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Resilience planning under information scarcity in fast growing African cities and towns: The CityRAP approach

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ABSTRACT

Urban planners seeking to enhance resilience contend with the complexity of interdependent systems and severe gaps in data and information. This complexity-capacity gap is most evident in smaller, rapidly growing cities. Experience in Africa shows these are also the cities where most risk is accruing and where the majority of population growth is felt. Bridging this gap to build resilience requires new decision-support tools that can operate on data that is not comprehensive but good enough. This paper examines the prospect for such a generation of tools to enable decisions that can build resilience that also enhance inclusive decision-making processes. It draws from the experience of the City Resilience Action Planning Tool, developed by UN-Habitat and shows how this or other similar tools can: build local government capacity; attract additional investment; contribute to longer-term processes of legislative reform; generate cooperation between communities and local government, and; work across power dynamics and open space for further collaboration.

1. The urban complexity-capacity gap

African urban systems are complex and interdependent. Data and human resource constraints mean that for planners in African cities decision-making continues to be undertaken in conditions of heightened information scarcity. Advances in information technology offer some support but are seldom comprehensive or contemporary across the range of concerns important to resilience planning. This is not a minority problem. The gap between urban complexity and data availability is stark across the majority of poorer and smaller cities where growth can be most rapid and resilience most stretched. This is also not a problem that technology will resolve soon. Bridging this gap requires mechanisms that can enhance decision-making where data will continue to be limited in the medium term. Meanwhile, in most low and middle income countries, the speed of urban growth is currently outpacing existing policies, tools, means and capacities to manage it adequately. The Sustainable Development Goals and the New Urban Agenda demand that no-one and no place are left behind. This global agenda highlights that support tools for urban planners that respond to the urban complexity-capacity gap need to also respect the principles of inclusive decision-making and of development that can be informed by local priorities and knowledge. One response to these challenges is the City Resilience Action Planning (CityRAP) Tool [1] developed by UN-Habitat,[1] including within the Urban Africa Risk Knowledge (Urban ARK) programme. The experience of designing and deploying this tool presented here allows a wider discussion on the challenges and opportunities for systems thinking and a resilience lens for urban Africa.

Demographic statistical projections indicate the scale of the urban

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[1] For more information, please consult: http://www.dimsur.org.

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challenge for Africa. The urban population of sub-Saharan Africa will triple in absolute number by 2050 as compared to 2015, passing from approximately 400 million to 1.2 billion people [2]. In most cases, both central and local governments of the region are ill-prepared for such an extraordinary growth. Rapid land use change at the outskirts of cities and towns due to uncontrolled urban sprawl, combined with the increased needs (especially in terms of access to basic infrastructure and services, such as water, electricity, etc.) of a predominantly poor population that has migrated to urban areas looking for a job or income, growing socio-economic inequalities, lack of urban planning and management capacity and weak financial mechanisms, will undermine the aims of the Sustainable Development Goals without action now to prepare for the future. A future where urban growth is too often accompanied by an accumulation of urban risk, which has consistently been observed across the continent, favoured by inadequate urban development interventions and exacerbated by the impact of climate change [3].

The time delay imposed on comprehensive reforms to grow governance capacity (probably 15–20 years, based on UN-Habitat experience in Africa) points to building on existing local capacities as the most viable solution in the short to medium-term. This can be deployed alongside broader processes of policy and legislative reform, though the scale of reform needed, the pace of African urban growth and its complexity suggest catch-up is a long-term aim. Due process for policy catch-up requires much necessary legal and institutional reform at different levels including for finance, land zoning, infrastructure development, education, health and community development. However, at present many cities and communities at risk, face the cumulative effects of political challenges for the design and application of land reforms, obsolete and/or weakly enforced policies and legislation, financial constraints, inefficient governance and increasingly the impacts of climate change. The growing complexity and spread of the African urban challenge are especially visible in small towns and intermediate cities where the distance required for catch-up and the speed of urban growth is most dramatic.

How can external agencies support existing local capacities to contribute more centrally to urban resilience planning? Urban resilience planning is understood here as an integrated effort to plan coordinated actions targeted at the short, medium and long term for improving the city or town's resilience, i.e. its "ability to maintain continuity through all shocks and stresses, while positively adapting and transforming toward sustainability" [4]; p. 13). The first imperative is to build a common understanding and solid cooperation mechanism for city governments and urban dwellers to enable them to face this challenge jointly, with shared responsibilities, and guide city development towards more sustainable paths. Secondly, out of the multi-faceted complexity of the urban challenge, is the need to clearly identify priorities, in a participatory manner and through consensus-building, responding to the question: "where to start and why?". It is not feasible to try and address all issues affecting an urban system simultaneously. Prioritisation requires a transparent process for identifying who determines priorities and the basis upon which these are selected. This is a core tenet of leaving no-one behind. Since issues of urban poverty reduction, economic growth, quality of life and resilience are inter-linked, prioritising critical underlying issues opens scope for multiple issues to be addressed within a resilience frame. Thirdly, and while responding to the question: "how to do it?", achieving these priorities should translate into defining implementable actions, or fundable projects. The difficulty is to trigger this process in a way that can be led by the end-users of city management, i.e. the municipality or city council. The aim of the CityRAP Tool is to close the complexity-capacity gap by fostering an endogenous development dynamic, and so avoiding the trap of local actors and agendas being driven by external expertise, vision and norms. The alternative – and currently dominant mode of working – is for external planners or entities to increasingly set priorities for the management of urban systems, which are not sufficiently contextualised and/or owned by local actors. Beyond any losses of effectiveness or legitimacy arising from inadequate inclusion of local knowledge, this approach misses an opportunity for the process of resilience building to enhance city-level ownership, responsibility and capability for strategic planning – the procedural expression of leaving no-one behind.

In response to this challenge, the development of the CityRAP presents a concrete tool that has been co-designed through participatory processes with city planners to offer concrete experience for conceptualising, co-producing and deploying a tool as a lens onto the process of opening spaces for demand-led urban resilience planning and, importantly, prioritising actions for supporting city-level actors in progressively building urban resilience. After all, resilience building relies fundamentally on local capacity to absorb shocks and stresses and to transform to better adapt to them while developing in a more just and sustainable manner. Strengthening such a capacity will be difficult without the involvement of the local actors from day-one of the resilience planning process and ensuring full understanding and ownership of the decisions being made.

After framing the current complexity-capacity gap and reviewing existing literature and tools, the paper focuses on the key concepts co-defined with city planners that underpin the CityRAP design. This is followed by a discussion on wider implications for resilience planning in fast growing, poor cities, and concluding recommendations for its potential scaling up.

2. Urban resilience in the African context

Sub-Saharan Africa will experience the highest rates of urban population growth globally over the coming decades [2]. As a result, the growth of cities and towns and their spatial form and expansion will increasingly exceed formal planning capacity. In the absence of adequate, affordable social or public housing processes, the urban poor, including vulnerable migrants tend to settle informally in hazard prone areas. This results in a concentration of risks associated with inadequate disaster risk management, lack of access to basic services and critical infrastructure maintenance, within already weak urban planning and governance frameworks. Such vicious cycles increase stresses and enhance inequality exacerbated further by the impacts of hazards driven increasingly by global environmental change [5].

In the face of these complex, interdependent challenges African city governments often face difficulties in owning planning processes aiming to reduce risk and promote sustainable urban development [3,6–8]. This is a consequence of centralised policies and/or institutional architecture and lack of municipal finances, human resources, data and technical capacity with which to observe and understand complex, systemic urban processes. Lack of data leads to imperfect knowledge so that planning visions draw from assumptions or are open to emotive political narratives, for example in representing the urban poor and their places of residence and work [9]. For all but the largest African cities, constraints on human resources and visualising the city are perpetuated through a lack of command over financial resources and inadequate legal and policy frameworks [5].

As a result, city managers tend to rely on national governments and resort to outside expertise to make and implement key urban development decisions [10,11]. City governments and municipal assemblies are marginalised from their roles as assigned by decentralisation policies and, consequently, adequate urban planning and management process and outcomes are undermined. Good urban governance is based on civic participation in decision-making; however, as planning control drifts from the city to external actors (e.g. national government, consultants, donors or business companies), the citizenry is in most cases excluded from planning processes in African cities [12]. The local population is commonly disempowered largely due to the belief that they do not have the required understanding and knowledge to contribute meaningfully to a complex issue such as urban resilience planning, for example, or simply because their participation is seen as a hurdle to an investment

objective.

3. Review of urban resilience tools

The interdependencies of urban systems have stimulated a number of approaches to urban planning. Integrated development approaches of the 1990s responded to local, participatory development tools that highlighted the advantages of joined-up infrastructure planning [13]. More recently urban resilience planning has moved from a focus on physical hazard mitigation towards a more encompassing set of practices that recognise the importance of responding to development gaps – from the rule of law to education, basic infrastructure, and self-empowerment to environmental quality as necessary in their own right, and as basic components for urban security and flourishing [14].

The emergence of urban resilience as a central working concept in the development and humanitarian community has resulted in an increasing number of tools and guidelines [15]. Each works to frame visions and practices for urban planning – determining who has a voice and how priorities for planning are selected. Table 1 details seven leading urban resilience planning tools, which are discussed below. Inclusion in this analysis was based on three criteria: (1) all tools understand resilience as a broad, cross-sectorial and integrated concept – although some have specific focuses and emphasis (e.g. climate change adaptation, disaster risk reduction, urban governance and management); (2) they are relatively recent tools, published between 2011 and 2018; (3) these tools have been created by (or in partnership with) international organisations with a global presence and perspective.

While most tools put emphasis on the role of local governments, they require capacities that are not yet available in the context of most fast-growing cities in Africa. ACCCRN and BARC are meant to be applied by local governments with minimal external support; this may be difficult for cities with low capacity and little data availability. Meanwhile the other tools, despite providing a leading role for local governments, suggest that expertise is mobilised to support the process. CRPT also includes specific training sessions, significant data collection and study tours, which have non-negligible cost implications for the city. CRI targets support to local authorities in partnership with the Rockefeller Foundation. CSD is directly implemented by an external team of experts.

ACCCRN and BARC provide a step-by-step methodology that includes data collection and analysis, prioritisation, planning and monitoring and evaluation. In particular, ACCCRN is composed of six phases, each one including specific instructions meant to empower local governments. Meanwhile the other tools put more emphasis on assessing the state of resilience through qualitative and quantitative methods, with less detailed guidance for action planning. RPM proposes a general cross-cutting framework to be applied in all initiatives to make them risk-informed and resilient.

None of the analysed tools put significant emphasis on community participation in the resilience planning process, nor on the establishment of a systematic consultative process with all concerned stakeholders to enable collective data/information gathering, analysis and decision-making. Generally, these tools tend not to take full advantage of existing local knowledge in the planning process. The analysed tools are generally complex or require robust technical input to deploy external support for their implementation. They risk falling into the trap of reinforcing top-down planning dynamics.

4. Locally-led city resilience planning

Since the urban dimension of resilience has not yet been sufficiently addressed in existing policies in Africa and institutional knowledge around this topic is still under development, the current trend is to rely mainly on the mobilisation of outside expertise resulting in top-down urban resilience planning that shifts the decision-making power away from the population and the responsible municipal staff. This is despite often considerable experience in local government and by organised

Table 1
City resilience planning tools.

Name	Owning Organisation	Status	Aim/Niche
Asian Cities Climate Change Resilience Network Process (ACCCRN)	ICLEI	Tested in three Indian cities: Shimla, Bhubaneswar, and Mysore – and is subsequently being used in a range of cities in Indonesia, Bangladesh, the Philippines and India.	Streamlined process for cities to assess their climate risks, formulate and implement corresponding resilience strategies.
Building Adaptive and Resilient Communities (BARC)	ICLEI	Widely available online; focus on cities in Canada.	Compendium of resources that provides a milestone-based framework to assist local governments in the creation of adaptation plans to address the relevant climate change impacts associated with their communities.
City Resilience Profiling Tool (CRPT)	UN-Habitat	Different versions and parts of the tool have been implemented in cities like Barcelona, Port Villa, Asuncion, Maputo, Lokoja, among others.	Framework to diagnose the level of resiliency (through various indicators) within a city and proposes a plan on how to increase it through action.
City Resilience Index (CRI)	ARUP	Piloted in 5 cities: Shimla, India, Concepcion, Chile, Arusha, Tanzania, Hong Kong, China and Liverpool, UK.	Comprehensive, technically robust, globally applicable basis for measuring city resilience. It is comprised of 52 indicators that combine qualitative and quantitative data.
City Strength Diagnostic (CSD)	World Bank	Implemented in Addis Ababa, Chan To, and other cities.	Rapid diagnostic tool for cities that results in the identification of priority actions and investments for resilience. It is an engagement process, not an analytical study.
Disaster Resilience Scorecard (DRS)	UNDRR (ex-UNISDR)	Available for ample dissemination and application.	Provides a set of assessments for local governments to monitor progress in the implementation of the Sendai Framework for DRR and assess their disaster resilience.
Resilience Pathways Model (RPM)	UNOPS	Ongoing development; tested in Afghanistan, Bangladesh, Curaçao	Proposes a path for planning and implementing development and humanitarian actions mainstreaming resilience. It is not a stand-alone process but rather a tool to be applied during other projects and actions, approaching resilience at different levels, scopes and contexts.

Sources: Gawler and Tiwari [16]; ICLEI, UN-Habitat [4]; ARUP and The Rockefeller Foundation [17]; Lynch [18]; UNISDR [19]; UNOPS [20].

community actors in the components that make up resilient communities and cities – critical infrastructure planning, inclusive decision-making and social development. This creates a perverse incentive that justifies a missed opportunity for strengthening local institutions in the name of 'leaving no one behind'! In response, we argue, there is a need for a paradigm shift in the development and implementation of urban resilience planning tools that challenge this drift towards external professionalisation and enable local authorities and communities to lead the planning process. This is not to romanticise the local but rather to acknowledge the centrality of the local in sustainable, legitimate and contextually appropriate planning processes.

4.1. The CityRAP tool methodology

CityRAP was conceived and developed by UN-Habitat between 2014 and 2019 in co-production with several local governments in sub-Saharan Africa and aims to operationalise such a paradigm shift. Within the broad spectrum of urban resilience, the tool is built on participatory methods and consensus-building techniques to involve all those concerned stakeholders to identify the entry points to start building the city's resilience in a progressive manner, with minimal external support. As explained earlier, resilience building is an all-encompassing concept looking at reducing (both environmental and socio-economic) risks, enhancing adaptation and promote sustainable development. Since it is not possible to address all these aspects at the same time, there is a need to prioritise and identify the key entry points so that the concerned local authorities are fully in control of the urban resilience planning process.

The conceptual framework of CityRAP aims to contribute to this paradigm shift, it draws on external expertise not to remove from cities vision and experience of decision-making, but to co-create with local decision-makers a participatory planning process that culminates in a locally determined ten-year city Resilience Framework for Action (RFA). This planning process is structured around five pillars: urban governance; urban planning and environment; resilient infrastructure and basic services; urban economy and society; and urban disaster risk management. These pillars guide city government in collecting and

Fig. 1. A schematic overview of the four phases of the City RAP Tool process.

analysing locally available data, knowledge and information in a way that enables city leadership in strategic thinking and action planning for reducing urban risk and building resilience. The process of interaction between the city team and external facilitators is ideally completed within two to three months through four phases (see Fig. 1):

4.1.1. Phase 1: building understanding

Resilience planning integrates across professional disciplines. To enable effective dialogue, it is necessary to find a common language with which all involved stakeholders (e.g. community representatives, municipal and central/sub-national government staff, civil society organisations, academics, private sector representatives and the media) are able to communicate. This goes beyond the use of a common glossary or simplification of dialogue. In this phase, a four-day course is organised by external trainers to demystify the intrinsic complexity of the concepts defining urban resilience through simple and interactive presentations, art-based materials, games, group exercises and open debates.

In this phase a satellite image showing the city is used to select, by simulating a participatory planning exercise, the most vulnerable neighbourhoods where data will be collected at the community level. The selection of these neighbourhoods is mainly based on criteria such as: exposure to natural hazards, poverty, criminality, access to basic services and infrastructure, etc. Additional training is provided to a team of municipal focal points designated by the Mayor, which will be responsible for leading the implementation of the tool during the next phases.

4.1.2. Phase 2: data collection and organisation

Data collection and analysis seeks to integrate formal knowledge of the municipality with the lived experience of communities at risk. This is achieved through three steps. First, the municipality carries out a self-assessment to understand how the five urban resilience pillars are performing based on the knowledge and perception of staff in its different departments. This is led by the designated focal points and by using a questionnaire of seventy-five questions with four closed answers per question. Questionnaire design was initially inspired by a review of existing tools on urban resilience and risk reduction (see Table 1, Section 2). In the course of testing CityRAP in almost thirty African cities or towns during five years, the questionnaire has been revised several times and finalised in co-production with municipal focal points. Second, the focal points meet with communities living in vulnerable neighbourhoods identified during Phase 1. By using a satellite image, local actors are asked to describe the hazards to which they are exposed and to present proposals for specific hazard mitigation. As described by Spaliviero et al. [21] the use of satellite images is key to facilitate participatory planning process at community level since it allows all participants, including illiterates, to recognise their territory and actively provide their inputs. In this way, the use of local knowledge is maximised, and a first prioritisation is made at the neighbourhood level, following a bottom-up process. Third, all collected data are organised in a matrix that allows for the identification in one snapshot of the major gaps to be addressed in building the city's resilience.

4.1.3. Phase 3: data analysis and prioritisation

Data from municipal self-assessment and participatory risk mapping are analysed through five focus group discussions, one per resilience pillar (governance, planning and environment, infrastructure and basic services, economy and society and disaster risk management). Each focus group gathers local stakeholders who are knowledgeable or involved in the area of the pillar being analysed. The leader of each focus group presents the results during a one-day prioritisation workshop facilitated by an external team where all stakeholders are represented. This allows planning to advance beyond the sectoral perspective of each pillar towards a focus on common underlying issues linking the different pillars among themselves. To help understand where to start building the city's resilience, three cross-cutting issues are used as prioritisation lenses: climate change adaptation and mitigation, inclusive and safer cities, and sustainable city growth.

4.1.4. Phase 4: preparation, review and validation of the city's Resilience Framework for Action (RFA)

To build a strategic framework of action each of the priority issues identified in Phase 3 is reviewed through a baseline assessment according to five components or city management dimensions: policies and legislation, plans (both spatial and developmental), institutional set-up (who does what and how actors interact and coordinate), finance, and concrete interventions (i.e. existing ongoing projects and activities related to the priority issue). Following this, priority actions for building resilience are proposed by the municipal focal points with the support of an external team (see Fig. 2), including activities or projects in the short-, medium- and long-term. The proposal is discussed in a participatory manner with all stakeholders in a review workshop. Based on the outcomes of the discussions, clear responsibilities are assigned for each project and a budget is proposed. The compendium of projects, some of which are inter-linked, constitutes the city Resilience Framework for Action (RFA) articulated around a ten-year vision. Of course, the RFA needs to be aligned with existing national and local level priorities, which have been analysed in depth during the baseline assessment. The process helps building ownership of the concerned municipal authorities and the local population, thus facilitating demand-led studies and the mobilisation of expertise do develop fundable projects so that the city can progressively become more resilient.

4.2. Tool design, co-production and implementation process

The CityRAP Tool derives from a long working experience of UN-Habitat in deploying participatory planning approaches at community level since the early 2000's in southern Africa, as described by Spaliviero [22] and Spaliviero et al. [21]. Considering that Dodman et al. [23] recommend that climate change adaptation is based on a dialogue between competent local authorities and the inhabitants of the settlements most at risk, a deliberate choice was made to target city managers and their technical support staff working in the different municipal departments.

The first version of the tool was simpler, composed of three phases (i.e. building understanding, data collection and organisation, and planning) that were supposed to be carried out in only four weeks. Starting in 2015, and in collaboration with governance analysis from the Urban Africa Risk Knowledge programme, the tool has been refined through a comprehensive process of learning and evaluation with city partners. The process was first tested in August 2015 in Chokwe, a 65,000 people city located in southern Mozambique and highly vulnerable to floods. The testing was repeated in Vilankulo and Mocuba in Mozambique, Morondava in Madagascar and Zomba in Malawi until mid-2016. Based on the lessons learned and the feedback received from the targeted municipalities, the tool was progressively revised. This drawn out process of learning and testing with city partners represented an iterative period of co-produced action planning that allowed UN-Habitat to analyse the strengths and weaknesses of the tool, and to implement improvements. These included:

- *Designing a better preparatory phase* to tailor the CityRAP process to the local needs through a preliminary risk assessment and obtain a strong commitment from the targeted local authority, especially by appointing a team of municipal focal points who are dedicated to the tool implementation during two to three months.
- *Replacing the city Resilience Action Plan* (final product of the first version of the tool) *with a city Resilience Framework for Action*, thus avoiding the design of one more plan that may overlap or conflict with existing municipal plans and strategies, and rather designing a

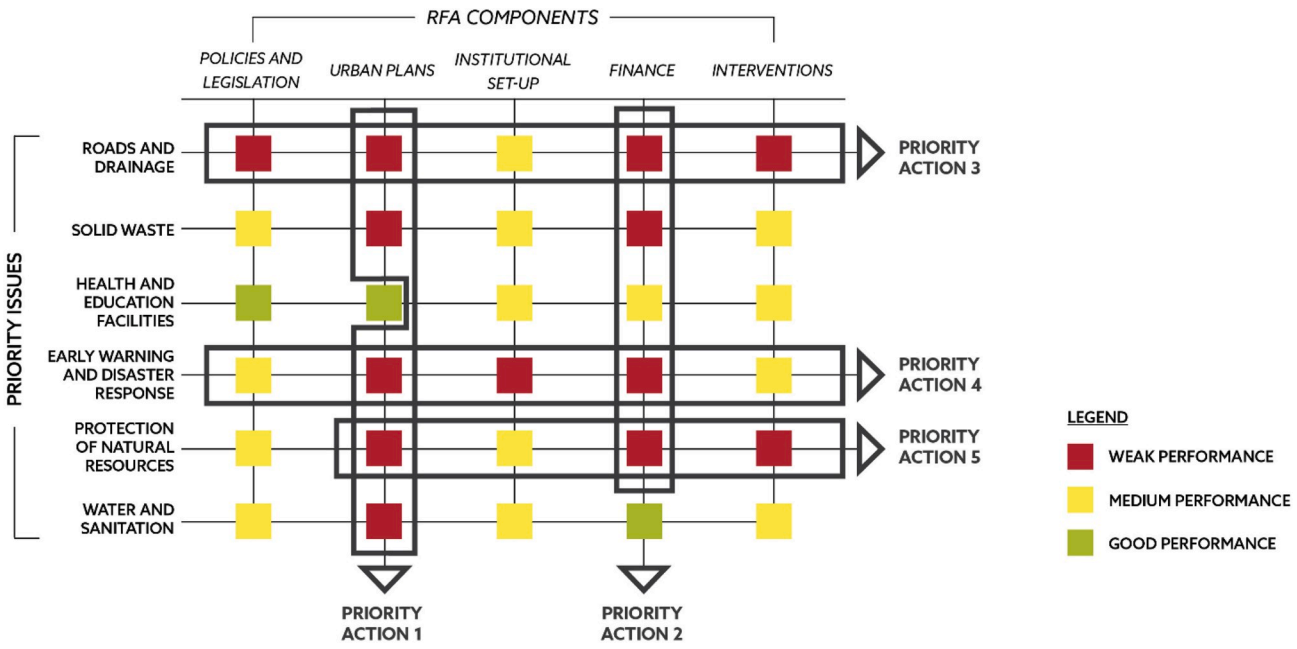

Fig. 2. Baseline assessment and formulation of priority actions during the City RAP Tool process in Chipata Zambia, August 2019.

framework which allows existing and future plans to fit and create synergies for mainstreaming resilience.

- *Breaking down the process into four phases instead of the initial three*, by strengthening the data analysis, prioritisation and having more time for the elaboration of the RFA, hence further leveraging the city government and community's engagement and ownership of the process.

While the second version of the tool was still under elaboration, during the second half of 2016 it was decided to test it in Addis Ababa, Ethiopia, in the flood prone Lideta sub-city (with a population of approximately 250,000 inhabitants). This allowed a real time co-production thanks to the active collaboration of the sub-city focal points in the finalisation of the tool, and at the same time to prove the CityRAP's adaptability to target areas of different sizes without losing its rationale. Consequently, the data analysis and prioritisation phase was improved, as well as the design of the fourth phase consisting of the RFA preparation thanks to the added element of baseline assessment to facilitate action planning and better defined roles of the focal points.

In 2017 the tool was implemented in Ouagadougou, Burkina Faso, at the neighbourhood level, and in Moroni, Comoros, at the metropolitan level. Once again, the flexibility of the tool was shown to work at different geographical scales and in various institutional settings. During the same year, a Training of Trainers (ToT) modality of the tool was designed to favour its dissemination and avoid dependency on the UN-Habitat team who conceived the tool. In addition to the fact that the ToT represented an efficient and rapid approach for forming up to thirty CityRAP national trainers at once, as it occurred in Comoros, Burkina Faso, São Tomé e Príncipe, Cabo Verde and Guinea-Bissau in just four-day sessions, it also constituted an opportunity for further testing and improving the methodology through feedbacks from the participants and simulation exercises. In total, almost thirty African cities and towns were reached in only four years (for more information, please see www.dimsur.org), resulting in a final second version of the tool in 2019. There is evidence of the tool translating into national policies, for example in Malawi, where the CityRAP Tool has been embraced for the urban context in the national guidelines for disaster risk management plans. In Mozambique, elements of the tool are included into a methodological guide for the elaboration of urban plans developed by the Ministry of Land, Environment and Rural Development, to enhance its disaster risk management and resilience dimension.

5. Lessons learned for bridging the urban complexity-capacity gap through local resilience planning

Five general lessons are presented below for resilience planning that can help to bridge the urban complexity-capacity gap. These have been identified through reflection on the CityRAP tool development and implementation processes, including two independent evaluations conducted in January–February 2017 and in September–October 2018 (available online at www.dimsur.org). The latter was an independent external evaluation including the following objectives: (i) to assess the achievement of the tool's implementation in increasing technical understanding and knowledge of municipal authorities in terms of risk reduction and resilience building; (ii) to assess the extent to which the implementation of the tool has created 'value-for-money' and if it has worked well or not; (iii) to make recommendations based on the findings of the evaluation for improving the tool. The assessments and ratings of performance made by the evaluation followed UN-Habitat criteria for evaluation in terms of relevance, efficiency, effectiveness, impact outlook and sustainability.

How to build local governance capacity through resilience planning.

- The tool reached maturity through successive phases of testing and improvement involving local authorities and communities. According to the 2018 evaluation report, despite the tool being user-friendly, it remains relatively complex overall for the municipal focal points to fully implement it on their own, thus the guidance and support from the trainers remain indispensable for the successful preparation of the RFA.
- In terms of implementation, the CityRAP process requires relatively low levels of funding (about USD 50,000 per city), promotes understanding, builds capacities and raises awareness at different levels, relies on local knowledge (which is especially valuable in data scarce environments) and leverages consensus-building and a pragmatic approach for ensuring effective results.
- Local ownership means the tool can be flexibly deployed to fit according to the specific context and demand. According to the 2018 evaluation report, the tool helped promote the efforts of the

municipal staff involved in the process and gave them confidence in their roles and capacities.
- Where implemented, the CityRAP often allowed local authorities to demonstrate their planning and management capacities to the national governments, hence effectively supporting decentralisation goals and building confidence.

How to attract additional investment through resilience planning.

- Thanks to its participatory approach, the tool triggered community self-mobilisation and physical implementation of prioritised actions, such as road opening and improvement of drainage conditions in informal settlements, and voluntary resettlement of people away from a flood prone area in Chokwe, Mozambique. Meanwhile in Morondava, Madagascar, the city council was able to mobilise 1.5 million Euros from an external donor to implement some of the activities to reduce coastal erosion prioritised through the CityRAP Tool.

How local resilience planning can contribute to longer-term processes.

- As mentioned above, the implementation of the CityRAP Tool is already influencing existing legislation and policy for urban planning in Mozambique, Guinea-Bissau, Cabo Verde and Malawi by helping the integration of urban resilience.
- However, according to the 2018 evaluation report, the short implementation period of the tool involves stakeholders for only a limited time and does not provide enough time to cover the resilience concept and proposed interventions in detail. Indeed, there is a trade-off to be reached by the tool, and the idea is that detailed studies can be carried out once the city has clearly defined (and is in control of) its priorities to build resilience progressively, which is the main purpose of the RFA.

How local resilience planning can help generate cooperation between communities and local government.

- According to the 2017 evaluation report, the data gathered by the CityRAP during the participatory planning sessions in the vulnerable neighbourhoods has the potential to be better used for urban planning purposes and should therefore be stored in a municipal database.
- In some cities, community mapping and participatory planning methodologies have been integrated as good practices among municipal staff and have been replicated to gather information and plan with communities. For instance, the city of Chokwe in Mozambique has been using this method to map natural waterways in different neighbourhoods for planning purposes.
- According to the 2018 evaluation report, the resulting city RFA, if not properly supported by technically qualified professionals, can lead to the definition of weak and broad objectives, which are not realistic and thus difficult to implement.
- When implementing participatory planning with communities, some communication barriers may exist in terms of language being used (e.g. if it is too technical it may not be understood by illiterate community members) by the facilitator and his/her mediation skills. The CityRAP Tool provides some guidance on how the participatory planning process should be conducted, and the central role being played by the use of the satellite image as accurate geographical representation of the neighbourhood being studied.
- Another challenge is the geographical scale of intervention, i.e. making sure that the participatory process implemented at the neighbourhood scale is well aligned with planning decisions made at the city level and beyond (e.g. a city being part of a river basin and flooding risk depending on heavy precipitations occurring upstream). Hence, the involvement of city officials and of concerned sub-national or national government entities in the participatory planning sessions is important.
- The 2018 evaluation report indicates the risk of frustrating neighbourhood residents' expectations raised by the participatory process, if these are not managed by a clear communication on the objectives of the process and by supporting RFA implementation, at least through 'quick-wins' projects.

How local resilience planning can support working across power dynamics and open spaces for further collaboration.

- Good communication and appropriate external facilitation can help avoid developing a stand-alone RFA product, manage expectations and avoid frustrations, especially when over-ambitious priority actions have been identified; in general, Phase 4 (RFA preparation, review and validation) has proven to be the most complex one to be carried out by the municipal focal points by themselves.
- Careful selection of the municipal focal points is required to ensure the success of the CityRAP Tool implementation; while they acquire technical knowledge and skills during the process, applying them has proved more difficult, especially when these municipal focal points lack decision-making powers.

Experience to date also raises questions and challenges for further tool development. In particular, how to ensure continuity, monitoring and evaluation once the CityRAP process has been concluded, including the measuring of impacts, remains an open question. This and other lessons learnt indicated above are currently being addressed in the final version of the tool.

6. Conclusions and way forward

The CityRAP Tool represents a first attempt to support fast growing African cities and towns to plan for progressively building their resilience by enhancing their own capacities and taking maximum advantage of existing local knowledge. This is a paradigm shift away from prevailing trends which seek to resolve the urgent need for resilience building in Africa's fast growing urban settlements through expert led approaches. These dominant approaches offer quick and professional solutions to immediate concerns for resilience policy options, but they miss an opportunity to strengthen local capacity through resilience planning, thus undermining the very target of their actions.

Much has still to be done to further improve and scale-up locally centric approaches to facilitated urban resilience building. The CityRAP approach, as any other, is a trade-off between what is ideal and what can actually be achieved. It is important to note key tensions:

- What is more important when implementing the tool: the learning and empowerment process of the local stakeholders or the quality of the city RFA, i.e. the final output?
- How can such a short period of implementation (two to three months) create the right dynamic and enthusiasm at the local level, and at the same time cover the resilience concept and the proposed interventions in sufficient detail?

The CityRAP tool has benefited from an approach that has constantly learnt from experience and adapted its method over time following experience and leadership from city level decision-makers. UN-Habitat is currently making efforts to further improve the tool, which should be considered a living and constantly adaptable approach to the local needs. Specifically, an online training on the CityRAP Tool is under development to increase its outreach and use, develop an auto-learning dynamic and establish a network of local users. This will be embedded in a centre of excellence on urban resilience, the Technical Centre for Disaster Risk Management, Sustainability and Urban Resilience

(DiMSUR) which is headquartered in Maputo, Mozambique, and currently serves four countries in southern Africa. The idea of the centre is to promote the sharing of experiences between neighbouring countries suffering from similar hazards, develop much needed technical capacities and increase local knowledge.

The needs of Africa, this fast urbanising continent, are immense. They require strategic thinking and building of partnerships. This was one of the objectives when introducing the CityRAP approach to the critical eye of the consortium of partners participating in the Urban ARK programme. The authors of this paper are convinced that there is a need to increase the focus on designing and promoting the right tools and approaches to trigger genuine endogenous developmental processes which are essential to ensure sustainability and build resilience. Especially, we should refrain from thinking that existing approaches to local development are providing all the answers.

The CityRAP Tool has met with high demand from several African countries. The Tool is currently being implemented in Comoros, Ethiopia, Malawi, Mozambique, South Africa, Zambia and Zimbabwe allowing scope for further rounds of learning. This said, considering the complexity of the issue being addressed in urban resilience and the rapid urban growth the African continent is witnessing, much more needs to be done to enhance existing local capacities in support to the needs of urban dwellers, especially the poor and the most vulnerable. The CityRAP Tool represents a small but concrete contribution for supporting these capacities in the name of urban resilience that leaves no one behind. Bridging the data scarcity and rapid changes that underlie the complexity-capacity requires not one off-interventions but on-going engagements that can adapt with the complexity of urban risk where solutions and their attendant capacities co-evolve with resilience challenges. The learning approach that lies at the heart of the CityRAP Tool development and will continue with current and future deployments is as important as the detailed mechanisms developed within it. Learning and innovation, driven by a desire to hold planning as close as possible to those at risk mean the CityRAP Tool can support city managers in engaging with populations at risk, leveraging local knowledge and enabling a process which allows the timely undertaking of decisions for building endogenous resilience.

Declarations of interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijdrr.2019.101419.

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