



**URBAN  
RESPONSE**

**ALNAP**

# Systems thinking for humanitarians

An Introduction for the Complete Beginner

Leah Campbell



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ALNAP is a global network of NGOs, UN agencies, members of the Red Cross/ Crescent Movement, donors, academics and consultants dedicated to learning how to improve response to humanitarian crises.

**[www.alnap.org](http://www.alnap.org)**

#### **About the authors**

At the time of writing, Leah Campbell was a Research Fellow with ALNAP.

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# Introduction

**In 2015, ALNAP surveyed its Urban Response Community of Practice.<sup>1</sup> The results revealed that members were keen for ALNAP to undertake research to improve humanitarian response to urban crises. This marked the beginning of a multiyear research initiative that would attempt to address the critiques often levelled at humanitarian response in urban crises, namely that it:**

- fails to recognise the resources and capacities in the city
- misses opportunities to work collaboratively with urban stakeholders
- disrupts or hinders long-term planning and development
- cannot deal with interconnected problems or issues in the city
- fails to operate across different scales<sup>2</sup> of the city.

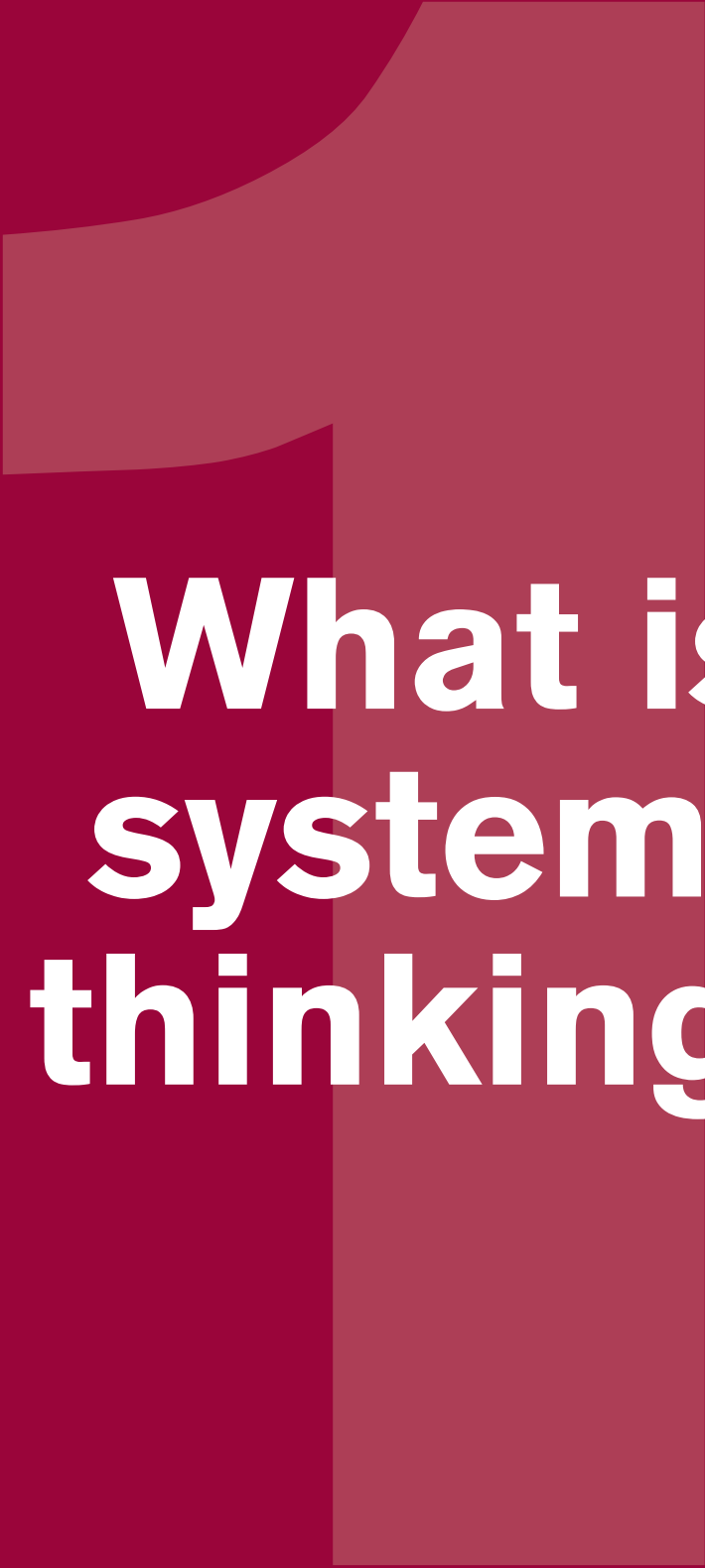
While undertaking research for its first paper on these themes – *Stepping Back: Understanding cities and their systems* (Campbell, 2016) – ALNAP found that many people outside the humanitarian sector described the complexity of urban contexts in the language of ‘systems’. *Stepping Back* called for the humanitarian sector to embrace the idea of the city as a system.

The response to *Stepping Back* was largely positive, but there was also some confusion. ‘Systems’ can mean many things and without introducing these ideas clearly readers were left to draw their own conclusions. In the years since *Stepping Back*, ALNAP has invested in its own understanding of systems thinking, participating in events and workshops, reading relevant literature and discussing systems thinking with a wide variety of experts.

This paper is the culmination of these efforts. It is an attempt to explain much more clearly what systems thinking is and why humanitarians should pay attention to and adopt it. This paper is significantly informed by ALNAP’s work on urban crises; however, it is relevant for all humanitarians who encounter complexity in their work.

This paper introduces the ‘what’ and ‘why’ of systems thinking, situating it within the broader systems universe and demonstrating its relevance for the humanitarian sector. The paper looks at systems thinking in comparison to traditional reductionist and linear thinking, which fail to address the sorts of complex problems that humanitarians face, and introduces the principles, competencies, language and tools that can be used to put systems thinking principles into practice. The paper is accompanied by a companion handbook, which provides the ‘how’ of systems thinking. The hope is to inspire all readers to invest in building and applying their own systems thinking skills.

Definitions for key systems thinking concepts (including emergence, feedback, mental models and perspective) are provided throughout this paper, and you can find a glossary in the companion handbook '[Systems Thinking Handbook for Humanitarians](#)'. The methodology can be found in the [Annex](#).



**What is  
systems  
thinking?**

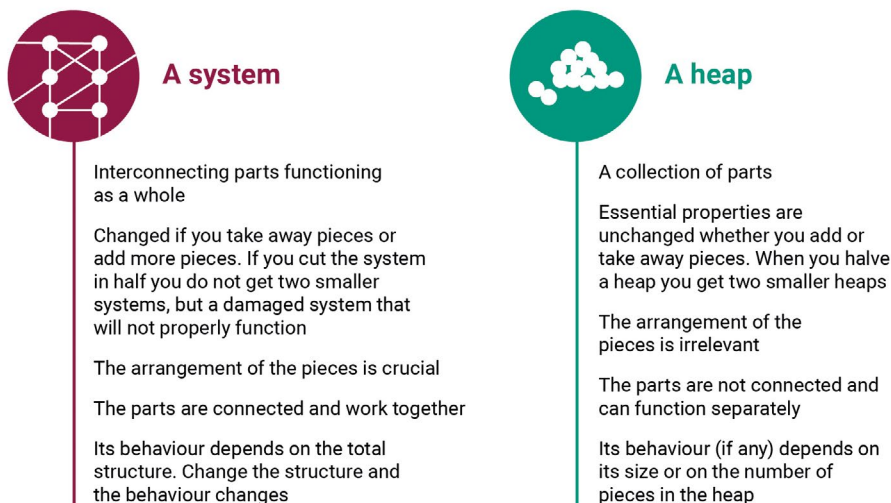
# 1 What is systems thinking?

From medicine to business, high-school teachers to economists, the practice of systems thinking is being used across many different disciplines and actors. Tapping into this approach and the body of existing resources available on systems thinking could add great value to the humanitarian sector. But to do so, we need to get on board with the language of systems and answer the question ‘What is systems thinking?’

Since publishing *Stepping Back: Understanding cities and their systems* (2016), ALNAP has found that many humanitarians are either put off by the language of systems, finding it obtuse and abstract, or misunderstand the language of systems and make dismissive assumptions. At ALNAP’s learning exchange on systems thinking, in March 2021, one participant noted ‘We all have different things in our minds when we speak about systems thinking’ and multiple discussions emphasised the need for simplicity and clarity.

The terms ‘system’ and ‘systems thinking’ are used by different people from various sectors and perspectives. Like many terms familiar to humanitarians – for example, community, coordination – systems thinking is a broad term with no one commonly agreed definition, even among experienced systems thinking practitioners (Monat and Gannon, 2015; Goodman, 2018). However, various articulations share many commonalities. A system<sup>3</sup> is a group of ‘interacting, interrelated or interdependent’ things (Monat and Gannon, 2015) that combine to achieve some purpose. It’s opposite is a ‘heap’ – a group of things that are not related. In other words, ‘systems are defined by their interrelationships and their functionality’ (Acaroglu, 2017a: 3).

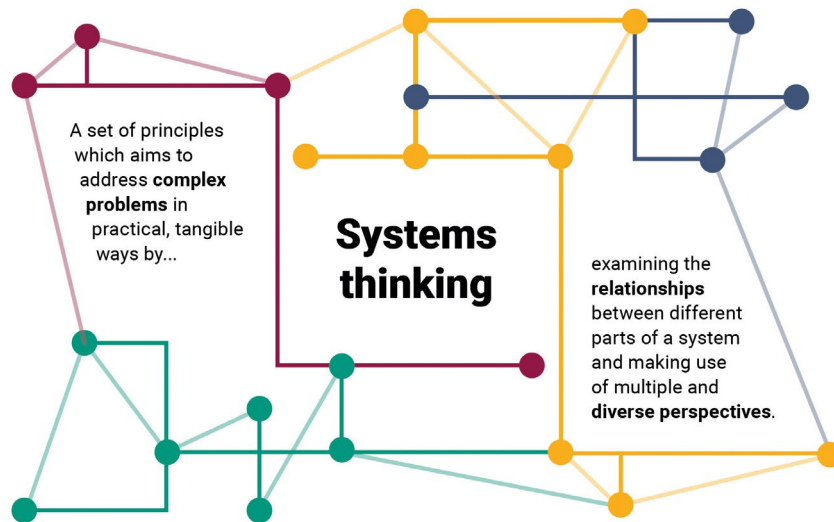
**Figure 1: System or heap?**



Source: O'Connor and McDermott (1997: 3).



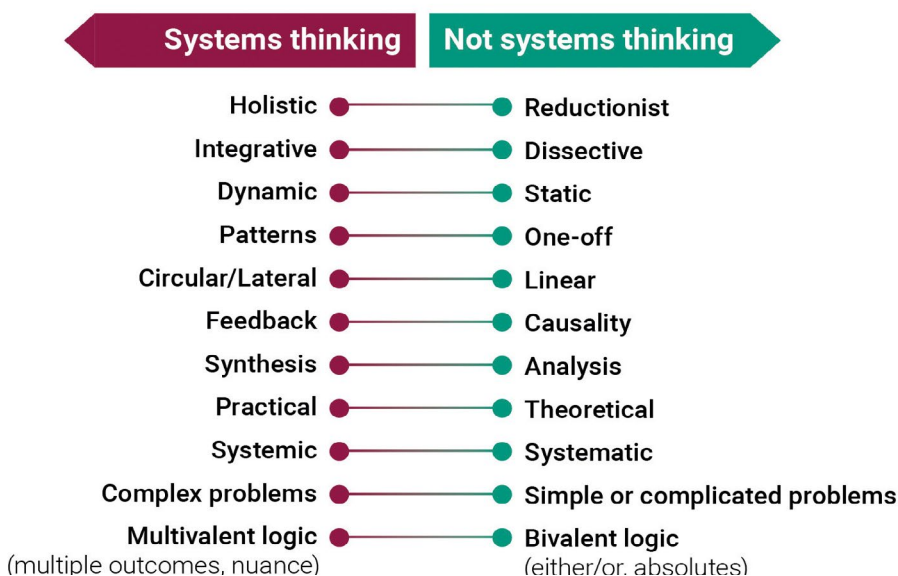
Figure 2: Systems thinking



What then is **systems thinking**? ALNAP proposes<sup>4</sup> the following definition:

The lack of a common definition of systems thinking is due in part to the fact that the practice has emerged from multiple disciplines and has a diverse history (Peters, 2014; see also [Box 1](#)). Although it shares many concepts with the broader family of systems concepts and approaches, systems thinking places the primary focus on cognition. There is not one 'right' way to practise systems thinking nor does it not require users to adopt a new set of tools (see [Section 3.2](#)); systems thinking is about how we frame a problem, rather than a formulaic or prescriptive new way of doing things (Morgan, 2005). Systems thinking adds to our existing skillsets, tapping into our innate understanding of nature and patterns, and can be honed through practice and reflection.

Figure 3: What is and what isn't systems thinking



<sup>4</sup>"Systematic means "having a plan or a method" while systemic means "affecting entire body or organism". So systematic thinking deals with orderly, methodical thinking and systemic thinking with the behaviour of wholes' (Open University, n.d.).

### **Box 1: History of systems thinking**

Systems thinking is not new – Aristotle knew that the whole is more than the sum of its parts and many systems thinking concepts are found in Indigenous traditions (Booth Sweeney, 2001). Some have described systems thinking as ‘the most common form of human thinking... until the advent of Western Rationalism’ (Morgan, 2005: 5). The Industrial Revolution in Europe and North America formalised this understanding, with systems concepts spreading through engineering and computing sectors, as well as biology and natural science (Sherwood, 2002).

Being a transdisciplinary field, it is difficult to pinpoint the precise origins of systems theories. However, many people trace modern systems theories back to the 1950s and 1960s, and in particular the seminal work of Ludwig von Bertalaffy (*General Systems Theory*, 1968) and Jay Forrester (*Urban Dynamics*, 1969) (Barton et al., 2004; Peters, 2014; Emes and Griffiths, 2018).

Following this initial wave of mathematical and computer modelling systems theory (‘hard systems’), there came a second wave of systems theory, described as ‘soft systems’, which focused on more qualitative approaches. Over time, systems theories expanded to focus on power, complexity and ultimately cognition (Cabrera Research Lab, 2016). The work of Peter Senge (*The Fifth Discipline*, 1990) and Donella Meadows (*Thinking in Systems*, 2008) brought systems thinking into the organisational development and sustainability sectors respectively.

Today, many different types of systems theories and approaches now sit under the broader systems umbrella, including hard and soft systems, cybernetics, chaos theory, critical systems theory, complex adaptive systems and system dynamics.

The term ‘systems thinking’ was coined in 1987 by Barry Richmond (Arnold and Wade, 2015) and is one of the newest and most straightforward forms of systems approaches. While many other systems approaches have strict methods, supporters and critics, systems thinking is more broadly a way of thinking, with no set rules for how to apply this thinking. Many systems approaches emphasise ‘particular corners of the systems field’ (Hummelbrunner, 2011: 401) whereas systems thinking can be considered as an umbrella term for a mindset or worldview.



**Why systems  
thinking?**

## 2 Why systems thinking?

Systems thinking emerged as an alternative to traditionally reductionist and linear thinking when dealing with complexity. The simplest answer to ‘why systems thinking?’ is ‘because reductionist and linear thinking (that is, *not* systems thinking) is making things worse’. In the humanitarian sector, there is now more recognition than ever before about the negative impacts of sector siloes and logframe-driven project management – manifestations of reductionist and linear thinking.<sup>5</sup> ALNAP’s urban research has highlighted the need for a different way of thinking and working that is better suited for dealing with complexity (Campbell, 2016).

### 2.1 The challenge of complexity

A complex situation involves many stakeholders and lots of change. These changes do not conform to simple patterns and causality is not linear (Peters, 2014). Simply put, complexity is big and messy (Acaroglu, 2019).<sup>6</sup>

**Complexity** refers to situations that are ‘messy, unpredictable and hard (or impossible) to replicate’ (Egan, 2019: 8).

Complex situations can also be described as ‘wicked problems’ (Lee, 2016) or ‘VUCA’ – contexts characterised by significant volatility, uncertainty, complexity and ambiguity (Cabrera Research Lab, 2016). But ‘complex’ is the term used most commonly in the literature to describe these contexts. Complexity and systems thinking go hand in hand, both recognising interconnectedness, patterns, dynamism and so on.

While many problems can be addressed with technical solutions and traditional thinking, using these approaches when things are complex can have significant negative consequences. Complexity requires something different. As one participant at ALNAP’s learning exchange explained, ‘If it’s complex, we need a different set of tools, a different way of thinking, a different way of collaborating with others’.

Figure 4: Complex problems are distinct from complicated ones



### Complicated The knowable

The problem is intricate. The questions which need to be answered are clear, and it is obvious how to obtain the answers.

While there may be some disagreement about what to do, especially where they require coordination of specialised expertise, one or more experts can determine the appropriate solution.

There is a problem which can be solved by applying expert knowledge and executing a planned course of action.

Not simple, but the causality is fully knowable, the variables are finite, and the outcome of potential interventions can be reliably predicted

#### Examples:

**A jet engine with a mechanical fault:** a skilled technician is required to identify and fix the fault.

**Transporting needed supplies from A to B:** a robust supply chain system run by skilled logisticians is needed to achieve the task.

### Complex The unknowable

The situation is highly uncertain. It is not clear what the right questions are or what the nature of the problem might be.

No matter how much time is spent in analysis, you cannot accurately predict the solution or the amount of effort which will be required. There is high disagreement between stakeholders about what to do.

The predicament requires experimenting to gather more information, reassessing and adapting, trying different approaches to address, repeating until a 'complicated' problem becomes clear.

Everything seems to connect to/depend on everything else. The variables and potential causality are infinite, and the outcome of potential interventions cannot be reliably predicted.

#### Examples:

**The human body:** Doctors working on a patient with a heart condition monitor all vital organs and treat the heart within the context of the broader body, knowing that any problem or intervention could have unexpected impacts elsewhere.

**Conflict:** With many drivers and stakeholders, conflicts cannot be solved with one intervention. It is difficult even to understand the full nature of the perspectives involved.

Source: Hummelbrunner (2011); Wester (2013); Pollard (2014); Bowman et al. (2015); Allen (2016); Emes and Griffiths (2018).

## Box 2: Urban crises as complex problems

In the foreword to one of the systems thinking books that informed this paper, John Speed writes:

My own organization [the European Court of Auditors] has a relatively decentralized structure and somewhat diffuse overall goals – the various sectors of the organization have their own vision of what is important and what are their priorities. In these circumstances there is a structural tendency to ignore the whole view.

(Sherwood, 2002: xvii)

Replace 'organisation' with 'sector' and this is a description of the humanitarian system: many actors, many visions, many goals. Humanitarians tend to break things up into as many small parts as possible, despite attempting to address some of the most complex global problems facing the world: food insecurity, conflict, poverty, displacement, and so on.

The challenges humanitarians attempt to address are complex, as are the contexts within which they work – including urban crises. Although urban crises present some unique challenges (Campbell, 2016; Sanderson, 2019), in many ways they simply magnify challenges faced across all complex humanitarian contexts. Diez Roux highlights the 'long tradition of conceptualizing cities as systems' (2015: 10), something which ALNAP's earlier work on urban crises also underscored (Campbell, 2016).

Cities face complex and interdependent problems – from homelessness to infrastructure, politics and population growth (McFadden, 2018). Adding a crisis onto this only increases the complexity. One participant at ALNAP's learning exchange highlighted the example of Beirut and the explosion that happened there in 2020: 'There is an economic crisis, there is a COVID crisis, and then, on top of that, we have the blast.'

Urban crises involve a range of interconnected and dynamic challenges and, in the words of another learning exchange participant, a 'hypercomplex' mixture of actors and interests. At best, the current coordination system achieves alignment<sup>7</sup> between humanitarian actors, with organisations making slight adjustments to reduce gaps and duplication or follow similar guidance (Knox Clarke and Campbell, 2015). For a long time, humanitarian actors have applied reductionist, linear thinking to the contexts and crises they work in – and the consequences of this have been well documented. As ALNAP's *Stepping Back* report (Campbell, 2016) summarises:

1. Individuals responding to urban crises struggle to move beyond their existing mental models.
2. Humanitarian response programmes are designed, funded and implemented in sector siloes.
3. Humanitarian response focuses (near) exclusively on the vulnerability of individual households.
4. Humanitarians create new, duplicative structures rather than understanding the context and empowering local actors.
5. Humanitarian institutions are inflexible, limiting their ability to adapt based on changes or new learning.
6. There is a lack of meaningful coordination to address challenges that are beyond the capacity of one organisation.

What's missing from humanitarian response, particularly in urban crises, is systems thinking.

## 2.2 Traditional thinking vs systems thinking

There is an expression, often attributed to Albert Einstein, that 'We can't solve problems by using the same kind of thinking that created the problem in the first place'. When it comes to complexity, we need a different way of thinking.

### 2.2.1 Reductionist thinking vs systems thinking

Reductionist thinking refers to an approach that takes things apart in order to find out how they work. Reductionism '[breaks] the world down into individual and manageable parts' (Acaroglu, 2019). It is the mindset that most people are taught in school – 'to think logically, to understand by analyzing – breaking events into pieces and then reassembling them' (O'Connor and McDermott 1997: xvi). The reductionist approach is so pervasive, it dominates our organisational structures, which are 'departmental, silo-like' (Sherwood, 2002: 18). Sector siloes are one of the ways in which humanitarians often get stuck in reductionist thinking. Looking exclusively at household-level vulnerability is another.

Reductionist thinking is an important skill, and helpful for many of the simple and complicated problems we encounter. However, we run into problems when we apply reductionism mindlessly. Reductionism leads us to assume 'that the world stands still as we study it, that puzzling situations will stand still while we break them into component pieces' (Booth Sweeney, 2001: 20) and ignores the relationships between the pieces that are so critical to a system's behaviour (ibid.; Monat and Gannon, 2015).

When it comes to complexity, reductionism is not only unhelpful but can be damaging. A dissection 'slice and dice' (ibid: 19) approach can sever the connections between components in a system as it attempts to simplify it – an effect that can change the system and result in all kinds of consequences (Open University, n.d.; Morgan, 2005). In the humanitarian sector, our attempt

to divide needs and vulnerabilities into technical sectoral problems ignores the reality that people affected by crises experience.

Reductionism also allows us to shift the blame when the consequences of this approach are negative. We apply 'prediction and control', using 'an endless parade of tools and frameworks or recipes' (Morgan, 2005: 7) in order to achieve our objectives. When these are unsuccessful, we use reductionist accounts to explain 'personal failure, resistance to change, and so on. The cycle repeats itself. People and organizations get trapped in fixes that fail' (ibid).<sup>8</sup>

Finally, by focusing on problems one at a time, reductionism 'focuses on "either-or" choices in a world that is more and more "both-and"' (ibid: 6) and makes it difficult for us to practice 'innovation and adaptation, the very qualities that are crucial for long-term effectiveness' (ibid).

### 2.2.2 Linear thinking vs systems thinking

Linear thinking relates to how we think of causality. It posits 'a straight line between a problem and its solution' (Booth Sweeney, 2008: 3–4) and thus fits in well with the human brain's 'tendency to think in simple cause-effect patterns' (Hummelbrunner, 2011: 395). Simply put, linear thinking is about one thing causing another thing to happen – like a car stopping because it has run out of fuel (Ollhoff and Walcheski, 2006).

Logframes, which outline at the start of an intervention a set of activities and expected outcomes, are one example of linear thinking in the humanitarian sector. By establishing the start and end points and requiring practitioners to jump through lengthy administrative hoops to make changes, logframe approaches to project design and management don't easily allow for adaptation, which a complex environment will inevitably require.

Linear thinking is an important skill for dealing with simple or complicated problems where one thing does lead to another and is helpful for 'more mechanical, short-term tasks' (Ricigliano, 2012: 23). Systems thinking, on the other hand, assumes that causality is dynamic – that 'most of the time, various components affect each other in various, and often unexpected, ways' (Ollhoff and Walcheski, 2006).

**Table 1: Reductionist thinking vs systems thinking**

Reductionist thinking	Systems thinking
Reduces problem into smaller and smaller parts	Uses multiple partial views to understand problem
Focuses on breaking problem down into its simplest parts	Focuses on improving relationships among the parts and understanding the problem's environment
Others – either within or outside our organisation – are to blame for our problems and must be the ones to change	We unwittingly create our own problems and have significant control or influence in solving them through changing our behaviour
Tackles many issues simultaneously	Focuses on a few key coordinated changes sustained over time

Source: Adapted from Stroh (2015) and White (1995).



**Table 2: Linear thinking vs systems thinking**

Linear thinking	Systems thinking
The connection between problems and their causes is obvious and easy to trace	The relationships between problems and their causes are indirect, circular and not obvious
A policy which achieves short-term success will also ensure long-term success	The unintended and delayed consequences of most quick fixes neutralise or reverse immediate gains over time
The goal is to create order amongst chaos	The goal is to find patterns amid the chaos
Treats organisations as predictable and orderly	Treats organisations as unpredictable in a chaotic environment

Source: Adapted from Ollhoff and Walcheski (2006); Stroh and Zurcher (2012); and Stroh (2015).

### 2.2.3 Systems thinking for complex problems

Systems thinking is not a fix-all or a replacement for the ways of thinking we use most frequently day to day. Indeed, 'in many situations, simple, technical and even small-scale solutions will be appropriate' (Bowman et al., 2015: 18). However, reductionist or linear thinking is not appropriate for complex problems. For these, we need systems thinking and the new, unique insights it provides (Burge, 2015; Acaroglu, 2016).

Using systems thinking allows us to move from a place of blame to a feeling of agency and responsibility (O'Connor and McDermott, 1997; Stroh, 2015; Jones, 2020). This allows us to see where we have power to affect change (Acaroglu, 2016) rather than feeling victim to circumstances out of our control. Systems thinking inspires collaboration, showing us how we can either create poor results or work together effectively (Bowman et al., 2015; Stroh, 2015).

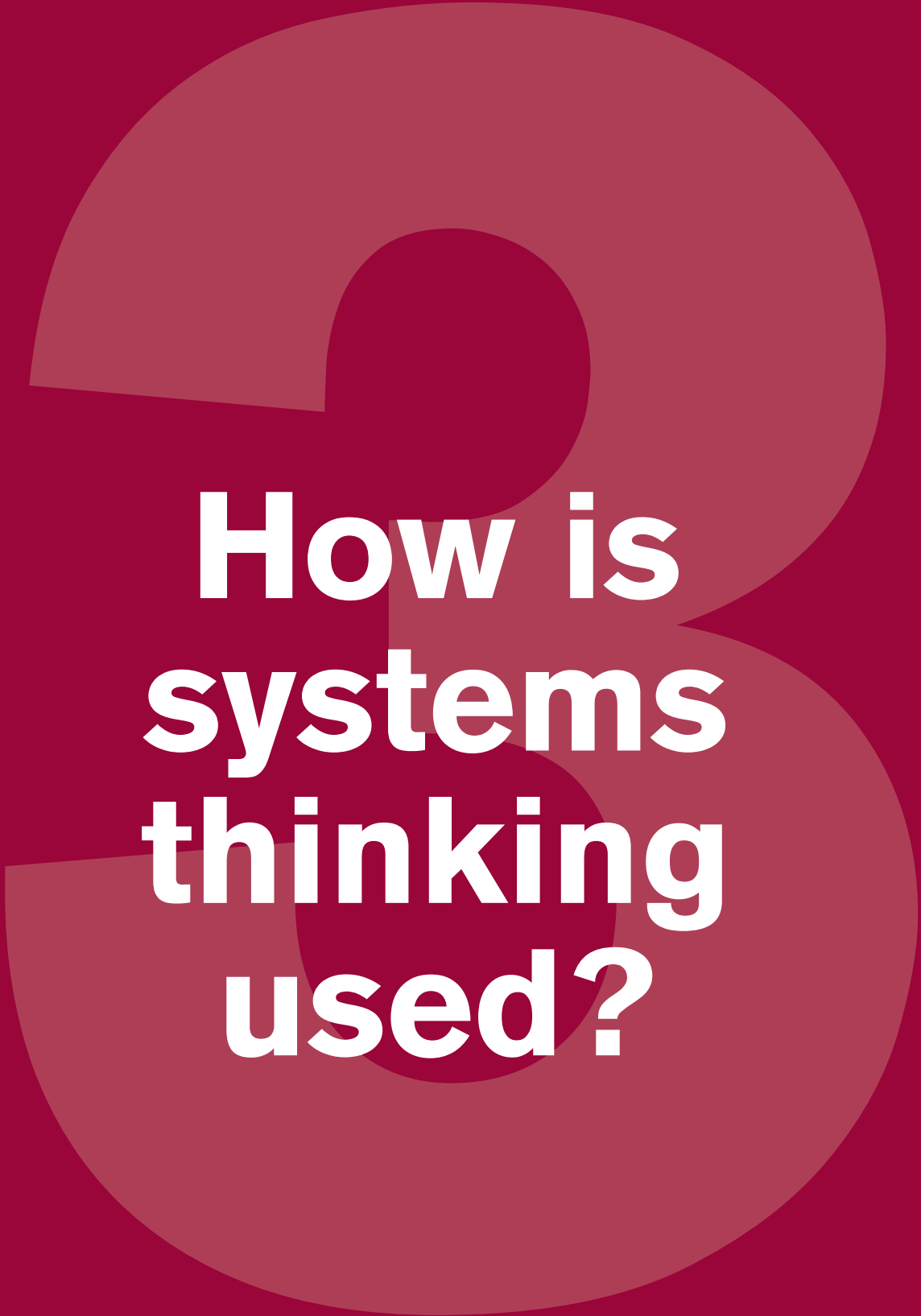
Systems thinking helps us to anticipate negative consequences and use this understanding to get what we want (Pollard, 2014; Stroh, 2015; Goodman, 2018). It allows us to uncover underlying patterns and focus on actions that will have long-lasting, far-reaching impact (Omidyar Group, n.d.; Bowman et al., 2015; Stroh, 2015).

Many of the problems that humanitarians grapple with are complex: protection, food insecurity, conflict, to name just a few. The humanitarian sector itself is a complex system. And the contexts in which humanitarians work – including but not limited to urban contexts – are complex too. It should not be a surprise, then, that 'the traditional linear and reductionist approach used in aid programme design, management and evaluation is at the centre of repeated criticisms. It is argued that it does not take into account the complexity of development processes in social systems' (Ribesse et al., 2015: 1).

Systems thinking has already been used in the humanitarian, development and peacebuilding sectors and to deal with issues from homelessness to food insecurity. InterAction have used systems thinking in their results-based protection work, the United States Agency for International Development have embedded it in their development work (USAID, 2014) and CDA Collaborative have used it in their work on

accountability. Participants at ALNAP's learning exchange agreed that there was significant potential to use systems thinking even more in humanitarian contexts, in particular in urban and protracted crises.

If there was any doubt about the need for systems thinking when dealing with complex problems, the COVID-19 pandemic has removed it. Writing in April 2020, Reynolds pointed out, 'our failure to understand the interconnections of our system has already cost us almost 100,000 lives globally, a grim tally which will only grow in the weeks ahead'.



**How is  
systems  
thinking  
used?**

# 3 How is systems thinking used?

One of the great things about systems thinking is its versatility. It can help you make sense of and respond appropriately wherever you encounter complexity. So, what exactly does that look like?

Imagine you're running a humanitarian programme. You've conducted a needs assessment, planned an intervention and are trying to juggle a range of daily challenges and obstacles. Mid-way through the programme you realise that, alongside positive impacts, your intervention is having some unexpected negative consequences. These have angered stakeholders you weren't aware of. You are not sure if your plans are still relevant and there are so many unknowns, you don't know what to do next. At the same time, you find that affected communities are upset with how aid was provided last year and are now hostile to new efforts – despite the humanitarian situation having deteriorated. You worry that your interventions are not having the desired impact and that you might even be making things worse.

In this scenario, using systems thinking could help you to:

- be better prepared for the consequences your intervention will have
- understand the best place within in a system to intervene to have the biggest impact
- gain a more comprehensive understanding of the situation
- understand why things are or aren't happening and what agency you have to do something about it.

Some humanitarians argue that the short-term, basic-needs approach of humanitarian response means that they do not need to consider the greater complexities of the environment in which they operate. However, increasingly there is a recognition that more often than not, crises are long-term, protracted and dynamic, requiring multiple actions over a longer time frame to effect and measure change.

Even for those unconvinced about the role of humanitarianism in longer-term issues, systems thinking is still a critical skill. The reality is that the situations and issues humanitarians encounter on a regular basis are complex. And in those complex situations and crises, systems thinking is required. Avoiding unintended negative impacts is an important component of the humanitarian commitment to do no harm. More positively, understanding the unintended positive impacts of humanitarian assistance helps support the case for such assistance in a demanding funding environment.

Section 2 of this paper proposed a definition of systems thinking. This section outlines six principles that help us to understand the implications of this definition and introduces the competencies, language and tools that systems thinkers use to apply these principles to their work.

### 3.1 Six principles of systems thinking

**Systems thinking is a set of principles which aims to address complex problems in practical, tangible ways by examining the relationships between different parts of a system and making use of multiple perspectives.**



#### 3.1.1 The different parts of a system are interrelated, and these relationships have consequences

This principle is about seeing how parts of a system work together. Systems thinking promotes a holistic view, which means understanding the whole without losing the nuance of detail. In other words, keeping ‘one eye on the forest, one eye on the trees’ (Richmond, 1994, in Arnold and Wade, 2015: 671). Others describe the value in being able to both ‘break things into parts (deconstruction) and put parts together into a whole (construction)’ (Cabrera and Cabrera, 2015: 60).

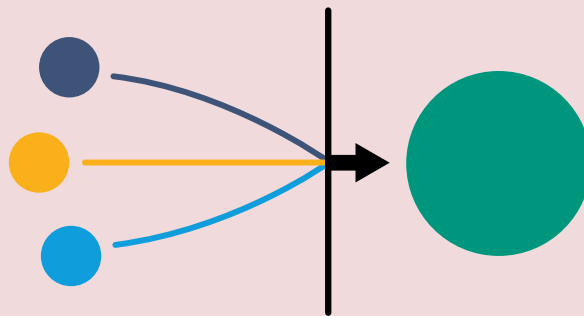
A **holistic** approach focuses on looking at the whole of something (the parts and their relationships).

Systems thinking places particular emphasis on the relationships and interconnectedness between different parts of a system, more so than on the parts themselves. Systems thinkers look for circular feedback relationships, rather than linear causality. Oxfam’s introduction to systems thinking gives the example of a river system, in which rainfall interacts with the soil and human activity interacts with water levels: ‘To understand what is happening we need to understand how the different parts of the system interact and affect each other, which actors are affecting the system and what motivates them’ (Bowman et al., 2015: 5). Applied to the practicalities of humanitarian action, this could mean undertaking multi-sectoral needs assessments, looking at the needs of both displaced and host communities, and designing interventions that benefit entire communities and not only individual households.

Systems thinkers also look at the properties that emerge when parts of a system interact. This is called ‘emergence’ or ‘synergy’. It can be a difficult concept to grasp but really just means that the whole is more than the sum of its parts – that when parts come together, something special happens that wouldn’t have been possible if the parts had remained independent.

For example, the spirit of community that emerges when individuals living near one another work together.

**Emergence** is the idea that there are characteristics of a system that only emerge when the parts of a system interact with one another, characteristics which are not found in any of the individual parts on their own and cannot be predicted by analysing the parts individually.



The humanitarian sector tends to apply a reductionist approach, attempting to deal with different needs and vulnerabilities in siloes. While there is an important role for the rich technical expertise found in sector specialisms, the holistic view is often lacking, as is an understanding of how the different issues and challenges in a crisis connect. Applying this principle of systems thinking will require humanitarians to balance their siloed technical view with a more balanced, holistic one that reveals the relationships and emergence inherent in the crisis or context within which they're working. Applied to humanitarian action, this could mean more multi-sectoral needs assessments and programming, area-based coordination structures, holistic forms of data analysis, etc.



### 3.1.2 Change in one place creates change elsewhere, and these changes can be different in time, space and scale

The relationships between different parts of a system mean that change in one part of it will lead to change elsewhere. This means that 'when you are dealing with a system you can never just do one thing' (O'Connor and McDermott, 1997: 21). Making changes in one place, hoping they'll have only the intended results and nothing else will happen, is 'doomed to failure' (Sherwood, 2002: 5).

The effect of changes are subject to:

- **Delays:** Events influence one another 'even if the second event occurs a long time after the first' (Booth Sweeney, 2001: 20).
- **Far-reaching places:** Changes can include 'ripple effects' (Stalter et al., 2017) and may take place 'far away' (Booth Sweeney, 2001).
- **Magnification:** Small acts can have big consequences (Acharya et al., 2010; Meadows et al., 2016), also described as 'Micro effects can have macro causes' (Morgan, 2005).

Applying this principle to humanitarian practice could mean changing how impact is monitored and reported – including the monitoring time frame. It would also mean thinking through the potential impacts of any intervention as part of project design.

Recognising delays in time and place means recognising the value of both a short-term and a long-term view. 'Lasting change is best achieved through an on-going process not a knee-jerk reaction that produces a one-off fix' (CPS HR Consulting, n.d.: 3). For humanitarians, mention of the long-term can give rise to arguments about the role of the humanitarian sector in long-term development. However, this defensiveness is decreasing thanks in part to the rising prominence of the humanitarian–development–peacebuilding nexus and the efforts of specialists from protection, shelter and cash, among others.

Fundamentally, even short-term actions can be informed by a long-term view – and that sometimes short-term actions can bring about lasting change. Anderson and Johnson explain:

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**The point is not that the long-term view is 'better' than the short-term view... the best approach is to strike a balance, to consider long-term and short-term options and to look for the course of action that encompasses both. At the very least, try making your decisions by first thinking through their likely ramifications – both short-term and long-term.**

(Anderson and Johnson, 1997: 19)

Applying this principle to the humanitarian sector means finding ways to act in the short-term that don't make things worse in the long term.



### **3.1.3 To change a system, we must understand its structure because this is what drives its behaviour**

The behaviours of a system derive from its structure. If you don't change the system's structure, you won't change the outcomes. The 'structure' of a system is another way for describing the nature of the relationships between different elements: how one thing affects all the other things. Structure is about patterns, dependencies, causality.

Changing one factor (Morgan, 2005), blaming one actor (Kim, 1994) or expecting any one intervention to solve the problem won't have a substantial impact. Systems thinkers at ALNAP's learning exchange described the influence of the system's structure as an elastic band: if you pull one element in an attempt to change it or move it elsewhere, the structure will snap it back into place as soon as you let go.

Interventions that focus on one element alone are very unlikely to succeed. This is, as one participant explained, giving a household several goats doesn't break the cycle of poverty: ultimately you've not changed the

structure of the system. 'Rather, the key to success lies in optimizing the activities, relationships, and interactions among the various components of a system' (Gopal and Clarke, 2015: 1).

In terms of humanitarian response, this principle highlights the need to work more strategically. Some of the processes currently used in the system to harmonise programming can end up being more like a tick-box exercise than true coordination (Knox Clarke and Campbell, 2015). Humanitarians engaged in advocating for humanitarian access may have relevant learning to share in how to understand the structures of complex stakeholder dynamics.

While many humanitarian organisations work across multiple sectors, the overall setup of the system is highly siloed, which creates disconnection. There have been efforts by, for example, protection actors, to emphasise the strategic need to work collectively to ensure the safety and protection of affected populations. However, challenges persist in agreeing the scope and purpose of humanitarian action, the meaning of protection, and the concepts and incentives of mandates and territories.

Systems thinking emphasises a more strategic approach to using limited resources: although problems are complex, there are underlying patterns that are themselves simple enough to understand (Cabrera and Cabrera, 2015): 'We must first understand what causes the system to function the way it does' (WWF, n.d.: 9). By learning to see patterns in the properties and behaviours exhibited by systems, humanitarians can identify where they can intervene to achieve the most impact.

**Leverage** is the idea that, in a system, where you try to have influence matters. Using leverage you can identify where a small change can have a big impact, and this will be more effective than a scattered, untargeted approach.



### 3.1.4 We need to understand the recurring patterns in a system's structure, rather than trying to solve individual events

Systems thinking can help humanitarians to see that there are in fact rules that drive seemingly 'isolated and independent incidents' (O'Connor and McDermott, 1997: xiii). By looking at dynamic patterns rather than 'static snapshots' (Emes and Griffiths, 2018: 6), we can see how structures are more influential than individual events (Morgan, 2005: 4).

When we apply linear thinking, we focus on identifying problems 'in terms of their solutions' (Anderson and Johnson, 1997: 88). However, 'before you can "solve" anything, you must first understand it' (Acaroglu, 2017b: 3). Humanitarians are often driven by our innate desire to fix things, a preoccupation that can distract us from looking deeply at the structure (ibid). Linear thinking makes us focus on surface-level problems that are really symptoms. 'Unfortunately, making a symptom go away



won't solve the problem. In fact, it may make things worse' (Ollhoff and Walcheski, 2016: 9).

Humanitarians may recognise this pattern when it comes to cyclical crises like flooding or drought. When humanitarians move beyond focusing on a single incident of drought and try to understand broader seasonal climate patterns that result in cyclical food insecurity, they are applying systems thinking. Levine et al. (2011) explore this in their reflection on cyclical crises in the Horn of Africa. Having first diagnosed the problem as a complicated technical one, the recognition that the problem was in fact *complex* led to the examination of the structure underlying the system.

One significant barrier to humanitarians applying this principle is that we have convinced ourselves that the patterns and structures aren't our responsibility. We gather information about needs but not about context (Campbell, 2018). This is a consequence of the prevalence of linear, reductionist thinking. But by focusing on events, and not on underlying patterns, well-meaning interventions can end up being part of the problem. Humanitarians can put this systems thinking principle into action by using tools like ALNAP's *Systems Thinking for Humanitarians Handbook* (Campbell, 2022) to understand the dynamics and use this understanding to look for opportunities for leverage.



### 3.1.5 Perspectives and mental models shape our view of the system

Systems thinking is about recognising the value of multiple perspectives (Arnold and Wade, 2015). Systems thinkers recognise that the more perspectives involved, the better the overall understanding will be (Morgan, 2005). They acknowledge their own view 'depends on where we are in the system' (Booth Sweeney 2001: 20). By seeking out multiple and diverse perspectives, systems thinking can level power imbalances by creating knowledge equity among perspectives.

**Perspective** (or framing) is how you look at something. Systems thinkers recognise that each situation can be viewed in different ways, through multiple lenses or framings.

The first step to expanding one's perspective is to recognise that everyone is affected by assumptions and mental models. By becoming more alert to the fact that there are deep-rooted assumptions and beliefs underpinning how we are viewing a problem, we can challenge this 'and become aware of how they limit us' (Booth Sweeney, 2001: 20).

Humanitarians can apply this principle to their work by ensuring that a wide range of stakeholders are engaged throughout project design and implementation. They can act iteratively, identifying points of reflection to challenge the assumptions informing action and whether any perspectives are missing.

**Mental models** are the deep-rooted assumptions, stories and beliefs which shape what we perceive as reality, a way to frame information based on our perspective and worldview.

Setting boundaries can be a helpful way to frame or bring perspective to a problem. We can create distinctions about what the problem is or is not to help us understand it (Cabrera and Cabrera, 2015). It's important, however, to remain aware that all boundaries are superficial and are simply another part of the perspective we are using at that moment. While boundaries are a helpful concept, often it is widening our perspective that leads us to the most effective solution (Anderson and Johnson, 1997).

In systems thinking, a **boundary** refers to what's in and what's out when looking at a particular issue.

Systems do not have entirely objective viewers; if you can observe a system, and take a perspective on it, you are part of that system (Sherwood, 2002). Some even describe this as being not an observer but an architect, emphasising the strong influence of perspective (Leal, 2016). Systems thinkers recognise that 'reality' is in the eye of the beholder (Morgan, 2005). Once we intervene in a system, we must start adjusting our future interventions to account for the changes that our intervention, and the interventions of others, will have.

Humanitarians tend to work in siloes and attempt to draw a fairly narrow boundary when looking at problems. By expanding the range of stakeholders involved, humanitarians can bring in relevant perspectives from across and beyond the humanitarian system. Deliberately seeking out diverse views from outside a sector or discipline can enrich thinking, increase collaboration and identify more options for addressing a problem.

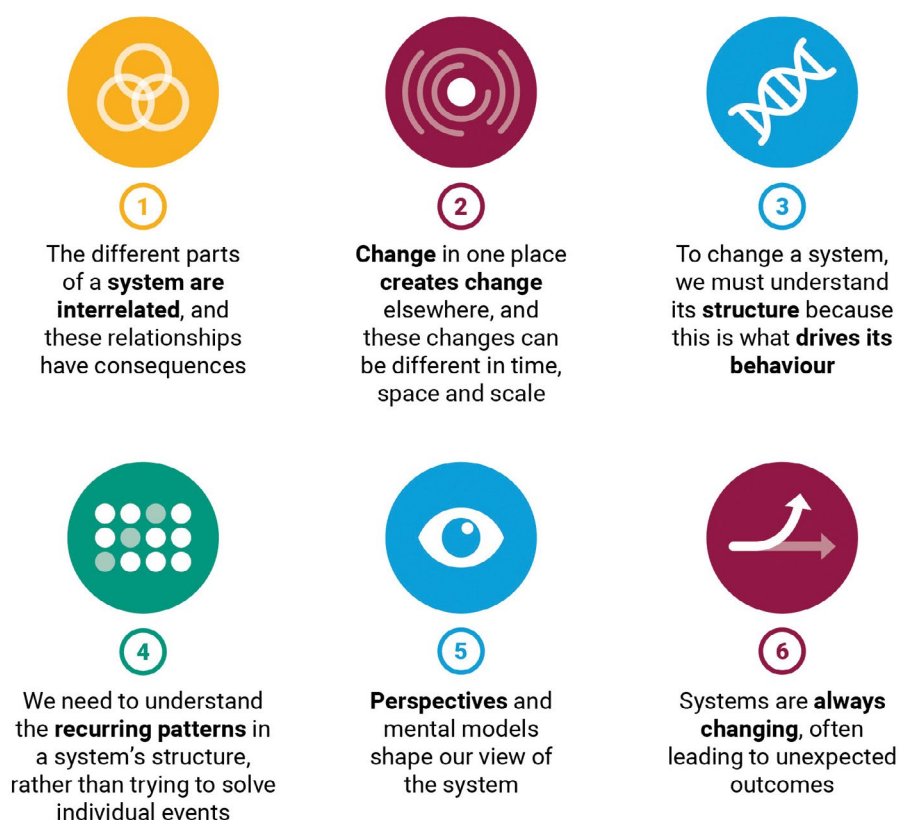


### **3.1.6 Systems are always changing, often leading to unexpected outcomes**

Systems are dynamic – 'always moving and changing' (Booth Sweeney, 2001: 20); 'the system we see today is different to the system that we will see tomorrow and quite different to that which we will see in three months' time' (Burns and Worsley, 2015: 63). Changes occur in the system based on our actions as observers (see [Principle 5](#)), and some changes happen on their own.

Systems thinking pays attention to 'flow and movement' and 'assumes a good deal of randomness and unanticipated consequences that cannot be foreseen even under the most laborious exercises in risk analysis' (Morgan 2005: 4). Understanding patterns (see [Principle 4](#)) will help us to 'anticipate or even avoid unintended consequences' (Booth Sweeney,

Figure 5: Six principles of systems thinking



2001: 33) and can also help us to reinforce *intended* consequences. Systems archetypes help reveal common patterns in systems (see Section 4.7 in ALNAP's *Systems Thinking for Humanitarians Handbook*).

For humanitarians, applying this principle to action could mean being more adaptive and flexible, using iterative approaches to planning and monitoring rather than rigid, linear logframes. To effect and measure change, humanitarians need to be iterative and able to adapt both actions and what is being measured. Using a broader range of monitoring and learning tools – such as outcome mapping, process evaluation, most significant change and contribution analysis – can support this. Humanitarians can also move away from standardised global indicators to those that are locally identified and regularly revised to measure changes as the situation evolves over time.

### 3.2 Putting systems thinking into systems practice

The clue is in the name: the most important and prominent element of systems thinking is *thinking*. There isn't only one path or model. There isn't a checklist or 10 steps to follow. How you apply systems thinking to your work is up to you; at the beginning, it can help to think about systems thinking competencies, language and tools.

### 3.2.1 Competencies

Competencies allow us to focus on what it looks like to do something well. ALNAP's research identified six systems thinking competencies:

1. **Perspective awareness:** Having an awareness of your current perspective and mental model.
2. **Perspective versatility:** The ability to use different perspectives to increase your understanding.
3. **Improving mental models:** Taking action to improve your mental models.
4. **Understanding relationship impact:** Identify relationships in the problem you're trying to address.
5. **Working the structure:** Explain the structure of a problem and use this structure to your advantage.
6. **Iterative action:** Adjust your behaviour so it is appropriate to a changing system.

Each of these competencies contains several criteria. For example, improving mental models involves (a) deliberately seeking new information, (b) surfacing and testing your assumptions and (c) communicating your mental models and those of others. ALNAP's *Systems Thinking for Humanitarians Handbook* explores each of the six competencies and provides suggested activities that you can use to strengthen them.

### 3.2.2 Language

Systems thinkers have a 'unique vocabulary' (Kim, 1999). This language helps systems thinkers to recognise patterns and apply concepts across disciplines. If you can get past the jargon, systems thinking can be quite practical – evidenced by its use in everything from nursing to education. However, the language of systems thinking can be off-putting to the unfamiliar and is one of the biggest barriers to its wider understanding and use.

Much of the literature about systems thinking is vague and littered with jargon. This is particularly the case with the broader world of systems approaches (see [Box 1](#)), which have evolved from various disciplines – including engineering and biology – and feature highly conceptual and mathematical concepts. This can also make systems thinking seem elitist or highly technical and overwhelm people (Lamont, 2020) – a feeling echoed by participants at ALNAP's learning exchange. And although these diverse histories provide many helpful insights into systems thinking, they also come with a lot of baggage.

One of the biggest challenges to using the language of 'systems' in ALNAP's work has been the assumptions people make based on their experience or knowledge of the broader world of systems thinking. This not only includes assumptions about the difficulty of anything to do with systems, but also about what systems thinking is or isn't. ALNAP experienced this following the publication of *Stepping Back* in 2016, as some people interpreted the report's use of 'systems' language as one or another specific systems approach.

A helpful aspect of systems thinking language is the strong visual component, which provides clear and concise ways to understand and clarify complex issues (Goodman, 1994, in Kim, 1994). Visualising systems<sup>9</sup> can help to 'foster a collective understanding of a problem' (ibid: 6) and is particularly helpful where problems are not measurable (Anderson and Johnson, 1997).

The key thing to remember is that it is the systems thinking *concepts* that are important, not the exact terminology.

Systems thinking can be simple. You can be a systems thinker without ever uttering the words 'emergence' or 'mental model', or drawing a systems map. Systems thinking is about thinking differently and it can be practiced by anyone. In the accompanying *handbook*, we outline simple, practical ways that any humanitarian can apply systems thinking to their work.

### **3.2.3 Tools**

Participants in ALNAP's learning exchange emphasised that the promise of systems thinking for humanitarians was in generating a shift in perspective, rather than adopting new tools. This is good news for a sector that many feel is already drowning in toolkits.

This being said, there are a number of 'techniques and devices for visually capturing and communicating about systems' (Kim, 1999: 2), often described as systems thinking tools. You can practice systems thinking without ever using these tools, but they do exist and they can be helpful. The companion *handbook* to this paper introduces some of these tools, including the ladder of inference, iceberg diagram, systems maps and archetypes.

### **Box 3: Is systems thinking evidence based?**

As part of the methodology for this paper, ALNAP conducted a literature review to identify evidence, positive or negative, about systems thinking. However, most of the publications identified focused on forms of systems approaches (see [Box 1](#)) rather than systems thinking. The nature of systems thinking (a mindset, rather than a single intervention) makes it difficult to evaluate in the way that a more tightly defined programme or intervention could be, or to rigorously compare its effectiveness against reductionist or linear approaches. Previous work has come across the same challenge, finding little rigorous study of the effectiveness of systems thinking (Cavaleri and Sterman, 1997).

The most comprehensive study identified is by Waters Center for Systems Thinking, which looked at 197 studies of systems thinking used in schools in the United States. It found evidence that systems thinking helped students to develop a range of skills and competencies, with applicability to real-life problems (Waters Center, 2020). Other studies have found positive impacts from systems thinking in addressing homelessness (Stroh and Zurcher, 2012) and in business (Valerdi and Rouse, 2010). Cavaleri and Sterman (1997) found that systems thinking had a positive impact on organisational performance within an insurance firm; Emes and Griffiths (2018) found systems thinking tools were deemed useful by project managers; and positive impacts were also reported by studies exploring the effectiveness of systems thinking games (Goodwin and Franklin, 1994; Bacon et al., 2018).

Given that systems thinking can be described in comparison to analytical and reductionist thinking, the strongest evidence in its support may be that it offers to address the complex problems that linear and reductionist approaches have been unable to address.

# Conclusion

# 4 Conclusion

ALNAP's previous research found that humanitarian response in cities often:

- fails to recognise the resources and capacities in the city
- misses opportunities to work collaboratively with urban stakeholders
- disrupts or hinders long-term planning and development
- cannot deal with interconnected problems/issues in the city
- fails to operate across different scales of the city.

This paper proposes that developing and applying systems thinking skills will help to address these deficiencies and improve humanitarian response. Systems thinking is holistic, integrative and circular, and is part of the broader family of systems approaches, which have multidisciplinary origins. Based on a comprehensive literature review, participant-led learning exchange and informed by the author's participation in several systems thinking events and trainings, the paper defines systems thinking as a set of principles that aims to address complex problems in practical, tangible ways. This involves taking account of multiple perspectives and looking at patterns, feedback and the relationships between parts of the system while also looking at the whole.

Complex problems are messy, unpredictable situations where change doesn't conform to simple patterns and there isn't a straight line explaining that A happened because of B. When things are complex, it is hard to describe the problem let alone know how to solve it. Everything connects to everything else, with infinite variables and no way to predict the potential outcome. Complex can be distinguished from complicated problems, which might present an intricate challenge, but which can be solved with expertise.

Systems thinking is very different from traditional forms of thought – namely reductionist thinking (breaking problems into individual, manageable parts) and linear thinking (focusing on one thing causing another thing to happen).

## 4.1 What next?

This paper has introduced six core systems thinking principles:

1. The different parts of a system are interrelated, and these relationships have consequences.
2. Change in one place creates change elsewhere, and these changes can be different in time, space and scale.
3. To change a system, we must understand its structure because this is what drives its behaviour.
4. We need to understand the recurring patterns in a system's structure, rather than trying to solve individual events.



5. Perspectives and mental models shape our view of the system.
6. Systems are always changing, often leading to unexpected outcomes.

Putting these principles into practice and applying systems thinking requires changing how you think and act. It means admitting that many of the things that are ingrained in existing ways of working within the humanitarian system 'may actually be producing or at least contributing to the current problem' (CPS HR Consulting, n.d.: 5). This includes sector siloes and territorialism, and the compulsion to 'rapidly identify and implement a solution' (ibid).

Embracing systems thinking means embracing diverse perspectives – and this shift to a more equitable understanding of whose voice is heard and whose ideas feed into decision-making can be seen as a threat to established power dynamics and structures that emphasise expertise. For systems thinking to have practical value, humanitarians need to overcome the instinct to hold on to reductionist, linear ways of working when it comes to complex problems. For systems thinking to have the most value, it will need to be used widely across the sector.

Bolstered by this paper's introduction to systems thinking, it is now time to start building your own systems thinking skills. The accompanying [handbook](#) outlines six systems thinking competencies and gives examples of how to build and practice these skills. It also provides a glossary of systems thinking terms and introduces eight basic systems thinking tools. If you're the type of person who finds themselves flipping straight to the tools section, remember: systems thinking is first and foremost a mindset. Although they may be useful, the tools are optional.

Alongside [the handbook](#) that accompanies this paper, you may find the following resources helpful:

### **Waters Center for Systems Thinking**

The Waters Center is a US-based non-profit who offer a variety of free resources and learning tools about systems thinking, including monthly webinars and a self-guided learning platform, 'Thinking Tools Studio'.

### **Acumen Academy Systems Thinking e-learning (free)**

This free e-learning course for teams/groups, developed in partnership with Omidyar Group, will walk you through how to use systems thinking and develop a systems map.

### **The Systems Thinker**

This website offers a variety of articles, guides and multimedia resources exploring various systems thinking topics, tools and applications.

### **Academy for Systems Change (Donella Meadows Project)**

This organisation furthers the work of the late Donella Meadows, a systems thinking and environmental advocate. The academy offers various resources including a system leader's fieldbook and various other articles, resources and stories.

# Annex: Methodology

This paper aims to explore the potential for humanitarians to make use of the practical 'systems thinking' tools and practices used in education and healthcare fields outside the humanitarian sector, in relation to making urban humanitarian response more context appropriate.

The research questions are:

- What are systems thinking approaches and practices?
- To what degree can systems thinking approaches support urban humanitarian response to be context appropriate?<sup>10</sup>
- What evidence exists that systems thinking approaches and practices have impact?
- Which specific practices and tools can humanitarians use to improve their systems thinking skills?

This paper is based primarily on a literature review. An initial search was conducted on Google Scholar and Google, using the following search strings: "Systems thinking" + "in practice", "Systems thinking" + "humanitarian", "Systems thinking" + "tools". The first 100 results for each were considered. A further literature search was conducted on Google Scholar, using the following search strings: "Systems thinking" + "evidence", "Systems thinking" + "impact" and "Systems thinking" + "critique". Additional documents were identified from the literature review conducted for *Stepping Back* (Campbell, 2016) and through the author's own library. In total, 222 documents met the inclusion criteria.<sup>11</sup> These were then coded using MaxQDA and informed the structure and content of the paper.

In March 2021, ALNAP held a two-day virtual learning exchange with 28 participants from nine countries and a mix of humanitarian, development and systems thinking disciplines. The discussions at the learning exchange were recorded, transcribed and reviewed by the author as a further source of evidence to this paper. Anonymised quotes from participants are included throughout.

The paper has also been informed by the author's participation at a number of workshops and events, including the Waters Foundation's Systems Thinking Institute, training workshop for 'Friday Night at the ER', and University College London's Systems Thinking course.

# Endnotes

1. The Community of Practice was closed in 2019, following a membership survey: [www.alnap.org/help-library/urban-response-community-of-practice-2018-membership-survey](http://www.alnap.org/help-library/urban-response-community-of-practice-2018-membership-survey)
2. Such as: streets, neighbourhoods, zones, city-wide, nationwide.
3. See Kim (1999) and Open University (n.d.) for more on the definition of 'system'.
4. For more on the definition of 'systems thinking' see Arnold and Wade (2015); Monat and Gannon (2015); and Stalter et al. (2017).
5. ALNAP. (2020, 19 February) '[Story in 5: Arbie Baguios | Decolonising project management in the aid sector](#)'. YouTube.
6. See Boulton et al. (2015) for an introduction to complexity.
7. ALNAP's coordination research identified three levels of coordination (between complete independence and full merger): communication, alignment and collaboration. Alignment is defined as 'Organisations retain a high degree of independence but may adjust their activities to create a more effective response on the basis of the activities of other organisations. Adjustments might include accepting common guidance, or changing the nature or location of activities to reduce gaps/duplication. Organisations are working separately but influenced by one another' (Knox Clarke and Campbell, 2015:6).
8. See the [accompanying handbook](#), Section 4.7 on system archetypes for more on 'fixes that fail'.
9. See Egan (2019) for more on visualisations in systems evaluations.
10. A context-appropriate urban response is one that does not fail to recognise the resources and capacities in the city, does not miss opportunities to work collaboratively with urban stakeholders, does not disrupt or hinder long-term planning and development, is able to deal with interconnected problems or issues in the city and to operate across different scales of the city.
11. Inclusion criteria: documents that outline systems thinking tools or practices; guidance, training materials, resource packs, articles and similar formats. Exclusion criteria: documents that are purely theoretical and do not contain practical tools or practices; documents that contain the phrase 'systems thinking' but are not themselves about the subject matter.

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