Working paper 565

Towards evidence-informed adaptive management

A roadmap for development and humanitarian organisations

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Key messages

- Evidence is central to effective and rigorous adaptive management. However, despite this central importance, exactly how evidence has been used to inform decisions for adapting development and humanitarian programmes in the past remains unobservable to many.
- There is a need to strengthen and document evidence-informed adaptive management. This working paper proposes a roadmap to do this.
- Those seeking to use evidence for adaptive management will need to manage trade-offs between ensuring a rigorous, documented (and auditable) trail of evidence-informed actions, being pragmatic about the time and resources allocated to documentation and recognising that it may be necessary to proceed without rigorous evidence when it is unavailable.

This working paper sets out four steps for strengthening evidence-informed adaptive management:

1. Establish the need for evidence in adaptive management (why, what and how).
2. Consider the appropriate types and levels of evidence.
3. Assess the robustness of that evidence, including whether and how it can be used for decision-making.
4. Ensure the basis of adaptive management decision-making is sound, transparent and documented.

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Introduction

Development and humanitarian organisations seeking to be adaptive have emphasised the need to be transparent about complexity and uncertainty; to be honest about their inability to control what happens; and to design programmes that change over time to become more appropriate and relevant. At their heart, adaptive management approaches emphasise 'flexibility, reflectiveness, and the ability to learn and, even more importantly, "unlearn" what no longer works' and adapt programming accordingly (Prieto Martin et al., 2017: 5). Changing programmes according to what is learnt has been explicitly put at the centre of adaptive management (Valters et al., 2016).

The cornerstone of effective learning is the creation, gathering, accumulation, interpretation and use of data and evidence. Evidence is fundamental to effective monitoring, evaluation and learning (MEL) within adaptive management efforts. It is only through evidence that those leading and managing adaptive programmes can really know whether they should be adapting, and in what ways. As such, evidence is central to effective and rigorous adaptive management.

However, despite this central importance, exactly how evidence has been used to make decisions for adapting development and humanitarian programmes in the past remains a 'black box' – or hard to observe – for many. The few exemplary adaptive development programmes that have been extensively documented have usually not systematically captured – or disseminated – exactly how decisions to adapt or not have been made, and on the basis of what evidence (see Dasandi et al. (2019) for examples from governance programming). In part, this is due to sensitivities in exposing internal processes. It also reflects the reality that decisions to adapt are often tacit and go undocumented; they often 'just happen' as part of managing a programme, rather than being made explicit. Most accounts – where they are provided – include generic descriptions of learning processes, but fail to genuinely reveal how decisions have been taken and on what basis at different points in time. Some organisations, such as The Asia Foundation (Booth, 2014; Sidel, 2014), have gone further than most, but in general adaptive decision-making processes tend to be most visible to those directly involved and largely invisible to everyone else.

As a result – although these programmes may have helped give credibility to the 'what' and 'why' of adaptive management – the development sector as a whole remains in the dark about the 'how' of adaptive decision-making, and how and in what ways evidence and data are drawn upon in practice to support testing, learning and adaptation.

The question of how evidence is used to inform and underpin adaptive decision-making is central to the Global Learning for Adaptive Management (GLAM) programme. Established by the United States Agency for International Development (USAID) and the United Kingdom's Department for International Development (DFID), GLAM seeks to strengthen evidence-informed adaptive management through enhanced MEL, referred to as monitoring, evaluation and learning for adaptive management, or MEL4AM for short. The core hypothesis – which is being explored through technical assistance, research and collaborative learning – is that strengthened MEL4AM systems, capacities and techniques are a core capacity for adaptive programmes, and can mean the difference between a programme that proactively and successfully learns and changes in response to the context, and one that fails to learn or change in the face of adverse events and shocks.

This working paper provides development professionals with tools, strategies and ideas to help them use evidence for adaptive management in practical and evidence-informed ways. An accompanying paper (Pasanen et al., forthcoming)

examines a small set of monitoring and evaluation tools and approaches, discussing their potential usefulness to support adaptive management, particularly within programmes that include complex aspects. This working paper is intended as a 'test case': MEL specialists and programme designers can use it to structure their use and documentation of evidence for adaptive decision-making, to test the framework presented and, in the process, develop better evidence on the basis of which decisions are taken, and the types of information, data and learning this draws on. It provides a set of ideas to be tested and refined, to help identify what 'adaptive rigour' looks like, and how best to achieve the 'documented, transparent trail of intentions, decisions and actions' it involves (Ramalingam et al., 2019).

Due to the dearth of literature covering the role of evidence in adaptive management in the development sector, this working paper was inspired by and builds on reviews in other sectors, notably the extensive literature in conservation (Salafsky and Redford, 2013; Salafsky et al., 2019), the more nascent exploration of adaptation related to health interventions (Escoffery et al., 2018) and more general assessments of evidence and evidence-informed decision-making in development.

The paper consists of four sections, which together form a series of steps towards strengthening the evidence base for adaptive management programmes. It starts by establishing the *diverse needs for evidence* faced by those running adaptive programmes, interventions and strategies. Next, there is a need to think through the *types and levels of evidence for adaptive management*, looking at the range of different kinds of information that can be gathered and used by individuals and teams involved in making decisions. Then, there is a need to *assess the weight of the evidence*, using a range of criteria including relevance, reliability and quality. Finally, there is a need to *ensure that the decisions being made are sound*, *transparent and documented*, drawing on burden of proof criteria. The paper concludes by summarising these areas into a series of steps for consideration by evidence-informed adaptive programmes and interventions.

1 Step 1: Establish the need for evidence in adaptive management

According to research on adaptive management in the business world, managers and leaders of adaptive programmes need to bring different types of evidence together to answer the following three questions (adapted from McKeown, 2012):

- **Why they need to adapt** – the triggers and changes in the wider world that support or challenge hypotheses and assumptions and might require a programme or intervention to change course, strategically or tactically.
- **What they need to adapt** – the specific elements and qualities of a programme that need to change.
- **How they should adapt** – how they should make sure that decisions are made in ways that are sensitive to capabilities and the wider enabling environment.

Answering these questions requires distinct types of evidence to be assembled and synthesised from a variety of sources, including a programme's own MEL systems, research, client and end-user feedback, and wider information sources. Building on the extensive work of the Overseas Development Institute's (ODI's) Research and Policy in Development programme, as well as GLAM's initial work in this area, it is clear that adaptive programmes need a broad range of evidence. As noted in a 2016 study:

> Effective policy decisions will be based on a broad definition of evidence that includes research, statistical and administrative data, evidence from citizens and stakeholders, and evidence from evaluations. The robustness of the processes through which each type of evidence is sourced and used is as important as the technical robustness of the evidence itself (Wills et al., 2016: 9).

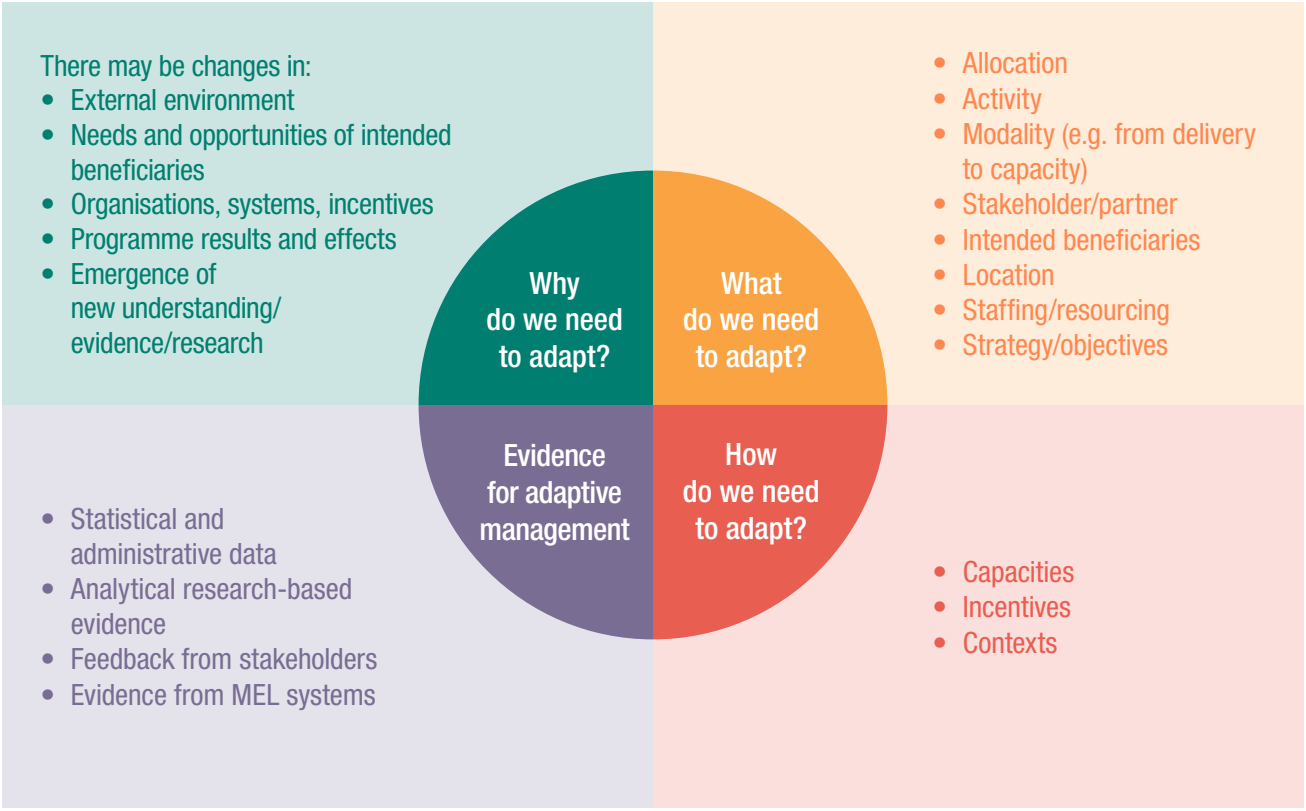
This broad evidence base is needed to help:

- diagnose, develop, budget for, implement, monitor and evaluate adaptive policies and programmes
- inform decisions (and adaptations) that need to be taken throughout the policy and programme cycle
- report on overall outcomes, impacts and results.

Figure 1 further unpacks the why, what and how for the need to adapt.

Why we need to adapt. The aim of adaptive management is to regularly test, learn and iterate or adapt based on that learning, supporting a process of continual improvement. Thus, it requires an underlying theory or outline of the changes envisaged and a roadmap for achieving them, as well as a process of testing the theory or the underlying assumptions about why a set of activities will lead to particular change. Adaptive approaches are most often applied to complex problems for which evidence on what will work is lacking – hence the need to identify up-front the main evidence gaps, where assumptions are most uncertain and therefore there is the greatest need for testing and learning. These uncertainties can reflect uncertainties in the wider external environment (such as fluid or unpredictable contexts); in terms of the key stakeholders involved

Figure 1 The role of evidence in adaptive management



Source: The authors

(their incentives, networks and behaviours); and in terms of the programme modalities themselves (for instance, where there is a lack of evidence on which activities will work best).

What we need to adapt. A systematic review of implementation science identified four main types of adaptation in health interventions seeking to improve evidence-informed decision-making: *content* adaptations (e.g. tailoring, adding and removing elements, shortening); *context* adaptations (e.g. adding new target populations or geographies); *cultural* modifications (e.g. adjusting interventions to fit cultural and social norms, values, beliefs and family practices); and adaptations in *delivery* (e.g. deliverer and channel of delivery) (Escoffery et al., 2018). All are relevant in considering what might need to change for adaptive international development programmes too.

How we need to adapt. Simply increasing the volume or speed of data production will not by itself trigger adaptation. Decision-makers also need the capacity, incentives and authorising space to respond and act upon that evidence (Ramalingam et al., 2017; Barnett et al., 2018). It is not enough simply to collect data and evidence regularly as part of an adaptive programme, there needs to be a culture regularly using evidence to make decisions (Britton, 2005; Deprez, 2009; Ramalingam et al., 2019). Organisations need to signal to staff that adaptation based on evidence and learning is valued, and that staff will not be penalised if they can use evidence to justify why they adapted when things went wrong. Organisations also have a key role to play in ensuring staff have access to capacity-building opportunities concerned with how to document adaptation processes, including what evidence was used to adapt and why, and being more deliberative and proactive about adaptation (Escoffery et al., 2018).

2 Step 2: Consider the types and levels of evidence for adaptive management

Adaptive approaches are particularly interested not just in the generation of data, information and evidence, but also in the continuous active use of this evidence to inform decision-making.

Data refers to numbers and text that represent or describe raw observations about people, events or objects of interest. Data that has been processed or organised becomes information, however, decision-makers then need to make sense of this data and information. They need to interpret it in order to make more informed decisions. They need to assess the available body of data and information to see if it supports or refutes a particular proposition: this is evidence. That assessment invariably involves the use of knowledge and wisdom. Knowledge involves contextualising and interpreting information to answer questions about *how* things happened or may have happened; wisdom is arrived at when knowledge users are able to set and test hypotheses and theories on why to do something a certain way rather than another way, or whether they should stop doing one thing and instead do something else (Ackoff, 1989; Bours, 2015). Table 1 gives an example of the different levels of data, information, knowledge and wisdom required to interpret evidence effectively, especially for adaptive programming.

Traditional approaches to MEL often focus on the formal data and information to be collected, rather than the realities of decision-making and the judgement and wisdom involved. However, for MEL that informs adaptive management, we need to understand how these elements come together in reality in order to deliver timely adaptations.

This highlights two potential tensions. First, there is a need to ensure that, where possible, there is a documented (and auditable) trail of decisions and actions. This should seek to reduce biases (see Box 1), for instance by ensuring collective reflection processes and opening up the use of evidence and the basis of decision-making to external scrutiny.

Second, pragmatic approaches are needed so that evidence collection and reflection processes are not overly burdensome, and that they acknowledge the often positive role of judgement and wisdom alongside the importance of a commitment to learning. Moreover, in the face of complex problems, it will be important to allow programme designers and implementers to sometimes proceed without rigorous evidence, with the aim of generating that evidence through their actions over time. Also, a common finding for organisations introducing evidence and data

assessment frameworks that require extensive analysis and documentation is that carrying out such processes requires significant staff time and organisational resources (USAID, 2014; Ofir et al., 2016). The approach required sits between significant investment and a light-touch approach, so that rigour is added to the *process* of adaptive management through greater documentation, without assuming a 'perfect system' from inception. Balancing these elements is key for ensuring progress on adaptive MEL efforts and the practice of adaptive rigour.

Table 1 Levels of evidence in adaptive programmes: a food security example

Potential evidence	Level of evidence	Development/humanitarian example: food security and nutrition
Hypothesis to be tested		**A change is occurring in the levels of food security in a given region requiring a change in programme content**
Data		
Physical or symbolic items	Initial trigger data – raw observations about the situation of interest	Increase in malnourished children admitted across health clinics in intervention areas, leading to wider assessment of food insecurity
Set of accumulated facts or knowledge about a situation	Corroborating data – data that is intended to test hypotheses	Monitoring and evaluation data of the household economy and programme interventions across a range of sites
Information		
An assessment of the validity of the facts or knowledge	Information – analyses of data set to determine relationships and connections	Scientific/evaluative validation of the reliability of the data by external experts and evaluators
A body of potential hypotheses and theories	Corroborating information – related datasets that inform analyses	Climate and other information about seasonal rainfall and regional agricultural productivity
Knowledge		
Sense-making and interpretation of evidence	Knowledge – compares, contextualises and draws initial conclusions about evidence	Collective learning and assessment process to assess data and determine whether food insecurity is prevalent at specific thresholds
Wisdom		
Judgement as to whether a given assertion about a situation is true	Wisdom – applying the evidence to make a decision based on shared values and beliefs	Programme management conclusion that food insecurity is present beyond acceptable thresholds, triggering a decision to issue cash transfers to the most vulnerable households in the coverage area

Source: Adapted from Salafsky et al. (2019)

Box 1 Biases that may affect the quality of evidence use

Research from across the behavioural sciences and evidence-informed policy-making has shown that people often make irrational choices and tend to rely on mental shortcuts in the face of information overload. Assessments are also highly influenced by people's social and cultural environments (World Bank, 2015; Mayne et al., 2018). The World Bank (2015) identified four main biases that can affect decision-making:

1. **Using shortcuts in the face of complexity.** Studies show that, when decision-makers are given more options, they tend to go with the simplest one even if they would have chosen a more complex option when given only two options. Adaptive management approaches like Problem Driven Iterative Adaption (PIDA) are one way of overcoming this bias through continuous learning and experimentation that force implementers to try other solutions when the simple ones do not work.
2. **Confirmation bias and motivated thinking.** This refers to selectively gathering and paying attention to information that supports one's belief and/or theories while failing to consider alternative information and interpreting data and evidence in ways that fit predefined solutions, rather than with an open mind. This can be overcome by creating environments in which people with diverse viewpoints can debate with one another.
3. **Sunk-cost bias.** This refers to the tendency to continue projects once an initial investment has been made irrespective of whether the project is working, or if it is clear that it is failing. The World Bank suggests that this can be minimised if decision-makers can justify why resources were spent on failing interventions without potential negative repercussions.
4. **The effects of context and the social environment on group decision-making.** Decision-makers bring with them their own mental models and beliefs and can be affected by shared 'group think'. Again, this reinforces the need for exposure to different viewpoints, and a strong focus on understanding local context and listening to feedback from users or beneficiaries.

It is unlikely – if not impossible – to fully remove bias from decisions made based on informal learning such as wisdom, tacit knowledge, group discussions, etc. Although the use of tacit knowledge for decision-making is welcome, it is imperative that they are used in conjunction with appropriate monitoring and evaluation analysis techniques, rather than replace them. The use of appropriate techniques could help reduce potential biases by contextualising informal knowledge within formal knowledge and uncovering potential biases in informal knowledge bases, thus uncovering decisions that should be discontinued or reversed. Monitoring and evaluation methods that are capable of comparing real-life results of taking a decision with the result of not taking a decision – known as counterfactual – are considered the golden standard for reducing biases (e.g. randomised control trials).

However, there are also nimbler and lighter-touch methods that do not benefit from a counter-factual but allow us to make judgements about the causal strength of our assumptions (e.g. probabilistic approaches, developmental evaluation, outcome harvesting, qualitative comparative analysis, and process tracing to name a few) which may help separate good from poor decision-making. It should be noted also that decisions can be biased regardless of methods used if they are based on erroneous – or biased – data analysis and interpretation. For more on tools and methods suitable for integrating informal knowledge with formal knowledge for adaptive management see Pasanen et al.'s (forthcoming) complementary paper on tools for adaptive management.

3 Step 3: Assess the robustness of evidence for adaptive management decisions

There is a well-established literature on the challenges of supporting evidence-informed decision-making (Nutley et al., 2007; Sumner et al., 2011; Georgalakis et al., 2013; Mayne et al., 2018). This challenge is even greater for adaptive management processes, as they require more timely use of evidence and action based on it.

In helping to generate an auditable trail of the use of evidence to inform adaptations and learning, decision-makers and programme managers should consider how to ensure that their use of evidence is robust and rigorous.

Borrowing from a framework by Shaxson (2005), along with others by DFID (2014), USAID (2014) and Salafsky et al. (2019), this means asking a set of questions relevant to all programmes – but especially adaptive management – regarding six criteria: quality and credibility, relevance, reliability, strength and consistency, objectivity, and rootedness. The rest of this section covers each of these criteria, along with the questions teams involved in making decisions to adapt should ask themselves when assessing evidence.

3.1 Quality and credibility of evidence

We can adapt DFID's (2014) framework to identify a series of prompts for considering quality and reliability for adaptive approaches (see Box 2); Shaxson's (2005) framework includes criteria for credibility which overlap with many of the points in DFID's framework. Credible evidence is evidence that has a strong and clear line of argument, uses appropriate analytical methods, is informed by data that was collected and analysed rigorously and has conclusions that are presented clearly.

Although it is important to assess quality and credibility, there is no fixed definition of quality. Programme MEL staff and managers will need to develop this, based on whether it reliably tells them something about whether change is happening and can be actioned. Definitions of quality evidence are likely to vary from context to context and organisation to organisation. For example, organisations with different values and incentives may place different levels of

Box 2 DFID's principles for research quality with an adaptive management lens

1. Conceptual framing – acknowledgement of existing research and theory and clarity regarding how the evidence emerging about an adaptive programme fits into existing thinking. Usage of a clear conceptual/theoretical framework and explicit recognition of any assumptions.
2. Transparency – openness regarding design, methods, data used, location where data was gathered and funding sources.
3. Appropriateness – whether the method used is appropriate for the conclusions reached.
4. Cultural sensitivity – consideration of how local and cultural factors may influence the behaviours and trends observed.
5. Validity – four types: first, *measurement validity* (are the right things being measured?); second, *internal validity* (are the right methods and data being used to answer the question or come to the study's conclusions?); third, *external validity* (are the findings replicable elsewhere?); fourth, *ecological validity* (whether the research itself has altered the context and people being studied).
6. Reliability – is the right thing being measured in the right way? Do different analytical methods produce different results?
7. Cogency – does the evidence have structure and is it easily understandable? Are things signposted and easy to find? Is the analysis self-critical and have limitations been recognised? Have efforts been made to explore alternative interpretations?

Source: Based on DFID (2014)

importance across DFID's seven principles of research quality (see Box 2) (Ofir et al., 2016). Moreover, there may be occasions when no credible or quality evidence is available. This should not stop teams from acting in such situations. Instead, they should aim to build quality and credible evidence through their actions, over a sustained period of time. Teams assessing whether evidence is credible enough to make decisions should consider:

- whether it is likely that others – especially critics – would have come to the same conclusions when assessing the same evidence
- any credibility or quality implications regarding where the evidence is sourced (e.g. from experts or beneficiaries)
- whether the evidence makes sense to those who were consulted
- if the methods used were appropriate
- whether the way in which the data and evidence was collected has limited which questions were asked and which voices heard.

3.2 Relevance of evidence

Some frameworks may call relevance of evidence 'generalisability' (Shaxson, 2005). At its core, relevance and generalisability are concerned with whether evidence adequately reflects the people, places and hypotheses that its use will impact. It means identifying whether findings can be widely applicable, or whether they are particularly time- or context-specific, as well as judgement on how clear and consistent the evidence is. When it comes to tackling very niche and context-specific development problems, individuals and teams involved in adaptive decision-making may have to make inferences about what is relevant evidence and adapt what evidence is seen as relevant over time based on learning.

- Is the evidence widely applicable or context- and time-specific?
- Which aspects of the context may matter or impact/change the findings and why (especially when scaling to new places or target groups)?

3.3 Reliability of evidence

USAID (2017: 1) highlights that 'reliable data should reflect consistent data collection processes and analysis methods over time'. For adaptive programmes, these processes and methods need to be geared towards allowing teams to test their theories of change and underlying hypotheses and assumptions, and some measurement processes may need to change over time to reflect this. When assessing the reliability of evidence, and building on Shaxson's (2005) work, we suggest that teams assessing evidence to adapt programming should consider the following questions:

- Is the evidence directly related to the programme's theory of change and its underlying hypotheses and assumptions?
- Does it convincingly support or refute the hypotheses?
- Will the core questions being asked remain relevant over time? What might change over time and (how) will measurement need to change?
- Is there a clear evidence trail that others can follow?

3.4 Strength and consistency of evidence

For programmes working adaptively where the evidence base is weak, it is likely that the direction and consistency of evidence will be mixed (both positively and negatively). If this is the case, it is even more important for the teams and individuals involved in decision-making to build in processes to triangulate data sources with the data and viewpoints of others. This is why adaptive MEL systems often include elements of collective reflection (such as sense-making and strategy testing) to account for different evidence interpretations and viewpoints, and to help decision-makers make sense of incomplete or conflicting evidence. It also means being explicit and open about where there is conflicting evidence, and the process for managing this.

Similarly, the strength of evidence is not binary, but more of a continuum. A combination of several pieces of weak evidence can help develop a stronger case for a hypothesis or intervention than a weak piece of evidence on its own. The combination of several weaker pieces of evidence could also bring into question stronger evidence by illustrating or alluding to gaps that the stronger piece of evidence may not have been accounting for.

Questions to keep in mind when assessing the strength, direction and consistency of evidence include:

- Is the strength of evidence consistent across hypotheses, assumptions and the theory of change in their entirety, or are certain aspects of the programme better supported by the evidence than others?
- Is the direction of evidence the same for all assumptions, hypotheses and theories of change?
- Is the direction of evidence different for different places or groups of people?
- How has the direction and consistency of evidence changed over time?
- What does this mean for assessments of the reliability of the evidence overall?

3.5 Objectivity of evidence

As Box 1 illustrates, people are prone to biases that may influence their use of evidence. It is important to minimise and make these biases explicit, since they can condition decisions in the future. Moreover, the value of evidence can be limited by how questions are framed (for instance, through leading questions) and by the values given to different aspects of the evidence when it is being interpreted. Shaxson (2005) suggests that those concerned with the objectivity of evidence should:

- Allow the context and subjects to determine findings, rather than the biases, motivations and perspectives of those implementing adaptive programming. Have appropriate techniques been used to minimise biases when analysing new evidence?
- This may be beyond the control of teams using secondary data, evidence, knowledge and wisdom. Are there any biases that may have influenced previous analyses or the analyses of others?

3.6 Rootedness of evidence

Evidence reflects the particular questions asked, how they have been asked and how they are intended to be used. Narrowly defined questions asked by people with narrow bases of specialist knowledge will lead to narrow evidence-informed conclusions. Shaxson (2005: 108) suggests that 'rootedness is more than context, process, bias and the quality of information. Rather, it is about understanding the nuance of the evidence, exploring assumptions with an open mind, encouraging others to question the status quo as we see it, and thinking about who uses what evidence and for what purpose.' The rootedness of evidence could be further improved by not only ensuring that people and places are counted, but also that their concerns, insights, perspectives (including local knowledge) and values have been accounted for: in other words, localising knowledge (Ofir et al., 2016). The following considerations can help teams applying adaptive management to improve the 'rootedness' of their evidence use:

- Whose values have been considered in framing and gathering the evidence?
- What happens when the evidence is triangulated with evidence from those with different viewpoints or specialist knowledge? Do the findings still hold?
- Does the evidence fully meet the demands for decision-making or are there missing aspects that should and could be explored further?
- Does the evidence empower anyone to act? Who? How?

These frameworks provide a set of prompts or guides for further interpreting the existing evidence base, and for identifying gaps and strategies to fill these gaps. Adaptive approaches are likely to face particular challenges in terms of the strength, consistency, reliability and quality of evidence at the start and throughout implementation. But there are ways to mitigate or account for at least some of these factors, as well as to help address these points in future data collection. Considered reflection on the points above should help MEL specialists, programme designers and implementers better recognise these issues up-front and identify ways to mitigate or address them.

4 Step 4: Ensure that the basis of adaptive management decisions is sound, transparent and documented

Ultimately, using evidence to test hypotheses and overarching theories of change only matters if that is then used to inform decision-making, enabling programme adaptations when needed. Individuals and teams involved in making decisions in programmes implementing adaptive approaches will typically face a range of different intersecting decisions around design, implementation and ongoing adjustments.

Typically, there are no clear-cut answers to these questions; instead, numerous trade-offs need to be made for each decision, and across decisions as a whole. Some of the trade-offs in interpreting and using evidence for these processes are highlighted above. To make things more challenging, the outcome of each decision – along with the costs and benefits associated with each decision and the costs or benefits of taking no action – is often uncertain, especially when seeking to tackle complex problems (Salafsky and Redford, 2013). At present, these decisions often go undocumented – they are part and parcel of the process of adaptive programme management. However, it is key for programmes that aim to be explicitly adaptive to better document these processes, both for accountability and also to support internal learning and reflection.

The aim is not to create onerous additional reporting and compliance processes but to provide programme designers and managers with light-touch processes to review how they are using evidence, how this is informing their decisions and to ensure this is documented. This should go hand-in-hand with a commitment to more timely, useful data, with regular reflection points that can be structured around the above framework.

It also means recognising that not all types of decision require the same evidence standards or burden of proof in order to trigger action. Building on Salafsky and Redford (2013), below are eight parameters that teams and groups involved in adaptive decision-making should address when thinking about the burden of proof for evidence necessary to make decisions.

1. **What is the nature of the decision?** Decisions that affect people other than the decision-maker and/or their resources should require a higher burden of proof. The more people affected by a decision or the more costly it would be to make, the higher the burden of proof necessary. Similarly, the more it would cost to not make a decision, the higher the burden of proof necessary to show why it was not taken.
2. **Who is the decision-maker?** What authority do they have to authorise a change, including if it will have a significant impact on the programme or affect particular groups?

3. **What is the urgency of the decision?** Can 'rules of engagement' be developed for what to do when faced with urgent decisions?
4. **What is the degree of certainty of the decision?** If outcomes are uncertain, a lower burden of proof may be needed, but a more incremental approach (with a focus on incremental testing and learning) should be developed, rather than one large change.
5. **What kinds of biases might the decision be prone to?** Can any common decision-making biases be identified, such as using shortcuts in the face of complexity; confirmation bias; sunk-cost bias; or the influence of particular world views or group thinking (see Box 1)? For each of these, specific mechanisms can be put in place. For example, the programme manager might seek to systematise a process called 'red teaming', in which external teams purposely challenge and criticise the plans and contextual appropriateness of the hypotheses put forward by the internal team, to minimise any confirmation or sunk-cost biases (World Bank, 2015).
6. **What are the consequences of errors of action and inaction?** In some cases, it may be costlier or lead to more negative outcomes to act when you should not have acted; while in other cases it may be costlier or lead to more negative outcomes to not act when you should have acted. The burden of proof is higher when the cost of taking an action is higher than not taking the action.
7. **How reversible is the decision?** If a decision can easily be reversed without much damage or loss, then it requires a lower burden of proof. If a decision cannot be easily reversed, the level of evidence used to make that decision should be high.
8. **Is there an established burden and standard of proof within that field for that decision?** Some fields have very clearly stated standards for burden of proof. For example, a level of proof 'beyond reasonable doubt' is necessary to convict someone in a criminal case, while only a 'more probable than not' level of proof is necessary for a civil case (Salafsky and Redford, 2013). Although the international development field does not have an established burden or standard of proof, the field often overlaps with others which may have such systems in place (e.g. the precautionary principle in health and environmental risk assessment) (Martuzzi and Tickner, 2004).

Tracking decisions using this kind of approach is not just useful for the decision itself, it can also be of benefit when demonstrating programme accountability of adaptive programmes, to answer the questions as to whether or not programmes should have adapted in a given context in an evidence-informed fashion.

Indeed, one of the challenges in supporting the wider uptake of adaptive management approaches is the need to incentivise these practices, including those that put evidence at the heart of reflection and learning. In the field of market systems, a set of standards for results measurement has been produced – the Donor Committee for Enterprise Development (DCED) standards – and 'audits' are conducted. These review an organisation's results measurement systems, checking documentation to ensure that processes meet the quality requirements of the DCED standards. This aims to increase incentives to apply these standards by providing a judgement on the quality of their measurement processes, not just on the results they achieve (Kessler, 2019). A similar approach, following the processes set out above, could be applied to other parts of development and humanitarian programming to identify how well evidence is being used to inform decision-making.

Conclusions

Evidence can open the door to adaptation and can be used to make the case for adaptations to programming. It can also be used to demonstrate accountability for adaptation: should a given programme have adapted, if so, why, and if not, why not?

This working paper sets out a preliminary roadmap for strengthening evidence-informed adaptive management. Table 2 addresses each of the key steps.

Table 2 Four steps for strengthening evidence-informed adaptive management

Step	Key questions or prompts
1. **Establish the need for evidence in adaptive management** Identifying different evidence needs according to why there is a need to adapt, what might need to be adapted and how	• **What** triggers or changes support or challenge hypotheses and assumptions and might require a programme to change course? • **What** specific elements of a programme might need to change? • **How** should decisions be made so they are sensitive to capabilities and the enabling environment?
2. **Consider the types and levels of evidence for adaptive management** Identifying the role of data and information, as well as its interpretation, often involving forms of judgement and wisdom, in order to create appropriate evidence	• **How** will we gather data, organise it into information, interpret it to create knowledge and use it to inform wise decision-making? • **How** will trade-offs be identified and managed – for instance between a rigorous, documented trail of evidence-informed actions and the time and resources allocated to documentation? • **When** might we need to proceed without rigorous evidence when it is unavailable, and what steps can be taken to build that evidence over time?
3. **Assess the robustness of evidence for different decisions** Criteria for ensuring that, wherever possible, evidence used for adaptation is robust and rigorous, including how it is used	• **Quality and credibility:** Are appropriate data collection and analytical methods used? Does it say something meaningful about whether change is (or isn't) happening? • **Relevance:** How widely applicable are findings? Are they limited to particular timeframes or contexts? • **Reliability:** Are consistent measurement and analytical methods used? If not, why not and how has this been documented? • **Strength and consistency:** How is strong and weak evidence identified and assessed? How is evidence triangulated? • **Objectivity:** How have potential biases been identified and have appropriate techniques been used to minimise that bias? • **Rootedness:** Whose values and viewpoints have been considered in framing and gathering evidence? Does the evidence meet the demands for decision-making, and what are the gaps?
4. **Ensure the basis of adaptive management decisions is sound, transparent and documented** Criteria for assessing the burden of proof needed to make decisions to adapt or change course based on the evidence available	• **How** costly or significant is the decision? • **What** is the urgency of the decision and degrees of uncertainty? • **What** are the consequences of errors of action and inaction? How reversible is the decision?

Ultimately, evidence itself is necessary but not sufficient for effective adaptive management – in part because the development system, much like the criminal justice system, is not perfect, but is riven with complexities and challenges. Through better documentation of the basis on which decisions are taken and adaptations are made – making explicit the range of evidence drawn on and its strength and limitations, and putting in place mechanisms and processes that help staff test this evidence base and work through their biases – the credibility of these approaches can be strengthened and their practice expanded over time. This paper is meant as a useful preliminary step in this direction for those designing and running adaptive development and humanitarian interventions.

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