Centre for the Evaluation of Complexity Across the Nexus

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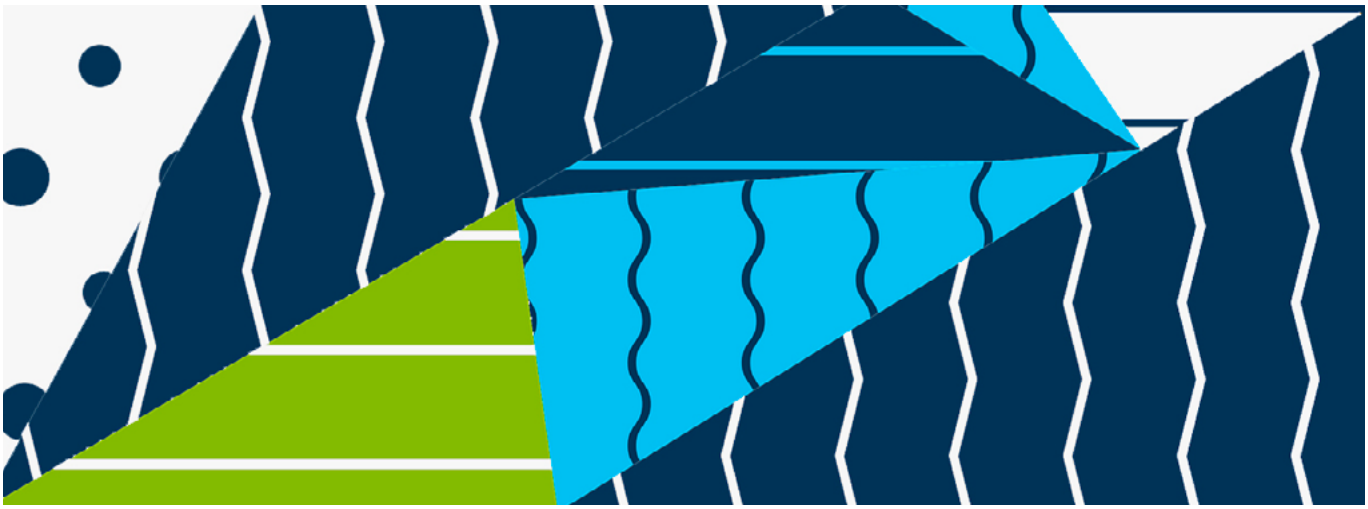
Evaluating Complexity in Context using Qualitative Comparative Analysis: The Environment Agency and Waste Crime

A CECAN case study Evaluation Policy and Practice Note for policy analysts and evaluators



Qualitative Comparative Analysis (QCA) is a method well established in the social sciences. As a case-based approach, it allows users to systematically compare cases to explore multiple and complex causation. It has been used in evaluation, but its application in a nexus context and within the organisational setting of the Environment Agency in particular is novel. Between 2016 and 2018, the CECAN case study team, led by Newcastle University, worked with the Environment Agency to develop a new approach to their evaluation of waste crime using QCA. A sustained and ongoing programme of advice and support from CECAN experts helped to guide the work at key stages, advising on the Agency's methodology and acting as a critical friend. In particular, two bespoke workshops were developed with the Agency which provided opportunities to co-design and co-develop a practical evaluation framework with CECAN experts in a highly participative way.

Why is waste crime an important issue?

Waste crime is important because it:

- Is estimated to cost the UK economy between £300m and £800m per annum. It has been referred to as 'the new narcotics' – a way of making quick, community damaging profit.
- Is a multi-faceted problem and includes a raft of activities including the operation of illegal waste sites (unpermitted sites taking multiple loads of waste), illegal dumping (large scale one off illegal disposal), illegal waste exports, and the misdescription of waste in order to avoid Landfill Tax.
- Has serious impacts on people and the environment and also on the economy and legitimate industry. Illegal waste sites can blight local communities, whilst illegal export can lead to far flung human and environmental impacts as waste is mis-handled at a final overseas destination.
- Typically costs the Environment Agency around £15m per annum spent on enforcing waste crime legislation.

What makes the system complex?

Waste crime demonstrated key characteristics of complex systems including:

- Adaptation (where criminals are capable of learning or evolving their behaviour, changing how the system behaves in response to interventions).
- Openness (An open system is one with many links and connections to its wider environment and which can be affected by changes happening elsewhere e.g. individuals involved in waste crime are often linked to serious organised crime).

Why was the evaluation challenging?

The evaluation was challenging because:

- Existing approaches to evaluation of interventions on waste crime were seen to be too narrowly econometric. The Environment Agency had information on the overall Benefit:Cost ratio of its enforcement work, but wanted evidence that it could use at a more detailed level to help improve its operational effectiveness.
- These crimes involve a large number of variables, often interacting with the additional complexity of links to organised crime. Interventions are often used in combination or sequence, so understanding the unique contribution of each had proven difficult for the Agency.

How did CECAN help?

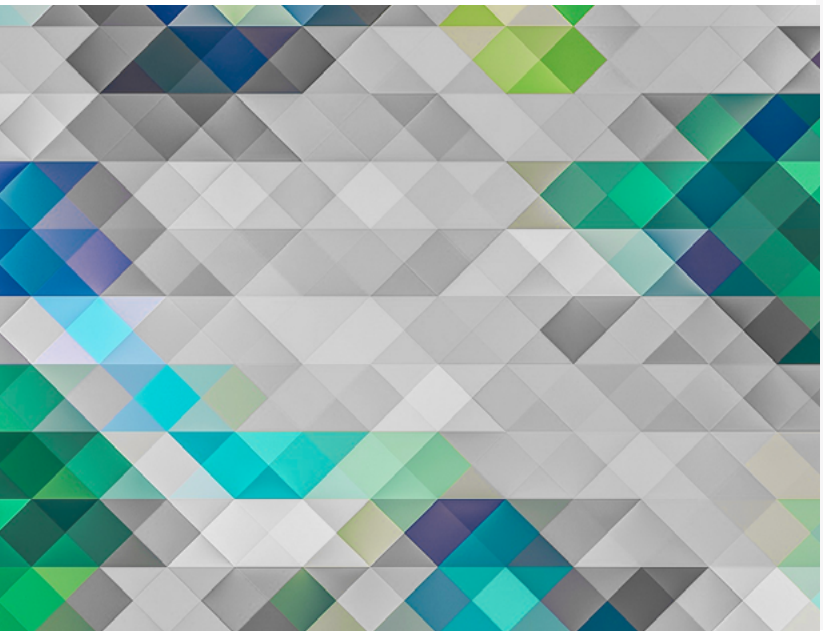
CECAN worked with the Environment Agency to help them explore a more behavioural approach to their evaluation. They wanted to develop a more nuanced understanding of how people responded to their interventions, in order to capture more fully the complex nature of the spectrum of criminality and help them understand the impact of their interventions.

What is Qualitative Comparative Analysis (QCA)?

It:

- Is a methodological approach which allows the user to make systematic comparisons across cases in order to explore what causes differences between the characters of cases.
- Starts from a careful qualitative consideration of each case when the number of cases is small enough for this to be done.
- Moves into a quantitative mode by describing each case in relation to a set of attributes which are considered to be of significance.

In this evaluation, QCA was used to conduct a systematic assessment of the effectiveness of waste crime interventions across different cases to understand and determine success factors.



CECAN Activity 1: Methods scoping workshop

In November 2016, a scoping workshop brought together CECAN practitioners from Risk Solutions and the Tavistock Institute and personnel from across the Environment Agency's Evaluation, Prevention and Disruption and Enforcement teams.

CECAN practitioners:

- Listened to Environment Agency staff outline the evaluation problems and challenges they faced and discussed at length possible approaches.
- Suggested systems mapping, realist evaluation and Qualitative Comparative Analysis (QCA) as potential approaches to consider.

The Environment Agency:

- Wanted to explore critical success factors across their range of interventions on waste crime, including what works well, in what contexts and how different interventions work in combination.
- Were particularly keen on the use of QCA as a way to bridge the gap between their need for both quantitative evidence (to convince Government and sponsors that their interventions were value for money) and rich and detailed qualitative description (to improve organisational learning around the effectiveness of interventions in combination).

CECAN Activity 2: QCA design workshop

In April 2017, a one-day design workshop:

- Brought together CECAN experts in QCA from Durham University and the University of Surrey and Environment Agency personnel from their evaluation, prevention, disruption and enforcement teams, plus representatives from the Welsh and Northern Irish counterpart agencies.
- Gave participants an introduction to complexity thinking and the application of QCA.
- Used facilitated groups to define outcomes and causal factors to feed into a QCA model.
- Helped the Environment Agency to design a data collection protocol that they can use to build an evidence base for a QCA analysis.

CECAN has helped to introduce complexity-compatible evaluation methods into our work to understand the effectiveness of our interventions to prevent waste crime. This support, in particular using Qualitative Comparative Analysis, has helped us to take our evaluation of this work to a level which we would not otherwise have achieved.
Jon Greaves (Senior Evaluation Advisor, Environment Agency)

How is the Environment Agency developing this work for the future?

The Environment Agency are now refining their data collection processes to enable them to use QCA for the first time as part of their evaluation toolkit for assessing their waste crime interventions. This work has included:

- An initial exercise collating data about the interventions used, and site context, from internal databases.
- A questionnaire survey of some enforcement staff to provide supplementary information.
- Initial QCA analysis.
- Having piloted the method, the Environment Agency is about to embark on more detailed data collection to allow the evaluation team to use the method more effectively.

What learning and insights did this case study produce?

There were a number of positive outcomes including:

- The independent, external advice of the CECAN case study team gave members of the Environment Agency's Research, Assessment and Evaluation team the confidence to explore alternative evaluation methods.
- The scoping workshop provided a safe space for the Environment Agency to discuss and consider new ideas and approaches to evaluation, guided by experienced practitioners with expertise in their application.
- The design workshop enabled the Environment Agency to understand the QCA method in more detail and begin to test its application, in a highly participative way, within their specific context.
- The setting encouraged expertise exchange between CECAN and the Environment Agency and also between the operational and strategic teams within the Agency and between the different devolved agencies, leading to a more nuanced understanding of the evaluation challenges and how to tackle them.
- Environment Agency personnel have a greater understanding and confidence as evaluators and commissioners to use QCA in the future

Introducing new or previously unused methodologies for evaluation into organisations also brings with it particular challenges:

- Environment Agency staff required upskilling in the use and application of QCA. This was made easier as the method was viewed as "doable" and an approach which could be "understood intuitively".
- Leadership is a key to success. The Environment Agency team was led by an individual whose commitment and enthusiasm to develop a new approach was critical. This demonstrated the vital role of institutional champions for facilitating and brokering innovation in evaluation.

What are the implications for future policy evaluation?

The project has changed the Environment Agency's approach to evaluation:

- The Environment Agency's work with CECAN on the evaluation of waste crime is underpinning a refreshed approach to evaluation of regulatory activity across the wider remit of the Agency.
- There is the potential for the lessons the Environment Agency has learnt from this experimental work to feed into future evaluations of waste crime in Wales, Scotland and Northern Ireland.

CECAN has co-produced a set of case studies with government departments and agencies to tackle evaluation challenges in complex policy areas. These case studies have involved an orchestrated succession of activities and relationship building. They bring together evaluation practitioners, methods and domain specialists, social and natural scientists and policy analysts to develop shared understanding of evaluation challenges and identify evaluation solutions.

References and further information

Byrne, D. (2016). Qualitative Comparative Analysis: a pragmatic method for evaluating intervention, CECAN Evaluation and Policy Practice Note, No 1. Online at: https://www.cecan.ac.uk/sites/default/files/2018-01/DAVE%20B%20PPN%20v2.1.pdf

CECAN Case Studies reports. Online at: https://www.cecan.ac.uk/case-studies

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Centre for the Evaluation of Complexity Across the Nexus

www.cecan.ac.uk / cecan@surrey.ac.uk / +44 (0) 1483 682769

The Centre for the Evaluation of Complexity Across the Nexus (CECAN) is a £3m national research centre hosted by the University of Surrey, which brings together a unique coalition of experts to address some of the greatest issues in policy making and evaluation.

This Evaluation Policy and Practice Note was written by Dr Amy Proctor (Newcastle University) and Dr Jon Greaves (Environment Agency). Contact: amy.proctor@ncl.ac.uk.