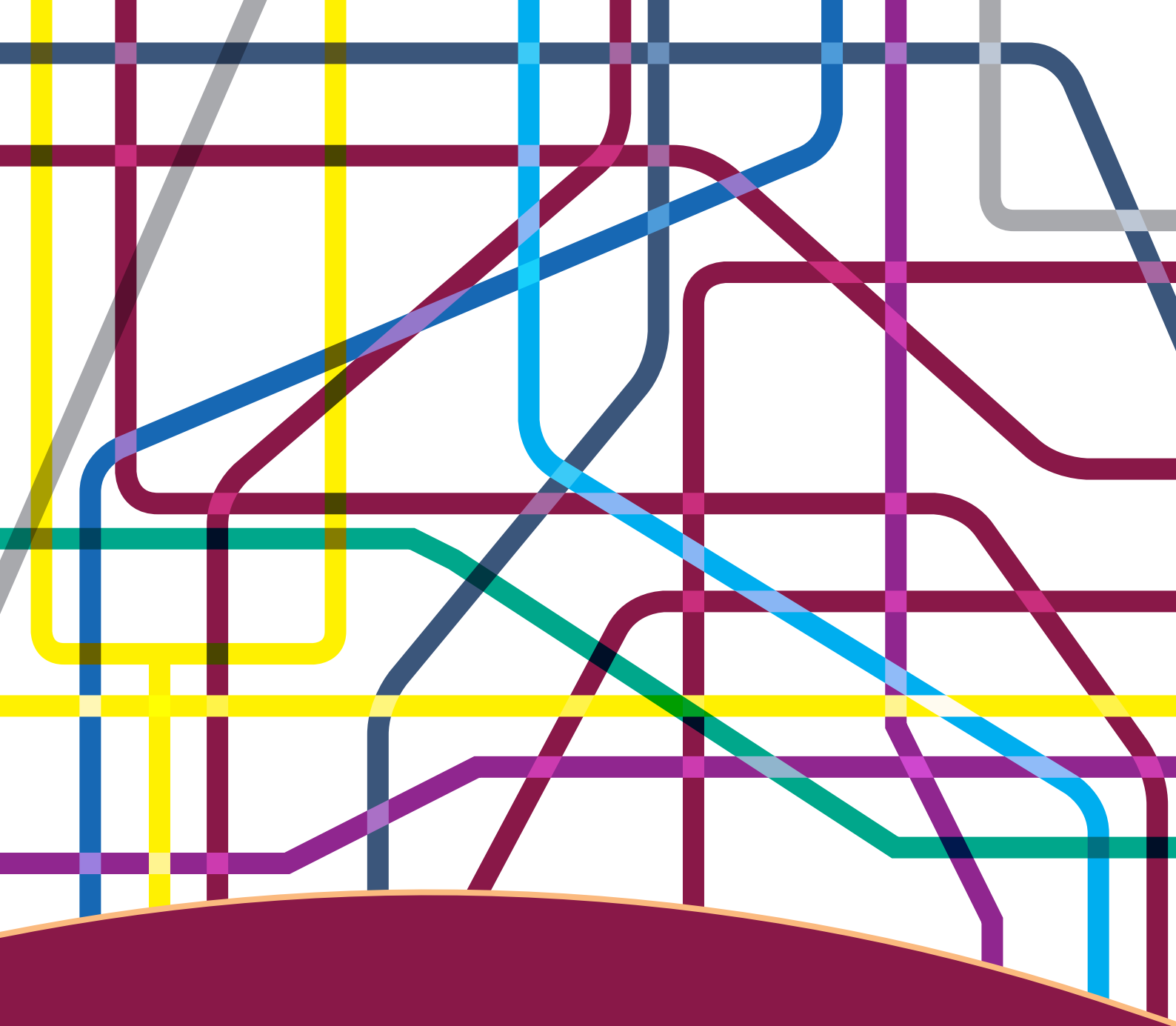

Stepping back

Understanding cities and their systems

Leah Campbell

ALNAP

ALNAPWORKINGPAPER

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Executive Summary

The world we live in is increasingly urbanized; 54% of the world's population now lives in an urban environment (UN Habitat, 2016). Having developed to respond to crises in rural settings and refugee camps, the humanitarian sector today is unequipped to deal with the realities of urban contexts. Despite organisations adapting their approaches, and developing tools and pilots, fundamental gaps remain. **Humanitarians are increasingly recognising the systems and stakeholders which exist in urban areas, but there is no clear, common understanding of what 'urban systems' are, or what humanitarians really need to know.**

Urban areas come in many shapes and sizes. There is no one set definition, but broadly speaking they contain a high population density, concentration of administrative structures, services and infrastructure, rely on a cash-based economy, have a significant built-up area and a range of livelihood opportunities, experience complex social pressures and have some defined administrative boundaries. Urban areas are by their nature interconnected to one another and to rural environments. Their density, diversity and dynamics pose challenges for those seeking to understand or work within them.

It is important for humanitarians to understand urban contexts, to ensure a response is not disconnected, or lead to negative impacts or exacerbate tensions. Understanding will also mean that crucial information isn't missed and local actors will not be undermined. Stepping back to understand urban environments is an important first step, which can lead to practical changes to policy and practice. Good contextual analysis is important in all humanitarian responses. However, at the moment urban contexts are particularly misunderstood, and there is a critical need for improvement.

One way to improve understanding the complexity of urban contexts is by using systems thinking. A systems approach focuses on the linkages, interconnections and interrelationships between different parts of a system. The urban system includes economics and livelihoods, politics and governance, society and culture, infrastructure and services, and finally space and settlements. These aspects of the urban context are all interconnected, dynamic and changing.

Looking at urban contexts through a systems approach means:

1. Recognising that cities are systems;
2. Getting comfortable with uncertainty and complexity;
3. Accepting the changing nature and resilience of urban systems;
4. Understanding urban contexts at different scales;
5. Taking the whole of the urban system into account, not just the separate pieces;
6. Acknowledging hierarchies and relationships; and
7. Focusing on urban spaces without excluding the wider picture

Understanding urban systems also requires that we look at the various stakeholders in an urban environment, including their functions and responsibilities, capacity and vulnerability, power and influence, access, interests and perceptions, and the relationships between different actors.

At the moment, despite several promising initiatives, the sector is failing to understand the urban environment. We are constrained by individual and institutional barriers, as well as the challenging nature of the problem itself.

This paper reflects on the nature of urban contexts, and how they may be conceptualised as systems. In doing so, it advocates the importance of understanding urban contexts and presents an approach which organisations might use to understand urban environments.

1. Introduction

Over the past few years, a shift in the humanitarian sector has slowly been brewing. Prior to the past decade, humanitarian response occurred primarily in rural contexts. This meant the tools and guidance that had been developed, and most of the experiences and lessons learnt, had rural contexts in mind (Crawford and Killing, 2012). In recent times, a number of major urban crises have occurred, including earthquakes in Haiti and Nepal, urban violence in Honduras and Colombia, the Ebola outbreak in West African cities and the on-going displacement in cities across the Middle East and Europe as a result of the conflict in Syria. These crises, and our responses to them, have repeatedly highlighted the failure of the humanitarian sector to understand urban situations, and in particular a lack of 'connectedness to context' (Zicherman et al., 2011: 9) as well as an absence of recognition of 'what's already there'. Both interviews and literature (including Grünewald et al., 2011; Patrick, 2011; Zicherman et al., 2011; Crawford and Killing, 2012; Kupp, 2012; Dodman et al., 2013; Brown et al., 2015; Earle, 2016) repeatedly insist that humanitarians 'struggle' to deal with the complexity of urban areas and 'don't fully understand it'.

In the months leading up to the first World Humanitarian Summit (WHS), held in May 2016, a group of urban experts (now the Global Alliance for Urban Crises (GAUC)) came together with the goal of ensuring issues around urban response and displacement were on the WHS agenda. One of the GAUC's recommendations was that humanitarians 'work with the systems that shape cities': engaging with local actors, understanding urban contexts and investing in urban infrastructure, governance, markets and society (GAUC, 2016: 1). This echoes several other recommendations made in the past four years, as the humanitarian sector has increasingly recognised the need to adapt policy and practice to prevent, respond to and recover from urban crises. In particular, recent work has noted:

- The need to '**think** differently' about working in urban crises (Currion, 2015: 5), review 'the very **concepts** and **assumptions** that inform humanitarian actors' understanding about urban society' (Fan, 2012: 568) and 'embrace the **language** and norms of the city' (Sanderson, 2016: 13).

- An increasing interest in exploring **area-based approaches** to urban crises, where humanitarians focus their interventions on 'the evolving socio-economic dynamics, power structures' that occur in a particular

geographic area (Impact Initiatives and UCLG, 2016a: 3, see also Parker and Maynard, 2015). At the same time, research has also pointed to limitations of relying purely on spatial analysis (Sokpoh and Carpenter, 2014).

- An increasing desire to engage with, support and build capacity of **local authorities** (Brown et al., 2015; Impact Initiatives and UCLG, 2016g) and urban **host communities** (Ciacci, 2014).
- That governance and basic services in urban areas **are interconnected**, and there is a lack of understanding of how humanitarian aid can respond in a context of complex infrastructure, political, economic and social dynamics (Jones et al., 2014b; Brown et al., 2015b; Sokpoh and Carpenter, 2014).
- The potential for humanitarians to learn from **urban planning and design** and its focus on the built environment (Kayden, 2016) and to align response with long-term urban planning and development (Impact Initiatives and UCLG, 2016g).
- A growing number of organisations currently developing or adapting **new tools** in order to better understand the urban context (including the International Rescue Committee (IRC), the UN Human Settlements Programme (UN Habitat), Save the Children, Impact Initiatives, the Red Cross Red Crescent (RCRC) Movement and the Joint IDP Profiling Service).
- A 'broad failure' of the humanitarian sector so far to understand urban crises 'at different **scales of analysis**', including a lack of 'understanding of how urban areas function as **complex systems**' (Brown et al., 2015b: 9).

All this represents a marked shift in how humanitarians conceive of and respond to urban crises. Meanwhile, a number of organisations have taken steps to adapt their response approach to urban contexts. And yet, amid calls to 'work through' local authorities, to address how a crisis affects infrastructure and markets and to approach response with a 'spatial understanding', there remains a lack of clarity about what, in practical terms, it would mean to understand and work effectively with existing urban systems. A growing number of actors are now working on new research, pilots and initiatives in these areas, and many use terms such as 'urban systems', but no common definitions, terminology or understanding around

this term exist. While a number of tools are already being developed, it is not clear what is needed for humanitarians to shift their thinking to the ways cities truly work. As one interviewee explained, '*There is now a common understanding that the approach needs to be different… but there isn't yet a clear understanding on how.*'

To help fill this gap in understanding, ALNAP's new research initiative explores how humanitarians can better understand urban contexts. It will explore the concepts and terminology around 'urban systems' as well as how humanitarians can most effectively embed these concepts into their practice.

This paper is the first output of the research. Section 2 outlines the methodology and evidence base. Section 3 explores the urban context: What do we mean by 'urban'? How are urban contexts dense, diverse and dynamic? Why is an understanding of urban contexts important? Section 4 introduces a systems approach to cities and a typology for urban systems. Section 5 considers how we should approach the exercise of understanding urban contexts through an urban systems lens, and what barriers there currently are to doing so. Section 6 reflects on barriers to our understanding, and Section 7 concludes with next steps for this research initiative.

2. Methodology and evidence base

The paper is based primarily on a literature review and interviews conducted by the author. The literature review identified over 650 documents from ALNAP's Urban Response Portal and Google Scholar, identified through a search for key terms.[1] Within this, the author also selected 10 key documents for a snowball reference search at two levels; interviewees also recommended further documents. All 200+ documents that were fully reviewed for the paper appear in the bibliography.

The author also conducted 59 interviews with humanitarians, urban planners, academics and geographers, chosen to represent a diversity of organisational, professional and geographic perspectives. Either interviews were recorded and transcribed, or the author took notes. A full list of interviewees is included in Annex 2. The author also reviewed notes from 11 interviews conducted by colleagues at IRC to inform the development of an urban context analysis tool, and reviewed over 60 questionnaires completed by participants in two pilot workshops organised by ALNAP, Interaction and the American Red Cross, in Washington, DC (June 2015) and London (November 2015). In these latter, participants were asked to reflect on their individual and organisational approaches and their understanding of urban stakeholders. In addition, the research was informed by the author's attendance at a number of workshops and conferences, including those convened by Harvard University and the Centre for Development and Emergency Practice (CENDEP) (Boston, 2014), GAUC (Barcelona, 2015 and 2016, and London, 2016), Impact Initiatives/UCLG (Geneva, 2016), ICRC and ALNAP (London, 2015), UN Habitat (Beirut, 2016) and the Danish and American Red Cross (Copenhagen, 2016).

3. Urban contexts

This section explores the nature of urban contexts, including what urban contexts are, what makes them difficult to understand and why it is important to understand them.

> “There is no consistent definition as to what ‘urban’ means.”

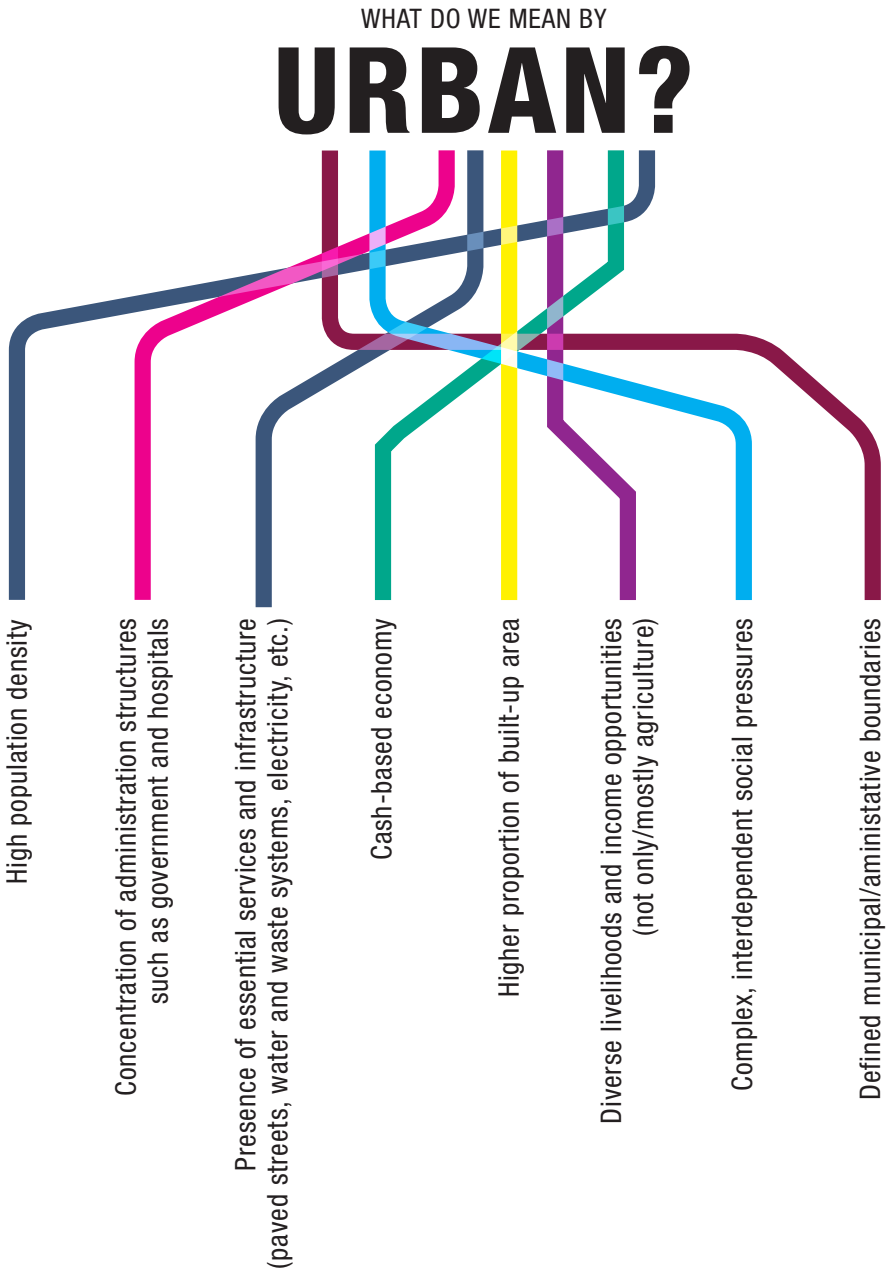
3.1 What is ‘urban’?

Defining ‘urban’ is not straightforward. There is no consistent definition among states or academics as to what ‘urban’ means. A study looking at governments in 228 countries found 25 of them had no definition whatsoever of urban contexts and six defined the entire country as urban (McCarney, 2006).

Urban contexts come in a variety of shapes and sizes. Their high density, porous boundaries and propensity for change mean that, rather than having a set definition, it is better, and more useful, to think of urban areas as on a continuum, with fuzzy boundaries. This means there is no defined cut-off point between what is ‘rural’ and what is ‘urban’ (Satterthwaire and Tacoli, 2002; Ramalingam and Knox Clarke, 2012). Whether one area can be considered ‘urban’ or otherwise will depend on a range of contextual factors. Broadly speaking, urban contexts include those that all or most of the following criteria, although some cities fall outside of these patterns (adapted from McGranahan et al., 2005; World Vision, 2013; ICRC, 2015; IDMC, 2015):

- High population density;
- Concentration of administration structures such as government and hospitals;
- Presence of essential services and infrastructure (paved streets, water and waste systems, electricity, etc.);
- Cash-based economy;
- Higher proportion of built-up area;
- Diverse livelihoods and income opportunities (not only/mostly agriculture);
- Complex, interdependent social pressures;
- Defined municipal/administrative boundaries.

Figure 1. What is Urban?



It is thus also important not to assume everyone has the same understanding of what urban means. One interviewee described working in Central African Republic, where national colleagues understood only the capital city as urban. Similarly, we must consider our own assumptions about what counts as urban. As Garrett (2005: 2) explains, 'The labels "urban" and "rural" fall

far short of capturing the dynamism and diversity of reality. Conjuring up visions of crowded cities and isolated countryside, they suggest separate worlds and ways of living. They mask the many ways urban and rural overlap and intertwine, as well as the variety of livelihood strategies within urban or rural areas.'

'Urban' and 'rural' are not distinct from one another; they are deeply connected at multiple levels. Individuals can work in an urban area while living in a rural one, or move back and forth between urban and rural environments throughout the day, or year (Kyazze et al., 2012). Produce, goods and money are brought from rural to urban and vice versa in a constant flow (Harroff-Tavel, 2010). Cities therefore do not function or develop in isolation, and are constantly interacting with other urban and rural contexts (Bretagnolle et al., 2009). Urban areas can also be very different from one another. It is hard to compare mega-cities like Dhaka, Mexico City and Kolkata with the suburbs surrounding London and New York, or small to medium-sized cities such as Dili and Malmo.

> "Rather than having a set definition, it is better, and more useful, to think of urban areas as on a continuum, with fuzzy boundaries."

3.2 What makes urban contexts difficult to understand?

Urban contexts are not only difficult to define, they are difficult to understand. To help break down and further explain the nature of urban contexts, Ramalingam and Knox Clarke (2012) put forward the concepts of 'density', 'diversity' and 'dynamics'. This section explores these aspects, with a particular focus on how they complicate an understanding of urban contexts.

Density

Urban environments contain a high density of residents, of buildings and infrastructure, of livelihood options and of stakeholders (American Red Cross, 2014). Crises will affect large numbers of people, concentrated in a dense area, who may also be surrounded by staggering amounts of debris. There are also many actors involved in responding – including international and national organisations, private businesses, governments at multiple levels, armed groups and individuals (Besiou et al., 2011).

Some argue that density is an advantage for humanitarian response, as one action can have positive impacts on a large number of people in one area and there is the possibility of building on existing services and working with local stakeholders who have a deep knowledge of the context (Harroff-Tavel, 2010).

However, density also presents challenges. For example, repairing an urban sewer involves a wider range of actors than humanitarians have been likely to encounter in non-urban environments, where aid focuses on engaging on a household-by-household basis (Killing and Boano, 2016). Density can also hasten the spread of disease, and of rumours and misinformation.

The relationships between these actors can also be a challenge. One interviewee explained, '*Working in an urban area where there are more stakeholders and more competition for resources and people's time and whatever else often is intimidating to people*.' The large number of stakeholders involved in recent urban crises has posed significant challenges for coordination and engagement – and post-crisis reflections suggest humanitarians have not coped well with this density of actors (Barcelo et al., 2011).

Even when not responding to crises, urban stakeholders often operate at multiple layers or scales, from the individual or household to the neighbourhood to the city and regional levels. Different actors may have parallel or overlapping responsibilities, which may not always be easy to identify (Dodman et al., 2013; Mountfield, 2016). When a crisis occurs, even more actors can arrive quickly and then the density of actors is even harder to decipher (Leis, 2016).

Urban areas also contain a density of infrastructure, including buildings, roads and services. This creates uniquely urban hazards in terms of the amount of physical material that can be affected during certain types of crisis, and can complicate access (Currion, 2015). It also adds to the number of actors involved – for example construction companies and vehicles (Harroff-Tavel, 2010).

Urban density also relates to the use of physical space. In any street – and sometimes in the same building – you may find a combination of residential, commercial and/or industrial activities. Use of space may change throughout the day, making it difficult to understand how space is used (Currion, 2015). The urban services on which urban residents depend, including health facilities, electricity, waste and water systems, add to the density (ICRC, 2015).

Diversity

The actors and infrastructure in an urban space are also very diverse. As Grünewald and Carpenter (2014: 33) explain, 'Urban space is often very heterogeneous. Rich and poor areas, new and old neighbourhoods, highly

populated centres and peri-urban peripheries, administrative districts and industrial zones often sit side-by-side.' The individuals who make up urban populations are themselves also diverse, coming from a wide variety of social, economic, linguistic and religious backgrounds.

Urban populations find themselves part of a diverse range of 'communities', most of which are not geographically bound. Urban citizens often live in a place (their 'neighbourhood') but spend very few of their waking hours there (Kupp, 2016). Assumptions that a spatially defined neighbourhood equals a community, as in rural areas, are not applicable in urban areas, with a multitude of communities operating on different levels and across spaces (ibid.). Kyazze et al. (2012: 34) note that in urban areas, 'There can be hundreds, even thousands, of coexisting communities, overlapping, interacting and competing for influence and resources… Multiple layers of systems and power structures considerably impact the daily lives of individuals.' And yet the terms 'community' and 'neighbourhood' are still often used interchangeably, suggesting deeper engagement is needed to explore what non-spatial communities really mean.

Hamdi (2004) defines five types of urban community, to which Kupp (2016) adds a sixth:

1. Communities of place: common spatial connection;
2. Communities of interest: formed around a common issue/concern;
3. Communities of resistance: shared experience of crisis/displacement;
4. Communities of culture: shared language, beliefs, values;
5. Communities of practice: common livelihoods;
6. Virtual/digitised communities: connected through new media.

Urban areas are also diverse in that there is no one type of urban context. As the introduction discussed, the term 'urban' applies to a wide range of different spaces. 'Some cities are relatively small and made of mud-bricks while others are mega-cities where millions of people live in multi-storey buildings and skyscrapers, slums and areas of acute poverty' (Grünewald et al., 2011: 7). They differ in their economies and markets, and their political influence – which affect how they operate and relate to one another (Grant, 2010). One interviewee described the differences between

the condense environment of Bhuj, India, and Banda Aceh, Indonesia, whose neighbourhood settlements almost resembled a rural space. Cities in the same country can be quite different, and will not simply 'mirror the dynamics of the country they are situated in' (Chapman, 2015: 23). There can also be great diversity within a city, for example between the inner city and its peripheries (Grant, 2010), and over time as a city develops. Finally, urban areas contain both informal and formal structures, settlements, economies, communities and infrastructure. Both formal and informal aspects of the city hold significance, and should not be underestimated.

Dynamics

Cities are not stable entities. They are dynamic and constantly changing (in terms of population growth, industry and commerce, physical space, infrastructure and buildings) (Sanderson, 2016) often in unpredictable ways. Changes can occur over very short periods, even over the course of a day. Urban environments are fundamentally interconnected within themselves and with other spaces. This means it can be difficult to examine any one element of a city (e.g. the water system, a neighbourhood or the governance structure) without seeing its connections and dependencies, and near-impossible to understand the boundaries. Resolving challenges in urban areas requires unpacking the inter-linkages between different actors and systems (Jones et al., 2014b). In the context of these dynamics, it can be difficult to establish a theory of change and to predict the outcome of any discrete action.

Cities can also be vulnerable to things happening far away (floods, epidemics, etc.), requiring solutions that look both within and outside the urban context (American Red Cross, 2014). Meanwhile, as we have seen, rural and urban areas share populations, markets and economies, making it difficult to differentiate between places that are not divided with clear lines (Dodman et al, 2013; Kupp, 2012). As globalisation accelerates and deepens the connections between places across the world, urban areas are no longer linked just to their surrounding rural areas, but also to urban and rural places around the globe (McGranahan et al., 2005). These relationships are not static but dynamic processes (World Vision, 2013).

The constant change in cities can be described as 'creative destruction' (Page, 1999). Urban environments are constantly being disrupted and disturbed – by crises, planners, development and growth. While this presents challenges, it also provides opportunities – particularly as urban contexts, despite their vulnerability, are also extremely resilient (Vale and Campanella, 2005).

3.3 Why should we understand urban contexts, and what happens when we don't?

When we don't understand urban areas, we end up with a response that is separated from the context. We risk having a negative impact or exacerbating existing tensions. We can undermine local actors and their plans, and miss opportunities to build on existing capacities, which can mean we miss out on crucial information. Ultimately we are not effectively supporting the people affected by crisis.

Every context has been shaped by the unique features – the space, structures, people and issues – that created it (Mathur, 2007). When an action is separated from the context in which it occurs, it is not adapted to the specificities of the situation (Lyytinen, 2009). What is appropriate for one country is not appropriate for another – but the same applies from city to city and neighbourhood to neighbourhood. Previous urban humanitarian responses have been criticised for being disconnected from the context, as if context was 'over there' and separated from programming decisions (Impact Initiatives & UCLG, 2016g; Ginsberg, 2015; Kyazze, Baizan & Carpenter, 2012; Patrick, 2011; Zicherman et al, 2011). While it is important to be clear on what aspects of the context are relevant at the time, 'the urgency of humanitarian assistance' should not be used as an excuse for insufficient contextual understanding (Ciacci, 2014: 24). We cannot respond in a way that is appropriate to the context if we don't take steps to understand exactly what that context is. While this issue is not unique to urban areas (see Section 3.4), the sheer density, diversity and dynamics of the urban environment arguably make it even more important here.

> "We cannot respond in a way that is appropriate to the context if we don't take steps to understand what the context is."

In order to 'Do No Harm' in an urban environment, we first need to establish exactly what aspects we need to understand (Wallace, 2015). The amount of actors at play in an urban environment mean the risk of a negative impact is significant. One interviewee noted, '*In urban areas… there's less room to make mistakes because you're going to compound existing problems in the city or create new ones without even meaning to.*' One risk is of exacerbating existing tensions. Past humanitarian responses have, for example, focused on supporting the displaced and ignoring the non-displaced, which can increase exclusion (Fan, 2012). Focusing on the national actors in large cities can 'obscure' the needs of local authorities (Barcelo et al., 2011). Humanitarian assistance has been found to have fuelled existing tensions and conflict in various recent urban responses, by 'failing to understand local sensitivities and dynamics' (Impact Initiatives

and UCLG, 2016g: 9). Humanitarians are often aware of these risks: 85% of humanitarians in one survey 'had been involved with or seen emergency work that inadvertently caused conflict or made existing conflicts worse', and 'understanding the context' was one of the top challenges facing humanitarians at the start of a response (Zicherman et al., 2011: 6).

Meanwhile, cities do not function automatically. There are established roles and responsibilities that ensure energy and water are supplied, hospitals are open and buses run. In a given space, these functions may be managed by local government, private companies, civil society or community groups. Often, humanitarians ignore the role of local authorities and community structures, establishing parallel mechanisms and effectively side-lining existing stakeholders. In doing so, they risk negatively affecting their legitimacy, credibility and effectiveness (Lyytinen and Kullenberg, 2013; Allex-Billaud, 2015; Impact Initiatives and UCLG, 2016b). The short-term focus of humanitarian aid programming does not take account of existing long-term city planning processes (DFID, 2014; Allex-Billaud, 2015; Impact Initiatives and UCLG, 2016g).

This is a missed opportunity to capitalise on the wealth of existing capacity in urban areas. While local actors may have lost capacity because of the crisis impact, or there may be pre-existing capacity gaps (Harroff-Tavel, 2010), it is not possible to know what there is without attempting to understand the context. Unfortunately, humanitarian responses in urban areas often fail 'to support or leverage upon local response capacities' (Impact Initiatives and UCLG, 2016g: 8; see also Barcelo et al., 2011), and so risk marginalising local actors and their existing coping strategies (Patrick, 2011). This may be because they do not know which actors to engage with or how to work with certain actors, such as the private sector (DFID, 2014), or fear getting involved in thorny political situations (Impact Initiatives and UCLG, 2016a).

Local actors have an understanding of the context and dynamics that is quite often missed by international actors (Impact Initiatives and UCLG, 2016g; WRC, 2015; Clermont et al, 2011; Davies, nd). When we fail to engage effectively with urban stakeholders, we also put at risk the amount and quality of information available to us, which can lead to gaps and duplication in our responses (Impact Initiatives and UCLG, 2016e).

The cumulative impact of not understanding urban contexts is that we are not effectively supporting crises-affected people (Impact Initiatives and

UCLG, 2016e). This may be because we are not aware of bigger issues affecting the whole system or are unwilling to address them (DFID, 2014), because we misunderstand needs or because our assistance models aren't flexible enough to adapt to urban contexts (Fan, 2012; Meral, 2015). In some cases we assume things about the urban context that make us miss vulnerabilities (Crawford, 2011; Pantuliano et al., 2011). In others we focus on a few vulnerable individuals and miss opportunities to support the recovery of urban systems and services (Meral, 2015).

To summarise in the words of one interviewee, when we are not taking steps to understand urban contexts, including recognising and building on existing capacities, we have '*off-the-shelf, sectoral, non-integrated solutions that fail to maximise opportunity or, worse, actively conspire to make things worse*'. If we are truly to respond effectively to urban crises, we need to take active steps to understand the interconnectedness of urban environments, including the systems and stakeholders that define them.

3.4 Are urban contexts unique or do we just need to do good context analysis?

While certain attributes of urban contexts underline their complexity, urban areas are not unique in the sense that they are the only contexts we should be trying to understand. A good contextual understanding is important to humanitarian response wherever we're working. And there are systems and stakeholders we need to understand in rural and camp settings, too.

That being said, the humanitarian system has had a lot longer to test its approach in rural settings, and has successfully developed and adapted a number of tools to help us understand these contexts. In some ways, we can learn from these approaches and bring them into our urban understanding; similarly, new approaches developed with the urban context in mind, particularly around mapping and the use of technology, may be useful to further our understanding of non-urban environments.

Why, then, does this paper focus on urban contexts and not just good contextual understanding? The reason can perhaps be described as advocacy. At the moment, our understanding of urban contexts is just not good enough – and we need to take action. In focusing on urban environments, the paper seeks to highlight the depth of the challenges involved in understanding them, and the need for a shift in approach. While some of the features the paper outlines may also be relevant to non-urban contexts, and good contextual analysis is important everywhere, one

interviewee explained it best when stating that, '*Simply saying you just have to do a contextual analysis I think dramatically ignores that different contexts are substantively difficult to understand and require deep engagement and knowledge and expertise.' Another interviewee noted that it's about the severity of the issues: 'These factors… are much more applicable and prominent and therefore have to be taken [into] account in urban space. I think they can be to some extent disregarded or agencies can be ignorant of them [when] working in a rural space, but if you're ignorant and ignore those in [an] urban space, then [there are likely to be] much higher levels of project failure',* and arguably even worse consequences.

4. A systems approach to cities

The first part of this paper has focused on the nature of urban contexts, including the range of challenges posed by the various layers, scales and interconnections found within urban areas. This section introduces a systems approach to cities and a typology we can use to consider urban systems. The final sections of the paper then explore the practical implications of a systems approach to cities, as well as how to understand urban stakeholders.

4.1 What is a systems approach and what are its implications?

A systems approach,[2] or systems thinking, is one that recognises and focuses on systems. Systems themselves can be loosely defined as a number of elements that are interconnected in certain ways so as to achieve something, and bounded in some structure that defines them (Laurini, 2001; Meadows, 2008; Ricigliano and Chigas, 2011; Wilson, 2014).

A story that appears in many cultural traditions is that of six blind men who encounter an elephant for the first time. They each approach the elephant and touch it, in an effort to understand what it might be. Later, they sit together to discuss the experience. One, having felt only the elephant's leg, compares it to a pillar. Another, having touched only the tail, compares it to a sweeping brush. Yet another has felt only the trunk, and so on. They start to argue, each sure he knows what he has experienced for himself. The lesson is that it is not possible to know the sum of a thing by just examining some of its parts.[3]

Why systems?

Throughout this research we encountered a number of critiques of systems approaches. Some prefer to think of 'networks', emphasising the non-permanent nature of some interconnections. Others raise concerns about turning the theory of systems into something that is practically useful. We use 'systems' terminology because most of the evidence identified aligns well with this approach and because, when you break systems down to their most basic understanding, and are clear what you mean, 'systems' does seem to be an appropriate reference even for non-permanent structures. We attempt to address critiques of practicality by focusing on the specificities of urban systems.

To paraphrase Bowman et al. (2015), systems thinking is not going to magically solve every possible problem: often the most appropriate solutions are simple ones. However, in difficult environments like urban crises, using systems thinking can increase the scale and depth of understanding, and therefore of impact.

A systems approach thus focuses on the linkages, interconnections and interrelationships between different parts of a system, not just the various elements themselves (Meadows, 2008; Ricigliano and Chigas, 2011). Systems thinking dates back to Aristotle, and attests that looking at the wholeness of something (e.g. an elephant or a city) 'will provide new and different insights than can be gained by looking at each of its component parts individually' (ibid: 2).

> "A systems approach recognises the potential to arrive at new and different insights than can be gained by looking at each component part individually."

Yet it is far easier to focus on the elements that contribute to systems than to examine their interconnections (Meadows, 2008). This is because elements are often physical and therefore tangible items (such as buildings) – though some can also be intangible (e.g. power or influence) (ibid.).

The large populations, the number of stakeholders and the interconnected systems and networks (Heykoop and Kelling, 2014) of urban contexts have led some to describe cities as 'complex systems' (Sanders, 2008; Batty, 2009; ICRC, 2015; Liu, 2016). Complex systems are intricate, comprising many parts that interact with one another and the wider world in ways that can never truly be identified (Shaw and Howell, 2016).

The elements that make up systems, and their interconnections, are dynamic and changing. Systems are resilient; they can move and adapt when pressed or stretched (Meadows, 2008). No one is in charge of systems (Levine, 2015); rather, they learn, complexify and evolve through self-organisation. Systems cause their own behaviour (Meadows, 2008) and no one actor necessarily directs their purpose. This self-organisation can create hierarchies, which reduce the amount of information any one part of a system has to keep track of while maintaining interconnectedness (ibid.). Sometimes, elements and context can result in a systems behaviour that no one sought out (ibid.), such as a conflict or crisis. Meanwhile, different stakeholders can experience a system in different ways (Reed et al., 2013).

Finally, a systems approach acknowledges that, before we intervene in a system, we need to observe it to understand its behaviour. This is because its function is often not explicitly expressed, taking time to identify (Meadows, 2008). When examining systems, you need to 'take your eyes off short-term events and look for long-term behaviour and structure… You are likely to mistreat, misdesign, or misread systems if you don't respect their properties of resilience, self-organisation and hierarchy' (ibid: 87).

4.2 Stocks, flows and feedback loops

At its most basic level, a system can be broken down into three elements (Meadows, 2008):

1. Stocks: something you can see, feel, count or measure at any point in time;
2. Flows: something that enters or leaves;
3. Feedback loops: control mechanisms that either stabilise or amplify the stock by increasing/decreasing the flow.

Meadows (2008) uses the example of a bathtub full of water (the stock), with water pouring in or draining out (the flow). The stabilising feedback loop is the drainer, which stops the bathtub from overflowing. In the urban context, we could think of the number of available housing/sheltering 'stock' available in a neighbourhood or city, with the number of people moving in and out as 'flows'. Here the birth rate provides an amplifying loop of new children who will reside in the houses, and the death rate stabilises the system by making houses available for other residents. Systems can comprise any number of stocks and flows, and can contain both stabilising and amplifying feedback loops (ibid.).

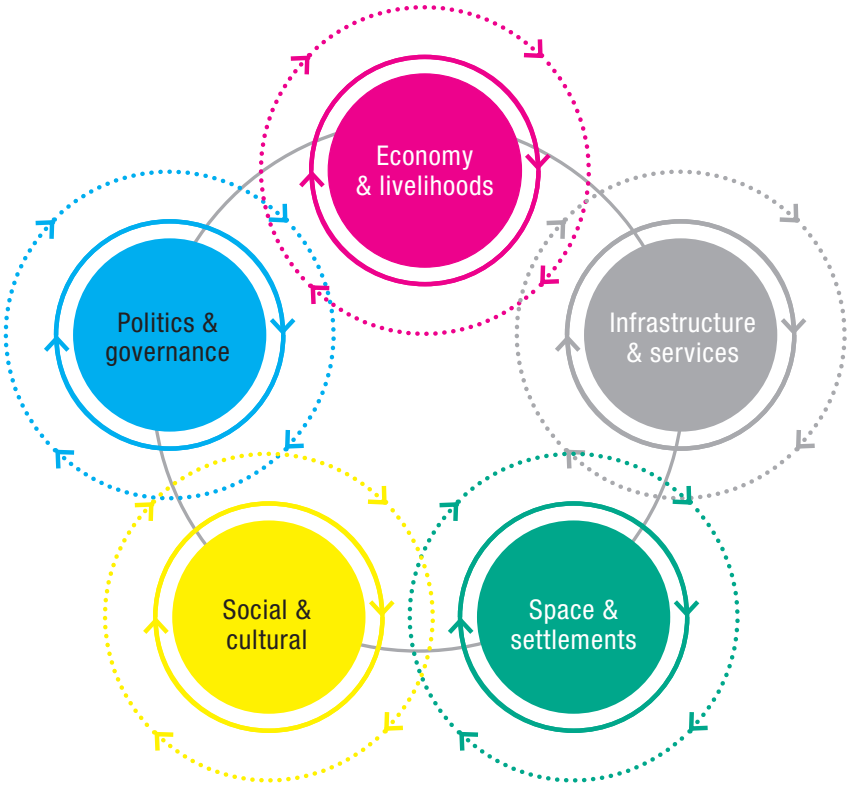
As discussed earlier, the humanitarian sector has been criticised for its tendency to make assumptions about the functioning of urban contexts. Taking into account the actual behaviour of stocks, flows and feedback loops in an urban system can help to combat this. This is because thinking about these aspects of systems, 'keeps you from falling too quickly into your own beliefs or misconceptions, or those of others' (Meadows, 2008: 171).

4.3 A typology for urban systems

While each urban context is unique, it is helpful to think about them in a way that can be practically useful and easily understood (da Silva et al., 2012). Thankfully, most urban areas share similar attributes when it comes to their economy, politics, social, infrastructure and physical spaces (Meikle, 2002).

In order to provide a comprehensive framework for the urban system and its sub-systems, this research prepared a matrix[4] to identify common themes across a variety of existing frameworks for urban systems, networks or components. Based on this review, we propose a typology of five urban systems:

Figure 2. A typology of urban systems



Together, urban systems fulfil a number of functions, including 'habitat, production, services and political control' (Bretagnolle et al., 2009). Individually, each urban system is composed of stocks, flows and feedback loops. They are also influenced by structures and concepts. The following sections discuss each of these further.

Urban economy and livelihoods

Urban economic and livelihood systems depict the production, consumption and balance of resources in an area. Urban economies are primarily cash-based (Currion, 2015), with populations typically relying more on wage labour than on agricultural production. Cash-based economies centre around markets (ibid.), which means urban populations are highly connected to them, relying on markets for access to basic food items and supplies, getting around the city, health and education services and gainful employment (Creti, 2010; Friedman, 2016) – in other words they are 'consumption-driven' (Sitko, 2016b). Urban services such as water, energy and waste collection are also often monetised in urban areas (Brown et al., 2015b). Markets can be defined as anywhere the exchange of goods, services or labour takes place between buyers and sellers (Friedman, 2016). They are not necessarily a physical space – we can think of the housing market, the labour market, and so on. For these reasons, urban markets and the private sector can be considered the 'lifeblood' of any city (Sanderson, 2016).

Table 1 provides a handful of examples of the physical structures, concepts and processes within an urban economic and livelihood system, as well as the functions they perform and key events which shape them.

Table 1. Economic and livelihood system

Physical structures	Structural processes	Influencing concepts	Functions	Events
Markets/shops Factories Warehouses	Trading standards Credit agreements Employment laws	Resilience Market differentiation	Production of goods Generation of livelihood income Facilitation of trade	Market days Labour migration events Harvest

Sources: US Marine Corps (2014); Brown et al. (2015b); Sitko (2016b), among others.

Another way to think about each of the sub-systems is as stocks, flows and feedback loops. For example, the stocks in an urban economy include markets, shops and the employment rate. Money, commodities and people flow through, and feedback loops such as production, consumption and credit stabilise or reinforce those flows.

The urban economy is both formal and informal, and the two are intricately linked. Any crisis can put pressure on the relationships, and can even lead to economic collapse (Sitko, 2016b). It is therefore important for humanitarians to understand economic systems, and work through them (Sanderson and Knox Clarke, 2012). The urban economy also has the potential to benefit from its spatial connection to a large population that can create economies of scale and to a steady supply of labour, services and finance (Brown and Lloyd-Jones, 2002). Meanwhile, items imported at national level can affect the local level, and global economic forces can affect city markets and even individual traders (Sitko, 2016b). In this way, urban markets depend on global trends, prices, availability of raw materials, finance, etc. (Creti, 2010). And, again, each urban context is unique, which reinforces the importance of understanding the economy and livelihoods in a given city.

Urban politics and governance

Fundamentally, urban politics and governance are about decision-making and power (Meerow et al., 2016; Sitko, 2016b), which may be why some have described them as 'the processes and structures that form the institutions through which people are excluded and included in cities' (Gupte, 2016: 3).

Urban politics and governance are dynamic and changing (UN Habitat, 2001). There is often confusion about roles and responsibilities (Pantuliano et al., 2011), particularly around formal vs. informal actors (Devas, 2002). This makes it even more important to take steps to truly understand the city, rather than relying on assumptions.

Table 2 provides a few examples of the physical aspects, structural processes and influencing concepts that can be found in urban politics and governance, as well as key events and functions they perform.

Table 2. Politics and governance system

Physical structures	Structural processes	Influencing concepts	Functions	Events
Government buildings (courts, city halls, military bases) Meeting halls and community buildings	Laws and policies Political boundaries/ areas of influence	Accountability Power Legitimacy	Security Public administration Judicial/ legal administration	Elections Rallies/ protests Conflict/war

Sources: CARE (2014); US Marine Corps (2014); Meerow et al. (2016); Osofisan (2016b), among others.

To understand urban politics and governance, we should consider both their quality and their underlying nature. There is a need to question relationships, go under the surface and understand influence. For example, national stakeholders can have significant bearing on the city, both positive and negative. 'Understanding the governance and decision-making structures of organisations operating at these scales is an important element of the project' (Carter, 2009: 6). Moser and Rodgers (2012) identify a number of interconnected politics and governance relationships in their study of urban conflict settings, including between national and city-level governments, between police and organised crime and between traditional authorities and state government.

Humanitarians sometimes ignore governance issues, owing to fears about corruption and politicisation (Grünewald, 2013). However, doing so ignores the potential impact we may have on politics and governance in an urban crisis (Brown et al., 2015b). Büscher and Vlassenroot (2010) analyse the impact humanitarian actors have made on politics and governance in Goma and find that, as the Congolese government has been unable to deliver basic services for a variety of reasons, 'urban decision-making processes have gradually become the responsibility of international humanitarian agencies' (Brown et al., 2015b: 35).

Urban social and cultural systems

Urban social and cultural systems describe the beliefs and behaviours of urban populations. The large number of diverse people concentrated in an urban area creates a cosmopolitan urban culture and social system, which is spatially

organised and to some degree spatially segregated. People participate in a range of different 'communities' and social networks, which are all shaped by the physical environment in which they occur (Grant, 2010).

Cities contain a diversity of ethnicities, cultures, languages and religions, which often find themselves in close proximity (World Vision, 2013). Their populations regularly move within and outside of the urban environment. These physical connections across geographies shape the culture and social aspects of cities. Likewise, cultural and social aspects, including the degree of social cohesion, shape the political, environmental and economic functions of the city.

Table 3 lists some of the physical structures, structural processes and concepts which influence urban social and cultural systems, as well as some of the functions they perform and important events.

Table 3. Urban social and cultural system

Physical structures	Structural processes	Influencing concepts	Functions	Events
Public spaces (parks, monuments, markets) Religious and cultural sites Schools and libraries	Demographic trends Majority/ minority cultures	Tradition Communication	Preservation of tradition Celebration Social cohesiveness	Community gatherings Sports events Religious observances

Sources: CARE (2014); US Marine Corps (2014); Meerow et al. (2016), among others.

The individuals who live and work in cities experience their environment in the context of the social relationships they form. Grant (2010: 6) explains, 'Many key services, for example, are necessarily delivered in and through social relationships (e.g. doctor–patient, teacher–student). The same is true of how people are incorporated into economic, political and other socio-cultural spheres.'

Urban infrastructure and services

Urban infrastructure and services can be understood as 'the provision of commodities, actions or other items of value to an urban population'

(ICRC, 2015: 18). They include water, sanitation, waste management, transportation, energy, health, emergency services, education, public safety and social welfare systems (UN Habitat, 2015d). These are 'highly interconnected and mutually dependent in complex ways…in other words, what happens to one urban infrastructure systems can directly and indirectly influence other infrastructures' (Yazdani et al., 2014: 50). When considering urban infrastructure and services, it is helpful to understand their availability, accessibility, affordability and adequacy (UN Habitat, 2015d). In addition, given their interconnectedness, it is important also to consider the relative functions and areas of responsibility, as well as coordination (Yazdani et al., 2014).

Table 4 features some examples of structures, processes and concepts that make up urban infrastructure and services, as well as functions they perform and key events that influence them.

Table 4. Infrastructure and services system

Physical structures	Structural processes	Influencing concepts	Functions	Events
Bridges, bus stations, roads Waste treatment sites Electrical lines, power plants	Market value Laws and standards	Rights of access Perceptions of quality	Provision of basic services Public safety and hygiene	Strikes Epidemics Infrastructure breakdown

Sources: US Marine Corps (2014); Brown et al. (2015b), among others.

Urban space and settlements

Urban space and settlements are the diverse range of natural (including green space, geology, water, etc.) and physical (streets, buildings, public spaces) environments and human settlements that comprise any urban context (Butina Watson, 2016). Urban space and settlements are by their nature different from rural, agricultural contexts on a physical level, but also because urban environments shape the social, political and economic aspects of urban living (Currion, 2015). Sometimes, insufficient attention is given to the physical environment. Society can be perceived as the dominant force over a subservient physical space (Wamsler, 2004), even though space can be very influential.

Table 5 includes physical structures, processes and events that are part of urban space and settlements, as well as key events that influence them and functions they perform.

Table 5. Urban space and settlements system

Physical structures	Structural processes	Influencing concepts	Functions	Events
Houses, buildings, shelters Parks, open spaces	Laws Land tenure agreements	Community/ neighbourhood Informality/ formality of space	Housing/shelter Social cohesion	Displacement Planning processes Construction

Sources: Wamsler (2004); Grünewald (2011); Meaux and Osofisan (2016); American Red Cross (nd); Myanmar RCS (ndb), among others.

Land can be a particularly difficult aspect of urban space and settlements to understand. Often, convoluted ownership/right to land arrangements exist, which are impacted by social, political, and economic factors. How land is used, by whom and under what conditions is an important aspect of understanding urban space and settlements, and one that has proved a significant challenge in humanitarian contexts. In the words of one interviewee, it can '*paralyse*' a response.

Vulnerability and poverty in an urban area also have spatial dimensions: there are settlements (i.e. slums and informal settlements) and other geographic features (location along transportation routes, proximity/access to services, etc.) that all play a role. Indeed,

> 'Compared to other urban dwellers, people living in informal settlements, particularly in slums, suffer more spatial, social and economic exclusion from the benefits and opportunities of the broader urban environment. They experience constant discrimination and an extreme disadvantage characterized by geographical marginalization, basic service deficits, poor governance frameworks, limited access to land and property, precarious livelihoods and, due to informal settlements' location, high vulnerability to the adverse impacts of poor and exposed environments, climate change and natural disasters' (UN Habitat, 2015b: 2).

The informality of these settlements limits their ability to address the inherent vulnerabilities they face (Earle, 2016).

Finally, urban space has particular implications in crises contexts. As one interviewee pointed out, physical density can pose significant challenges in terms of displacement. If your shelter is destroyed, unlike in a rural area it is unlikely you'd be able to live temporarily next to your home while it is rebuilt. Similarly, if a large structure, such as an apartment building, collapses, re-establishing that shelter can take some time, and the former residents cannot all physically fit on that piece of land until another structure is created.

5. What does a systems approach to urban contexts look like?

Systems thinking is ideally suited to the complexity of urban contexts, 'not only for understanding the root cause of the issues but also for untangling these connections, designing solutions that would work in this complex environment' (Kadihasanoglu, 2015). But the question remains: **What does a systems approach really mean for humanitarians?** This section explores the implications of looking at cities, and their stakeholders, as systems.

A systems approach to urban contexts can be broken down into seven principles:

1. Acknowledging cities as systems;
2. Accepting uncertainty and complexity;
3. Recognising how urban systems change and exhibit resilience;
4. Looking at urban contexts across multiple scales;
5. Focusing not just on the elements of urban areas but also the whole;
6. Addressing the relationships and interconnections in cities;
7. Being spatially focused but not geographically constrained.

5.1 Acknowledging the city as a system

There is wide acknowledgement in both the literature and the interviews that cities are systems (including Krendel, 1970; Batty, 2008; Sanders, 2008; da Silva, et al., 2012; Dodman et al., 2013; Grünewald and Carpenter, 2014; Tyler et al., 2014; Wilson, 2014; Kadihasanoglu, 2015; Twose et al., 2015; Meerow et al., Shaw and Howell, 2016; Sitko, 2016a). Despite this, humanitarians are not taking a systems approach to understanding cities. This may be because not enough work has been done to present the practical realities of urban contexts being interconnected systems. Though more and more humanitarian response occurs in cities, Earle (2016) acknowledges that this response is 'fundamentally at odds' with how urban contexts are organised and function.

So, what does 'cities are systems' really mean?

- Humanitarian and development contexts are not 'blank slates' (USAID, 2014).
- People, organisations and infrastructure are the prime components (Wilson, 2014) and are all systems in themselves as well.
- The different elements and sub-systems of cities are interdependent (IBRD and World Bank, 2009), and while these connections may appear chaotic and 'messy' (Sanderson, 2016: 5) they are in fact highly ordered (Sitko, 2016a).
- We need to 'break out' of our silos and work with others (Bowman et al., 2015).

A systems approach acknowledges that problems, and their solutions, are non-linear and occur in an uncertain context (Tyler et al., 2014). Acknowledging cities as systems therefore means moving away from a 'linear, mechanistic' and 'results-based approach' (Ramalingam and Jones, 2008). This is not necessarily a comfortable shift for humanitarians, and can 'represent a dramatic new way of looking at things – not merely looking at more things at once' (Sanders, 2008: 276). Focusing on systems requires us to explore new ways of thinking (Sanders, 2008) as well as new ways of responding to urban crises.

"One of the biggest changes required of us is to acknowledge and embrace uncertainty and complexity with open arms, rather than shying away from the challenges they present."

5.2 Accepting uncertainty and complexity

One of the biggest changes required of us is to acknowledge and embrace uncertainty and complexity with open arms, rather than shying away from the challenges they present (Tyler et al., 2014). According to one interviewee, urban areas comprise a range of elements that are constantly interacting in ways that can't be predicted just by looking at the different pieces. While the feedback loops do provide some degree of predictability as they seek to balance or reinforce existing patterns, the interdependencies of urban systems can lead to very quick and radical shifts.

Recognising and accepting this is vital: it's one thing to not be able to predict something but if we think we can when we actually cannot the potential for damage is huge. At the moment, many humanitarians are operating on the basis that we can predict things, which means there is no incentive to move to a more flexible working approach that anticipates and leaves room for the unpredictability of urban systems. And whether

we understand it or not, 'complex systems will change in ways we cannot predict' (Bowman et al, 2015:14).

Accepting uncertainty means that we need to be comfortable working in grey areas. One interviewee describes this as having '*a zen-like approach, where to understand it is to somehow accept that there might be parts you're not sure how they're going to work. So you [need to] remove the hubris of feeling you can predict what's going on.'*

It also means thinking in an emergent way, using a multitude of approaches, including experimentation and adaptation, and getting comfortable with change, which is required constantly and over time, not just in isolated places. To accomplish this, humanitarians need to practice more observation and adaptation than planning and implementation. A range of potential options should be explored (Ramalingam and Jones, 2008), generating continuous experimentation and learning (Tyler et al., 2014).

5.3 Recognising change and resilience in urban systems

Urban areas are in a constant state of change and evolution. Some have described urban systems as 'adaptive', putting particular emphasis on their ability to adapt to change (Sanders, 2008; Sitko, 2016b). Meadows (2008) argues that systems change and move in response to events as a result of their elasticity, which demonstrates their resilience. In order to understand how urban contexts may stretch and adapt as a result of crises or humanitarian actions, we first need to understand their normal state of functioning. As one interviewee explained, if you make assumptions rather than understanding what is normal, you will '*make mistakes when you try to fit into that system… so you have to understand what was going on before the disaster'.*

Once we understand the pre-crisis urban area, we can determine the impact of the crisis on the context, and the potential impact of any humanitarian action. Meaux and Osofisan (2016) also point out the importance of going beyond 'what has happened' to understanding 'why'. Looking at how things have changed over time helps identify how flexible a system is and how significant any change may be, and is the first step to finding out 'why'. Charts and graphs can be helpful tools here (Meadows, 2008).

Urban crises can put systems under tremendous pressure, and they can even become disconnected from one another. As one interviewee noted, 'If you… try to apply a humanitarian way of functioning or humanitarian

programmes according to how it is out of the book and then you don't take into consideration that it has changed due to the crisis, then your way of taking the urban system into consideration will be completely misunderstood. This is something we find quite regularly in crisis is that people try to understand the way the society is. *You… have to understand* how it has changed due to the crisis in order to try to see how it is right now.' The unpredictability and interconnectedness of urban contexts mean cause and effect relationships are not linear (Ramalingam and Jones, 2008).

5.4 Looking at urban contexts across different scales

The traditional humanitarian approach focuses on the individual or household. With the development of participatory approaches, a 'community' focus has also been applied. As we have seen, the nature of urban communities presents challenges to taking a community focus in an urban area. In addition, there are issues relevant to any crisis-affected individual or household, which are themselves broader, even city-wide. National or even global issues can also shape neighbourhood and city levels (Sitko, 2016b). Focusing solely on any one level of analysis will not help us understand urban systems and contexts.

A systems approach emphasises the importance of looking across scales of a response (American Red Cross, 2014). It supports a number of recent recommendations for humanitarians to, for example, take a 'multi scalar' analysis (Meaux and Osofisan, 2016). Reflecting on the response to Typhoon Haiyan, Maynard (2015) emphasised the impact of city-wide issues on urban services and communication for crises-affected households in Tacloban. Heykoop and Kelling (2014: 9) note that the Norwegian Refugee Council 'learned to reposition their approach to urban areas by… addressing how interventions could be carried out at different scales and how the different scales connected and interacted with each other: this required not just a change of implementing methodology, but a shift in analysis and strategy'. Earle (2016: 6) notes that even though they focus on a neighbourhood level, 'area-based approaches should operate at different scales…[considering] how this neighbourhood is related to the wider town or city'.

> "The point is to intentionally look across scales… one woman can be an individual, a head of household, part of a community, a vendor in the market and so on."

While it is important to 'add' the city-wide and other scales to our analysis, it does not negate the importance of the individual or household (Sitko, 2016b). The point is to intentionally look across scales, not to replace one with another. Often individuals can act as a 'link' between different

scales. One interviewee pointed out that one woman can be an individual, a head of household, part of a community, a vendor in the market and so on. This emphasises interconnectedness between scales. While it can be easier to focus on one scale, to narrow down to just the individual, in taking a systems approach we just have to look across scales. Simply put, as one interviewee said, '*It's not enough to understand the system at one scale.*'

5.5 Focusing on the elements within systems, and how they come together as a whole

By their very nature, urban systems involve elements that are interconnected in a number of ways. For example, 'a damaged electrical transformer can immediately shut down the supply of water to an entire neighbourhood or hospital, greatly reducing the quality of the public health service and drastically increasing the risks posed to public health and well-being' (ICRC, 2015: 8). But, as we have seen, we can't address systems problems by simply 'adding up' or 'tinkering' with elements on their own (Batty, 2009). As Ramalingam & Jones (2008) recognise, systems need to be understood in terms of interdependence and interconnectedness, and not merely as a collection of elements. To illustrate, Bowman et al. (2015) explain that we can't understand why a river has no water by looking at the riverbed. This argument is articulated by much of the literature reviewed for this paper (including Garrett, 2005; Batty, 2009; da Silva et al., 2012; Yazdani et al., 2014; Brown, 2015a; Currion, 2015; Kadihasanoglu, 2015; UN Habitat, 2015d).

As urban systems evolve, the linkages between them develop – between electricity and water supply, between transportation and telecommunications (Yazdani et al., 2014). This is sometimes called 'emergence', referring to the patterns of interaction that develop naturally and undirected (Sanders, 2008). 'Emergence' is how systems demonstrate their creativity and uniqueness – and also means that, sometimes, systems 'function as a whole or not at all' (Ruth and Coelho, 2007: 327). This is not to say that a system-wide focus is appropriate at all times. Rather, again, as we have seen regarding multiple scales of analysis, it is important to look at both the elements within a system and the whole. In systems theory, 'holism' is an approach to looking at the entire system, whereas 'reductionism' emphasises the examination of individual parts (Rafferty, 2007). In complex urban crises, humanitarians need to use both holistic and reductionist approaches because each shows us something the other does not (see Figure 3). This may require new skill sets that humanitarians, who

have focused on developing their own capacities to address specific sectoral problems, do not yet have (ICRC, 2015).

Figure 3. Holistic vs Reductionist approaches

5.6 Recognising the hierarchies and interconnected relationships within urban systems

Systems develop hierarchies in order to reduce the amount of pressure and demand on the system. Hierarchies reduce the amount of information that needs to be tracked at a single point (Meadows, 2008). They aren't the same as hierarchies within organisations, as they are not linked to authority and status. Systems contain 'hierarchies of scale': actions that happen at one scale (in a household or a neighbourhood) have implications for other scales (city-wide or national) (Ramalingam and Jones, 2008).

Interconnectedness is an 'organic' aspect of all systems (Ricigliano and Chigas, 2011). It can occur 'between individual elements of a system, between sub-systems, among systems, between different levels of a system, between systems and environments, between ideas, between actions, and between intentions and actions' (Ramalingam and Jones, 2008: 9).

5.7 Having a spatial focus without geographical restriction

Urban contexts are inherently grounded in space. As they centre around human settlements and livelihoods, they often form around a relatively stable 'geographic or climatic feature' such as a river, mountains or seasonal temperature variations (Sanders, 2008: 278).

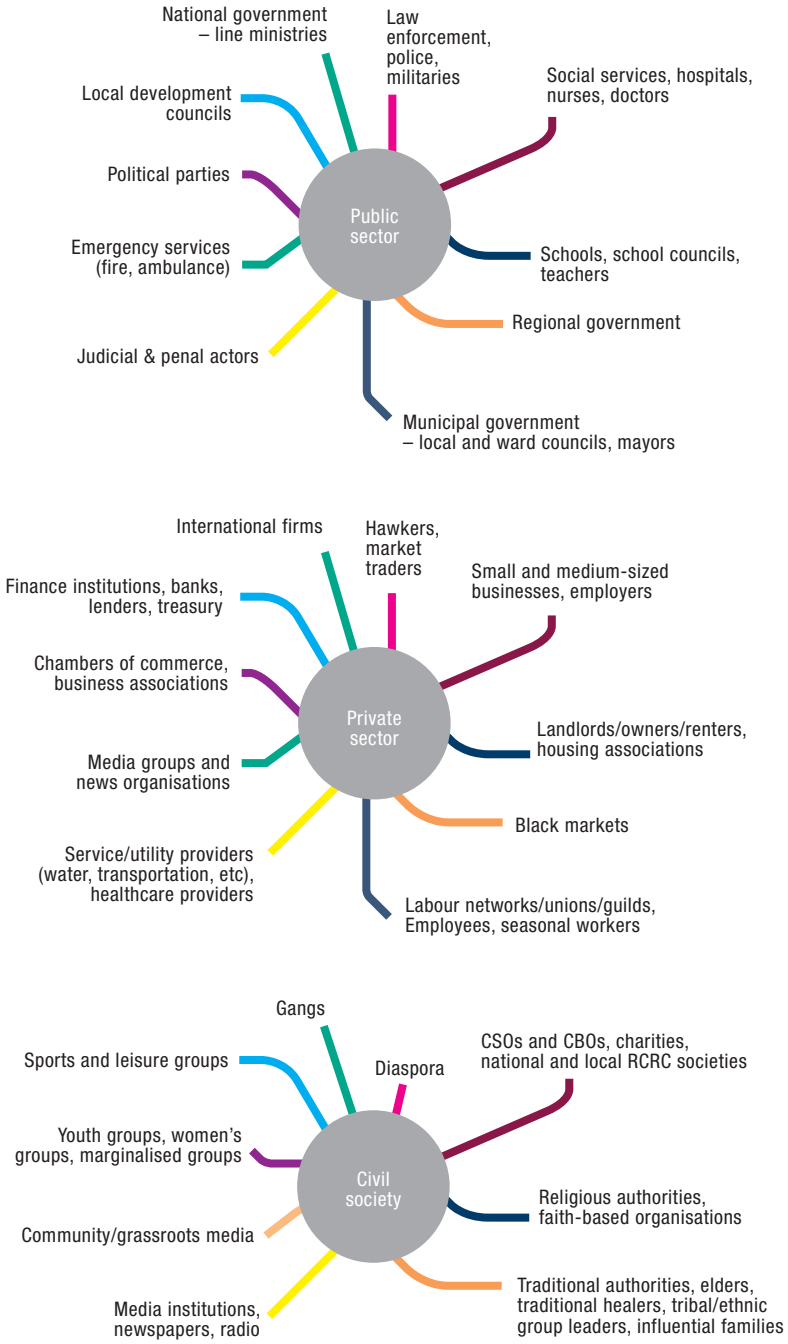
Recently, a great deal of attention and discussion about urban humanitarian response has focused on 'area-based approaches'.[5] The most 'defining characteristic' of these is a focus on a specific geographical area and the attempt to have a holistic view within that geographic focus (Parker and Maynard, 2015); more traditional humanitarian approaches focus on a sector or target group (Parker and Maynard, 2015; Earle, 2016). While geographically targeted approaches have benefits, including the potential for 'inclusive' programmes that bring together entire populations in a given area, and therefore the potential to reduce tensions and conflict (Parker and Maynard, 2015), there is also a risk of being disconnected from the dynamics and connections present across an urban space, not just in any one area. As we have seen, it is likely near impossible to draw boundaries that capture one single community. While an area-based approach may be 'inclusive' for those involved in it, interconnectedness means no one area in an urban system can be demarcated on its own.

Building on some of the ideas of the area-based approach, a systems approach to urban areas encourages a spatial awareness but not to the degree of geographic exclusion. This means taking account of the spatial aspects of cities, including the administrative and physical characteristics, infrastructure and built environment, geographic proximity and features, but not restricting that understanding through geographical boundaries. It means understanding the interconnectedness within urban systems and taking account of these connections across different scales of a response – from the household to the neighbourhood, to the entire city, region and so on.

5.8 A systems approach to understanding urban stakeholders

Understanding how systems function also requires us to look at the actors, often called stakeholders, who play a role in urban systems. This is especially important because of the self-organisation and hierarchical nature of systems. A 'stakeholder' is any actor who has 'something to gain or lose' (Hovland, 2005). Typically they have a 'direct or indirect interest' in the issue, and their 'attitudes and actions' have the potential to influence any activity (Health Cluster, no date). Urban stakeholders are 'a diverse group of people with different backgrounds, roles and expertise who represent the different facets of urban complexity' (Tyler et al., 2014). They are not necessarily different than those found in rural contexts but the number of actors and their intricate relationships with one another are important to keep in mind. Figure 4 below shows some examples of urban stakeholders.

Figure 4. Urban stakeholders



Often, stakeholders are defined by how much power and/or interest they have in relation to the system (Mitchell et al., 1997). While power and interest are important factors, they are not the only aspects which might be relevant to consider about stakeholders in an urban context. These various factors are explored below.

The first aspect to understand relates to **functions and responsibilities**: who the relevant stakeholders are and what their relative roles and responsibility are – which may be ambiguous (Levron, 2010). There also may be a disconnect between legitimacy on paper and that acknowledged by the population. For example, in some contexts the population may consider the police illegitimate (de Boer, 2014). As such it can be useful to understand what areas of responsibility exist and how they are divided; what mandates there are; and any formal or informal arrangements that outline roles and responsibility.

Second, it is important to understand the **capacity and vulnerability** of these various stakeholders. Capacity covers the presence, visibility and credibility of the actor, as well as the resources available to them (funds, facilities, equipment). It can also include relationships and networks, personal and organisational skills, data, norms and values and ability to make decisions (Patrick, 2011; American Red Cross, 2014). Vulnerabilities can be both acute and chronic and include mental, physical, financial and emotional aspects (Lucchi, 2014). Often, vulnerability relates to a reliance on another stakeholder, or a stock or flow in the system, and may therefore be identified by examining interconnectedness.

Third, **power** is a key aspect; this also relates to legitimacy, authority, agency and representativeness. Power can be simply defined as 'an expression of control and influence' (CARE, 2014:10) and can impact whether or not an action occurs (Oxfam GB, 2014). Power can take many different forms, and can be visible (decision-making mechanisms, laws, rules and procedures), invisible (norms and ideologies) or hidden (influencing from behind the scenes), formal and informal (Wu, 2011; Pettit, 2013; CARE, 2014; Oxfam GB, 2014). Power has a role in all relationships, and is a changing variable. Though we often think of 'power over', power can also be understood as 'power to', 'power with' and 'power within' (Pettit, 2013; CARE, 2014).

Understanding power includes:

- Who has it, where it comes from, what it is used to influence and what reinforces it;
- How it is exercised, and what checks and balances there may be;
- What opportunities there are to leverage power for positive results;
- What risks there are that power will be used for negative results.

Related to capacity, and to power, is **access.** Access can be physical or financial or relate to power and ideology. It can be restricted by the control of another actor. Understanding access includes looking at who has it, why or why not, at what cost and what barriers there might be. It also includes what the impact of the access (or not having access) is, whether there are patterns to who has or doesn't have it, where it is evenly distributed and whether it is of the same quality and quantity.

It is also important to understand the **relationships** between stakeholders and between stakeholders and elements within systems is important (Olsher, 2015; Verhagen, nd). The nature of relationships between actors can be described as their social cohesion (Guay, 2015). They can be interpersonal, alliances or formal and informal networks (Pettit, 2013). Sometimes, they can best be described as **conflict**, which occurs as a result of real or perceived incompatibility in aims, perceptions and/or behaviours (Scheffran et al., 2012). In an urban system, it can be helpful to understand any frequent or recurring conflicts; what stakeholders are associated with the conflict and what their main interests are; what actors have taken a role in mediating it; whether it has escalated to violence, any historical roots; relevant timing or seasonality; and the fundamental dividers (tension sources) and connectors (peace builders) (Zicherman et al., 2011; Wallace, 2015; Monzon, nd). Conflict has the potential to escalate to violence, which also behaves itself as a system, with relevant interconnectedness between types, the processes that connect them and the broader institutional context (Moser and Rodgers, 2012). Conflict and violence often contain spatial elements, and a seemingly small, every day, occurrence can actually be linked to deeper and more substantial on-going conflicts (ibid.). Relationships can also be

described in terms of their degree of **influence**. This can be understood as the degree to which actors or elements in a system can put pressure on one another. It is thus important to understand how actors are linked, what power dynamics are involved, how transparent the actors are and to whom they are accountable (CARE, 2014), keeping in mind that they may not be forthcoming about the extent of their influence.

The final aspect to understand relates to stakeholders' **interests and perceptions.** Interests can be both general and in relation to a particular issue, and include the incentives or disincentives actors may have and their motivations, goals and points of view (Ross et al., 2000; CARE, 2014). Sometimes these are obvious; in other cases they are hidden or unclear – and they may also be in conflict with one another, or with those of others (Mathur et al., 2007). It is also important to understand the reasons and motivations for these interests, which can be influenced by an actor's culture, lifestyle and beliefs (US Marine Corps, 2014). Ideologies, discourses and values also shape what is considered 'normal' and 'accepted' in that context (CARE, 2014). Perceptions are also important, as different actors can see a situation in a variety of ways (Verhagen, nd). Wamsler (2004) gives the example of those who choose to live in a vulnerable area because they perceive the threat to be low, and value the status that comes from living in that area. In urban areas, where populations are diverse, even established communities don't have the same perceptions or recollections of the past (Kenya Red Cross, 2016).

6. Our current understanding of urban systems

A lot of urban research and reports reflect on the lessons learnt responding to the Haiti Earthquake – arguably the largest and most complex urban disaster to that point. But as one interviewee pointed out, '*Haiti wasn't the worst case scenario of an urban response*'. The lack of pre-existing city-wide infrastructure systems for waste, electricity, etc. reduced the number and complexity of urban systems to navigate. And while we have made significant improvements and shifts in policy and practice in terms of urban response since then, we have a long way to go.

6.1 What approaches have humanitarians taken to understand urban contexts so far?

While this paper did not set out to provide a thorough depiction of current humanitarian approaches to understanding urban contexts, a number of initiatives have been identified. These include adoption of market analysis tools as profiled in a recent ALNAP webinar, a series of courses piloted by RedR looking at WASH and shelter responses in urban contexts. The Global Food Security Cluster's urban working group has conducted a number of pilot assessments which have explored the challenges of urban communities and engaging with municipal actors.

A number of organisations have explored the use of context analysis tools, including social network and political economy analysis. A variety of assessment tools are undergoing revision and adaptation, and more and more agencies are beginning to use technology such as GIS data and spatial mapping to improve their spatial analysis. Despite some progress, however, these activities can be described as 'piecemeal'. The 'big picture' of how urban systems and stakeholders are connected together, the detail in the complexity, is still missing.

There are several examples where individuals and organisations have been working on these issues for some time, and new initiatives have emerged throughout the course of the research for this paper. For example, the PCI/CHF 'KATYE' programme in Haiti piloted a 'neighbourhood-based approach' which was based on years of experience responding to urban crises and drew upon elements of systems thinking. However often this experience is concentrated within a limited few individuals and hasn't been translated into an organisational policy or approach that is used consistently. Some of the existing frameworks that humanitarians use do look at systems in

their own way. The sustainable livelihoods framework includes looking at access to resources, infrastructure and services, land tenure, markets, power, etc. (Sanderson, 2000; ACF, 2010; Crawford, 2011). Some argue that, in doing so, the approach has attempted to 'integrate humanitarian responses across sectors' (Crawford, 2011: 330). However, the approach focuses on the individual level, which limits its ability to reflect the interconnectedness of these different elements.

Similarly, conflict analysis has been used since 1990s by development and humanitarian practitioners (Midgley & Garred, 2013). Conflict analysis, or conflict sensitivity, specifically seeks to understand the context and the potential impact of an action on that context (Zicherman et al, 2011). Some organisations have also found ways to incorporate systems thinking into their programming, however not from an urban lens. Oxfam, for example, have recognised the importance of 'understanding how systems work and where power lies' and have used systems thinking approaches to do so (Bowman et al, 2015:7).

More recently other organisations have also piloted 'neighbourhood-based' or 'area-based' approaches (Parker & Maynard, 2015). The recently launched Global Alliance for Urban Crises has made understanding systems and stakeholders one of their core focal areas, and under this broader banner Impact Initiatives and UCLG recently conducted a series of case study workshops with local actors to determine how humanitarian response can be better suited to urban crises.[6] There are also a number of tools currently in development which seek to look at certain elements of urban systems understanding, including an Urban Situational Analysis Tool by Save the Children, an urban Context Analysis tool being developed by IRC on behalf of a DFID & ECHO funded consortium, and a City and Neighbourhood Profiling tool being developed by UN Habitat offices in Syria and Lebanon.

There is also potential to learn from the work of both urban planners and designers, and from development actors and national organisations, who have been working on understanding urban contexts for some time, and may be able to build on the existing humanitarian approach. As Killing & Boano argue (2016:48), 'the complexity of urban areas demands a correspondingly complex means of analysis. The typical analyses of both humanitarians and urban planners and designers have their strengths and in other ways are lacking; they should be seen as complementary and enriching of the other perspective, rather than necessarily contradictory'. Similarly, many interviewees pointed out the wealth of information

national colleagues have about the context, as well as that of development and national organisations.

6.2 What gets in the way of a deeper understanding of urban systems?

> “The humanitarian system continues to respond to urban crises as though they were rural – so many individuals have not yet developed the skills and experiences related to responding effectively in urban contexts.”

Given this interest in and commitment to responding more effectively to urban crises on the part of humanitarian agencies, non-governmental organisations and donors, we do not have an adequate grasp on urban contexts so far. A number of barriers currently limit the degree to which humanitarians effectively understand urban contexts. These can be broadly grouped as individual barriers, institutional barriers and barriers related to the nature of the problem.

Individual barriers

When facing complex situations, the human mind relies on its own prior experiences and intuition, to make sense of the situation using what can be described as ‘simple mental models’ (Besiou et al., 2011: 80). Although a growing number of humanitarian crises are occurring in urban areas, most people working in the humanitarian sector have primarily non-urban experiences. This is because, regardless of location, the humanitarian system continues to respond to urban crises as though they were rural – so many individuals have not yet developed the skills and experiences related to responding effectively in urban contexts. As explained by one interviewee, ‘*A lot of people have worked the majority of their career in rural or semi-urban environments and don’t necessarily have the experience working in urban environments*’. Another interviewee joked that a rural mind-set is so engrained in humanitarians today that, *‘You can even see the reflection in the fact that we drive around in 4x4 vehicles in the middle of a city.’* When humanitarians are faced with the complexity of the city, we resort to our known mental models, which are unable to provide us with an understanding of the urban systems we are attempting to understand. Often, we may not even realise we are using our existing mental models and not seek out new information – especially when we’re not sure what questions need to be asked or where to ask them.

Systems thinking requires humanitarians to go against the nature of situations they are placed in, and sometimes their own mind-set. Systems thinking requires stepping back, whereas many humanitarians have developed their skills to respond and make decisions rapidly.

Another individual attribute that may be holding us back as humanitarians is our affinity for text, tables and spreadsheets. Crawford and Killing (2012) suggest humanitarians prefer information to be largely text– and numbers–based, whereas urban planners and designers tend to use more visual mediums, including maps and diagrams, which can help in understanding intricacy and interconnectedness.

Institutional barriers

The first institutional barrier has to do with the humanitarian sector's focus. At present, humanitarians divide their programming and coordination into various sectors (education, food security, health, etc.). As a context, the urban cuts across all of these sectors. There are several implications of this, including:

- A sector-based structure makes it difficult to think holistically about the situation (Crawford and Killing, 2012) and to see interconnectedness.
- When humanitarian organisations divide their programming into sectoral teams, there are no clear 'owners' of urban, so urban expertise and understanding across an organisation is patchy. Urban expertise is not brought into all programming in an urban area (Earle, 2016).
- There are urban issues (e.g. electricity) that don't fit into the current sector structure.
- Urban environments are themselves often divided along sectoral or governance lines, which don't necessarily line up with humanitarian structures.

Ricigliano and Chigas (2011) point out that current donor structures and funding arrangements also encourage focusing solely on one aspect of a system.

Another barrier to effective understanding is our focus on the individual person in crisis-affected areas. While there are benefits to this in terms of accountability, dignity and empowerment, it has a number of limitations:

- It restricts the ability of humanitarians to work at a larger scale, with communities, as is often required in urban crises (Crawford and Killing, 2012).

- It results in vulnerability criteria that, while seeking to support individuals, limit the ability to do so where needs are shared with others across an area, such as where a basic need is access to water and the issue is rooted in municipal infrastructure (Crawford and Killing, 2012).
- The important message of supporting self-recovery and 'helping people help themselves' faces practical challenges in urban environments, where individuals themselves don't have the ability to address system-wide challenges or to fix the pipes within a municipal water system.

When responding to crisis, humanitarians default to the 'institutionally convenient' model of rural or camp-based humanitarian response (Anderson, 2012: 4), developed over years in places where there was 'little to build on' and so organisations 'put in place their own systems' (Earle, 2016: 4), which they are now 'slow' (Dodman et al., 2013) and in some cases reluctant to adapt. Dealing with complexity is seen as an 'indulgence'; organisations prefer simple approaches that are perceived to be low-risk (Ramalingam and Jones, 2008). Terminology around 'community', 'mobilisation' and working 'in the field' echo our rural roots. Some organisations have taken steps to respond differently to urban crises, but in practice their efforts to address issues around systems and interconnectedness often mean focusing on geographically defined neighbourhoods, which does not include addressing broader, systemic issues, seen to be beyond their budgets (Crawford and Killing, 2012). It also creates 'small islands of excellence, while other equally or more vulnerable areas and populations are neglected, and the infrastructure and markets that links these neighbourhoods, and the wider city, are ignored' (Earle, 2016: 5). The result is that humanitarians are not translating their desire for contextual understanding and empowerment of local actors into a reality when responding to urban crises, and in particular are missing the nuances of the urban context (Fan, 2012).

“When responding to crisis, humanitarians default to the 'institutionally convenient' model of rural or camp-based response.”

Another aspect to our default model relates to our inflexibility (Skopec et al., 2010; Fan, 2012; Pavanello, 2012; Scott, 2014; Meral, 2015). The humanitarian sector often takes a 'plan then implement' approach, which may help us prepare for crises in advance but limits our ability to respond to emerging situations. To respond effectively to urban crises, we need to find ways to be more flexible in our approach, to focus less on planning and more on observation and less on implementing our pre-designed models for response and more on how to adapt to the context at hand.

Sticking with our default model also stops us from building on existing structures and capacities. One interviewee explained, '*When it comes to humanitarian action… suddenly the existing system can't cope… and therefore everything gets tossed out… Humanitarians… just come in as though they're starting from a blank sheet… Doing that in an urban area is wasteful, and also draws resources and good people away from existing services, and undermines the perception of local authorities and other local leaders in the mind of the host community.'*

The default models are reinforced when default assessment tools are used that fail to capture the complexities of the urban environment and communities (Kyazze et al., 2012; Currion, 2015), such as power relations (Fan, 2012). Though more and more organisations are starting to re-examine the tools they use for relevance in urban crises, there also exists a degree of tool wariness – with many reluctant to take up new ones. The root of this fear suggests a rather narrow definition of 'tools', conjuring up thoughts of lengthy manuals and bureaucratic processes. Broadening the definition of 'tool' to something more like 'anything that can be used to help you' may help calm this tool-phobia.

Another barrier is that the scale and dynamics of urban crises are too difficult for one organisation to understand on its own, particularly where they focus their work by sector and/or geographical area, but also because, 'Organisations may not have the resources to bear the analytical burden of examining the systems they operate in… they may not have the scope to incorporate a realistic understanding' (Ramalingam and Jones, 2008: 66). Understanding urban contexts may also require a wide variety of skillsets and backgrounds, which it is unrealistic to expect any one organisation to have on hand. To address this, we need to work better together, and also to accept that a full understanding may never be possible. While we should strive to broaden our understanding, we need to accept a level of uncertainty rather than aiming for the impossible.

Lack of time is a related barrier. As one interviewee noted, *'It takes time to understand the complexity of the urban environment.'* Humanitarian programming timelines are often quite short, whereas a good understanding can take months or even years. If we look back at cities affected by crisis several decades ago, for example London recovering from World War II, it has taken decades for them to recover and redevelop. Many of the current approaches to context analysis in the humanitarian sector take two to

three months to complete; in a 10- or 12-month programme it would be unrealistic to dedicate this amount of time to understanding the context. One interviewee described time as a luxury. This raises an important conflict: if understanding urban contexts can only be done with time, and in reality there is no such time, how do we move forward?

Barriers related to the nature of the problem

The final area getting in the way of a deeper understanding of urban contexts is the nature of the problem itself. The depth and breadth of changes required mean that understanding urban contexts is an 'adaptive challenge' rather than a 'technical problem'. Unlike technical problems, which may have quick and easy answers provided by an expert or generated from best practice, adaptive challenges require time in terms of identifying causes and dimensions; need a change in attitudes or approaches across numerous places and organisations; and often meet resistance (Bowman et al., 2015).

Additionally, we are limited by the nature of the other stakeholders in an urban environment, and the perceptions they may have of us. As Currion (2015) reflects, 'In these urban spaces… we are one stakeholder amongst many, we are much more reliant on these other stakeholders than we are in the rural or camp settings, and so all the understanding in the world may not in fact help us to do more effective and appropriate programming'. Many of the stakeholders we should engage with in an urban context are overstretched, and may not be functioning well – or at all. They are also affected by the same siloes humanitarians struggle with. As one interviewee noted, '*Every single municipal authority I've ever had any contact with struggles with understanding the entire system, because they've got the same problem we have, or a similar problem, which is they silo according to ministry responsibilities or departmental responsibilities*.' We are also affected by the view others in the urban environment have now established about us. Crisis-affected governments and communities may think (based on their prior experiences or perceptions) humanitarians are there to distribute supplies, and '*can't really help… get this urban water system back online or work out user fees for half of the city',* as one interviewee said.

7. Conclusion

In many ways, humanitarians are failing to understand urban contexts at the moment – which raises the question of how we can address this gap. Thinking in terms of urban systems can help humanitarians grapple with the density, diversity and dynamics of the city. By emphasising the interconnectedness of urban environments, a systems approach provides a helpful framework to examine not only the pieces, but also the whole. However, to think in terms of systems requires a change in how we approach the city.

7.1 Next steps

This paper is the first output of a broader research project. In focusing on the nature of urban contexts, this paper has reflected on how urban areas can be conceptualised as systems, and possibly complex systems. It has focused on the need to 'step back' as a first step in changing our approach to urban contexts. It also recognises the importance of making practical and system-wide changes to how we move forward and respond effectively to urban crises.

When beginning the research, we sought to identify tools or operational approaches that could help organisations understand these issues in an urban humanitarian response. A number of initiatives are underway, and we are particularly grateful to UN Habitat, IRC and Save the Children for sharing with us details of tools they are each developing. Tools hold great potential for helping organisations address some of the challenges we have outlined. However, they are only part of the solution. We also need to identify ways to change ingrained modes of thinking in individuals and to break down institutional barriers.

There are also a number of questions that logically follow the argument of 'We should understand this better'. The first is: Where do we draw the lines? Bowman et al. (2015: 8) ask, 'If everything is linked in systems, and different systems themselves are linked, does that mean our programmes have to engage with everything? There can be a tension between 'thinking big', and targeting resources and retaining focus.' What learning is really needed, and how do we obtain it? Similarly, how do we avoid 'analysis paralysis' (Bowman et al., 2015) and effectively prioritise our understanding, but in practical terms? Finally, what would these changes really look like: What does an adapted approach look like, in practical terms, and what

do we need from donors, academia, evaluators, etc. to support this? What concrete examples are there where this has been done effectively – and what made them work?

The next phase of this research initiative will move beyond looking at what we need to understand and focus on how we can really gain this understanding. It will focus on how urban humanitarian response should 'move forward', and will attempt to address the questions raised here, and continue to explore the emerging tools and guidance materials being developed, as well as how training, policy changes and further research can complement these.

Those interested should follow ALNAP's urban research work at www.alnap.org/what-we-do/urban.

Endnotes

1 Terms used in document search: 'urban system', 'urban stakeholder', 'understanding urban', 'working with/within urban ', 'urban context analyses and 'urban complexity'.

2 Systems theory dates back to the 1930s. This paper uses key aspects of systems theory as a lens for understanding urban systems but does not attempt a comprehensive analysis or critique, rather focusing on a practical application. For more on systems theory, see Meadows (2008), Ramalingam and Jones (2008) and Bowman et al. (2015). 'Urban systems' is also an important theoretical base, and the literature review brought up several 'urban systems' documents. However, most of these focus on the connections between cities and how each city itself fits into a wider system. As such, many were not relevant to this paper, which focuses on the systems within cities, while also recognising that cities are part of a wider system themselves and the importance of looking at various scales of analysis. For more on urban systems theory, see Bretagnolle et al. (2009).

3 This story was paraphrased in Meadows (2008) and also appears in numerous cultural traditions and texts worldwide.

4 Annex 1 presents a matrix showing 15 of the frameworks/models reviewed and how they are represented by these categories.

5 For more see the ALNAP webinar on this issue: www.alnap.org/webinar/23

6 See documents by Impact Initiatives & UCLG in bibliography.

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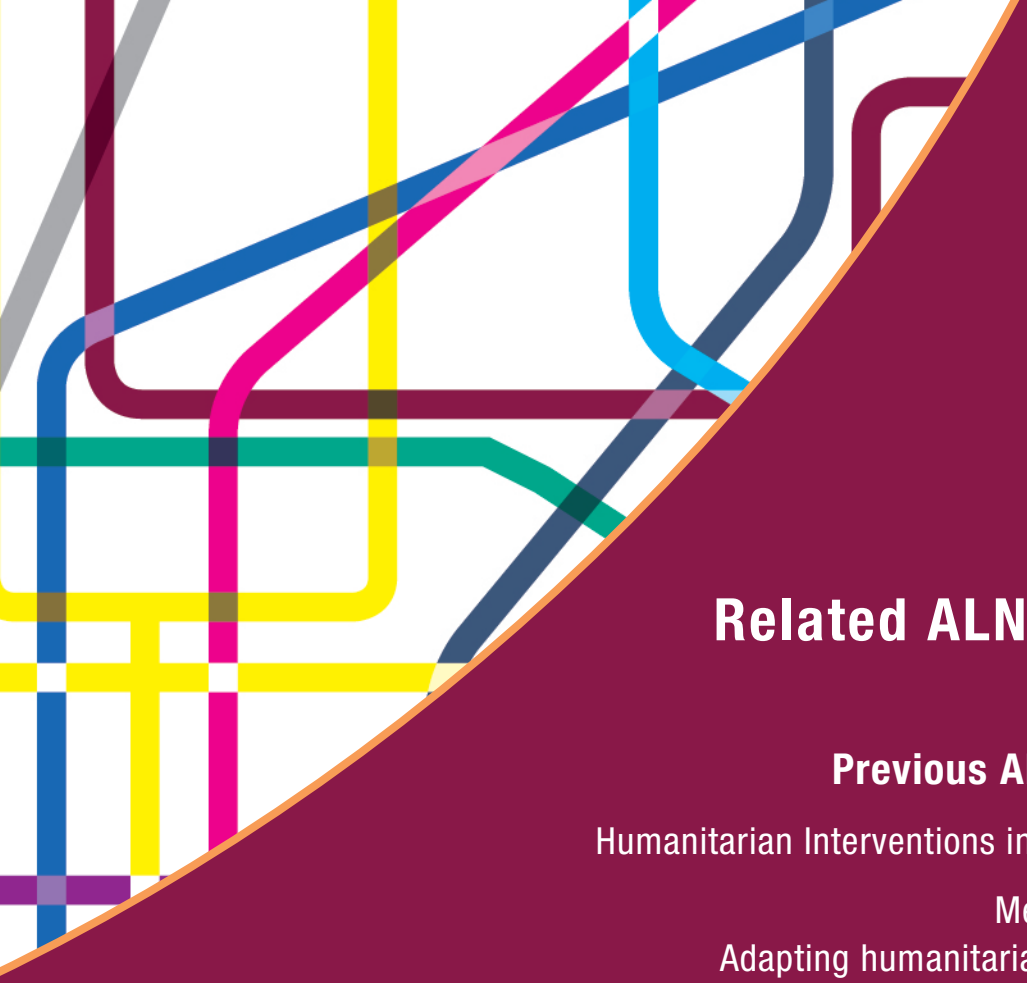
Annex 1: Matrix of frameworks/models for urban systems

Source	Framework/model	Politics an	Economy and livelihoods	Social and cultural	Infrastructure and services	Space and settlements
Butina Watson, (2016) from Roberts (2009)	Resilient city as a system	Politics and governance, civil society	Economic issues	Social humanitarian issues	Technological drivers	Environmental
Gupte and Commins (2016)	STEEP Framework	Political	Economic	Social	Technological	Environmental
ARUP (2016)	City Resilience Framework	Leadership and strategy	Economy and society		Infrastructure and environment	
				Health and wellbeing		
Meerow et al. (2016)	Conceptual schematic of the urban 'system'	Governance	Socioeconomic dynamics Networked material and energy flows		Infrastructure and form	
Grünewald (2011)	The multiple dimensions of urban contexts	Political Societal	Economic	Demographic Historic Social		Environmental
UN Habitat (2015e)	Urban Systems Model Approach	Organisational resilience Political hazards	Functional resilience Economic hazards	Social Hazards	Physical resilience Technological hazards	Spatial resilience Natural hazards
da Silva et al. (2012)	Simplified conceptual model of the urban system	Institutional		Knowledge	Infrastructure	
US Marine Corps (2014)	PMESII-PT operational variables	Political Military	Economic	Social Information	Infrastructure	
Lautze and Raven-Roberts (2009)	Asset Pentagon	Social/political	Financial	Human	Physical	Natural
Meaux and Osofisan (2016)	Urban context analysis themes	Governance and power	Economic systems and livelihoods	Vulnerability, conflict and social	Urban systems Service delivery	Urban systems (spatial analysis)
UN Habitat Lebanon (2016)	Themes for City & Neighbourhood Profiling	Governance	~~Services, infrastructure~~, livelihoods	People	Services, infrastructure, ~~livelihoods~~	
Sitko (2016a, 2016b)	Complex Adaptive Systems & Morphological Layers	Governance	Economic	Social	Buildings and services layer	Topographical layer Public space layer Plots layer
Laurini (2001)	Steering sub-system of the city		Employment Budget	Population	Transportation Public services	Housing Land use Environment
Interviewee, UNISDR	N/A	Governance	Economic	Social	Infrastructure	
Luff (2016)	Factors prominent in urban areas	New stakeholders	The market	People/community	Nature of urban space	

* This framework had one element that didn't fit the table: intergenerational equity.

Annex 2: List of interviewees

Eddie Argenal
Lizzie Babister
Shima Beigi
Sonia Ben Ali
Synne Bergby
Andras Beszterczey
Sarah Brennan
Alan Brouder
Cathrine Brun
Anne Burlat
Emily Cole
Paul Currion
Joseph D'Cruz
Filiep Decorte
Jim DiFrancesca
Lucy Earle
Jihad Farah
Amy Gill
Ezra Glenn
Patricia Holly
Karen Jacobsen
Aynur Kadihasanoglu
Jerold Kayden
Selline Korir
Christine Latif
Ann Lee
Richard Luff
Suzanne Maguire
William Martin
Ansa Masaud
Andrew Meaux
Jalal Mesady
Hilmi Mohamed
Ian O'Donnell
Daniel Olsher
Wale Osofisan
Abhilash Panda
Ronak Patel
Laura Phelps
Brigitte Piquard
Luca Pupulin
Aline Rahbany
Jamie Richardson
Samer Saliba
David Sanderson
David Satterthwaite
Graham Saunders
Kevin Savage
Samer Schinder
Louisa Seferis
Pamela Sitko
David Smith
Margaret Stansberry
David Sweeting
Ombretta Tempra
Kelogue Therasme
Gaia van der Esch
Clay Westrope



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