

**Conference “Systemic Approaches in Evaluation”
January 25-26 2011**

**Key Note Address
“Systems Thinking and Evaluation”**

**by
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Why Systems Thinking?

Interventions in the field of international development (projects or programmes) are increasingly faced with the following situation/challenges:

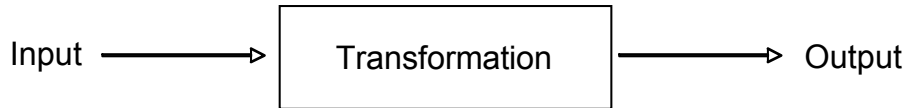
- Their success depends on the interaction of various resources (e.g. physical, economic, social, cultural) - and on the quality of collaboration between key actors having access to or being responsible for these resources.
- The main actors (funders, implementers, partners, beneficiaries) are social beings with specific needs, interests and values.
- The context in which these interventions take place is often insecure and turbulent, which makes it hard to foresee routes or predict effects.
- Development not only requires transfers (of resources, technology or knowledge) but also is conceived as an open change process, which cannot be determined in advance and needs to be continuously shaped, in order to cope with changes or integrate lessons learned along the way.

As a result, interventions become multi-layered and multi-faceted, i.e. more complex. Complexity is the result of many different elements (e.g. actors, actions, factors) and their linkages. Due to the linkages, changes in a single element do not remain isolated but can influence others – often with unforeseeable consequences.

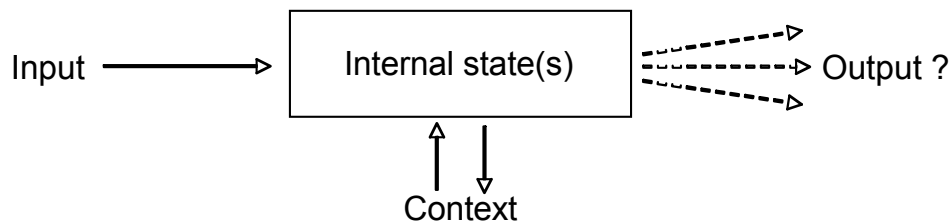
20 years ago the German cognitive psychologist Dietrich Dörner has explored how complexity challenges our everyday thinking, which functions along „linear“ rules. Human cognition has the tendency to think in simple cause-effect patterns and to ignore what cannot be directly observed or easily understood. Incidentally, his book „Die Logik des Misslingens - The Logic of Failure“ (1989) is full with examples from development aid, which he at the time considered particularly poor in coping with complexity. And he has identified a range of pitfalls in dealing with complex situations and suggested ways to avoid them.

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He found that the most frequent reaction is to either ignore complexity - or to mentally reduce it in order to cope with it. This mirrors a behaviour pattern which the cyberneticist Heinz v. Foerster has called “mental trivialisation” (1999): Social systems are in this case regarded as machines, a simple input-output model, where the same input will always lead to identical output, regardless of circumstance.



But such reductionism strips social systems of their most important qualities – internal dynamics and self-organisation: They can react differently to the same input – depending on their internal state. And since they are embedded in a context, their behaviour can neither be explained from inputs, internal states or context alone, but results from their inter-relationship.



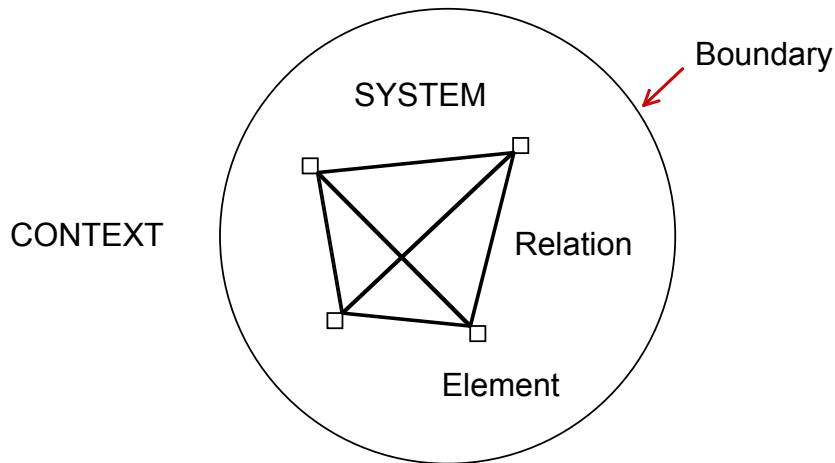
Both of these authors – and many others - advocate replacing ‘mechanistic’ thinking by systems thinking, which can help to avoid inappropriate simplifications. It can notably be used to better analyse inter-relationships and identify patterns for understanding the behaviour of social systems.

What is Systems Thinking?

The idea of describing phenomena as systems is far from new. However, it is not a uniform stock of knowledge, but stems from research originally undertaken in diverse fields such as anthropology, biology, cybernetics, communications theory, sociology and management, which have mutually influenced each other. Therefore a single, concise and generally agreed definition of a system does not exist.

Systems theory is a specific way to conceptualize the world around us. In its broadest sense, a system consists of elements linked together in a certain way, i.e. inter-relationships that connect parts to form a whole. And it has a boundary, which determines what is inside of a system and what is outside (context or environment). With that broad definition pretty much everything can be regarded as a system - and it is therefore futile to discuss what does and what does not constitute a system.

In its earlier days, systems theory considered systems as objects of the real world and analysed their operations. Systems were thought to be physical entities: fixed, largely undisputed, and mostly self-evident. But practice has revealed that there are nearly always several possibilities to describe and delimit systems, depending e.g. on the purpose and the actors involved.



Thus later on systems were considered to be mental constructs that permit comprehending more clearly what is going on. Systems are representations, they are necessarily simplifications and should not be confused with the real world (“the map is not the territory”). And the fundamental question is not whether these representations are “right” or “wrong”, but whether the essential aspects of a situation have been captured in relation to a specific purpose or issue.

G. Midgley (2000) has described the historical development of the systems field over the past decades and has identified three distinct “waves”. Each wave has emerged in response to critical assessments of the logic and methods of its predecessors, and focused on a different concept:

- **1st Wave: Inter-relationships**

This is probably the most familiar systems concept, partly because it is also the oldest: how things are connected, by what, to what and with what consequence, stems from the earliest thinking about systems. During the 1960s and 70s the focus was very much on inter-relationships and methods were developed that explored these in depth (e.g. system dynamics).

- **2nd Wave: Perspectives**

By the mid 70s it was clear that inter-relationships were not neutral, but that the importance of particular inter-relationships depended on the ascribed purposes. Thus methods were developed that helped explore the implications of different perspectives that could be taken of the same situation (e.g. soft systems methodology). A systemic approach is more than exploring interconnections, what makes an inquiry “systemic” is *how* to explore and interpret them.

- **3rd Wave: Boundaries**

During the mid 80s it became clear that perspectives were not neutral either. They determined what was relevant and what was not, what was “in” the system and what lay outside it. Whoever defined the dominant perspective controlled the system’s boundary. A lot of power issues are bound up in boundaries, thus the importance of studying boundaries and critiquing boundary decisions became the third key element of a systems approach (e.g. critical systems thinking).

Taken together these three concepts constitute the essence of systems thinking and distinguish a systems approach from other approaches for dealing with complexity.

Thinking systemically is about making sense of the world rather than merely describing it, a sense-making process that organizes the messiness of the real world into concepts and components that allow us to understand things a bit better.

Why and when to use Systemic Approaches in Evaluation?

Just as interventions are faced with increasing complexity, so are the evaluators of these interventions. They are often confronted with a diverse or even conflicting picture of reality, e.g. when seen through the eyes of various stakeholders or compared to some pre-defined (mostly linear) logic. And attempts at reducing this in an inappropriate manner can lead to questionable or even misleading findings, harm the relevance of the evaluation and bring forth resistance from those which feel not properly represented.

In his recent book “Developmental Evaluation” (2010), Michael Q. Patton has formulated the challenge to the evaluation field like this: *“Evaluation has explored merit and worth, processes and outcomes, formative and summative evaluations. The great unexplored frontier is evaluation under conditions of complexity.”*

First and foremost, any evaluation approach should be matched to the nature of the situation. During recent years new research (e.g. Ralph Stacey, Glouberman and Zimmerman, Kurtz and Snowden) has been undertaken that allows operationalizing and further differentiating the space between the simple and the complex. Although their concepts differ, their findings allow distinguishing between three types of domains and provide criteria for it:

- **Simple:**
There is high certainty and high agreement between stakeholders about what to do. Cause and effect patterns are clear, predictable and controllable. This is the domain of the ‘known’, where there is a known right answer (within the current context) and best practice ‘recipes’ can be confidently recommended.
- **Complicated:**
There is some disagreement about what to do and some uncertainty (due the involvement of many actors or areas of expertise). The relationships between cause and effect depend on the context, they are neither obvious nor predictable and there are alternative routes to achieve affects. This is the domain of the ‘knowable’, where good practices can be identified and tested. But answers require careful analysis, coordination and expert knowledge.
- **Complex:**
There is high uncertainty and high disagreement between stakeholders about what to do. The relationships between cause and effect are only evident in retrospect and depend heavily on initial conditions. This is the domain of the ‘unknowable’, where each situation is unique and previous success provides insufficient clues. The key to answers lies in observing the relationships among variables or behaviour patterns.

Some have added a fourth domain (‘Chaotic’), where patterns cannot be observed – at least not during implementation - and there is no previous experience to rely upon.

Cause and effect appear completely dissociated, almost anything can happen for almost any reason.

These distinctions provide a heuristic framework to facilitate situational recognition. Instead of categorizing entire interventions as being either simple or complex, they permit identifying whether an intervention contains aspects that fall into one of these domains. Furthermore these distinctions allow identifying appropriate approaches for monitoring and evaluation:

- In the simple domain, monitoring of implementation can be used to identify deviation from best practice and unforeseen effects. Summative evaluation is possible, based on a sound programme theory that relies on linear logic models.
- In the complicated domain, monitoring and formative evaluation can serve to understand how the intervention unfolds under the specific context conditions and to analyse cause-effect patterns. Summative evaluation is possible, but first a suitable programme theory and appropriate designs for testing must be developed.
- In the complex domain, monitoring can be used to identify changes from initial conditions and capture emerging patterns, paying attention to even incremental changes. Evaluation needs to provide on-going and rapid feed-back for implementers, and for this purpose Michael Q. Patton (2010) proposes 'developmental evaluation' as a new type of evaluation, which occupies a niche beyond formative and summative evaluations.

While systems thinking will hardly be needed for evaluating simple aspects, it is very useful for complicated situations: For instance to visualize entangled or non-linear relationships between causes and effects, to analyse or overcome differences in viewpoints, to capture the interdependencies between intervention and context or to reflect on the implications of these boundaries. And it is a pre-requisite for complex (and chaotic) situations, because it is essential for identifying the relevant patterns between variables or actors.

What are Systemic Approaches in Evaluation?

Having explored the rationale for using systemic approaches, the question arises what systemic practice in evaluation actually means. Despite drawing on some of the same philosophical, sociological, and scientific developments, the two fields - systems thinking and evaluation – have operated virtually independently since their inceptions. And they are both rather large and diverse concerning their theories, methodologies and techniques, as can be seen from the following two overviews.

The figure on the next page is an overview of systems methodologies, predominantly from an Anglo-American perspective. What is known in the Central European - notably German speaking - systems field as 'the system approach' is a mixture of these methodologies, consisting either of variations (e.g. F. Vester - System Dynamics, F. Simon - systemic family therapy) or further developments (e.g. St. Gallen Management school using management cybernetics). Also some original contributions were made (e.g. Social Systems Theory of N. Luhmann and H. Willke).

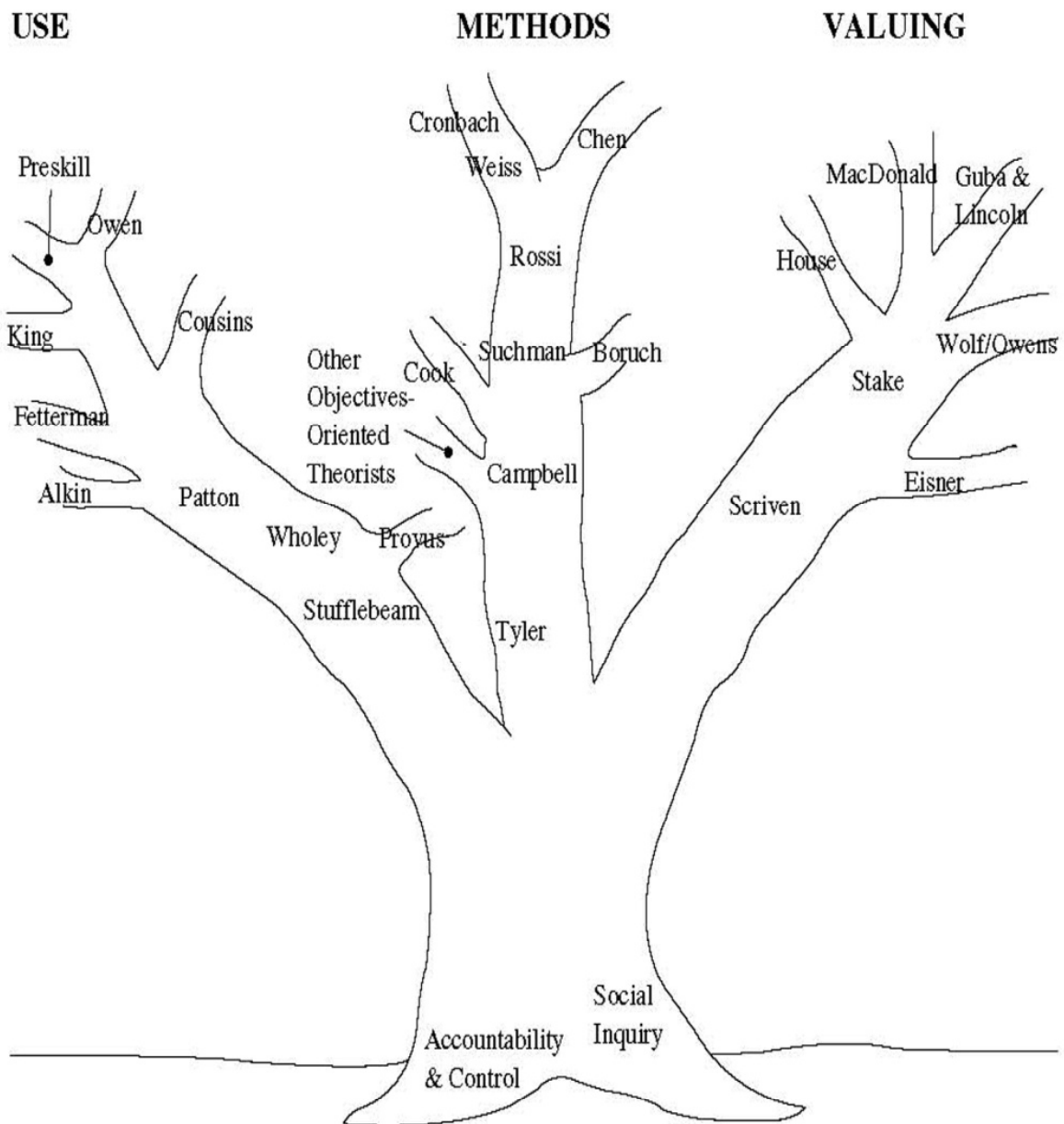


Fig. 2 Evaluation theory tree (Source: Alkin/Christie)

Is there something like a 'systemic evaluation'? And if so, what are the main characteristics - and how does it differ from other evaluation approaches? And where would it be located in these two fields?

A few years ago, Bob Williams and Iraj Imam compiled an anthology on "Systems Concepts in Evaluation" (2007) and organized a meeting with contributors, people who have applied systems thinking to evaluation work. They discussed these questions and found that connecting the two fields through such a specific evaluation type would neither be practical nor appropriate. Instead they proposed that a systemic approach in evaluation is characterized by the use of systems thinking, and they have identified the three concepts mentioned above (interrelationships, perspectives and boundaries) as being the essence. Because they have concluded that all systems methods, no matter when or where they were developed, are applied with these three basic system concepts in mind. Moreover, in this way systems thinking is valid for many evaluation approaches and not confined to a particular niche.

But these concepts are not new to the evaluation field, they have been applied for some time already and a range of methods / techniques were developed to deal with them. In order to identify the specific contributions that the systems field can make, a closer look at the underpinning aspects and methods is needed.

- **Interrelationships**

The systems field can particularly help in analysing the following aspects:

- dynamic aspects (i.e. where inter-relationships affect behaviour of a situation over a period of time)
- non-linear aspects (i.e. where the scale of “effect” is apparently unrelated to the scale of the “cause”; often but not always caused by “feedback”)
- the sensitivity of inter-relationships to context (i.e. where the same intervention in different situations or areas leads to different results)
- where the inter-relationships are massively entangled (i.e. distinguishing the behaviour of “simple”, “complicated” “complex” inter-relationships)

There are various techniques available for modelling interrelationships that fall into two broad categories: Models that provide insight and models for prediction. As a rule of thumb, the more elaborate and comprehensive models are the better they serve for prediction (e.g. models from the system dynamics tradition).

- **Perspectives**

On one hand, systems approaches distinguish between perspectives in relation to

- *Stakeholders* (people as well as things): They are encouraged to deliberately expose their beliefs and underlying assumptions. Different stakeholders may share the same perspective – or one stakeholder can hold different perspectives.
- *Stakeholdings*: They are connected with people’s motivations and help to comprehend - or even foresee - behaviours. These may have little or nothing to do with formal goals or objectives, yet they will affect the performance and results of an intervention.

On the other hand, the systems field provides methods and/or a language

- for conveying ideas between different and often disparate stakeholders, and to overcome differences by working with them constructively in order to improve mutual understanding, achieve consensus or create new insights or options.
- for comparing perceptions of what *is* or with what *might* be, which again can lead to deeper learning and generate better insights into the actual functioning of an intervention.

- **Boundaries**

Contrary to what people often think, systems approaches are not “holistic” in the sense that they aim to include everything. This would not even be possible, since in every situation choices must be made what is included and what not, what is

considered relevant - and by whom. What systems approaches do is identify the main boundaries and assess the consequences of those boundary choices. And the implications are often the opposite of holism: Being concerned with what can be reasonably left out – but also deeply and openly aware of the consequences.

A lot of power issues are usually involved around boundaries, as it is the dominant perspective(s) that decides the boundaries. Systems thinking takes a critical approach to boundary choice around the following dimensions and questions:

- Motivation: Who benefits in what way?
- Control: Who does (and does not) have what resources?
- Knowledge: What expertise is honoured or ignored?
- Legitimacy: What makes this the right thing to do - and who decides that?

Since international aid is characterized by considerable power differences / imbalances between the various 'partners', this might be the systems concept that holds the highest potential for application in this policy arena. And the corresponding approach of "Critical Systems Thinking" has not yet spread far. For instance, it is largely unknown in the German-speaking systems community – despite the fact that is heavily based on German philosophic traditions and was originally developed by a Swiss, Werner Ulrich (2010).

How to choose appropriate systemic approaches or methods?

So the systems field can provide some important and distinctive contributions to evaluation. As the earlier picture revealed, it actually has a lot to offer –and there is growing interest among evaluators to take up this offer. But since the systems field is methodologically large, most evaluators enter the field through a single gate or are familiar with only one approach and its associated methods. And many of them are geographically bound and did not (yet) travel far. This is particularly relevant for international development, because people across the world will most likely come from different corners of the systems field.

Whereas each of these approaches – System Dynamics, Complex Adaptive Systems, Social Systems Theory, Soft Systems, etc. - have great merits, they invariably emphasise particular corners of the systems field. If evaluators only use a single approach then they are missing out on the full power of systems approaches. And they are tempted to take a one-size fits all attitude and risk fitting the situation at hand to a particular systems approach or method, rather than exploring the systems universe for something that might fit better.

That's why Bob Williams and myself have lately focused on providing guidance for choosing appropriate methods. In our new book "Systems Concepts in Action" (2011) we have assembled proven methods from a wide sweep of the systems field. And we have taken care to consider for each method what we felt were the specific aspects of a situation or inquiry that they addressed. We chose to express these as "questions" since, as evaluators, we know that questions go to the core of evaluation methods and should be the route that evaluators need to take for selecting the most appropriate approach to use.

Furthermore, a question orientation encourages the use of multiple approaches, since the questions emerge in the early stages of inquiry design unconstrained by method considerations. And we encourage to move away from selecting which method suits what situation towards which systems methods - or even elements of systems methods - suit both the situation *and* the intended purpose of an inquiry. This is also in line with tendencies in the evaluation field towards ‘multi-methodology’, which also means that systems methods can - and should - be used alongside other ‘traditional’ evaluation methods.

Beyond Methods - Being Systemic

Appropriately identifying and selecting approaches and methods from the systems field is important, but not sufficient to make an inquiry or evaluation “systemic”. What it also takes is to “be systemic” in engaging with situations, to apply approaches and methods with a specific stance. The most important orientations that allow you to be systemic are the following.

Be reflective

There are many definitions and understandings of what it means to be reflective. At core it means observing oneself, being aware of assumptions, mental models and values - and how they affect what we see or hear. It also means checking whether these assumptions are still valid, for which a skilful use of perspectives and boundaries is very helpful.

In the German speaking systems community we use the “Systemic loop” to illustrate and guide reflective practice. It is centred around the formulation and testing of hypothesis: Actions should be based on prior hypothesis and monitoring their effects enables adjusting hypothesis and subsequent actions with a view to what has been - or remains to be - achieved. Hypothesis should provide useful explanations for the present status. To this end they should open new possibilities, i.e. focus on aspects which can be changed and stimulate solutions.

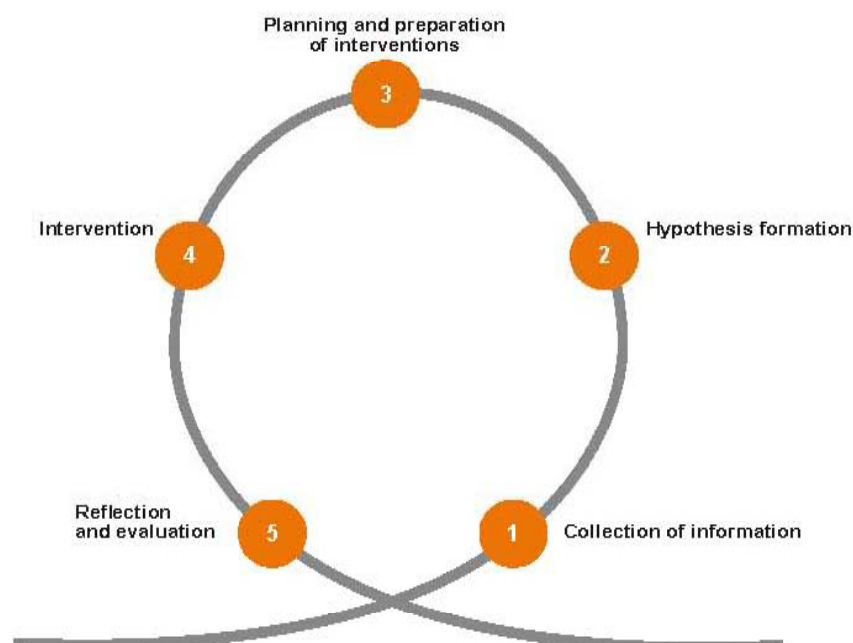


Fig. 3 Systemic Loop (Source Capacity WORKS Manual, GTZ 2008)

Evaluations that are conceived in this manner would require recursive designs, consisting of successive reflective loops. Thus an important requirement is flexibility in implementation, i.e. the evaluation process should remain sufficiently open to respond to new findings, requirements or issues.

Some might recognize the resemblance of this loop metaphor to Action Research, used in organizational or community development. As described by Bob Dick, Action Research “*is a family of research methodologies which pursue action (or change) and research (understanding) at the same time. It does this by using a cyclical or spiral process which alternates between action and critical reflection*”. But in this concept, observation is neither independent from the observer’s values nor opposed from action – it is actually undertaken in service of the action.

A similar conclusion has been reached by Michael Q. Patton for his ‘Developmental Evaluation’ approach (2010): An evaluation style to guide adaptation to emergent and dynamic realities, where the evaluator is often part of the development team, infusing it with evaluative questions, thinking and data. In his book he specifies how a reflective practice process should be organized and he draws analogies between evaluation and yet another recursive concept, the “adaptive cycle” originally developed by ecologists.

Respect and trust self-organization

As I have pointed out at the beginning, development interventions essentially deal with social systems. These are relatively stable and yet unpredictable, an inherent paradox due to the contradiction between closure (= self-referential, autonomous) and openness (= linked to a surrounding context). Social systems and their context mutually influence each other, they adapt and co-evolve - they self-organize.

Self-organization assumes development, i.e. the gradual transformation of systems through their capacity to produce and reproduce structures that are capable of dealing better with changes in the environment. The appearance of new structures, patterns and properties during the process of self-organization is called “emergence”. So having trust in self-organization is about paying attention for emerging patterns, responding to them - and resist the temptation to control or exert direct influence!

Since social systems maintain their balance through continuous renewal, their only constant is change. Therefore differences from original states are inherent to assure their stability. And changes in short term targets or plans are often necessary for the achievement of long-term objectives. Evaluations of interventions in social systems need to be aware of these fundamental differences and should not be conceived as an external ‘regulator’, regarding differences from original plans a priori as negative and propose corrective actions to put an intervention back “on track”.

Instead they should be in line with - and strengthen - internal regulatory mechanisms and pay attention to emergence. This requires above all to value differences: Analysing differences in outputs (as well as results and impacts) can help to assess

the appropriateness of an intervention in view of its context (e.g. framework conditions, needs of target groups, interests of implementing partners). But it can also provide valuable indications about the internal dynamics and self-organising forces that are at work within social systems and thus improve their understanding.

For evaluations to work this way they should not be limited to observing intended effects or routes, but instead look at the entire range of processes triggered, irrespective of whether they are in line with original intentions. Exceptions, discontinuities, contradictions and puzzles are valuable sources of information, they can provide useful clues (e.g. relevant changes, new challenges, innovative or “informal” ways of handling situations), which can help to improve implementation.

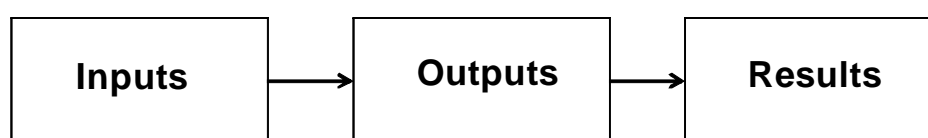
In his new book “Evaluation in the Face of Uncertainty” (2010), Jonathan A. Morell advocates that evaluators should move from explaining surprise to dealing with it. And he provides a framework for incorporating the unexpected into the routines for planning and conducting evaluations. One of his key advise is to shift from advance planning to early detection – and complexity/systems thinking figures prominently in his repertoire: e.g. for identifying patterns, expanding the horizons of observation or providing better models. Irene Guijt, who is also present here, has written a book “Seeking Surprises” (2008) based on her PhD study of monitoring development programs, which contains some valuable thoughts and contributions to this topic.

Think – and act - circular

Circularity means that a system’s operations are inter-connected, thus one operation might influence other operations within the same system - and can reach beyond the boundaries to its context. We can prepare for this by mentally stepping inside systems, learn about their structure and processes and discover the rules that steer their behaviour. Or on more general terms, by seeing a situation from different perspectives and reflecting on boundary decisions: In short, systems thinking.

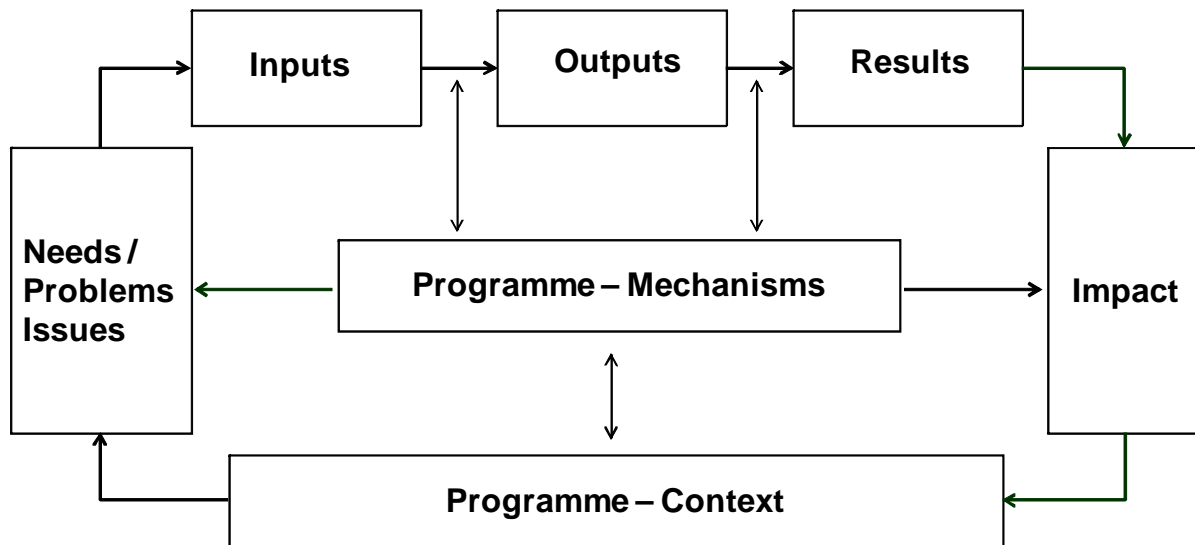
However, interventions in development aid are still predominantly conceived as “linear” interventions. Although deeply flawed conceptionally, the logical framework (or its equivalent, linear logic models) is still the dominant planning and management tool used by most donors, aid agencies and NGOs. Despite numerous attempts no other approaches have been sufficiently convincing to aid managers to replace it as alternatives for planning and monitoring. Incidentally, with the new management model ‘Capacity WORKS’ GTZ is a most notably exception and to my knowledge the only major donor to undertake a radical departure from log-frame - and applying systems thinking in managing interventions!

Therefore evaluators will most likely be confronted with interventions that are structured in the following (linear) manner and with the following elements: objectives, inputs, and a sequence of expected effects.



Of course, this poses a challenge for thinking circular. One way forward is to turn this into a “circular” logic model, by adding two components that are interrelated with the elements of the original logic model, but also connected with each other:

- the relevant operational context that can influence implementation (e.g., socioeconomic development, legal or administrative framework, interests of implementing partners and project owners).
- the intervention’s mechanisms (e.g. activities, criteria and conditions, decision making mechanisms) that influence the relations between these elements.



In this way, the intervention can be structured as a system and linked to its context in a recursive logic. Such a model can provide a framework for evaluations that are both theory-based and systemic. I am notably using this for impact-oriented monitoring and evaluations, thereby regarding effects as the result of specific mechanisms acting in a specific context (“what works for whom – and under which conditions”). It is important to see that every inter-relationship can be both - cause and effect - and does not only work one way. Since the relations are now circular, identifying interaction patterns (how?) replaces the search for “causes” (why?).

Patricia Rogers has explored this much further and provides new insights that link theory-based evaluations and systems thinking (2008). In her forthcoming book “Purposeful programme theory” (2011) she notably shows how simple, complicated and complex aspects can be adequately represented in logic models.

However, being systemic is perhaps the most difficult aspect. One can learn about approaches or methods, but these orientations confront our ideas about expertise, values and certainty in ways that are often more emotional than cognitive. They require coping with recursive designs, challenge desires to influence and control or make us uncomfortably aware of our (inevitable) leaning towards mechanistic thinking. Some people are comfortable about these challenges and ambiguities whilst others are not.

This might also be the reason why so many people feel uncomfortable with the consequences of thinking systemically, find it disturbing and unsettling. And prevents some from “falling in love” with systems ideas, even though they initially find them attractive...

Concluding remarks

To end my address, I would like to thank GIZ and BMZ for organizing this Conference and the initiative to provide such a forum for discussion and exchange. As far as I can tell, this is quite a unique gathering of key people from both the systems and the evaluation field, as well as many representatives of the international aid community. And it comes very timely, as a range of new developments is taken place right now...

I have tried to lay the ground: By outlining why systems approaches in evaluation are important, what are their characteristics, how to go about selecting methods from this wide field and apply them with care. And last but not least I have highlighted some of the most recent work and publications, most of which will be presented here.

Admittedly, this might be quite a lot to digest. And could raise the question where to start. Therefore I would like to end with an advise from Gerald Midgley:

*“Do not feel intimidated by the extent of literature:
start from where you are right now, and build your knowledge as you go”!*

So let's start with the Conference! Thank you!

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