**Integrating climate into decision making and planning: a systems view**

Sandro Luis Schlindwein

Federal University of Santa Catarina, Florianópolis, Brazil

"*In the post-modern world hard-systems problems are the central issues of the past and soft-systems situations are the key concerns of the future*"
[Kay and Foster, 1999]

One of the motivations for this WCRP Conference for Latin America and the Caribbean is the observation that very often available climate knowledge is not translated into actionable information in important domains of human affairs like decision making and planning. This has lead to a growing consensus that a research challenge that needs to be addressed is how to design a process of informing climate knowledge to policy and decision making in the different socioeconomic sectors. Decision makers and planners need guidance in making non-trivial decisions today under uncertain climate events and risks of tomorrow. But the task is far more complex than it appears. Therefore, building upon this situation, this talk will explore from a systems perspective why this process of informing climate knowledge to policy and decision making has proved to be a difficult task and will also give a glimpse of how a process for an "*improved interaction between the climate science community, intermediary institutions/individuals, and policy and decision makers from the public and private sectors to define lines of research needed to improve effective communication and to incorporate climate knowledge into current decision and policy*" could be possibly designed.

Decision making and planning are concerned with the behaviour of social rather than natural systems. It means that "the kind of problems that planners deal with – societal problems – are inherently different from the problems that [climate] scientists deal with". Situations of planning and decision making have been named "wicked situations" or "messes", because they are ill-defined and ambiguous, being associated with strong moral, political and professional issues. In such situations there is often little consensus about the processes driving their emergence, let alone how to tackle them, since they commonly "involve multiple causal factors with many interdependencies". In these situations we can notice high levels of controversy, conflict and dispute. Under such circumstances of decision making and planning it is not difficult to understand why climate knowledge – as any other form of scientific knowledge – may eventually not be considered or included.

Partly this also results from the fact that "the classical paradigm of science and engineering – and the results of their adoption – is not applicable to [solve] the [wicked] problems of open societal systems". Although scientific evidence can enlighten the decision making process and might be even necessary for it, if taken isolated almost always it is not enough. In other words, the effectiveness of traditional scientific approaches [and their results] based on linear thinking may be very limited to improve such situations of decision making and planning. "Attempts to address wicked situations based on traditional approaches often lead to unforeseen and unintended consequences, and hardly ever sit conveniently within the responsibility of any single organisation" or scientific discipline.

The consequence of what has been discussed so far is that the integration of climate knowledge into decision making and planning is not straightforward. It is a much more complex process than just improving effective communication between science and politics. So, it might depend much more on epistemic awareness about the distinctive nature of the issue being addressed (recognizing that it is a matter of dealing with a wicked situation) and commitment of the concerned people that any strategy to integrate climate into decision making and planning must be based on new forms of thinking and acting. To tame wicked situations and to manage complex policy and planning problems a different approach is required.

Systems approaches have been built upon systems thinking, a conceptual framework and a body of knowledge to deal with complex (wicked) situations consisting of richly interconnected sets of parts. Systems are coherent whole entities exhibiting properties different from the sum of its own parts, and to think in terms of systems allow us to connect events that are distant in space and time. Based on different systems approaches a whole range of methodologies and tools have been developed which can provide methodological guidance (as a systemic framework) and facilitate the complex process of integrating climate knowledge into decision making and planning.

However, improving ("solving") wicked situations is fundamentally a social process, and therefore there are no recipes or quick fixes to inform action of how to integrate climate into decision making and planning. And this is exactly the reason why we should adopt systems approaches to address societal problems, since they can offer us a platform to accommodate different perspectives about the situation of concern, allowing the emergence of favourable circumstances for the inclusion of climate knowledge into policy and decision making. Therefore, the design of a research strategy to address this complex issue must be arranged as innovative systemic action-research and be built upon the combination of a set of practices ranging from the effective engagement of key stakeholders up to the ability to work across organizational boundaries, which will lead to some degree of behavioural change. These sets of practices and ideas can be shaped in such ways that they become systems of inquiry through the systemic actions of those involved in them. This process of enacting a researching system (a system of inquiry) will allow to recognize not only that it is a complex situation, but also who is involved, what do they value, how to they think and what constitutes an improvement in the situation.

If we accept following Russell Ackoff that decision making is basically the conversion of information into instructions, and that these consist of messages that affect behaviour within the wicked situation resulting in the improvement of its performance (in our case effectively integrating climate information into decision making and planning), the research challenge we need to face is to develop messages capable of informing systemic action for innovative climate governance.

"*Act always so as to increase the number of choices*"

Heinz von Förster – The Ethical Imperative