vacant space that is now used for playing. Houses were burnt in this area in order to make way for a secondary access road. b) Children use this space to play intermittently, in other occasions the same space is used for drying seeds. c) A compost site with banana leaves close to the riverside where children engage in acrobatics and similar games

sixty — sixty-two
These pictures show the different activities that take place in the football field as the main space of children interaction: d) children use the poles to play by attaching a string and a bottle which they take turns to kick e) this field is the only place where some organised games take place, mainly football matches f) Nearby schools use the field to organise group activities

fifty-seven

fifty-eight

fifty-nine

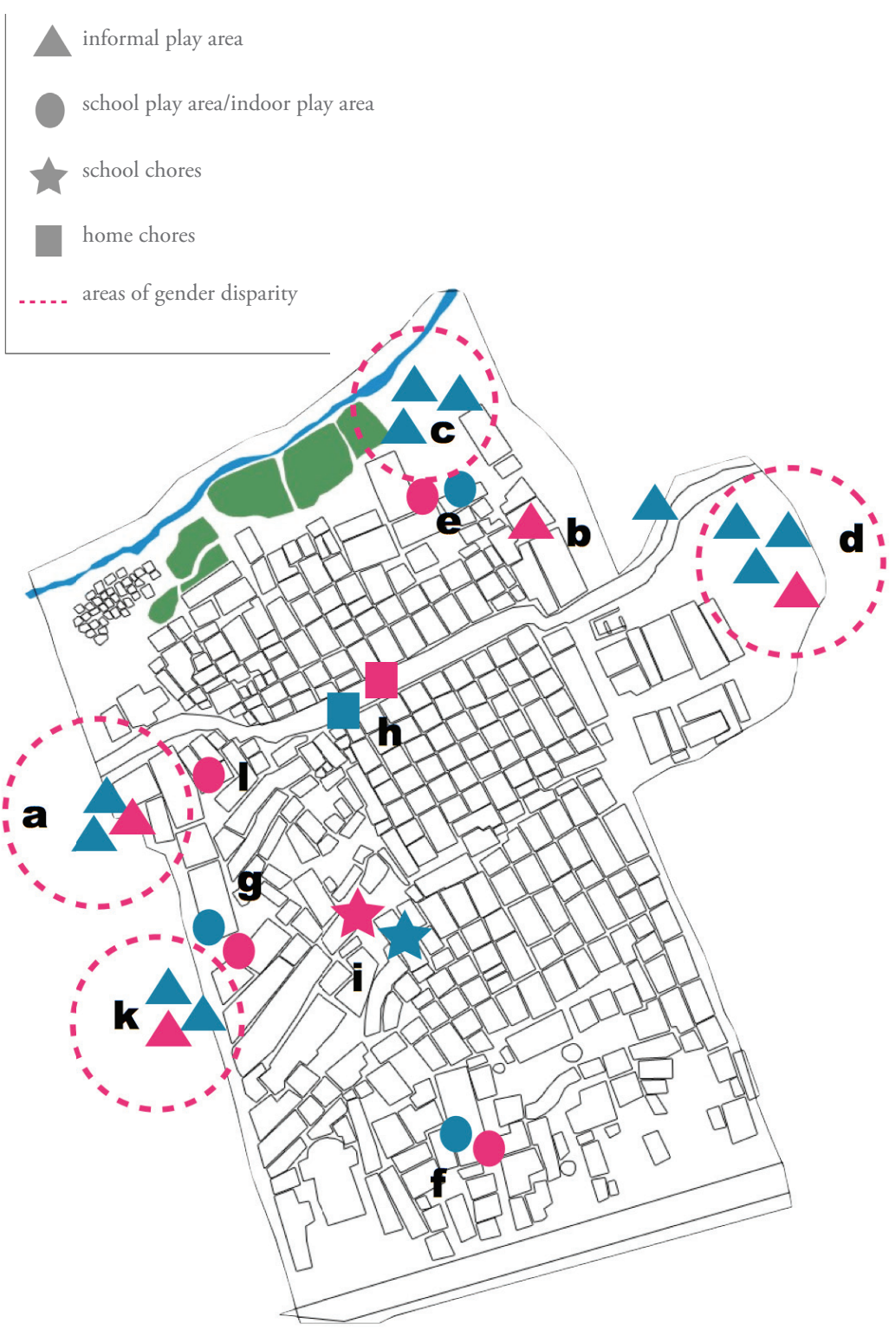
sixty

sixty-one

sixty-two

sixty-three
Relevant spaces for children

sixty-four
Spaces, activities and gender differences


pink = girls, blue = boys
informal play area
school play area/indoor play area
school chores
home chores
areas of gender disparity
a
b
c
d
e
f
g
h
i
k
l

Play area / indoor play area

Some children do not feel safe or do not like playing in the few open spaces available in the neighbourhood hence they limit their play and social activities to school and churches. These facilities usually have open areas that serve as playgrounds which, in most cases, provide children with a safe space to play under the supervision of adults. During weekends, children resort to play inside or near their houses where they can be accompanied by family members.

Other activities, although in less quantity, are school and home chores. Some small corners and residual spaces become relevant to children as they practice and do their school chores in them. Likewise, many of the children in Mashimoni engage in home chores, particularly fetching water. This activity takes place several times during the day, making children frequent users of the water points and the access corridors and roads leading to them.

Gender differences

The main difference between girls and boys experience of Mashimoni is in the use and appropriation of the football field and the larger residual spaces used as play areas (see figure sixty-four). Although girls indicated these spaces as relevant for them, they also mentioned they feel unsafe and/or unwelcome as they usually have to compete with groups of boys or older children in order to use them. Some girls indicated they resort to play inside their homes or at school as they are afraid to get in conflict with other children. Another space that showed a gender divide was the riverside, where most of the children were boys and older teenagers. Safety issues were mentioned as a common cause as well as the fact the place is isolated from the rest of neighbourhood.

sixty-five — sixty-seven
These pictures show some of the schools and churches that provide safe play areas for children, in some cases being the only place where they can engage in social and play activities

sixty eight — seventy
h) Children frequently use access roads to undertake home chores, particularly fetching water, i) and j) children using small residual spaces to undertake school chores and practice grammar

sixty-five

sixty-six

sixty-seven

sixty-eight

sixty-nine

seventy

"It would be good if we could put a big sign for the big people saying 'no waste by the river!' "

Child, resident of Mashimoni

Main issues voiced by children

Through the drawing workshops and the interactive mapping game, children demonstrated how their daily experience of the neighbourhood is constantly accompanied by the precarious conditions of infrastructure. The open sewage and garbage dumping was unanimously referred to by children as the main nuisance in their everyday life in the neighbourhood, as it not only interferes with their leisure and play activities but also with their chores and home environment.

When asked about the places they dislike the most in their neighbourhood, they all mentioned places that are either regularly used as dumping sites or open sewages. This is not surprising as most of these sites are located adjacent to their most relevant spaces (figure seventy-five).

When it comes to sewage, children are highly aware of the health risks of open trenches and they expressed their constant fear of falling down when playing or passing-by these sites. At the same time, the open sewages are also situated in highly transited areas and some of the children noted how it affects their home chores when using these roads and alleyways to collect water or run errands.

Dump sites were also frequented mentioned by children as an issue. This is due, in part, to the fact some of the main dumpsites are located right adjacent to the places they use to socialise and play (figure seventy-three). This is the case with the football field, some of the interior vacant spaces and the riverside, where dumpsites are situated in their vicinity.

Children, particularly girls, also refereed to the poor condition of the roads, and more

seventy-one

seventy-two

seventy-three

specifically they expressed their dislike of the dirt and dust in them as it affects both their play areas and their homes. The most common roads mentioned were Mau Mau Road and the new access corridor at the west side of the settlement.

Children are also affected by the high density of the settlement. Some of them mentioned the problems of overcrowding not only in their houses, but also in their play areas and the schools. As indicated previously, children need to compete in order to appropriate vacant spaces for play activities. Even within the school grounds, the space is usually insufficient and therefore limits children's physical activities like running or playing football.

Children's dreams

When we enquired about their dreams for their neighbourhood the football field was an important topic of discussion. All of the children expressed their desire to have an official pitch with proper goal posts and grass. They also wished the field was properly lighted to increase both the safety of the area and to allow them to use the field until later hours.

The exercises also revealed a strong desire for green areas and trees in their community, specially in the top area of the cliff around the football field and in the riverside.

Finally, all the children agree they wish the garbage would be removed completely and that adults would stop dumping the waste in the few open spaces they can enjoy. Indeed, one child said that "it would be good if we could put a big sign for the big people saying 'no waste by the river!"

seventy-four

seventy-five

BOX FOUR

The challenging conditions of children's schooling

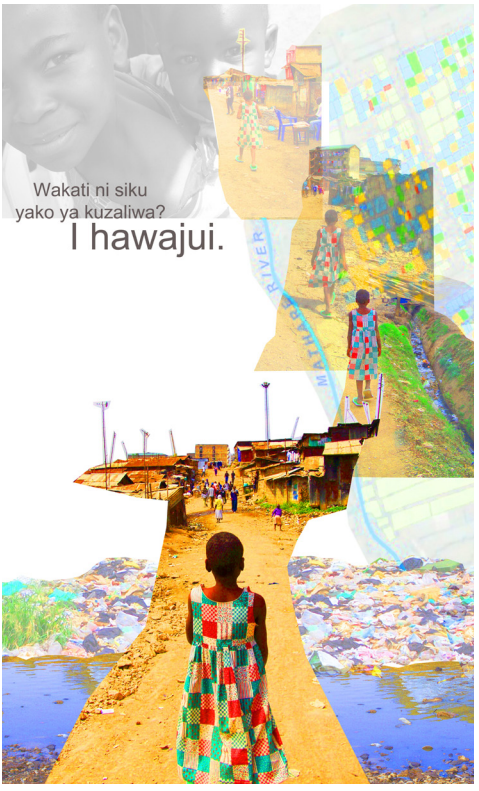
There are at least six schools within the boundary of Mashimoni, but these all cater for only nursery and primary education. Most local schools currently operate as private facilities, which create problems of affordability and means that the quality of education is not controlled. We visited the majority of these facilities and managed to observe the many difficulties children and teachers face. In one of our mapping exercises, we visited the only school funded by the government. The school is the cheapest in the area, requiring a fee of KSH 150 per month, which includes food and uniforms. This school is an example of how the issues with infrastructure and lack of space affects children even when spending time at school.

This facility is located right below the cliff and in the vicinity of an area well-known as a drinking spot for adults. The corridors and the entrance leading to the school are composed by a dirt path and an open sewage. Moreover, two of the main sewage trenches coming from as far as Juja Road run down the face of the cliff , leading to the small patio where the children play. The patio is highly over-crowded (see image below) as the school caters for 45 students of varied ages.

The school has a proper, legal connection to the municipal water system, and a toilet. We spoke with Lydia, the teacher in charge, who has been working in the school for over a year. She laments that the school is overcrowded, has insufficient space inside for the children to study, and not enough outside space for them to play, which in some cases has led to injuries. As the school is located at the bottom of the cliff, the tiny courtyard is dotted with ponds collecting sewage from above. The conditions worsen during rainy season, creating unsanitary conditions in the patio and posing a serious health hazard for the children.

This situation illustrates the vulnerability of children in the settlement of Mashimoni. As explained in the previous sections, in many cases, schools constitute the only space where children can play and socialise, and these precarious conditions severely hinder their enjoyment of the only space they have at their disposition. *Isis Nunez*

seventy-six



seventy-seven

seventy-six and -seven

These illustrations depict the story of a girl's daily life in Mashimoni. This story illustrates how children are active users of many spaces in the wider neighbourhood and for various purposes. Her relevant spaces were associated with learning and play activities as well as home chores like fetching water. They highlight that many of the resident's activities are undertaken outside the geographical boarders of Mashimoni. *Whitney Burdge*

3.3.3
Key space: riveside

Market: The east side of the riverside is occupied by an established market of second-hand clothes. The market is comprised by timber stalls that people can rent for selling purposes.

Allotments: A large portion of the land in the riverside is currently used for agricultural purposes. Some of the allotments are managed on an individual basis and others have been developed as community initiatives. The majority of the people managing these allotments have been trained by an NGO called Solidarité on agriculture techniques and the use of sacks for growing vegetables. This practice has become widely used within the settlement, expanding from the riverside to alleyways, school playgrounds and residual spaces in the community. Water for irrigation is taken from wells dug along the site.

Community toilets: Recently two community toilets were built in the area, providing clean facilities for users of the riverside and residents living nearby, These toilets are managed by users of the riverside (see box five).

Dumpsite: A large dumpsite and compost area has been created to the west border of the riverside. This site is widely used by residents to dispose of their garbage. In some cases it is also used for open defecation, specially during the night when community toilets are often closed.

Riverside - main issues

Through the drawing exercises and the interviews, we managed to enquire with different residents about the main issues affecting the riverside. We interviewed both active users of the space and other residents from the community.

The issue mentioned the most was the lack or difficulty of access to the area. The riverside is only accesible through small corridors that often double-up as sewage trenches, making the access difficult to pedestrians and limiting the number of visitors. This is a key challenge specially for the market sellers that regularly struggle to get frequent customers.

Some of the residents interviewed in other parts of the settlement indicated that the only reason they didn't visit the riverside more often was because the access is too difficult and the area was too isolated. Therefore, in their opinion the riverside was regarded as both an unkept and unsafe space. Residents also discourage their children to visit to area, as they are afraid they can fall into the contaminated river and get sick.

The riverside and the river are commonly used to dispose of waste by both the residents and the community cleaning groups. The users of the area strongly disagree with this practice and are perfectly aware of the detrimental effect on the environment, the allotments and their own health.

However, they also indicate the lack of any other alternatives to properly dispose of waste away from their houses and their roads. The existence of these dumpsites in the vicinity also detracts people from using the area in a more proactive way.

Furthermore, several sewage trenches bisect the area at regular intervals, carrying waste from further up the hill.

These trenches affect the access to the area, contaminate the wells and allotments and discourage customers from the market.

These negative perceptions about the riverside are also exacerbated by the lack of adequate lighting in the area. During the night this area becomes completely dark and is highly avoided by the residents. However, some of them are forced to use it late at night as an open defecation area, due to the majority of community toilets remaining closed during the night.

The riverside is also a subject of conflict between the residents. Allocation and ownership of the land for agricultural purposes is unclear. While some argue the land is allocated on a first come first served basis, others argue that permission to cultivate the land was requested and subsequently granted on the basis that it cannot be used for housing purposes as it is a flood-prone area. These conflictive views has limited any intentions to use the area in a more communal way.

Finally, the riverside is regularly affected by flooding, contaminating the market and irrigation wells with sewage and rubbish and destroying many of the allotments. Upgrading of the market include attempts by some of the vendors to prevent flooding by growing trees and grasses along the river bed, and these also prevent children from falling into the river.

seventy-nine — eighty-one

The main issues with the riverside are the difficult access to it, as well as the unsanitary conditions created by the waste

Residents expressed their desire to make the riverside a thriving area with different community facilities and activities

Riverside - dreams and opportunities

The dreaming exercise with residents revealed a strong desire to use the riverside as a community area that can serve the whole neighbourhood. Such a community area would ideally have upgraded market facilities accompanied by financial mechanisms that can enable others to start businesses in the area.

Likewise, residents expressed their wish to have allotments that can be managed collectively and properly designated green areas that adults and children could use for leisure activities. They also mentioned the need for an effective barrier mechanism to stop or reduce the flooding from the river.

Residents also indicated they want community facilities in the area, for example a community hall that the neighbourhood can use for different activities, especially children and youth.

This in their opinion, would attract more people to the riverside and therefore attract customers to the market. Overall, all residents expressed their desire to make the riverside a thriving area with different community facilities and activities, and in this way to also tackle the negative perceptions that currently prevail about the riverside.

eighty-two and eighty-four

Residents wish to scale-up the existing urban agriculture initiatives by creating more allotments that can be managed collectively and serve the whole community

eighty-three

The market was mentioned as an opportunity for diversifying livelihood strategies within the settlement, provided that the facilities are upgraded and financial mechanisms are put in place to start businesses in the area.

eighty-two

eighty-three

eighty-four

BOX FIVE

Elizabeth - community networks and ingenuity

Elizabeth was one of the first women we met in Mashimoni and it's not surprising that she is a well-known member of the community, considering her active involvement in community groups and the ingenuity she embeds in her many endeavours. Elizabeth moved to Mashimoni in 1994. She is an active member of several community groups, including the Muungano savings group, the Market group, the Chandani Group (urban agriculture) and the Community Cleaning Services (CCS).

She has had a market stall the entire time she has lived in the area but perhaps she is more well known for her remarkable work in the allotments at the riverside. She was trained by the NGO Solidarite, that taught her agricultural techniques, specifically on how to grow vegetables in sacks and directly into the soil. She then transferred her skills and knowledge to other members of the community, including the Chandani Group, which now has its own community garden.

Elizabeth proudly explained the techniques she uses to irrigate, grow, and harvest her impressive variety of crops, which include onions, sugar cane, corn, watermelons, pumpkins, plantains and a wide range of legumes typically used in Kenyan food. She has been growing vegetables for two years now, which she usually uses for her own consumption. When there is an excess, she also sells to others to have an alternative income.

Elizabeth is also involved in the management of the community toilets in the riverside. One of her strategies to improve the toilets has been to place plastic reservoirs with water in an adjacent tree in order to encourage better hygienic practices among the users.

Despite her success, Elizabeth also faces many challenges. For example, she noted how the contamination brought by the sewage and garbage dumping in the riverside seriously threatens her allotments. Likewise, whenever the river floods the area, she loses all her crops and has to start the process all over again.

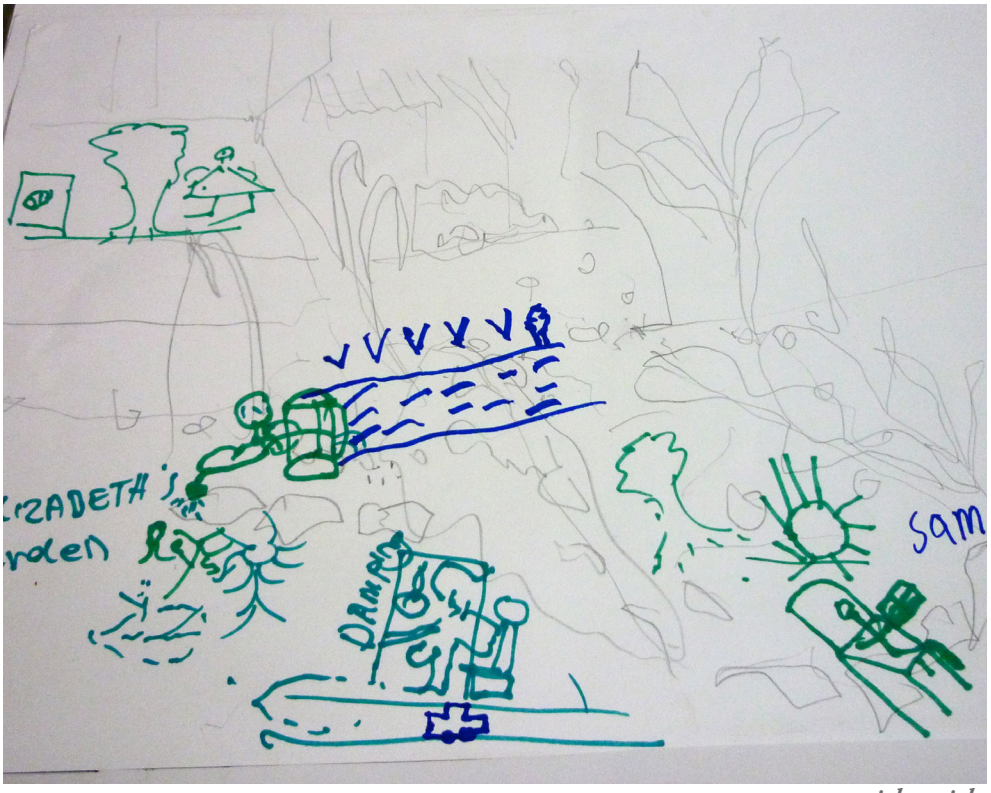
In the dreaming exercise, she expressed her desire to have a proper dumpsite, located away from the riverside and the houses, where people could dispose properly of their garbage. She also wished the river was clean so she could use it to irrigate her crops. Finally, she envisioned the riverside as green space with a proper barrier for the river, where the children could play and read safely and in peace.

Elizabeth is an example of the ingenuity and diverse livelihood strategies many of the residents use in order to improve their life. By being involved in many community groups she has improved and diversified her skills, as well as expanded her networks and support base within the community. Through her activities she has also been active in sharing her knowledge among her networks having a bigger impact on her own community.

eighty-five

eighty-six

eighty-seven



eighty-eight

3.3.4
Key issue - Sanitation and garbage

Sewage

The moment you arrive in Mashimoni, the lack or poor condition of sanitation infrastructure is evident and manifested in almost every space of the settlement, having a substantial impact on the everyday activities of its residents.

In Mashimoni all of the sewage is drained by trenches, which in most cases are dug and maintained by community members. The trenches run generally open, bringing sewage and garbage from as far as the Air Force grounds across Juja Road. The sewage runs downhill from the top of the area to the cliff face and then down to the river, polluting the small corridors in front of the houses and the riverside.

Through our exercises it became clear that women are particularly affected by the sewage, as they frequently use and appropriate the internal corridors -through which the sewage usually runs through- for various home and social activities, including washing clothes, cooking and chatting with neighbours. For example, due to the lack of space inside their houses, women are forced to build small platforms made out of timber directly above the sewage as a way to extend their living space. It is here where food preparation, cooking and washing usually takes place, hence these range of daily activities are always accompanied by flies, running sewage and the odour coming from the open trenches. This precarious situation poses a serious threat to the health of the women using these spaces and their families, significantly reducing their quality of life. The issues with open sewage also varies according to seasons. While in the dry season, women said to be affected by flies and odours coming from the sewage; the wet season brings the risk of flooding, which usually occurs when trenches gets clogged by water streams and garbage and the sewage spills into the neighbouring houses.

Nonetheless, within this context, some of the residents manage to improve their built environment and reduce some of the health impacts by using different coping strategies. These include the use of timber to cover the trenches and building concrete ditches to effectively channel the sewage and avoid flooding. However, these strategies, specially the latter, do imply a substantial investment that many families cannot afford.

eighty-nine — ninety-three
The lack of, and poor condition of sanitation infrastructure is clearly evident in Mashimoni. Sewerage is drained by trenches leading down to the river. Due to a lack of space residents are forced to appropriate these spaces to undertake their daily domestic activities