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**Resilient
Urbanism: The**
intersection
of shared
data and
inclusive public
engagement

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Flexible city



Resourceful city



Robust city



Inclusive city

Resilient Urbanism:

The intersection of shared data and inclusive public engagement

Urban resilience is at the heart of addressing the 21st century's most troubling problems – ensuring that all stakeholders in a city not only survive, but adapt and thrive in the face of acute shocks and chronic stresses. One of the foundational aspects of effective urban resilience is public engagement in civic decision-making. This moves beyond engagement for the sake of engagement, and pushes to create meaningful involvement in mobilising resilience.

MAIN INSIGHT

Impactful community mobilisation, towards increasing resilience, must be founded at the intersection of measureable shared data through enumeration and asset-based community participation. The combination of these two distinct, but intertwined, fields promotes greater resilient urbanism. This is urban development that embraces and builds upon the multiplicity of the everyday urban reality, exploring means of improving what already exists, in an incremental way, whilst creating a dynamic urban form that builds resilience from within.

Purpose

In the context of community level resilience, there are two fundamental development approaches that are required to create the “space” needed for inclusive public engagement. This “space” creates the opportunity for communities to identify community priorities, resources, needs and solutions in such a way as to promote representative participation. The two developmental approaches are: (1) data as a shared asset and (2) participatory co-design aimed at asset-based community development. Traditionally, these two approaches are implemented as separate methodological approaches to public engagement, each with their own benefits and challenges.

This brief aims to answer one fundamental question: Can city level resilience be enhanced by reinforcing participatory co-design with a shared data approach?

This brief discusses:

- Enumeration¹ and asset-based community participation for development.
- Data as a shared asset: An exploration of the ‘data and domain’ approach to facilitate participatory co-design for urban resilience.
- A case study of the Alternative Service Delivery Unit (ASDU) and its enumeration process in two informal settlements in Cape Town.

This brief is written for:

A diverse set of stakeholders, each playing a vital role in understanding and addressing the challenge of creating meaningful community involvement in building and institutionalizing resilience. This includes, but is not limited to:

- Cities focused on building resilience through innovation and partnership.
- Cities exploring asset-based urban development as a mechanism to grow resilience.
- Entities exploring the establishment of participatory co-design interventions.
- Communities seeking to nurture community cohesion and development.

¹ Enumeration is the process of collecting residents’ socio-economic and demographic information at a community or household level

A dualistic approach to local resilience: Enumeration and asset-based community participation

Community-led development is not a new concept – communities all around the world have, over the millennia, come together to drive their own development. Concepts like citizen-led and endogenous development, strengths-based community work, community planning and place-making approaches are all based on facilitated community participation.

Asset-based community development

Asset-based community development (ABCD) unlocks the possibility of building and institutionalizing local resilience by empowering communities to identify their own problems and be part of their own development through the local assets available to them. Essentially, communities know their own contexts better than anyone else. Engaging communities creatively helps them appreciate their own strengths (assets) as a unit and empowers them to help design their own solutions; encouraging community buy-in and support for the process. It helps stakeholders with gaining inherent knowledge on current systems that are in place and what would work for a community. An informed and well-functioning group, built on this foundational understanding, has the potential to build trust and a shared understanding – both fundamental ingredients for collective action and local resilience.

Participation is not a silver bullet solution. One of the major drawbacks of community engagements are the proverbial “rabbit holes” into which a diverse stakeholder group can be drawn. Everything is urgent and super important or specific stakeholders misuse the process to benefit a minority and even the creation of “gate keepers” are all disadvantages of a purely participatory process.

Engaging communities creatively helps them appreciate their own strengths (assets) as a unit and empowers them to help design their own solutions; encouraging community buy-in and support for the process.

Data led development: community enumerations

Enumeration is a community-led process of conducting a census in an area (usually used in informal areas). An enumeration survey consists of interviewing 100% of the households living in an area. It collects socio-economic and demographic information relating to tenure and migration, structure details (how people live), current services (water, sanitation, waste and energy), employment, local skills, training and education needs, income and expenses, grants and subsidies, disasters and death and community structures (community leaders; churches; schools; police station). Communities are heterogeneous and an enumeration helps to create a rich picture of a community. It is easier to plan developmental

interventions if you can see how different parts of a community fit together. This is essentially the purpose of an enumeration. The information gathered allows those facilitating a development process to create an accurate, up-to-date and locally accepted representation of who lives in these areas, and under what conditions. In the context of data as a shared asset, the communities own this data and determine how it is used and distributed.

As with participatory co-design, a data led development approach is not a silver bullet solution. A significant amount of value and nuance can be lost in the data. Information can be misrepresented to drive a specific narrative (i.e. all respondents highlight that they are unemployed to get social grants).

Data as a shared asset: an exploration of the data and domain approach to facilitate participatory co-design for community development

Every approach to meaningful participation will have its benefits and challenges. However, if combined, it is possible to address the shortfalls of the two approaches discussed above while creating a reinforcing loop to enhance their strengths. Impactful community mobilisation, towards building resilience, must be founded at the intersection of measurable shared data and asset-based community participation. The combination of these two distinct, but intertwined fields, creates the possibility of resilient urbanism, and is facilitated by the data and domain approach.

Data becomes an asset when it can be used to better understand and respond to challenges and risks faced by society and to help it learn, adapt and build resilience against these risks. This shared data must be extracted and transformed into information that can be used to:

- stimulate excellence in service delivery and;
- become the foundation for better decision-making in the face of increasing complexities.

Doing so in a participatory co-design process will foster trust, secure community buy-in, and ultimately, ensure that quality data is obtained to provide contextually appropriate and desired solutions to the community, in a collaborative and transparent way.

This is urban development that embraces and builds upon the multiplicity of the everyday urban reality, exploring means of improving what already exists, in an incremental way, and creates a dynamic urban form that builds resilience from within.

Data and domain approach

Domain refers to an area of knowledge-territory owned or controlled by a particularly group, which is traditionally accessed by co-design. Communities know their contexts better than anyone else. Empowering them to bolster this understanding with a more formal overview better equips them to help design their own solutions; encouraging community buy-in, building trust and support in the process. It helps stakeholders with gaining inherent knowledge on current systems that are in place and what would work for a community.

The shared data gathered from these citizens through extensive mobilisation and enumeration processes becomes the net used to allow stakeholders to safely navigate the participatory co-design space, tightened by a framework for trust-building.

CASE STUDY:

GreenCape's Alternative Service Delivery Unit

As of the last census, between 1.1 - 1.4 million households, or ~2.9 - 3.6 million people were living in informal settlements in South Africa. In the city of Cape Town, there are at least 204 informal settlements. These settlements have been established in response to rapid inward migration (mostly from other provinces into the Western Cape), and they are predominantly located on municipality-owned land. Using a resilience lens, the acute shocks² and chronic stresses³ experienced in Cape Town are most profoundly experienced by those living in these settlements.

Informal settlements are characterised by a lack of formal tenure, insufficient public space and facilities, inadequate access to municipal services and poor access ways. While the City of Cape Town provides access to basic services in informal settlements, including electricity, water and waste services, the provision of these basic services becomes legally complex when informal settlements are located on privately owned land.

Besides their physical locations often being on dangerous sites that are more prone to natural and other disasters, these areas often overlap with high social vulnerability such as poverty, unemployment and high crime rates. The two communities we investigate in this paper, Freedom Farm and Malawi Camp, are no different.

Freedom Farm and Malawi Camp

Malawi Camp and Freedom Farm are home to more than 3 000 people. The land where these settlements are located is a mix of private and state owned land. Residents have been living in the area for as long as 30 years. There is no formal electricity infrastructure in these two informal settlements, and more than 90% of residents are still making use of bush and bucket toilets and limited communal water points. The unemployment rate in the area is close to 45% and more than 50% of children of a schooling age, are not in school.

The Alternative Service Delivery Unit

In order to aid the government, and in some cases private landowners, and to empower citizens, a data-driven and community-led alternative service delivery project has been created by GreenCape. This project was established to promote unserved and unserviceable areas as spaces for innovation through the provision of basic services, empower communities through co-design and social choice, and support local municipalities and landowners to explore new approaches to providing innovative service delivery models that promote economic growth.

GreenCape's Alternative Service Delivery Unit has been working in these two areas since 2019. This foundational work focused on creating a strong social foundation for service delivery, building an inclusive platform for local community members to express infrastructure preferences, and to understand the communities' propensity to pay for infrastructure services while also mapping existing infrastructure assets.

² An acute shock is usually a sudden sharp event that threatens the community, for example, natural disasters like droughts or fire; disease outbreaks and infrastructure failure.

³ A chronic stress is a challenge that continually affects the community on a more regular basis, for example, violent crime; substance abuse; unemployment.

Reflections of the ASDU enumeration process

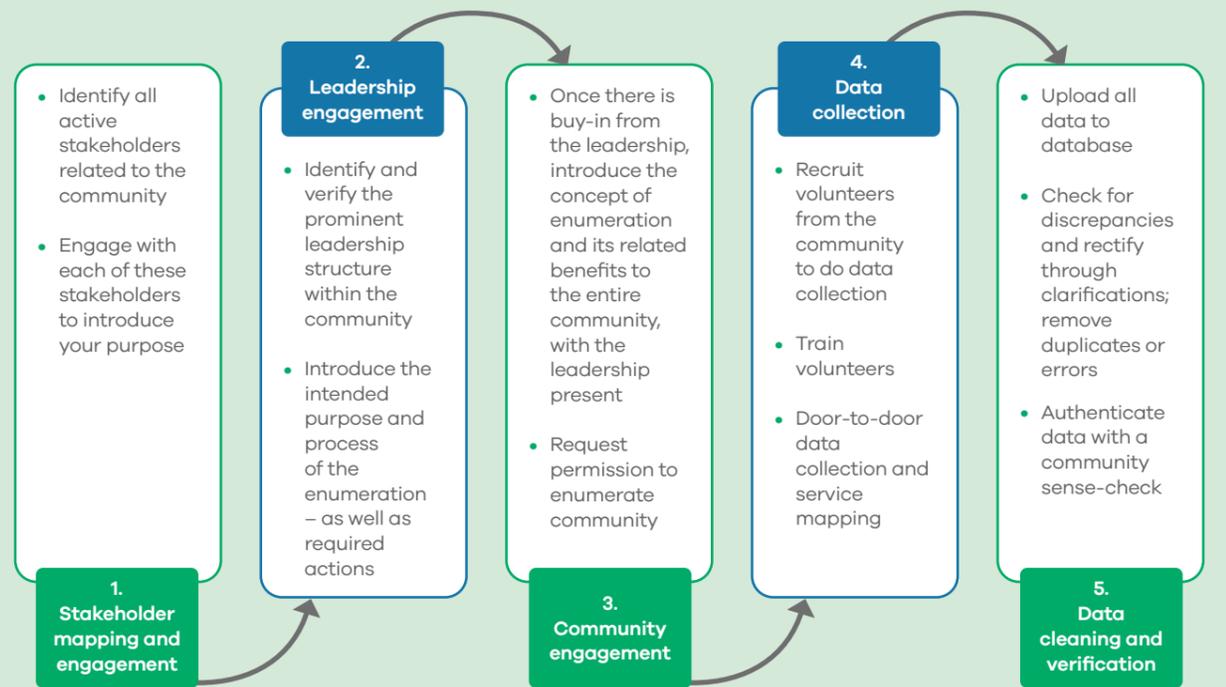


Figure 1: ASDU enumeration process

Stakeholder mapping and engagement

Relevant stakeholders in the given community are identified. This can include the community leaders; the locally elected ward councillors; community based organisations, NGOs and public institutions already operating in the area. These community stakeholders are interviewed on the community – the local need, current programmes and other existing assets. Each of these stakeholders generally direct the interviewer to others. Engaging with these stakeholders is essential to introduce the project offering and to assess the community’s interest. This is critical to the success of the projects: the community must need, but also want, what is offered. It also forms the early foundation for trust and community buy-in. This can be a delicate position to manoeuvre, particularly when trying to make it clear that the project is apolitical. Factors like who is forging the relationship, with whom and how, must also be considered. It is very easy for these engagements to deteriorate if sufficient respect is not given, and if one does not remain humble but firm throughout. At the same time, preconceived cultural, racial and gender biases need to be actively managed (i.e. a female

facilitator engaging an older male stakeholder may be met with less respect). Perseverance, trust and sincerity are key to navigating these difficult engagements.

Leadership engagement

The community mapping and “snowball” engagements helps to identify a local core leadership team⁴. Introductory meetings with this leadership team should be held on site if possible (creates a sense of trust and commitment). A formal request is made to engage the wider community, either directly or through them as a leadership.

Community engagement

Once the leadership has allowed community access (respect and trust), mobilisation and enumeration teams engage with the community leaders and members to 1) introduce the enumeration component of the project offering and its benefits, 2) identify volunteers from the community (already giving them autonomy), and 3) to mobilise the community and build trust.

When engaging with the community, it is valuable to consider doing so in the dominant language or in a preferred language (for e.g. in multicultural communities, English may be preferred). This includes everyone from the start, and helps them to feel at ease in engaging with the content. It helps to highlight the benefits of the enumeration process by gauging what the community already knows about their community. Simple information like population size, employment and education statistics, as well as information about their access to basic service delivery is usually not available to them in a productive format when engaging with municipalities to meet their demands. This process highlights the need for the enumeration in the first place. The availability of this data to them is the only promise that can be made and it needs to be highlighted that this data is an empowerment tool. If the community accepts, the enumeration process can begin.

An in-depth enumeration exercise will be carried out by the selected volunteer members of the community to collect the data on the demographics and dynamics of the communities (they are provided with a stipend per enumeration and a device with which to capture the data).

Early engagement through community mobilisation is a significant aspect of this step – an institution cannot just appear with questionnaires. It is essential to invest time in the exercise so that residents are aware of the project. Communities need to take ownership of the enumeration exercise. These communities have ‘survey-fatigue’ and they may have mistrust in the system when there has been no useful outcome from the questionnaires to them or they have not been kept informed on the progress.

Data collection

In order to get the right information, it is useful if the data collector volunteers are recruited from the respective communities. Oftentimes, external recruiters are treated with suspicion and not afforded the same respect as people within their community who they can trust. Capacitating data collectors with training on how to do the exercise in-house also shows the community that you are willing to invest in them. The exercise requires data collectors to administrate a questionnaire to every household after getting their permission, and to map the services in the neighbourhood they enumerate. The last six digits of the ID number of each of the household respondents is captured when answering the questionnaire for use in verification in the final step of enumeration.



Figure 2: Community engagement

⁴ If no elected leadership is present, then the mapping exercise should highlight stakeholders with local relevance and influence in the community.

Table 1: Tips for data collection



How to get a list of volunteers

Detailed explanation

This is context-specific, however, there are a few common ways:

- In some communities, municipal job-seekers databases can be visited by engaging with the relevant sub-council. However, many of these databases are outdated (communities may not trust these databases because of assumed political interference, and often want people from their own communities to do the data collection).
- Communities can facilitate random volunteering during a general meeting (unemployed people who meet the requirements come forward)
- Communities list all the unemployed people's names into a container, and randomly pick the required number of volunteers.



Criteria to choose volunteers to become data collectors

Detailed explanation

- Resident. The volunteer should be a permanent resident of the given community.
- Unemployed. There is an emphasis on recruiting otherwise unemployed volunteers who are not politically affiliated. The reason for this is to avoid residents monopolising opportunities in order to give the less fortunate a chance. It also has to do with their availability. Community (and other) politics may disrupt the entire exercise, so politically vocal volunteers should be avoided at all costs.
- Diversity. While language, race and gender are not prerequisites to volunteering, the coordinators have a choice to recruit a diverse team to their benefit. Based on previous experience women tend to understand how to liaise and share information around the community and are traditionally a bit more resilient when it comes to getting the required information. They are also often able to verify the information sooner.
- Education. As writing and comprehension is required in the process, volunteers should have a minimum of a Grade 9 certificate.
- Assessment. It will be determined during the training sessions whether the volunteers can in fact do the job. If they are not capable collectors, they may be given another job within the enumeration process.



The data collection process

Detailed explanation

- After two days of training, the data collectors are paired into teams of two. One asks the questions, while the other documents the information. Each team gets a electronic device (tablet) to document the information required.
- A questionnaire, in both English and the dominant language, is provided.
- Charging services (for the tablet) are offered if there is no electricity in the community.
- Using a map, the data collectors indicate all the amenities/services and community structures in the settlement.
- Usually, an informal settlement follows a numbering sequence for its structures. A data collection team will be assigned a set of structure numbers to complete, e.g. Collector A must complete questionnaires for structures 1-15. Not all informal settlements have a numbering system. In this case, the enumeration team must find a way to number the structures in order to capture their information correctly.
- The data is submitted to the database once a week.

Data cleaning and verification

Once all the responses have been recorded and are uploaded to the database, there a few steps to follow to determine the authenticity of the data.

Firstly, it is important to authenticate the information as it is being received. This is one of the reasons it is so valuable to have volunteer data collectors from the respective communities. They are often able to verify the information received on the spot – for e.g. they know beforehand that their neighbour's husband has a permanent job and is not unemployed, and can correct this information straight away.

If data entries per household do not align, they can be tagged for further verification. For e.g. the respondent may have said that they are unemployed, but later on in the questionnaire, they state that they spend 2 hours travelling to work. This kind of information can be quickly picked up and verified by the data collector. Data collectors are advised to pick up on this while they are administering the questionnaire. However, it depends on what the irregularities are and whether they are relevant for the purposes of the project to revisit.

Once the database is concluded, the database is printed out and delivered to the community. To verify the information written against their names, respondents of each household must sign next to the information next to their name (in this case, the last six digits of their ID) to confirm that the information was recorded accurately. The community is usually given a week to come and check their details, before it is assumed that the database is correct.

The final step of the verification process is during the feedback session with the community or representative community leaders to understand if the data accurately represents their community. This can be presented in a meeting or workshop format (or a combination), but is a very critical step in the process and cannot be excluded. There are many reasons why a respondent may feel the need to misrepresent information about their household.

These could include pride (embarrassed to indicate that there are only bush toilets available); suspicions about what the information would be used for/who it is being used by (would good information prevent us from advancing in service delivery or from receiving social grants?); or political reasons. Having this feedback session helps to clarify this information, and add any additional insights which may prove useful lenses through which to read the data. All of this is impossible without a co-designed session to unpack this.

Co-design: Interpreting the data to build a rich picture

A participatory community co-design process must be informed by real-world data collected in the enumeration process detailed above. This database co-design approach protects the process from getting pulled off course by participants (all decisions should be backed up by the data) while still allowing impact of participatory co-design.

At Freedom Farm and Malawi Camp, multiple co-design workshops were held with the leadership structure. They are structured as 3 hour long off-site meetings (neutral ground). The purpose of these workshops was to co-design an interim energy intervention with each community, as this was highlighted as the most pressing need following the mobilisation and enumeration stage of the process. These workshops focused on:

- Creating trust and connection between stakeholders.
- Creating a clear understanding of the issues being workshopped.
- Identifying, verifying and understanding the "assets" in the community.
- Identifying, verifying and understanding what are the most important energy needs.
- Identifying, verifying and understanding what the main problems were in the community.
- Prioritising and deconstructing the most critical problems that could be solved.
- Defining potential solutions and what they would require from different stakeholders.
- Identifying the most desired solution from the most appropriate solutions.

The workshop structure required the team to be creative to maximise meaningful inputs from the community given the language and education barriers. Various tools and facilitation techniques were used to ensure that all participants felt empowered enough to collaborate. The workshop structure is detailed overleaf.

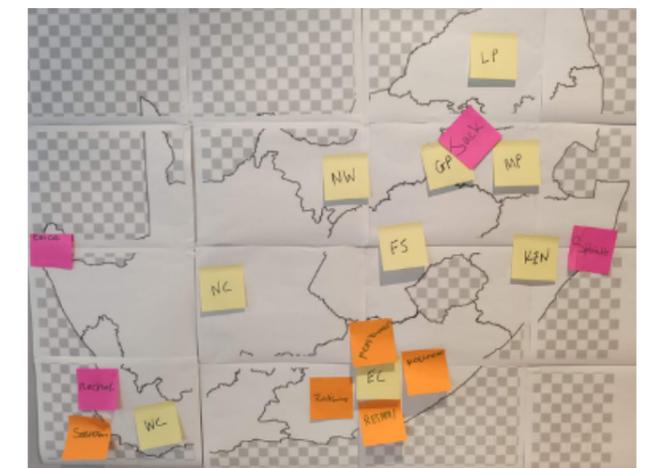


Figure 3: Birth map

| Co-design Workshop Session | Session Objective | Objective Expanded |
|---|-----------------------------------|--|
| INTRODUCTION / SCENE SETTING | | |
| Opening: Community leadership to open the meeting and confirm quorum | Opening of the meeting | The community leaders are asked to open the meeting – usually with a prayer – they are given the option to chair the meeting. Quorum must be achieved - this ensures that important decisions can be taken in the meeting and not delayed. |
| Objectives of the meeting (understand and prioritise key community problems for energy intervention to address) | Clarity / understanding | To ensure that all participants are on the same page, and can relevantly contribute to the subject at hand, deterring diversions that are |
| Introductions: Name, and where you were born/grew up (birth map) | Creating connection | <p>There is a large migration of people from other parts of the country into Cape Town every year. Many of these regional immigrants find themselves in communities like Freedom Farm and Malawi Camp. South Africans are particularly proud of where they come from, and the heritage they carry. Being able to connect in a new space based on where you are from creates bonds that have the potential to look past race, gender and class – if only for the purpose of creating a comfortable space for fruitful and productive engagement for a few hours.</p> <p>Another less obvious reason for this exercise is to get everyone’s voice in the room, right from the start – with a question hopefully all can answer with ease.</p> <p>Figure 3 illustrates this exercise.</p> |
| Guiding principles for the meeting: respect, courage, empathy, participation | Setting rules | This step spells out the key principles and ground rules that are essential and applicable to all for a successful meeting. We ask for suggestions from all participants to ensure that everyone feels respected and understands what is expected from them in terms of how they engage. |
| CONTEXTUALISING | | |
| Exploring the community: (each person to share) What is currently your top need that you use energy for? What do you currently do to meet that need? | Understand current energy context | Each community member’s contribution during this exercise weaves together the tapestry of what is currently in place in their community. People are already living here, and have done so for many years. This helps us to visualise current practices from both the data and lived experiences to get an idea of what we have to work with. |
| Dreaming exercise: (in groups) What would your community look like with reliable access to energy? | Understanding of aspirations | This exercise is always a slow-start. But once community members start dreaming, it is tough to get them to stop. From written word, to drawings, we get insight into dreams of a shared future, powered by (alternative) energy. Great insights into aspirations, but also the reasons behind them, become clear in some of the artworks (and aspirations) that come out of this session. Please see Figure 4 for an example. |

| Co-design Workshop Session | Session Objective | Objective Expanded |
|---|---|---|
| Prioritisation exercise: (everyone) Overview of enumeration results provided Community members list problems in their community The problems are grouped into different themes These themed problems are debated and placed on a Prioritisation Grid. | Understanding the main problems | The point of this exercise is to create the understanding that there are many problems, but accepting that we cannot address them all. This exercise helps participants to introspectively determine which issues are the most critical to the community for energy intervention to address. It is also a useful platform to discuss the enumeration results, and to verify the information useful for the project by getting direct feedback on the authenticity and reasons behind some of the data which was collected. This exercise is further elaborated later on in this paper. |
| DEFINING POTENTIAL SOLUTIONS | | |
| Breaking down the top issues based on their level of intervention (everyone) – do these require household level; block level or community level interventions? | Understanding what level of intervention is required | It is easy to assume what level some of these interventions can or need to be at based on perceptions, understanding of the technology and even from the enumeration data received. However, often, community members have a clear understanding of their own dynamics and can elucidate what would work at which level. For example, while we might assume that area lighting would solve a more pressing need based on crime statistics in the community, the lived experience may dictate that community members believe household level lighting is better protected and useful for their purposes. |
| Walk-about: (everyone) Go to where different potential solutions are pinned up (for example, home solar systems; microgrid; area lighting (Wifi-enabled); energy hub; etcetera) For each one, cover information like the approximate monthly cost for operation; what level of intervention it would be suitable for; what kind of appliances it can power; and allow for questions and answers Understand which technology is best received | Understanding what the possibilities are for a suitable energy intervention | This step helps clarify what types of interventions are possible, what they entail in terms of Understanding what is possible, and also, what it means to ask for a specific technology. It helps ASDU ascertain which technology is best received. |
| Wrap up and close: (community leadership and facilitator) Request that community leaders take this information back to their community Summarise way forward from ASDU What is one thing that everyone learnt today? | Clear way forward | Consciously closing a meeting like this one which was full of activity helps to ensure clear understanding of next steps and a way forward |



Figure 4: Dreaming exercises by workshop groups

Prioritisation Grid – Impact vs urgency

The ASDU team, as well as all the participants of the workshop, understood that there were many pressing and far-reaching problems within the community of Freedom Farm and Malawi Camp. Many of these issues were interrelated, and left various marked effects on different people and groups. Even within the leadership group, there were many contradictory opinions on which issues were the most important to address – and which were less urgent.

However, before working with the themed issues on the prioritisation grid, participants are asked to simply state problems they faced in their community (see Figure 5). This resulted in a range of responses which were then, with consensus, grouped into various themes (the colours of the sticky notes have no meaning). For some of these themes ahead of the prioritisation grid, it was agreed that particular solutions or problems within the themes should be considered rather than the overall grouping (for example, targeting area lighting specifically rather than crime). For each of these and to decide on the groupings, we facilitated and encouraged a respectful argument and debate amongst the participants.

Empathy is imperative – facilitators need to be aware of the leaders' lived experiences, and again, bring everyone's voice into the room. This facilitated a healthy, kind debate on what issues were important and vital for the community to survive and thrive. Semantics is often dismissed, but was especially crucial to developing trust and honest discourse. To this end, we struggled significantly with our choice of words for the axes on this grid. Originally, the axes were:

- Horizontal: Not urgent → Urgent
- Vertical: Important → Super important

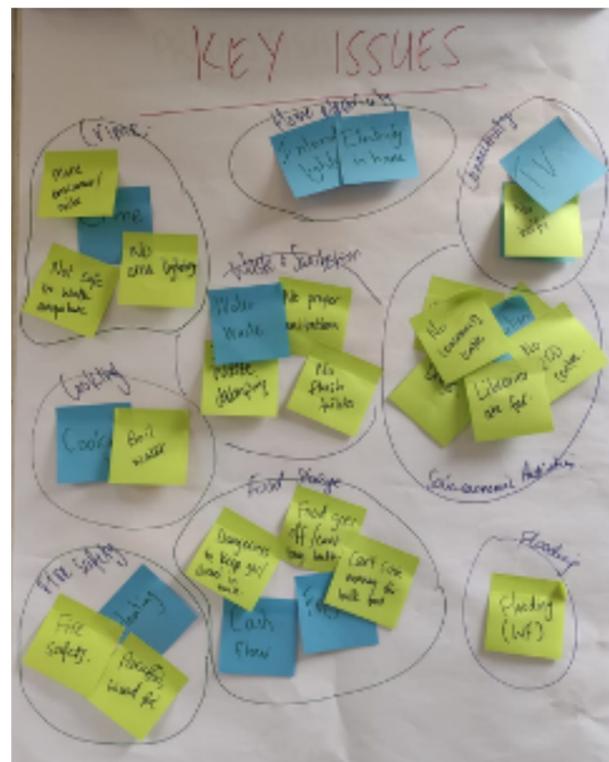


Figure 5: Grouping key issues into themes

Of course, with such a spectrum, everything was urgent and super important, and it would be unfair to suggest otherwise. This is an invaluable but very difficult space to navigate to make otherwise helpless people choose which of their problems they needed addressed first. The facilitators could also not afford to make any overarching promises – so we guided an introspection into what solutions they would prioritise if they had (to make) a choice.

For the prioritisation grid below (which focused on how the problems could be addressed by the themed solutions or focus areas), facilitators considered the urgency of each (from 'can wait' to 'need now'). Facilitators also re-evaluated what we meant by 'important'. The group settled on *impact*, which meant that the vertical axis now moved between what interventions or focus areas would be 'useful' to the community to which would 'change lives'.

This helped the facilitators guide the conversation. For each of the themed items (for example, fire safety; waste management; socio-economic activities, etc.), the participants placed sticky notes across the grid based on where participants felt they ranked.

Of course, these items moved around considerably in relation to new items that were presented. For example, connectivity was originally much higher on the urgency axis, until area lighting was discussed. We held space for each of them, and eventually went around the room, asking if each and every person was satisfied with how the final grid looked. When there was consensus, facilitators went one step further to understand what level of intervention would be welcomed in the community for the top three interventions – i.e. for each intervention, would the community require a household-level; street-level or a community-level intervention.

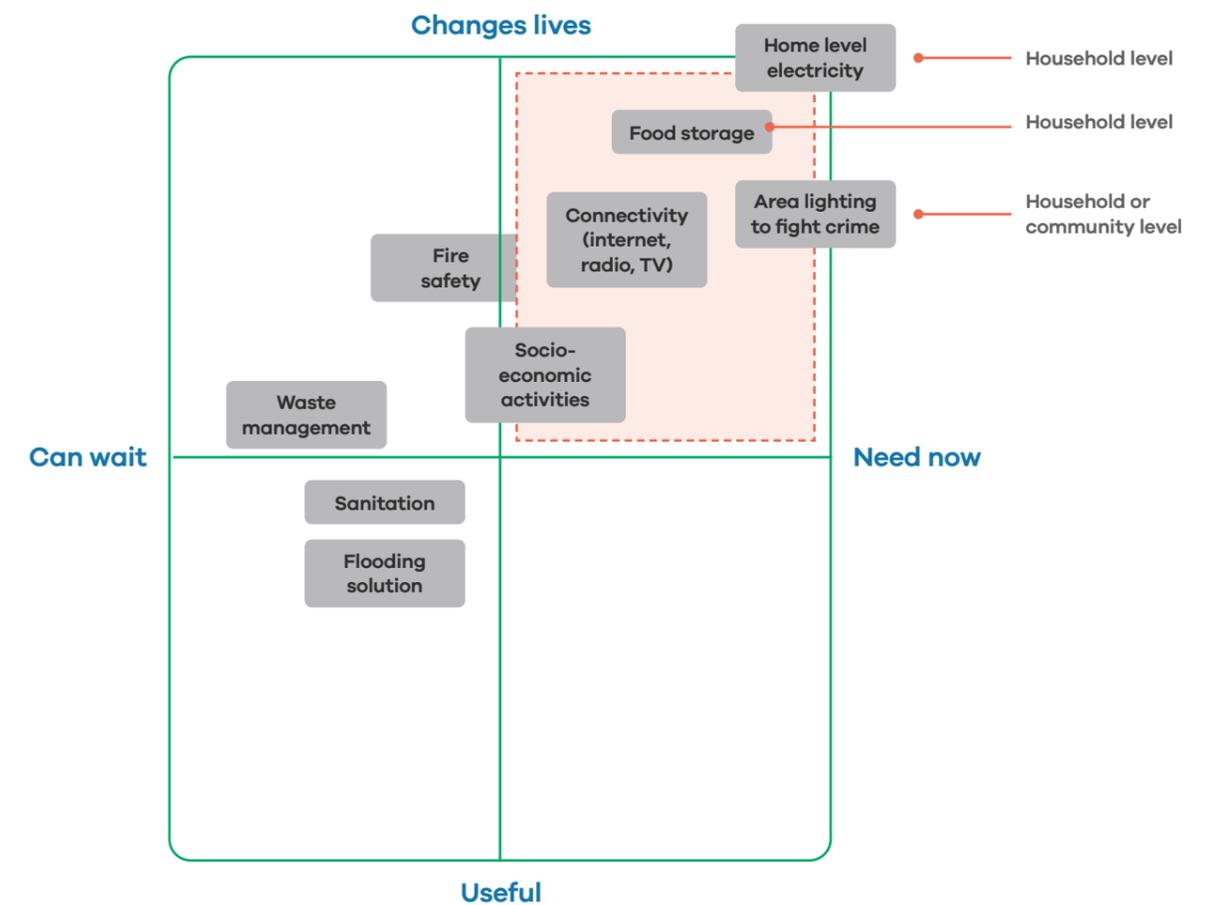


Figure 6: Prioritisation Grid (urgency vs. impact)

Facilitated by a participatory co-design process, the community leadership of the two communities prioritised the following key issues:

- Home-level electricity;
- connectivity (the ability to connect to the internet – potentially community-level; and to watch television and listen to the radio – household level);
- household level safe cooking;
- socio-economic activities;
- the product must be transferable to a new location as these two communities are awaiting relocation.

Affordability was also a serious consideration – both for the funder, but also for the community. The willingness to pay for a service is a trend we have been observing in all of the communities we are working in, however, the capacity to pay is different for each one. This type of business model is important to implement because it fosters greater buy-in and protection of the end product, while supporting the on-going maintenance of the system (should it be necessary).

In the case of Freedom Farm and Malawi Camp, a maximum monthly payment of R150 was acceptable to them, based on what they were paying for other sources of energy – such as paraffin, candles, gas. In fact, we understood from our processes, that they were being charged ~R5 a candle. If they used one candle per room of their structure per night, this could be as much as R35 per week on candles alone (assuming one room). This does not include their need to pay for other sources of energy.

The results of this co-design process were then overlaid with the enumeration data to help us to design intervention briefs for the two communities. These intervention briefs were supplied during an extensive tender evaluation process to determine the best service provider to provide these two communities with an energy intervention to suit their needs and desires.

Through a collaborative and immersive design process with the community based on their enumeration data to understand which alternative service offering would be the best fit for them, an experienced solar PV micro-utility company was chosen. This service provider met most of the needs of the community in the following ways:

- Solar home system comprising of a solar PV panel, battery AND on-going operations and maintenance support;
 - With this system, the basic offering could be powered for 8-10 hours per day.
 - The battery will last minimum of 2-3 years.
 - The system is paid for after 24 months, and can be relocated as required.
- Basic offering covering three internal lights; power for small appliances and devices (e.g. charging cell-phones or powering a small music system or tablet);
 - The basic offering would cost R50 per month for 24 months, with a once-off installation fee of R350. The system is then paid for, and belongs to the community member, and thus may be relocated with them.
- Upgraded offering includes a 24-inch flat-screen LED television that can be powered by the solar home system
 - This upgraded offering would cost R200 per month for 24 months. At the end of this period, the TV is theirs, along with the rest of the system.
- A community fund is created from a portion of the monthly TV payments, which can be used by the community to fund shared community resources (e.g. expansion of the community crèche; development of a food garden; bursary schemes; emergency funds; helping poor or unemployed to stay up to date with their payments)
- The project trains some community members to be qualified installers. Some of these trained installers will be employed by the project.

With the community now having access to (alternative) energy that can power appliances and devices, it makes them eligible for certain services that would not have been possible before, such as community-wide Wi-Fi services. This was a deciding factor when finalising bids because the other options, while potentially facilitating safe cooking or meeting other needs, would not enable a potential future upgrade of this nature. Without the combination of an in-depth enumeration exercise and participatory co-design process to build our understanding of the community's wants and needs, it would not have been possible to design such a solution for sustainable and alternative service delivery.

Conclusion

Cape Town is vulnerable to various chronic stresses such as high inequality, poverty and a lack of social cohesion. These threaten the fabric of the city, making it ever-vulnerable to the impacts of future shocks. Residents of informal settlements and other low income communities are often deemed the most at risk to the impacts of these shock events. To build their resilience, and the resilience of the city, it is imperative that we work together to collaboratively design alternative solutions that are sustainable, resilient and desired.

Impactful community mobilisation, of this kind, must be founded in the intersection of measureable shared data and asset-based community participation. The combination of these two distinct but intertwined fields creates the possibility of resilient urbanism. This is urban development that embraces and builds upon the multiplicity of the everyday urban reality, exploring means of improving what already exists, in an incremental way, and creates a dynamic urban form that builds resilience from within.

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