Briefing

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# Clearing the fog: new tools for improving the credibility of impact claims

Development actors facing pressure to provide more rigorous assessments of their impact on policy and practice need new methods to deliver them. There is now a broad consensus that the traditional counterfactual analysis leading to the assessment of the net effect of an intervention is incapable of capturing the complexity of factors at play in any particular policy change. We suggest that evaluations focus instead on establishing whether a clearly-defined process of change has taken place, and improve the validity and credibility of qualitative impact statements. IIED research in Uganda shows that the methods of process tracing and Bayesian updating facilitate a dialogue between theory and evidence that allows us to assess our degree of confidence in 'contribution claims' in a transparent and replicable way.

## Policy pointers

**Development NGOs,** think tanks and funders need to fundamentally rethink the way they measure impact if they want to prove that they are exerting a demonstrable influence over policy and practice.

**The traditional** 'counterfactual' approach to impact evaluation is inadequate to assess influence over policy and practice, whereas many qualitative tools, even if appropriate, are often affected by confirmation bias and other shortcomings.

**Instead, evaluations of a** 'contribution claim' should aim to establish whether a clearly-defined process of change has taken place, and provide a transparent way to assess our degree of confidence that it did.

**Evidence from Uganda** suggests that the methods of process tracing and Bayesian updating allow us to assess how and why policy and practice evolved with a degree of transparency unrivalled by other methods.

Development actors aiming to conduct rigorous impact evaluations need sharper methodological tools. The traditional approach has been to employ counterfactual analysis, but there is broad agreement that the latter is inherently incapable of controlling for the many complex factors that may lie behind a particular shift in policy or practice.[1] Seeking to acquire a greater understanding of alternative methods, IIED has trialled a combination of process tracing and Bayesian updating[2] (see Box 1) to evaluate the influence of the Uganda Poverty Conservation and Learning Group (U-PCLG) on a policy change that has benefitted local communities of the Bwindi Impenetrable National Park in Uganda. This combination of methods has been particularly effective in enhancing our understanding of the process of change. It has also allowed us to precisely and transparently measure our level of confidence in the contribution made by IIED research and the work of its partners.

## Formulating contribution claims

An evaluation team comprised of external consultants and IIED staff began by formulating a contribution claim based on available evidence pointing to U-PCLG's apparent influence over a particular decision by the Uganda Wildlife Authority (UWA) regarding park fees. Specifically, U-PCLG lobbying appeared to have **accelerated and shaped** the UWA's decision to give communities a greater share of the fee for gorilla watching levied at the Bwindi Impenetrable National Park (BIN Park). The team then formulated a detailed reconstruction of the pathway to change, while simultaneously identifying complementary and mutually exclusive explanations. The investigation therefore opened up parallel lines of inquiry to assess the validity of different explanations and contributing factors. During this iterative process, different theories about what had happened were tested and gradually winnowed out until two of them appeared to be most strongly and convincingly supported by the evidence.

## Reconstructing the process of change: step-by-step

Since U-PCLG's lobbying was not the only factor contributing to change, the contribution claim was divided into two, more specific, claims. These incorporated explanations that supported the primary claim:

*The investigation shed light on the importance of community pressure*

- In a context of long-term community pressure, where the UWA board had tentatively started a discussion on changing the community share of the gorilla-tracking permit fee, **U-PCLG accelerated the process** by providing new and relevant research findings, which gave the UWA board an opportunity to think about the change more thoroughly
- In a context where the gorilla-tracking permit fee had increased from US$500 to US$600 and where the UWA was expected to be reluctant to increase the community share of such a fee, after considering a number of possible figures, **U-PCLG suggested an increase from US$5 to US$10** because they thought it would make a difference to the communities and at the same time be acceptable to the UWA. The latter took this suggestion on board.

The first contribution claim was reformulated as a process and articulated into the following steps, which can all be considered contributing factors:

1. The communities around the BIN Park have, for a long time, been dissatisfied with the amount of revenue shared with them. This dissatisfaction increased with a rise in the gorilla permit fee by US$100

2. The UWA board was already considering a change in the community share of the gorilla permit fee

3. U-PCLG, in collaboration with others, had undertaken research on the causes of illegal activity taking place in the park. Such research:

    a. had generated new/original insight that justified/motivated the decision

    b. was tailored to support advocacy work

    c. was undertaken in a collaborative way, directly involving the UWA in an attempt to build trust

4. U-PCLG submitted a formal request for the specific change in the community share to the UWA board, which acknowledged receipt and initiated a formal response process

5. A U-PCLG member championed the change within UWA's formal response process through her role as a UWA Committee Chairperson

6. The UWA board eventually took the decision suggested by U-PCLG.

Similarly, the second contribution claim was also reformulated as a process and articulated into the following steps, which can all be considered contributing factors:

1. The gorilla permit fee had increased from US$500 to US$600 per person per trek for BIN Park. This price change took effect on 1 January 2014

2. The UWA board was expecting communities to exert further pressure for an increase in their share of the fee from the gorilla permits sold

3. The UWA board was reluctant to meet the communities' demands because the gorilla permits are an important source of revenue used by the UWA to manage all of Uganda's national parks, including those that generate little revenue from tourism

4. U-PCLG was unsure how much influence it held over the UWA so made a cautious proposal by requesting the UWA increase the community share of the gorilla-tracking permit fee from US$5 to US$10. This would nevertheless make a significant difference to the communities

5. No other group/source made the same suggestion to the UWA board

6. U-PCLG submitted a formal request for the specific change to the UWA board, which acknowledged receipt and initiated a formal response process

7. The UWA board eventually took the decision suggested by U-PCLG.

## Assessing the evidence

After the two contribution claims had been articulated as step-by-step processes, the evaluation team used process tracing and Bayesian updating to assess their validity. Relatively strong evidence was found for most components of the claims, but more importantly the method was fully transparent and allowed for a systematic assessment of qualitative evidence.

Several pieces of evidence gathered from interviews, meeting minutes, documents and emails were used to show the existence of various steps of the two 'chains'. Each step was associated

## Box 1. Definition of terms

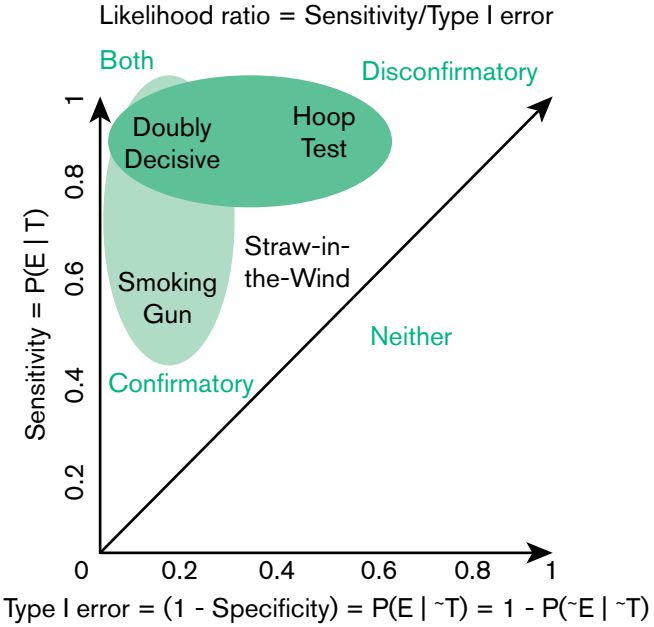
**Bayesian updating** is used to measure confidence in a claim about cause and effect, and update it according to the relevance of emerging new knowledge or evidence. Establishing prior and posterior probabilities is central to Bayesian updating, as is the estimation of the probative value of given pieces of evidence.[3]

**Process tracing** is used to explain outcomes in psychology, political science and historical studies. This method enables the examination of specific cases in great detail, establishing whether the apparently interlocking components of a mechanism united in a process to produce a particular effect.[4]

**Counterfactual analysis** is a causal inference strategy informed by Mill's Method of Difference, aiming to attribute a net effect to an intervention. The 'counterfactual' tries to reconstruct what would have happened in the absence of the intervention, and impact is estimated by comparing counterfactual outcomes to those observed under the intervention.

## Box 2. Process tracing tests by Sensitivity and Type I error

The Sensitivity indicates the probability of observing that piece of evidence if the step in the contribution claim is true, while the Type I error is the probability of observing the same piece of evidence if the step in the contribution claim is false. Evidence is subsequently put in a scatterplot with Sensitivity on the Y axis and Type I error on the X axis. Except for the 'Straw-in-the-Wind', all three other tests are useful to confirm or reject the contribution claim.




Source: authors' own, adapted[5]

**Smoking Gun (confirmatory):** if the evidence is observed, the hypothesis is confirmed. If the evidence is not observed, the hypothesis is not confirmed, but this is not sufficient to reject the hypothesis.

**Hoop Test (disconfirmatory):** if the evidence is not observed, the hypothesis is rejected. If the evidence is observed, the hypothesis is not rejected (it 'goes through the hoop', passes the test), but this is not sufficient to confirm the hypothesis.

**Doubly Decisive:** if the evidence is observed, the hypothesis is confirmed. If the evidence is not observed, the hypothesis is rejected.

**Straw-in-the-Wind:** if the evidence is observed, this is not sufficient to confirm the hypothesis. If the evidence is not observed, this is not sufficient to reject the hypothesis.

with a level of 'prior confidence', which the team decided to set at 0.5, equivalent to the 'no information' situation. Subsequently, the evaluation team estimated the strength of each piece of evidence, or the probative value for a specific part of the claim, by calculating their 'Sensitivity' and 'Type I error'. The comparison of these probabilities helps determine the significance of the evidence for confirming or rejecting that particular step of the contribution claim. In process tracing language, it helps to assess whether that piece of evidence is a Hoop Test, a Smoking Gun, a Straw-in-the-Wind or a Doubly Decisive test (see Box 2).

## Findings

The investigation shed light on the importance of community pressure as a complementary contributing factor, which had not been fully understood at the start of the evaluation. It also helped rule out two rival explanations, each mutually exclusive with the primary claim: that the UWA already had sufficiently advanced internal processes in place to review and change the policy, and that other pressure groups had advocated the same change and had greater influence on the decision. The explanatory mechanisms receiving strongest empirical support describe the research and activities led by U-PCLG as playing a central, fundamental role.

Several pieces of evidence were Hoop Tests for some steps of the contribution claim (with a high Sensitivity and a medium Type I error), and **all such tests were passed, with the claim not being disconfirmed in any component.**

Other pieces of evidence were Smoking Gun Tests for other steps of the contribution claims (with a medium Sensitivity and a low Type I error), and **confirmed the existence of the steps of the contribution claims**, and still others were doubly decisive (both high Sensitivity and low Type I error). However, some pieces of evidence were closer to Straw-in-the-Wind information, and **those steps of the contribution claims would benefit from additional evidence.**

The prior confidence for each step of the two contribution claims (set at 0.5) was then updated in light of the observation of various pieces of evidence (see Box 3).

Some elements of the contribution claims were supported much more strongly than others; however, the least strongly supported component still saw a rise in confidence compared to the pre-observation situation (that the research was undertaken in a collaborative way, 0.50 to 0.63). Some elements seem to be supported with virtual certainty: the existence of a formal process requesting the change (1.00), the existence of pressure from communities (0.91), the activities of a 'champion' who was both a U-PCLG member and a member of the UWA board (0.98); and the caution adopted by U-PCLG in proposing the modest increase that was eventually incorporated into legislation (0.97).

## Box 3. Confidence updating after observation of the evidence

*First contribution claim*

1. The communities around the BIN Park have, for a long time, been dissatisfied with the amount of revenue shared with them. This dissatisfaction increased with a rise in the gorilla permit fee by US$100: **from 0.5 to 0.91**

2. The UWA board was already considering a change in the community share of the gorilla permit fee: **from 0.5 to 0.80**

3. U-PCLG, in collaboration with others, had undertaken research on the causes of illegal activity taking place in the park. Such research:

   a. had generated new/original insight that justified/motivated the decision: **from 0.5 to 0.69**

   b. was tailored to support advocacy work: **from 0.5 to 0.77**

   c. was undertaken in a collaborative way, directly involving the UWA board in an attempt to build trust: **from 0.5 to 0.63**

4. U-PCLG submitted a formal request for the specific change in the community share to the UWA board, which acknowledged receipt and initiated a formal response process: **from 0.5 to 1.0**

5. A U-PCLG member championed the change within UWA's formal response process through her role as a UWA Committee Chairperson: **from 0.5 to 0.98.**

*Second contribution claim*

1. The gorilla permit fee had increased from US$500 to US$600 per person per trek for BIN Park. This price change took effect on 1 January 2014: **from 0.5 to 0.70**

2. The UWA board was expecting communities to exert further pressure for an increase in their share of the fee from the gorilla permits sold: **from 0.5 to 0.82**

3. The UWA board was reluctant to meet the communities' demands because the gorilla permits are an important source of revenue used by the UWA to manage all of Uganda's national parks, including those that generate little revenue from tourism: **from 0.5 to 0.70**

4. U-PCLG was unsure how much influence it held over the UWA so made a cautious proposal by requesting the UWA increase the community share of the gorilla-tracking permit fee from US$5 to US$10. This would nevertheless make a significant difference to the communities: **from 0.5 to 0.97**

5. No other group/source made the same suggestion to the UWA board: **from 0.5 to 0.69**

6. U-PCLG submitted a formal request for the specific change to the UWA board, which acknowledged receipt and initiated a formal response process: **from 0.5 to 1.0.**

In drawing broader conclusions about the credibility of the entire contribution claim, we should not ascribe it a greater overall level of confidence than the minimum level of confidence in any single step. In other words, confidence about the entire 'chain' would equal the confidence in its 'weakest link'. From this perspective, we would be 63 per cent confident about the first and 69 per cent confident about the second contribution claim.

## Conclusion

Considering the scarcity of rigorous methods to test qualitative claims about impact, we consider this methodology very promising on the basis of its ability to:

- Enable a close dialogue between theory and evidence
- Assess and even measure confidence in impact and contribution claims
- Provide a very high level of transparency over the assumptions informing the value assigned to each piece of evidence, and the assumptions behind those assumptions
- Incorporate explanations and causal factors that are complementary to the main claim we are trying to assess
- Test claims by searching for evidence that can either confirm or reject hypotheses. The absence of given pieces of evidence can clearly rule out any hypothesis — even those the evaluator would like to confirm or is biased against
- Be applied after a project is completed, without needing to interfere in the programme design.

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### Notes

[1] Stern *et al.* (2012) Broadening the Range of Designs and Methods for Impact Evaluations, DFID Working Paper 38. / [2] Befani, B and Stedman-Bryce, G (2016) Process Tracing and Bayesian Updating in Impact Evaluation. *Forthcoming in 'Evaluation'.* / [3] Bennett, A (2014) Appendix: Disciplining our conjectures. Systematizing process tracing with Bayesian analysis. In: Bennett, A and Checkel, J (*eds*). Process Tracing: From Metaphor to Analytic Tool. Cambridge University Press. / [4] Beach, D and Pedersen, R (2013) *Process Tracing Methods: Foundations and Guidelines.* University of Michigan Press. / [5] Humphreys, M and Jacobs, A (2015) Mixing Methods: a Bayesian Approach. *American Political Science Review* 109(4) 653–673.

Knowledge Products

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