

## The value of complexity theory for development

# Debating complexity

In 'Connecting the dots' (*The Broker 7*), Alan Fowler presented complexity theory as a potential approach to development thinking. *The Broker* asked a number of development experts to react to Fowler's piece. This article summarizes their responses.

### The following experts contributed to this debate:

- Robert Chambers, Institute of Development Studies, UK
- Irene Guijt, Learning By Design, the Netherlands
- Harry Jones, Overseas Development Institute, UK
- Arnaldo Pellini, University of Tampere, Finland
- Paul van Tongeren, Global Partnership for the Prevention of Armed Conflict, the Netherlands
- Seerp Wigboldus and Jim Woodhill, Wageningen International, the Netherlands
- Lada Zimina, Skillshare International

Does complexity theory offer a framework for understanding social development that is superior to existing approaches? Can it effectively guide action by development agencies? The debate prompted by Alan Fowler's article in *The Broker 7* indicates that the jury is still out on these questions. Interestingly, all the experts who have responded so far to Fowler's article agreed on what is wrong with current methods: planning models that assume linear cause-and-effect relationships and predictable outcomes, such as the logical framework, are ineffective when applied to a reality that is messy, unpredictable and impacted by multiple agencies and processes beyond the development intervention that is being carried out. Not only are current approaches to aid considered rigid and overly linear, but they tend to shy away from conflict and politics. Complexity, by contrast, draws attention to 'messiness', unpredictability and power relations.

By **Willemijn Verkoren**, assistant professor at the Centre for International Conflict Analysis and Management (CICAM) of the Radboud University Nijmegen, the Netherlands.

But does complexity offer a real alternative to existing approaches? The contributors to this debate did not readily agree. Some doubted that complexity is really new or that it truly challenges dominant discourses and the current authorities in development. Other questions that were raised are: Does complexity offer a coherent and workable framework for analysis? Is it applicable to social development? This article discusses each of these questions.

The debate has only just begun. The consensus to date is roughly as follows. An alternative framework for development interventions is badly needed. Although complexity is based on existing concepts, its novelty is in combining and drawing attention to them. Not all of the theory may be directly applicable to development, but its ideas seem to address much of the critique of current practices. And in the field of conflict transformation, some elements of complexity theory fit very well. Although complexity is at the current time unlikely to cause a complete overhaul in the field, some of its elements may contribute to a gradual shift in thinking and practice towards more modest planning, a learning-based approach and more emphasis on bottom-up, self-organizing processes. For this shift to occur, a thorough contextual analysis is key, both for determining the extent of the complexity of a given problem and for finding the best leverage points for intervention in support of existing social processes.

### Is complexity theory really new?

Fowler presents complexity not as something necessarily novel but as an overarching approach that incorporates many others. Some contributors also recognized existing theories and cautioned against claiming too much originality for complexity theory. It is, for example, not the only approach that recognizes power relations. Other approaches, such as *emergence*, in which outcomes emerge



Young monk in an ancient temple in the Angkor Wat complex, Cambodia, June 2007

in unexpected ways as a result of various anticipated and unanticipated factors, and *feedback*, in which outcomes influence the interventions that contributed to them, have been previously known as part of *systems thinking*. Systems thinking sees seemingly unconnected issues as part of an overall system in such a way that a change in one element affects the whole system. Not just in existing theories, but also in the practice of development programmes, complexity's ideas already play a role, such as in some 'empowerment' initiatives. So, complexity is not really new. Its value, however, is in combining existing ideas and practices and in drawing renewed attention to them. That in itself is an important contribution. Many joining in the debate felt that concepts such as non-linearity, co-evolution and unpredictability resonated with their own ideas, but that they are insufficiently recognized and applied.

### Does complexity theory challenge the powers that be?

So complexity offers concepts that may help correct some of the flaws of current approaches, but by how much? Can complexity challenge the vested interests in development and overcome existing obstacles to actual system change? Lada Zimina notes that while complexity recognizes issues of power, it remains unclear what it has 'got to say to some of the hard-core "political" questions about aid, such as where aid comes from and under what conditions. Who decides where it is directed and how? How legitimate are the development community and development interventions? Will complexity, like other approaches, be no more than a rhetorical veil that covers a reality in which little has actually changed? If complexity implicitly accepts the current global system of which aid is a part, then, as >

Zimina says, ‘it risks becoming yet another technical tool, even if a more sophisticated one, to prolong the dependency and injustice the development field claims to address’.

### **Does complexity theory offer a coherent and workable framework?**

Although some development experts agree with elements of the complexity approach, many seem unsure of what exactly to do with it. The whole body of complexity theory is rather, well, complex, and difficult to grasp in its entirety. Understandably, due to its brevity, Fowler’s article did not attempt to explain the theory in depth. In particular, he did not make clear how the different elements fit together. This lack of explanation may cause some people to shy away from the discussion. Even if they understand the theory, development professionals wonder how easily it can be put into practice. If complexity argues that the world is unpredictable, then how can we, in Fowler’s words, ‘estimate more realistically the probability of whether the ongoing processes determining change could be directed in a particular way’? Or is it possible to distinguish between those aspects of our world that can be

understood and predicted and those that cannot? Irene Guijt points out that some aspects of human relations institutionalize and thereby become predictable, such as banking processes. ‘I for one am glad that banks, originally a civic-driven social innovation, have standardized financial processes in ways that make me feel fairly sure that if I deposit money in my own name, it will end up in my account’.

### **Is complexity theory applicable to social development?**

Most contributors feel that complexity can offer insights for looking at social development in a more realistic way. However, not all elements of complexity at first glance have equally immediate relevance to the field. Concepts such as ‘strange attractors’ and ‘the Mandelbrot set of fractals’ do not seem to shed new light on social development and may only lead to confusion. More fundamentally, some question whether complexity thinking applies at all to social systems in a coherent and meaningful way. The theory originated in the biophysical sciences and its relevance for the social sciences is contested.

#### **Navigating complexity**

At the end of May 2008 about 50 international researchers and policy makers from ministries and NGOs gathered in Wageningen, the Netherlands for a workshop titled ‘Navigating Complexity’. Some had recently been exploring complexity and similar approaches. Others had a long history of critical reflection in the social sciences. On the morning of the second day, Robert Chambers summarized his observations on the discussions of the previous day, and partly repeated a somewhat sceptical commentary he had written in response to Alan Fowler’s article (see below). Chambers began by stating that his initial scepticism, as quoted in his comments on Fowler, had abated because of the things he had heard at the Wageningen seminar, and that he now had a more positive attitude towards complexity. In a letter to *The Broker* he wrote that he is ‘now less agnostic’ than when he made his initial comments. He now thinks ‘there is a good deal in complexity theory that is relevant and useful’, and sees exploring and applying some complexity thinking and insights to development thinking and practice as an ‘important frontier with transformative potentials’.

For the presentations, a summary of the dialogue, and further reading, see <http://portals.wi.wur.nl/navigatingcomplexity>.

#### **Robert Chambers’ comments**

**What are we to make now of the family of overlapping concepts and ideas known as theories of chaos, complexity and emergence?**

**Do the concepts of these theories obfuscate and disempower?**

Any new vocabulary at first marginalizes and disempowers some people and enhances the power and authority of others who introduced it and who use it with confidence. This could happen if complexity theory comes more into vogue.

**Do these concepts lead to new and useful ways of thinking and acting?**

Many of the concepts of systems theory, such as feedback, multiple interactions and emergent properties, overlap with complexity theory and are useful. But they are not new. Others, such as non-linearity,

sensitivity to starting conditions, co-evolution and adaptive agents, may bring new and legitimizing light to aspects of social change which have been known but often inadequately articulated or recognized.

An important practical question is whether complexity thinking can lead to, underpin and legitimize alternatives to mechanistic rules and procedures like the logical framework. That could be a significant, even transformative, contribution to development thinking and practice.

**Do these theories tell us something profound and new?**

For me, the jury is still out on this one. The Santa Fe Institute describes itself as a ‘multi-disciplinary collaboration in pursuit of understanding the common themes that arise in natural, artificial and social systems’. Each of these systems has many domains, and there have been many common themes. The question is, what do they signify?

A question to ask is how theories of chaos and self-organization resonate with empowering practices in development. We can find self-organization and unpredictable emergent group behaviour based on simple rules on a computer screen, as with the famous programme ‘boids’ (birds) where three rules lead to random blobs forming a flock and flying around. We find something similar with self-help women’s savings groups in South India where an NGO only insisted on two things: transparent and accurate accounting and rotating leadership, leaving everything else to group members. Then there is the experience of SOSOTEC – self-organizing systems on the edge of chaos – in workshops where creative emergent behaviour comes from simple guidelines and motivated individuals.

In all cases, complex unpredictable behaviour arises from simple rules or principles applying to entities or individuals with energy. Are similarities like these of deep ontological significance? If they are, then there may be much more of social relevance to be learned from complexity theory. Or are these just intriguing parallels? Or simply sources of metaphors?

I do not know. Can anyone help?

Because people do not always behave in predictable ways, it is questionable whether rules of behaviour can be pinned down. Conflict is one aspect of human behaviour that illustrates its unpredictability and irrationality. Conflict is an important characteristic of many developing societies, and indeed, of development processes. Although complexity may insufficiently address the sometimes irrational behaviour of people caught in escalating and violent situations, it may offer guidance for dealing with conflict. Zimina and Paul van Tongeren highlight how complexity is similar to the conflict transformation approach, which sees conflict as an opportunity to change a system, thereby presenting a leverage point in the development process. Depending on how conflict is dealt with, it can either stimulate or hamper (or even reverse) development (see 'Early action' in *The Broker* 8 for more on conflict prevention). This perspective is in line with Fowler's, who described aid as a temporary disruption of human systems, which then, in partly unpredictable ways, find a new balance that provides order and stability.

### **What are complexity theory's practical implications and applications?**

Given its emphasis on unpredictability, it is unlikely that complexity theory can provide a specific new approach to development planning. Instead, it calls for an alternative to planning, namely testing different strategies and learning from the results. In complex circumstances, such learning should not take the form of simply replicating 'best practices', which lose their meaning in a different or changed context. Rather, constant reflection and learning are required, and the best that we can hope for are, in the words of Jim Woodhill, 'emergent practices'. Complexity may help manage outcome expectations, depending on the situation. Concrete outcomes can be expected of interventions in relatively simple situations, but not in more complex and ambiguous ones. Therefore, a problem must be analyzed before an intervention is launched: how complex is the problem? In this context Guijt and Woodhill refer to the Cynefin framework, which characterizes situations according to their degree of disorder and linear causality. 📖 Categories in the framework are 'simple', 'complicated', 'complex' and 'chaotic'. When issues are considered to be complex or chaotic, programmes should have modest goals that explicitly allow for experimentation and even failure.

In terms of the type of development strategy employed, complexity calls for bottom-up approaches that rely on people to self-organize and that support processes as they emerge. Some current empowerment practices may fit in with such an approach. Complexity theory may be helpful in making strategic choices as to the best point of leverage for the strengthening of self-help initiatives – although the exact way in which it may do so remains unclear. In any case, a prerequisite is to have a clear understanding of the dynamics of local circumstances and agencies. Research is crucial, as programmes to strengthen citizens' engagement with local governance in Cambodia illustrate.

Another practical implication of complexity relates to currently dominant development management methodologies, which, as mentioned, tend to be based on linear cause-and-affect thinking and programming. The logical framework is a well known exponent of this. Here, progress is already being made, particularly in the development of alternative, qualitative monitoring and evaluation techniques. One such contribution, noted by Seerp Wigboldus, is the Most Significant Change technique, a qualitative monitoring and evaluation tool centred on stories of change. Wigboldus cautions, however, that improvements remain 'patchwork' and that a 'comprehensive and integral methodology' is needed that draws on complexity thinking and other related approaches. Otherwise, development programmes will keep falling back into 'linear programming mode'.

Unfortunately, systemic obstacles complicate efforts to find alternatives to dominant development management methods. The tension between learning (which benefits from uncertainty and open-ended reflection) and accountability (which usually emphasizes outcomes that are short-term, planned and readily observable) in many development programmes needs to be reconciled. More generally, incorporating uncertainty requires not only different planning models but different mental frameworks for how the world is perceived and approached, and how development agencies define and reward success. Another challenge is overcoming interagency boundaries and competition in order to ensure coherent and joint responses to the complexity and interdependency of development processes and interventions.

All this, writes Harry Jones, co-author of a recent ODI paper on complexity, 'requires a significant reality check, and a sense of humbleness about what each actor can achieve'. He adds, however, that we should be hopeful and accept that because 'we only have influence (and not control) over development processes, we must not lose our courage and ambition. The fact that the large-scale, long-term change that is required cannot be planned in advance, or achieved based any one actor's goals and intentions, is not a reason to give up the drive for change. Lessons from the concept of self-organization in complex systems show us the power for change within systems of heterogeneous and connected agents. The role that mindsets, feedback, leadership and sense-makers have in shaping the behaviour and interactions of interacting agents shows the true potential for change'. ■

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- Baser, H. and Morgan, P. (2008) *Capacity, Change and Performance: Study Report* (Discussion Paper, 59B). Maastricht: European Centre for Development Policy Management.
  - Jones, H. and Ramalingam, B. et al (2008) *Exploring the science of complexity*. ODI Working Paper 285.

📖 Readers can access the complete responses, and contribute to the ongoing debate at [www.thebrokeronline.eu](http://www.thebrokeronline.eu).