

Complexity Evaluation Framework

A system or process that is **complex** is made up of many diverse components that interact with each other in nonlinear ways. Their behaviour may also adapt or change over time.

The domains that Defra deals with are **complex**. As the UK government department responsible for safeguarding our natural environment, supporting our food and farming industry, and sustaining a thriving rural economy, Defra's remit involves working with complex ecological and social systems, usually together at the same time.

Characteristics of complex systems

Non-linearity When the effect of inputs on outputs are not proportional. Outputs may change exponentially, or even change direction (e.g. after increasing for some time, they may begin decreasing), despite small or consistent changes in inputs.



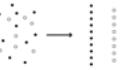
E.g. Increasing payment rates for land management does not translate into a corresponding increase in their uptake. Land managers do not behave as the rational agents of traditional economic theory – there are other factors at play.

Feedback When a result or output of a process influences the input either directly or indirectly. Feedback can accelerate or suppress change.



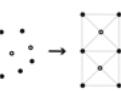
E.g. As the climate changes, permafrost melts and releases more greenhouse gases, contributing further to climate change (positive feedback).

Self-organisation Regularities or higher-level patterns can arise from the local interaction of autonomous lower-level components.



E.g. Sheep paths – informal paths across land – are formed by erosion caused by the footfall of individuals over time. Patterns of paths develop as each individual chooses their own route.

Emergence New, unexpected higher-level properties can arise from the interaction of components. These properties are said to be emergent if they cannot easily be described, explained, or predicted from the properties of the lower level components.



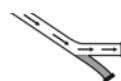
E.g. Community resilience – a community's capacity to function in and respond to shocks and extreme events – is shaped by and arises from interactions between human and environmental components.

Tipping point A point beyond which system behaviour changes dramatically and it may be difficult to return to the previous system state.



E.g. A species' population reducing in numbers to such an extent that it cannot re-establish itself in the wild.

Path dependency Current and future states, actions, or decisions depend on the sequence of states, actions, or decisions that preceded them – their 'path'.



E.g. The organisation chosen to lead a new policy initiative influences which other organisations also become involved; similarly, species which colonise a habitat first have 'founder effects', determining the ultimate composition of the community.

Adaptation Components or actors within the system are capable of learning or evolving, changing how the system behaves in response to interventions as they are applied.



E.g. When bacteria evolve to become resistant to antibiotics; or when an individual or organisation finds a way to circumvent a new tax or regulation.

- In a complex policy environment
- You cannot definitively predict how a system will behave
 - Expect the unexpected

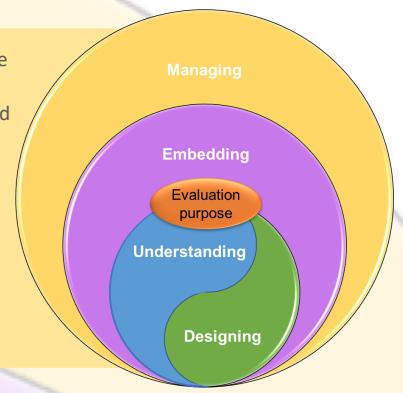
When seeking to influence or manage complex systems, evaluation is crucial; it helps us to understand and navigate this complexity.

A complexity-appropriate evaluation can greatly assist policy teams in understanding the challenges posed by complexity, and provides opportunities to anticipate and take steps to manage these challenges.

Complexity-appropriate evaluation is iterative and embedded throughout the policy cycle

A complexity-appropriate evaluation consists of a set of nested processes:

- The evaluation is centred around and defined by the evaluation purpose.
- This purpose informs an iterative process of understanding the system and intervention (UNDERSTANDING) and adapting the evaluation design (DESIGNING). These will both continue to develop and be updated throughout the evaluation.
- All of these activities are conducted with the ongoing engagement of stakeholders, and understanding and learning are fed back and embedded into relevant processes both inside and outside of the evaluation (EMBEDDING).
- Finally, all of these interacting components of an evaluation are led and managed by one or more individuals (MANAGING).



Have you talked about **complexity** with the potential audience(s) for the findings?

Have difficulties in generating definitive and generalisable findings been discussed?

Are there opportunities to feed back findings regularly to support implementation?

Is the evaluation timed appropriately to take ongoing change into account?

Have you considered multiple routes of dissemination?

Does your evaluation plan include regular opportunities for discussing early findings?

Evaluation purpose

Have you undertaken a mapping of the system, the policy and its delivery?

What **characteristics of a complex system** do you recognise – in the policy or its context?

How might these influence the way the policy is delivered or its outcomes?

Have stages for review been built in to policy design, implementation and evaluation plans?

Have you identified the key stakeholder groups and communities affected by this policy and its evaluation?

Have you actively involved some or all of these stakeholders in the policy and evaluation design?

To what extent is there agreement between stakeholders about the policy itself, its outcomes or its evaluation?

Choosing and using approaches: Useful resources

- HM Treasury Magenta Book
- Choosing Appropriate Evaluation Methods Tool (Befani & O'Donnell, 2016)
- Speak to colleagues and experts: individuals with experience of complex evaluation from Defra, Government Departments, arms-length bodies and/or external experts.
- CECAN Evaluation Policy and Practice Note Series (EPPNs)
- CECAN syllabus

There is no 'gold standard' way of going about evaluation – just the best approach given the purpose, nature and extent of complexity and resource availability and constraints. There are lots of evaluation approaches that can help. Combine them.

When selecting the overall approach, have you taken into account:

- the **complexity characteristics of the system**?
- the evaluation purpose?
- feasibility?

budget skills
experience timescales
data requirements

Are you clear about why your chosen approach is appropriate and what the limitations are?

Has flexibility to review and change the evaluation design been built into the evaluation plan?

Have participative evaluation approaches and methods been considered?

Have stakeholders committed to give the necessary time to the evaluation?

Have stakeholders been primed to anticipate uncertainty in findings?

Useful resources

Speak to stakeholders and experts with experience of the system, both inside and outside of Defra. E.g. individuals who are - or were previously - involved in the design, implementation or evaluation of policies, programmes or pilots in similar or relevant areas.

MANAGING

EMBEDDING

UNDERSTANDING

DESIGNING