Complexity, Resilience and the Comprehensive Approach: Using Complexity Theory to Stimulate the Self-Organizing Capacities of the Comprehensive Approach

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ABSTRACT

There is a widely held understanding that the lack of coherence among the diverse international and local agents that populate a typical peace support operation ecology has resulted in inter-agency rivalry, competition for funding and duplication of effort. In order to address these shortcomings, various agencies, governments, and organizations have started experimenting with a range of models aimed at improving the overall coherence of their interventions, and the most general term that has emerged to refer to these efforts is the 'comprehensive approach'.

This paper will offer a theoretical explanation for why policy makers and practitioners find coherence so challenging, and it will make recommendations for alternative ways in which the Comprehensive Approach can be pursued, based on our knowledge of Complexity and the role that self-organisation plays in bringing about coherence in complex systems.

The paper concludes with a focus on the place of the local in the Comprehensive Approach. It argues that for a peace process to be sustainable, the society will need to develop its own institutions that can manage its own conflicts peacefully, and for that to happen it needs enough space and time to allow for its own self-organizing processes to emerge. International actors may assist such a process, but if they interfere too much they will undermine and delay the self-organizing process. The key to successful interventions thus lies in finding the appropriate balance between international support and local self-organization.

1.0   INTRODUCTION

There is a widely held understanding in the peace and security policy community that the lack of coherence among the diverse international and local agents that populate a typical peace support operation ecology has resulted in, amongst others, inter-agency rivalry, working at cross-purposes, competition for funding, duplication of effort and less than optimal economies of scale. This lack of coherence, and its effects, is understood to contribute to an overall poor success rate, measured in the lack of sustainability of the systems that came about as a result of these international interventions.

In order to address these shortcomings and in an attempt to improve the overall success rate of these international interventions, various agencies, governments, and organizations have started experimenting with a range of models and mechanisms aimed at improving the overall coherence, cooperation and coordination of their interventions. All these initiatives have similar objectives, namely to achieve greater harmonization and synchronization among the activities of the different international and local agents. The overall goal is to integrate the political, security, developmental, economical and other dimensions assumed to ensure a system-wide response to any specific conflict system. Although there has been a number of different initiatives and competing concepts, the most general term that has emerged to refer to these efforts is the 'comprehensive approach'.

The comprehensive approach aims to address the coherence dilemma, i.e., the gap between the value and role ascribed to coherence at the policy level and the limits of coherence experienced at the operational level by practitioners. At the policy level, coherence is viewed as a critically important approach that works to improve effectiveness and sustainability. At the operational level, the feedback from the practitioners is that despite their best efforts over many years, and despite having tried various approaches, models and tools to enhance coherence, it remains an elusive and unattainable goal. At the tactical level the picture that emerge is mixed. Reports range from information hoarding on the one end of too significant cooperation on the other, depending largely on what the individuals involved have been able to negotiate in the specific context they find themselves in. The sense I get from everyone I have interviewed is that there is more pragmatic cooperation going on at the tactical level than what the level of coherence problems at the operational level would suggest.

This paper will offer a theoretical explanation for why policy makers and practitioners at the operational level find coherence so challenging to achieve, and it will make recommendations for alternative ways in which the Comprehensive Approach can be pursued, based on our knowledge of Complexity and the role that self-organisation plays in bringing about coherence in complex systems. Lastly, this paper will consider the implications of Complexity for the place of the local in the Comprehensive Approach.

2.0   COMPLEXITY

When crisis situations become so dynamic that we are no longer able to keep track of the effects of all the specific initiatives underway we commonly refer to them as 'complex'. What does it mean when we say a particular conflict, or the international response to it, is complex? What can we learn from applying the knowledge generated by the study of Complexity to the Comprehensive Approach? Could insights from Complexity theory assist us in improving our understanding of some of the core challenges experienced when pursuing the Comprehensive Approach? [1]

For the purposes of this paper, Complexity is described as a complex system that has the ability to adapt, and that demonstrates emergent properties, including self-organizing behaviour. It comes about, and is maintained, as a result of the dynamic and non-linear interactions of a large number of its elements, based on the information available to them locally, and as a result of their interaction with their environment, as well as from the modulated feedback they receive from the other elements in the system.

Paul Cilliers (1998:3-5) describes Complexity as a system that has the following characteristics:

- It consists of a large number of elements.
- These elements interact based on the information available to them locally (none of the elements are able to comprehend the complexity of the system as a whole).
- At least some of the elements also interact with the environment (it is an open system).
- The interactions are rich, non-linear, dynamic and they feed back on each other (recurrence).
- The conditions under which such a system operates are far from equilibrium, i.e. the elements are under sustained pressure.
- The combined result causes such a system to spontaneously organise itself, maintain itself, and adapt (there is no external, controlling agent).

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[1] *The insights from Complexity theory is based on the author's PhD dissertation entitled "Complexity, Peacebuilding & Coherence: Implications of Complexity for the Peacebuilding Coherence Dilemma" and it can be accessed at:* http://hdl.handle.net/10019.1/71891

- Over time, this process develops a history, i.e. complex systems evolve over time and the past is co-responsible for the present behaviour of the system, i.e. a complex system cannot be understood as a snapshot of the present, without also taking its evolving history into account.

A number of other thinkers engaged in the study of Complexity have identified similar characteristics, and some have added additional attributes (e.g. Mitleton-Kelly, 2003;[2] Clemens, 2001;[3] Ramalingam & Jones, 2008[4]). When comparing these different sets of characteristics, it is clear that there is great degree of convergence among Complexity thinkers about the core characteristics that constitute complex systems. In this introduction to complex systems three of these core characteristics, namely a whole-of-systems approach, non-linearity and self-organisation, will be discussed. In the process, a number of related concepts that form the basis of our understanding of Complexity, including emergence, adaptation and feedback will also be explored.

2.1 A Whole-Of-Systems Approach

The concept of Complexity is embedded in a whole-of-systems approach. A system can be defined in a very general sense as a collection of interacting elements that together produce, by virtue of their interactions, some form of system-wide behaviour (Mitchell, 2009:297). In other words, a system is a community of elements that, as a result of their interconnections, form a whole. In complex systems, the interaction is dynamic, i.e. a complex system changes with time (Cilliers, 1998:3-5).

Complexity is not, however, interested as much in the agents as nodes in the system. Rather, Complexity is interested in the patterns of their interconnections and how that generates meaning or purpose in the system as a whole (Cilliers, 1998:120). In other words, Complexity is interested in how the elements interact and how this interaction develops into the system as a whole having new capacities that did not exist within the individual elements.

In complex systems, the whole has properties that cannot be found in the constituent elements or in the sum of their properties. In social systems, for instance, the society as a whole develops and maintains norms and identities that serve the common needs of the community. In some ways this results in suppressing some of the interests and needs of the individual and of special interest groups in the interest in the general wellbeing and survival of the society as a whole. Morin (2005) points out that not only is the whole more than its elements because new qualities or properties emerge due to the organisation of the elements in a whole, but the whole can also be less than the sum of its parts because "a certain number of qualities and properties present in the parts can be inhibited by the organization as a whole" (Morin, 2005:11).

The concepts 'social' and 'society' conjure up images of systems made up of people that share a common socio-cultural, national or civic bond. When studying people in the context of them being part of a society, as opposed to studying them as individuals, a different side of their being—including aspects related to their role in society as well as aspects related to the restrictions that conforming to the society places on them—is revealed. These are aspects of their being that could not be revealed by studying them in isolation from their place in a social system. By studying the society as a whole, made up by the patterns of activity of the individuals and the various networks and sub-systems – such as family, clan and tribe that develop out of these patterns – we reveal insights into the way individuals derive meaning from their roles in a community and how the interactions between these individual roles shape, sustain and transform both the society as a

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[2] Self-organisation, emergence, connectivity, interdependence, feedback, far from equilibrium, space of possibilities, co-evolution, historicity and time- and path-dependence.

[3] Fitness, co-evolution, emergence, agent-based systems, self-organisation, self-organised criticality, punctuated equilibrium and fitness landscapes.

[4] Interconnectedness and interdependence, feedback processes, emergence, non-linearity, sensitivity to initial conditions, trajectory in phase space, relevance of chaos and the edge of chaos, adaptive agents, self-organisation and co-evolution.

whole and the individuals that make up that society. These are insights that could never be identified by studying only the individual.

In moving from the individual to the community and society, we come across organisation. Complex systems cannot do without hierarchy and structure, but in complex systems hierarchy is not hard-wired or externally determined and controlled. The hierarchy of a complex system is emergent and self-organised and thus changes with the system as it adapts and evolves in response to its environment (Cilliers, 2001:143). The vitality of the system depends on its ability to transform itself, including its structure and hierarchy. Hierarchy thus is a typical characteristic of complex adaptive systems, but in complex systems hierarchies themselves exhibit complex adaptive characteristics (Chapman, 2002:30).

The last aspect of a whole-of-systems approach that should be discussed is the role of boundaries and borders in complex systems. Complex systems are open systems and this implies that interactions take place across their boundaries (Cilliers, 2002:81). These interactions take place with other systems and the environment, i.e. there is a flow of information and/or energy between the system and its environment through its boundaries. Systems consist of interrelated subsystems, and some boundaries can thus fall within larger systems or share borders with them (Chapman, 2002:30). Not all sub-systems are neighbours physically; some are virtually linked – in social systems agents far away from each other may link up via social media, for instance, and collaborate, coordinate and otherwise influence each other's systems and in this way interpenetrate such systems.

Complexity thus builds on and is grounded in a whole-of-systems approach. However, it is concerned with a specific type of system, namely 'complex' systems, and to gain more understanding of that differentiation we turn to another set of important properties of Complexity, namely non-linearity and self-organisation.

2.2 Non-Linearity

In the previous section, a whole-of-systems perspective was introduced and it was explained that Complexity is interested in the patterns of interconnections among the elements, and how this dynamic interaction generates properties beyond those that exist in its constituent parts. In this section, the second characteristic of Complexity is introduced, namely that in complex systems the causal patterns of these interactions are non-linear—the outputs are not proportional to the inputs (Hendrick, 2009:6).

Jervis (1997:12) argues that mathematical linearity involves two propositions, namely: (1) that the changes in a system's outputs are proportional to changes in its inputs and thus, (2) that the system's outputs corresponding to the sum of two inputs are equal to the sum of the outputs arising from the individual inputs. He goes on to point out that we often intuitively expect linear relationships. For example, if a little foreign aid slightly increases economic growth, it is expected that more aid should produce greater growth. However, complex systems often display behaviour that cannot be understood by extrapolating from the units or their relations, and many of the results of actions are unintended (Jervis, 1997:6). Thus, an important characteristic of complex systems is that non-linear variables may have a disproportionate impact at one end of its range (Byrne, 1998:14). Non-linearity thus refers to behaviours in which the relationships between variables in a system are dynamic and disproportionate (Kiehl, 1995).

The first characteristic of non-linearity is that the outputs it generates are not proportionate to its inputs, i.e. they are asymmetrical. The second aspect of non-linearity is that non-linear systems do not follow a pre-determined, and thus predictable, cause-and-effect path. Nor can such a path, once traced in hindsight, be replicated to generate the same effect.

A third aspect of non-linearity that sets complex systems apart are that they cannot be reduced to something simpler, like a set of laws or rules that can help us to predict the behaviour of the system. Cilliers (1998:4) explains that "a large system of linear elements can usually be collapsed into an equivalent system that is

much smaller." Non-linear data sequences and non-linear system processes cannot be reduced to formulae or rules that can compress the amount of information necessary to manage them, or to make them otherwise predictable and controllable.

A fourth characteristic is that linear logic cannot be used to explain the behaviour of complex systems. Non-linearity generates outputs that are not necessarily proportional to the inputs; i.e. in complex systems it is possible for two inputs to generate an outcome that is larger, or smaller, than the sum of the two inputs together. For instance, in complex social systems we often talk of indirect or unintended consequences, for instance, one may organise a training course with the aim of imparting a skill, e.g. conflict management, but then it turns out that the most important benefit that the participants gain from the training is not necessarily the intended skill, but the team-building and social networking.

As these four characteristics have demonstrated, our common-sense understanding of non-linearity is often closely associated with the concepts of disorder, chaos and randomness because we typically explain non-linearity as the opposite of the linear, the logical and the orderly. It is thus important to emphasise that in the context of Complexity non-linearity is not associated with disorder. In fact, non-linearity is an essential ingredient in the processes of emergence and self-organisation that generate order in complex systems.

Non-linearity has been presented as the element that distinguishes a complex system from a linear-deterministic mechanical system. The latter is fully knowable, predictable and therefore controllable in principle. It, therefore, is also unable to do anything that is not pre-programmed or designed if it is man-made system or new in the sense that we could not know of it in advance if it is a natural system. In contrast, the non-linearity in complex systems is what makes it possible for these systems to adapt and to evolve, i.e. to create something new that goes beyond what is pre-programmed in the parts that make up the system. Non-linearity is thus an essential part, in fact a pre-condition, for emergence, self-regulation and adaption in complex systems (Cilliers, 1998:120).

One of the ways in which complex systems use constraints to maintain themselves within certain parameters is through the use of feedback mechanisms. When certain thresholds are crossed, positive or negative feedback is used to correct the system back to within the parameters. While complex systems may thus theoretically be capable of a huge variety or range of actions, their behaviour is typically constrained within a fairly limited range of options. While individuals may thus be theoretically free to choose any action, their behaviour is typically constrained to within a fairly limited range of options by influences such as what would be regarded as legal, moral and appropriate by an individual's society, family and friends. When an individual acts outside of these parameters, feedback is applied through a range of social sanctions that, in most cases, serve to direct the individual back to within the social norm.

At this point, the first two complex-systems characteristics were introduced, namely the whole-of-systems approach and non-linearity. Let us turn now to the third characteristic, namely self-organisation.

2.3   Self-Organisation

Self-organisation refers to the ability of a complex system to organise, regulate and maintain itself without needing an external or internal managing or controlling agent. Take for example the economy of any reasonably open economic system. An economic system is a self-organising system in that it continuously responds to a large number of factors without requiring a controlling agent (Cilliers, 1998:90). The economy is often discussed as if it were an organism, but we need to think of it more as an ecosystem because it is not the economic system as a whole, but rather the individuals and organisations that constitute the economic system, that individually consider and respond to the factors that matter to them. It is the cumulative and collective effect of these individual actions that determines the overall behaviour of the system. The state of the economy in any given country or region depends on a large number of dynamic factors. As these conditions vary, the individuals and organisations in the system continuously adjust their actions so that they

can reap the most benefit from the prevailing conditions. Each individual or organisation acts in its own self-interest, but sometimes their actions can have significant implications for the system as a whole, especially when a series of individual actions aggregate into swarm behaviour, e.g. where the actions of some trigger behaviour by others that result in large swarm-like fluctuations in the system as a large number of individual agents respond similarly in what appears to be coordinated behaviour. For instance, a large number of people may start fleeing when a rumour spreads that an attacking force may be approaching. Or a large number of investors may start flocking to a certain market or stock as rumours spread of its good prospects.

There are also some economic agents that are trying to influence the system in what they perceive to be in the best interest of their sub-system, or even the system as a whole. Governments, central banks, and multilateral institutions like the International Monetary Fund or the World Bank may, from time to time, try to act in ways that they perceive to be in the interest of the world economy or the economy of a region or a specific country. However, their actions also only constitute another input into the system. They do not have control over how the system responds to their inputs. We can thus not regard them as controlling agents. At best they are some of the more influential agents in the system.

The organisation of the economic system as a whole thus comes about as a result of the interaction between the various agents that constitute the system and its environment (Cilliers, 1998:90). There is no single agent or groups of agents that controls the economic system, but there are many agents that try to influence the behaviour of the system, and there are many more who simply respond to what they perceive to be the current state or future direction of the economy. The economy self-organises spontaneously, and this is an emergent process that comes about as a result of the cumulative and collective interaction of all the agents in the system.

As discussed in the previous section, this process is non-linear and dynamic and thus cannot be predicted or controlled. So many causal reactions are happening simultaneously that no one agent or group of agents working together can control the system.

Although a complex system like the economy is too complex to model deterministically (Cilliers, 1998:90), it is possible to influence it at various levels. As mentioned earlier, many organisations, like central banks, exist explicitly for the purpose of trying to influence the economy. Non-linear causality generates asymmetrical relations, which implies that relatively powerless agents can sometimes have a disproportionate effect on the system. However, the effects of any such interventions, regardless of the relative power of the agent, usually only influence the system in the short to medium term because the rest of the agents in the system will respond to any new developments, and these responses will impact on each other and result in further waves of reactions. The cumulative and collective effect of these responses will result in the system as a whole responding in unpredictable ways.

Another important property of Complexity in general, and self-organisation in particular, is known as emergence. Emergence is an important concept for Complexity because it explains how the elements in the system are not just merely interacting with each other in order to maintain themselves. In complex systems, the interactions of the elements generate a new collective effect (or effects) that would not have occurred if the different agents acted on their own. New system characteristics 'emerge' through the process of interaction (Cilliers, 1998:106). Morel and Ramanujam (1999) explain self-organisation as a "process of spontaneous creation of complex structure that emerges due to the dynamics of the complex system", which makes self-organisation an emergent phenomenon.

The dynamic and non-linear relationships among the components in complex systems generate new emergent properties, i.e. properties that cannot be predicted merely by analysing the individual components of the system. Mechanical systems do not have emergent properties, and the way in which they work can potentially be fully understood, and predicted, by analysing their components and the rules that govern their interactions (Cilliers, 2000a:41). In a mechanical system, disorder is understood as entropy, i.e. as the loss of

energy in the system that, if unchecked, will result in the gradual collapse of the system into disorder. In contrast, non-linearity and dynamism play a critical role in creating and sustaining order in complex systems, i.e. in enabling order to emerge (Cilliers, 1998:118). Another key characteristic of complex systems is thus that they emerge and maintain themselves spontaneously, i.e. without the intervention of an external designer or the presence of some form of internal or external controlling agent (Cilliers, 1998:89).

Three of the core characteristics of Complexity, namely a whole-of-systems approach, non-linearity and self-organisation have now been introduced, and key concepts such as feedback and emergence have also been discussed. In the next sections the focus is on the implications that non-linearity, self-organisation and emergence have for the Comprehensive Approach.

3.0 OPERATIONAL IMPLICATIONS OF COMPLEXITY FOR THE COMPREHENSIVE APPROACH

In this section we consider the implications of Complexity theory for the operationalization of the Comprehensive Approach. We will focus on the analysis-planning-implementation-assessment cycle, with sections on (i) conflict analysis; (ii) design and planning; (iii) assessments and metrics; (iv) management and coordination; and (v) unintended consequences.

3.1 Conflict Analysis

When something is complex it cannot have one definitive problem-set. We should thus not attempt to solve complex social problems with methodologies designed to identify such limited problem-sets, so that such analysis can then lead to a neat matching set of solutions. This insight from Complexity stands in stark contrast with the dominant determined-design approach to problem-solving. The current best practice is to start any new mission or programme, or to start the review ongoing missions and programmes, with a conflict analysis that is aimed at determining the root causes of the conflict. The logic is that you first need to identify, isolate and define 'the problem', so that you can design a set of actions that will address, and ultimately resolve the problem.

This dominant approach is deterministic, i.e. it is based on two assumptions: firstly that there is problem that can be discovered and solved, and secondly that the international actors, like NATO, have the agency to diagnose such a problem and to design and administer a cure that will be able to solve the problem. The main constraint on the agency of the international actors, from the perspective of the deterministic approach, is a lack of resources, i.e. all problems are potentially solvable provided you devote enough resources to it. However, because the potential resources for any particular intervention are limited, one of the main purposes of a conflict analysis is to determine priorities. A third assumption is thus that it is possible to isolate some causes or drivers in a conflict system that are more important, or of a higher order than others, so that if you focus your limited resources only on these select few priority areas you can still solve the problem.

The insights from Complexity theory suggest an alternative approach to conflict analysis. First, a complex systems approach reminds us to be mindful not just of the specific aspect we may be focussed on, but to consider it in the context of the wider system of which it is a part, including the context and environment within which that system operates. Second, it reminds us of the importance of the dynamic and non-linear interconnections among the agents in the system, and the way in which these interactions generate context specific meaning in the system. It reminds us that any given manifestation of a problem is unique to that context. A causal chain that may explain developments in one context may not necessarily hold in the next. Third, Complexity suggests that there is no static set of 'root causes' that can be identified, isolated and solved. We are not dealing with a closed system. We will always have to deal with multiple systems that are constantly in the process of interacting with each other, including the larger international and regional

environments of which the local system, and the international actors that are attempting to influence the local system, are part. To understand the system we need to see it in motion, and in relation to its environment, not in freeze-frame and not in isolation. Fourth, complex systems do not follow any pre-determined causal logic where certain root causes determine certain outcomes that can be discovered, identified and isolated through an analytic method.

A conflict analysis that is aimed at identifying the root causes, and an intervention that is designed to influence those root causes, are thus likely to be overly simplistic. It is unlikely to be able to adapt to the way conflict drivers are changing over time, e.g. since the analysis has been done. An analysis that is aimed at identifying only the most important root causes are also likely to miss or downplay other important factors that influence the conflict dynamics. Any intervention designed to influence such a prioritized set of root causes are thus likely to ignore some drivers whilst its focus on others are likely to distort the relationships between them, and it is impossible to know before hand – as a result of the non-linear interactions between them – how the system will react to these interventions.

An alternative complex sensitive conflict analysis will have to be based on the following considerations:

- In order to be sensitive to the dynamic nature of complex systems it will have to be an ongoing iterative process, as opposed to a once-off activity carried out at the start of the traditional project cycle.

- In order to be sensitive to our inability to fully understand the complex systems we are dealing with, the methodology will need to be exploratory and self-critical, i.e. it should not be aimed at arriving at definitive answers. Instead it needs to continously explore hypothesis, and it needs to be actively seeking new information that can disprove its findings, and help to update or revisit its findings, based on the most recent developments. Any products produced would thus have to be limited in scope and relevant for a relatively short period of time. Information gathering will need to take a multi-pronged and highly adaptive approach, so that it can be open and sensitive to feedback and changes in the system and environment.

Most current pre-mission conflict analysis are informed by short field visits that generate a once-off report, on the basis of which a mission is planned, and both the analysis, and plan, is only revisited periodically, e.g. annually as part of a new budget planning and reporting cycle. In the UN peacekeeping context, the original plan is partly locked-in because of the multi-year assessed Results-Based Budget (RBB) cycle, and it requires considerable political and bureaucratic will to make any fundamental changes to it.

As a result of the assumptions of the Comprehensive Approach the current assumed best practice is that conflict analysis should be a joint effort, i.e. it should involve as many of the participating agencies as possible. There is usually considerable pressure on the participants to agree on a common analysis, and there is a danger that this may result in group think, and that the effort generate an overly simplistic analysis, because the main driver for the process is no longer to produce an analysis but to generate group harmony and an agreed course of action. For this reason a Complexity approach would suggest that a shared analysis – where the emphasis is on sharing, explaining and learning from each other's analysis, without the pressure to conform to one common analysis – may be a better way in which to maintain the complexity of the overall effort, and to modulate that in such a way that it leads to a more rich overall picture.

This approach also suggests that there should be independence between those that are doing the analysis, and those that are doing the planning, so that the planning assumptions do not create blind spots that hinder the analysis. This kind of analysis should also be understood to be distinct from intelligence and thus free from its 'enemy seeking and tracking bias' so that it remains open to analyse the system as it unfolds, as free as possible from assumptions that will influence what kind of data it tracks and ignores, and how it interprets that data. A common problem with the deterministic-design approach is that once the original analysis has been done, subsequent data gathering is likely to focus mainly on the behaviour of the root causes identified

and prioritized in the original analysis, as well as the activities of the intervention that is aimed at influencing those root causes. As a result subsequent analysis are likely to be blind to other processes that are unfolding, because this approach is based on an efficiency logic of focussing resources on the priorities that have identified.

An alternative complex sensitive conflict analysis thus need to be informed by our inability to understand the system in all its complexity, and should be guided by an approach that takes account of the highly dynamic, non-linear and context specific properties of complex systems.

3.2   Design and Planning

Ricardo Wilson-Grau (2008:2) argues that in situations with high levels of uncertainty "intentional design tends to tie down the capacity to respond and innovate, above all when the social change or development organization is bound to achieving those predefined results in order to demonstrate success to its stakeholders, notably donors." He argues that the "alternative to full-fledged intentional design, as well as to the more conventional modes of strategic planning, is for the social change or development organisation to keep its planning process light and imaginative…do not be concerned about precisely what changes you expect to see…invest the time and energy you save, in monitoring the outcomes to which you have contributed" (Wilson-Grau, 2008:2). Similarly, Harry Jones (2008:3) argues that "recognizing uncertainty heightens the importance of building flexibility into projects, and adapting to the available signals about performance and progress as you go along."

The insight we have gained from the application of Complexity thus far, suggest that it is not possible to definitively identify a problem and design a solution at the outset, i.e. in the initial planning phase, using an analytical problem solving methodology. Instead we have to use an alternative planning methodology, what I will broadly term a continuous or iterative process of operational experimentation and adaptation. "A pragmatic and resilient policy that makes allowance for change events is the only evolutionary stable strategy for survival" (Rihani, 2002:83).

Design and planning cannot be limited to the start of a peacebuilding mission or programme, but need to be part of an ongoing iterative process of adaptation, throughout the lifetime of the operation or programme. The planning process should involve the broadest possible representative group of agents in the system, so that it can be informed by the widest possible cross-section of information. It should be as distributed as possible, meaning that central planning should be limited to broad strategic direction, so that the various downstream agents can interpret and apply that direction as they know best in their respective contexts. The design process should generate multiple options, and the planning process should experiment with those that it thinks may be most likely to have the desired effect. This is essentially an evolutionary process of variation and selection. Options that are not having the desired effect should be discarded. Those that seem to be having desired effects should be continued, but they should also be monitored closely because it should be anticipated that sooner or later even the more successful programmes will generate side-effects of become less effective, because to the dynamic nature of the complex systems we are dealing with. Operational experimentation thus needs to be understood as a continuous iterative process - the situation will keep changing, and therefore the interventions also need continuous adjustments.

Planning should thus not be seen as identifying a path to and end, and sticking to it, but rather as a continuous iterative process that is aimed at helping the mission or programme to adapt to its environment.

Graeme Edwards famously said that 'it is not the plan that is important, but the planning'. The process will generate milestones, such as an annual planning document, and intermediate reviews or updates, but the really important aspect is the continuous process of engagement by as many agents as possible in the dialectic process of making sense, together, of the how the system functions, how it can be influenced, how it is responding to earlier attempts to influence it, etc. An analytical methodology aims at generating solutions,

a complex systems approach generates processes for continuously managing our adaptation within complex systems

We will only know if a specific approach is having the intended effect on the basis of the feedback we receive, and this implies that our planning methodology has to designed in such a way that we are open to monitoring and processing the feedback generated by the systems we are trying to influence and the environment (Wilson-Grau, 2008:2). In the next section we will consider the implications of Complexity for monitoring and evaluation.

3.3   Assessments and Metrics

In a linear system it is possible to explain an outcome in terms of a sequence of causes, i.e. that A caused B, and that B caused C. Complex systems are non-linear. "Small changes can cause, through feedback and effects multiplying rather than just adding, very large changes elsewhere in the system. When effects are multiplicative rather than additive, it is not convincing to attribute one change to a single other change. The richness of interconnections means that any one change has several prior causes and itself may contribute to further changes in these causes." (Chapman, 2002:43).

As pointed out earlier, Morin (2005:12) stressed that emergence is indeductible from the qualities of the parts, and thus irreducible. This is why are unable to attribute causation when studying interventions and effects, and why considering contribution, i.e. how certain activities contributed to a certain effect, is a more humble and realistic alternative in complex systems. Morin (2005:15) also considers the role of feedback in what he describes as a circular system where the effect itself intervenes in the cause, or in other words "feedback is a process which complexifies causality". In complex systems the behaviour of the system is influenced by its own internal processes, in addition to external influences, and its internal system has evolved as a result of its particular history.

Traditional results based ideas of accountability and responsibility are associated with a simple linear theory of causation (Chapman, 2002:44). In order to monitor whether progress is being made, it is regarded as essential to provide measures of performance and targets. In complex systems the pursuit of any single target is likely to distort the operation of the system and thereby reduce its overall effectiveness. "One of the significant dangers of specifying targets and simple measures of performance is that the result will be sub-optimisation. Emphasising a single measure of performance leads to a decrease in overall performance. A specific target can encapsulate only one element of a complex organization, and its dominance is likely to undermine other aspects of the organisation that are crucial to its general and long-term effects. For complex systems the only effective judge of performance is the end-user" (Chapman, 2002:46).

Chapman's point is that in order for us to measure progress, we need to monitor the overall effect of the system, rather than monitor specific goals that we have set for ourselves. For instance, our theory of change may be that if we invest in increasing the number of police officers, we will reduce crime. If we monitor the number of police officers we may report progress as we achieve the milestones we have set for ourselves, but Chapman is arguing that if we want to measure progress in this case we have to monitor the overall changes in the level of crime. The causal relation between increasing the number of police and crime is our hypotheses. There are a large number of other factors that may influence the levels of crime. The overall effect is best measured from the perspective of the society we wish to benefit, and in this example, the feedback that will be generated from measuring the level of crime as perceived by the community, as opposed to the level of crime as monitored by the police, is likely to reveal interesting differences. Police statistics are usually incident and report related, and are thus likely to be limited to what the police monitoring system has been designed to see. However, a community based feedback system may reveal not only what the system anticipated to find, but it may also reveal how the system is adapting. For instance, in this example, increased policing my drive crime away from certain areas but into others. This kind of 'undirected' feedback is thus also useful to show how our interventions result in costs being externalised, for

instance shifts from one part of the system to another. The point is that complex outcomes is best monitored by looking at overall system effects, from the perspective of the end-user or, in the peacebuilding context, from the perspective of the communities that are intended to benefit from peace consolidation. This insight has important implications for the type of monitoring and evaluation systems we should design in complex systems, and the kind of feedback processes we should use to inform our decision-making processes.

Feedback is critical for adaptation and monitoring for feedback and effects should thus be a very important part of a Comprehensive Approach process. Current practice neglects monitoring and evaluation, and where it does take place it is usually programme specific, and output and outcome focussed. There have been very few attempts to monitor and/or evaluate the system-wide effects of Comprehensive Approach interventions to date. This is one of the areas that will require significant investment in the future.

3.4   Management and Coordination

As complex systems are dynamic, our methodology for generating knowledge about the system and the environment needs to have the ability to keep up with the rate of change in the environment. A management or command approach that is sensitive to the temporary nature of the approaches we are experimenting with, and to the need to continuously adapt our decisions based on new information, is more likely to cope with complex systems.

Management or command in this context refers to directing the experimentation, assessment and adaptation process. By contrast, a management style that is based on the belief that the manager or the organization has the knowledge and agency necessary to correctly identify the problem and to develop the 'right' solution for the problem, and that it is somehow noble to stick to that decision and 'stay the course', regardless of the feedback, is likely to be less effective when dealing with complex systems. According to Cilliers (1998:112) following such a management strategy constitutes "an avoidance of complexity". Rihani (2002:93) agrees and argues that "Complex adaptive systems respond better to light-touch styles of management based on constant monitoring of overall patterns of performance coupled with judicious small-scale incremental adjustments".

Real time decisions will always be a compromise between the urgency of the action, the information available at the time, and the time available and opportunity for pursuing coherence. In this highly dynamic and non-linear environment, most policy decisions are taken in the absence of crucial information, which prevents informed policy decisions, and in the presence of major uncertainties about the potential cost, benefits and risks involved in certain courses of action (Cloete, 2004:15). Being aware of the limits of our knowledge in this context is very useful, because it reminds us not to overestimate our ability to analyze a conflict, identify root causes, and prescribe medium to long-term solutions.

Our study of complex systems have found that distributed, decentralised control makes a system more flexible, and therefore increases its ability to cope with highly dynamic and non-linear changes in its environment and within the system itself. If we apply this notion to the management of complex social systems, it would argue against an over-concentration on centralised and top-down control. The critique against centralised management or rigid leadership is based on the knowledge that centralised control mechanism will, in complex systems, lead to the degeneration of the system (Cilliers, 1998:111). "Command-and-control methods and detailed forecasts and plans, effective for linear systems, are inappropriate as it is not possible to select sensible actions…where results cannot be traced back to specific causes" (Rihani, 2002:9).

A key feature of a resilient complex system is that there is a relationship between the level of coherence and the quality and flow of information in the system. Too little information will cause it to starve and disintegrate. Feedback, meaning conveying information about the outcome of any process or activity to its source, plays a critical role in this process.

However, most peace operations are burdened by institutional cultures and management and command structures that end-up controlling information, and discouraging information flow. If this tendency is not managed, peace operations develop information silos that operate, at best, parallel to each other, or at worst, against each other.

To counter this tendency we need collaborative processes that are designed to create connections between partner institutions engaged in multidimensional and integrated peace operations, to ensure that the flow of information through the system is facilitated, supported and enhanced, even when it is under pressure.

Self-organization is the process whereby partner institutions voluntarily synchronize their plans and operations with each other and with the operation as a whole. For the self-organization process to work optimally, each institution must adjust its own actions in response to progress or setbacks experienced elsewhere in the operational system. The effects of self-organization can be suppressed and inhibited, or it can be modulated and enhanced. The most resilient self-organizing collaborative processes have two things in common: the first is that they devolve the agency to collaborate to each partner institution, and the second is that they have enabling processes at various nodes in the system, that help to modulate the flow of information in the system.

An inter-agency collaborative approach that relies on self-organization differs from traditional coordination approaches that establish a control mechanism responsible for coordination close to the center of the operation. The key difference is that collaboration does not happen at or because of a central coordination mechanism, but because it is distributed throughout the system. The role of the enabling processes are merely to modulate the flow of information by enhancing it further and by combining it with related information from other sources.

The objective of such an approach is to: (i) assist partner institutions to pursue coherence and synergy in every phase of the project cycle through enabling processes such as shared assessments, integrated planning processes and shared monitoring and evaluation reviews, and (ii) to ensure that there is an enabling environment where managerial practices, organizational rules and regulations and financial management systems encourage coordination and coherence.

The traditional inter-agency governance approach aims to centrally control coordination. The role of mission leadership in an inter-agency collaborative approach that relies on self-organizing is to create and maintain an enabling environment within which self-organized collaboration can thrive. There needs to be a fine balance between modulating the flow of information and encouraging self-organization, without overstepping into trying to control specific outcomes, cooperative matches and influencing analysis to match or validate planning assumptions.

3.5 Unintended Consequences

The autonomous, self-organizing character of the peacebuilding system does not ensure automatic, guaranteed positive impact (Cloete, 2004:15). Although some may accept that political systems are complex, even fewer seem ready to recognise that many of their outcomes are the unintended consequences of complex interactions (Jervis, 1997:6). You do not need a complex system to have unintended consequences, but when you are dealing with complex systems, unintended consequences should be understood as a natural outcome of the dynamics of such a system and the phenomenon should therefore not come as a surprise (Aoi, de Coning & Thakur, 2007:11).

Jervis goes on to point out that in a system, the chains of consequences extend over time and many areas and they are always multiple. He argues that disturbing a system will produce several changes (Jervis, 1997:10). As the result of the interconnectedness of systems one can never merely do one thing. These kind of unintended consequences occur frequently in the context of the international response to conflicts and

humanitarian emergencies, where the introduction of a new element to a highly interconnected complex system generates unintended consequences. Aoi, de Coning and Thakur (2007:13) provides a number of examples in their '*Unintended Consequences of Peacekeeping*'. They point, for instance, to the problems that are created when the effects of incentives cannot be limited to a specific target group, for instance when the level of assistance to a refugee or internally displaced camp creates tension with the surrounding host community because the availability of food inside the camp is better than outside, or when ex-combatants are perceived to benefit more from the international community, through a disarmament, demobilisation and reintegration (DDR) programme, than those that did not participate in the violence.

An awareness of Complexity informs us that it is not possible to interfere in a complex system like a human community, and have only one effect. Whenever we attempt to change something in a complex system, the system responds to our intervention in a number of ways. We can anticipate that the system will respond in some of these ways, and some of these responses will have been the intended response that we wanted to elicit. However, the system is likely to also respond in other ways that we did not anticipate (Aoi, de Coning & Thakur, 2007: 6). This does not mean that we are powerless in the face of unpredictable and unstable system effects. On the contrary, an improved understanding of the dynamics of complex systems should improve our ability to anticipate that there will be unpredictable and unintended consequences, and this should enable us to be more sensitive to such consequences when they occur, and to take steps to mitigate their effects or to adjust our actions accordingly. Those responsible for the planning, management and assessment of peacebuilding missions thus need to recognise that unintended consequences are a normal consequence of the complex dynamic nature of complex systems. Aoi, de Coning and Thakur (2007:278) concludes that the UN and other institutions that undertake peace operations need to develop institutional mechanisms for addressing unintended consequences, and should institutionalise planning and assessment mechanisms that will enable it to anticipate and respond to emerging unintended consequences.

4.0   THE PLACE OF THE LOCAL IN THE COMPREHENSIVE APPROACH

When considering the Comprehensive Approach we tend to consider the need to achieve coherence among the various elements or dimensions of an international intervention. But what about coherence or alignment between the international actors and the local society they are trying to influence. State fragility is usually described as 'complex'. This has led me to look into what we know about how to influence self-organising complex systems. If a society is fragile, it means that the social institutions that govern its politics, security, justice and economy lack resilience. Resilience refers to the ability of these social institutions to absorb and adapt to the shocks and setbacks they are likely to face. The risk is gradually reduced as institutions develop the resilience necessary to cope with the challenges they are exposed too. Peacebuilding should be about stimulating and facilitating the capacity of societies to self-organise, and hence peacebuilding needs to be understood as essentially local.[5]

However, there is an inherent tension in the act of promoting a process of self-organization from the outside. Too much external interference will undermine self-organization. From a Complexity perspective one can say that every external intervention removes feedback from the system that would otherwise have contributed to self-organization. External interventions deprive the local system from an opportunity to learn how to respond to such problems. Social institutions are not established overnight, they emerge from trial and error over generations. They adapt to changes in their environment based on the positive and negative feedback they are exposed too. International support becomes harmful in the long-run when too much filtering and cushioning slow down and inhibit these processes. Thus, every time an international actor solves a problem or address a need, the local social institutions are prevented from an opportunity to respond to this problem or need themselves. They are thus deprived from the opportunity to develop local responses

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[5] Cedric de Coning, "Understanding Peacebuilding as Essentially Local", *Stability: International Journal of Security & Development, Vol 2, No 1 (2013), available at: http://www.stabilityjournal.org/article/view/sta.as*

and to learn from, and thus adapt, to their successes or failures. The solutions the international actors offer may address their needs in the short-term, but in the long-term it creates dependency and fragility.

Linear logic suggests that if a little bit of aid has a good effect, more aid will have an even greater effect. Insights from Complexity show that there is a threshold beyond which external influence contribute to the very fragility it is meant to prevent. This threshold is much lower then widely acknowledged. As a result most peacebuilding interventions, large and small, make the mistake of interfering too much and end-up undermining the ability of local systems to self-organize.

To counter this effect international peacebuilders should be serious about placing local agency at the center of their work. Local ownership is a pre-condition for self-sustainable institutions. That means that the agency to make decisions about the analysis, design, implementation, monitoring and evaluation of the programmatic actions that are meant to assist local institutions should be in the hands of those institutions.

However, one often hears the counter-argument that the locals lack the capacity to make these decisions about their own institutions. Whenever this is the case, it is symptomatic of a mismatch between external design and local context. Usually because the international actor have assumed the agency to design the program themselves, on behalf of the local institution.

The overall implication is that the international actors need to take a step back, and give up the notion that they can achieve specific pre-identified outcomes. International actors need to give space for local self-organization to emerge so that it can generate its own local context relevant outcomes. Externally driven statebuilding needs to be toned down. There needs to be a significant shift that place local agency at the center of a new peacebuilding agenda.

But are international actors like NATO willing to accept giving up control of the outcome of their interventions? The primary reasons why States, and the international institutions they control, are engaged in peacebuilding is the maintenance of the international system and the protection of national interests. When conflict erupts and a State breaks down, the primary concern of the international system is to re-establish the State apparatus as soon as possible, so that the other States and the international organizations have a counterpart to interact with. If the United Nations sends peacekeepers and if donors send aid, they need a government with whom they can enter into legally binding agreements with. The first priority is thus to get a government in place, hence the pressure on early elections and the focus on key government institutions.

When critical decisions are made, motivations like preventing illegal migration, combatting organized crime and countering terrorism in the short-term override the considerations and approaches necessary to foster self-sustainable local institutions. Driven by these pressures - and despite the knowledge that is available in research about the role of local agency in fostering self-sustainable institutions - statebuilding practitioners still, more often than not, embark on programs that aim to establish a democratic state almost overnight.

Under pressure to bring about stability in the shortest period of time, international peacebuilders attempt to short-circuit emergent self-organization by assisting societies recovering from conflict to adopt neoliberal political and judicial norms and model institutions. In the process they deny local societies the space necessary to develop their own institutions, informed by their own history, culture and context.

From this perspective, the essential act of peacebuilding lies in its design, i.e. an international actor diagnosing the local problem and designing a solution for it – from the outside. I argue for a fundamentally different approach. I argue for understanding sustainable peace as emergent from the local – from the inside. If so, then the Comprehensive Approach needs to add a local dimension that will enable it to align international support with locally led and informed peacebuilding processes. However, these two approaches – Comprehensive Approach for the sake of international system maintenance and Comprehensive Approach to achieve self-sustainable peacebuilding - do not have to be mutually exclusive. Investing in local self-organization is an investment in the long-term self-sustainable stability of the international system.

My guidance for a Comprehensive Approach that place the local at the centre of its approach would be that international interventions should be limited to providing security guarantees that regulate acceptable State behavior in the international system. Peacebuilding should stimulate and facilitate the emergence of resilient self-organized local societies, but should not interfere with local social institutions to the extent of engineering specific outcomes. For this type of Comprehensive Approach, the art of peacebuilding lies in pursuing the appropriate balance between international support and home-grown context-specific solutions.

5.0   CONCLUSION

In this paper we explored the implications of a Complexity theory for the Comprehensive Approach. We started off by introducing Complexity, and we specifically looked at three of the core characteristics of Complexity, namely a whole-of-systems approach, non-linearity and self-organisation. In the process we also touched on key concepts such as feedback and emergence.

We then considered some of the implications of Complexity for the Comprehensive Approach. The most fundamental implication of Complexity is probably the realisation that the ability of external agents to gain knowledge of the complex social systems we are dealing with is inherently limited. In other words, we need to recognize that international actors do not have the agency to analyse a conflict, design a solution, and apply that solution with a reasonable likelihood that such an externally designed intervention can result in sustainable peace. Firstly, in complex systems, there is no one definitive problem that can be solved. Secondly, for a peace process to be sustainable, the society will need to develop its own institutions that can manage its own conflicts peacefully, and for that to happen it needs enough space and time to allow for its own self-organizing processes to emerge. International actors may assist such a process, but if they interfere too much they will undermine and delay the self-organizing process. The key to successful interventions thus lies in finding the appropriate balance between international support and local self-organization, and this balance will differ from context to context.

Most of the technical models we rely on for conflict analysis, planning, management and assessments, are based on linear cause and effect assumptions that do not fit with our experiences and knowledge of how complex social systems function. In this paper we have suggested a number of new approaches for analysis, planning, management and assessments that address the non-linear and highly dynamic nature of the social complex systems.

The paper also considered the inevitability of unintended consequences when attempting to influence any complex system. When we intervene in such systems they will respond in several ways. Some of these we may anticipate, but a complex system, because it is non-linear and dynamic, will also respond in ways that we cannot anticipate. We now know that this will be the case, so NATO and other institutions that undertake peace support operations need to develop institutional mechanisms for addressing the inevitable unintended consequences of its interventions, and should institutionalise planning and assessment mechanisms that will enable it to anticipate and respond to such emerging unintended consequences.

The paper concluded by considering the place of the local in the Comprehensive Approach. It considered the inherent tensions involved in stimulating self-organization from the outside. The paper also explored the tensions between those that see the Comprehensive Approach as relevant essentially for international system maintenance, and those that see the Comprehensive Approach as relevant for pursuing sustainable peacebuilding.

The concluding guidance of the paper for a Comprehensive Approach that place the local at the centre of its approach would be that international interventions should not interfere in complex social systems with the goal of engineering specific pre-determined outcomes, such as trying to produce a neoliberal state. Trying to control the outcome produce the opposite of what stabilization aims to achieve; it generates ongoing

instability and dependence, and it undermines self-sustainability. A Complexity informed approach to the Comprehensive Approach should be about safeguarding, stimulating, facilitating and creating the space for societies to develop robust and resilient capacities for self-organisation.

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