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Does our theory match your theory? Theories of Change and causal maps in Ghana

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Abstract

What do the intended beneficiaries of international development programmes think about the drivers of change in their livelihoods and lives? Do their perceptions match up with the theories of change constructed by organizations trying to support them? This case study looks at an entrepreneurship programme aiming to economically empower rural women smallholders in Ghana. The programme was implemented by two Ghanaian savings and credit organizations, with support from Opportunity International UK (OIUK). We report on an evaluation of the programme that used the Qualitative Impact Protocol (QuIP) to gather stories of change from the programme participants. These stories were coded, analysed and visualized using a web application called Causal Map.

The chapter illustrates how the causal maps produced were used to answer evaluation questions by comparing them with the programme's original Theory of Change. We discuss how this information can be used to enrich the implementing agencies' strategic thinking.

Keywords

Theory of Change,

Causal mapping,

Evaluation,

Qualitative data analysis,

International development

Rural livelihoods

Summary

What do the intended beneficiaries of international development programmes think about the causal drivers of change in their livelihoods and lives? Do their perceptions match up with the theories of change constructed by organizations trying to support them? This case study looks at an entrepreneurship programme aiming to economically empower rural women smallholders in Ghana. The programme provided a combination of financial services, training and peer support to improve the women's productivity, and purchase and sale options. It was implemented by two Ghanaian savings and credit organizations, Opportunity International Savings and Loans and Sinapi Aba Savings and Loans, with support from the development organization Opportunity International UK (OIUK). We report on a mid-term qualitative evaluation of the programme that used the Qualitative Impact Protocol (QuIP) to gather stories of change directly from the programme participants. These stories were coded, analysed and visualized using a web application called Causal Map.

The first part of this chapter introduces causal mapping: a group of methods that we think has unrealized potential to inform strategic thinking of organizations by prompting them to think harder about the ideas and assumptions underpinning their actions and objectives. We explain how both theories of change and the type of evidence gathered using qualitative impact evaluations can be understood as different types of causal map. The second part of the chapter illustrates how the causal maps produced in the selected evaluation were used to answer evaluation questions by comparing them with the programme's original Theory of Change. We highlight differences revealed by this comparison and also discuss how this information can be used to enrich the implementing agencies' strategic thinking. This occurs through a process of evidence-based adjustment to the wider or 'middle-level' theory, informing the design and operation of the programme and others similar to it.

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Introduction: QuIP and causal mapping

What is a causal map?

A causal map can be defined as consisting of links or arcs between nodes, such that a link between C and E means, in some sense, that someone believes that C has or had some causal influence on E. In this chapter, we refer to the nodes as causal factors. This minimum definition is common to a wide variety of causal mapping approaches (Laukkanen, 1994, p. 323) (Axelrod, 1976, p. 3). In this minimum and inclusive definition, we understand the causal links only as expressing beliefs about some kind of causal influence, rather than more specific claims such as 'C was a necessary cause of E' or even 'C was *the* cause of E'. Evaluators are interested in any such claim, although of course they are additionally interested in how to quantify or at least compare the relative size, importance or significance of different causal claims; hence, causal maps may also differ according to the kind of additional causal

information encoded in the links, for example, strength and/or polarity of the causal connections.

What is causal mapping?

Constructing and testing theories (including theories of change and middle-range theories) is increasingly recognized as central to any evaluation that aims to find out how an intervention worked, and to generalize from the findings. 'Causal mapping' (Ackermann & Eden, 2004; Axelrod, 2015; Eden et al., 1992; Laukkanen, 1994; Nadkarni & Shenoy, 2004) has been used quite widely for several decades across a variety of disciplines and fields and provides very useful tools for these tasks. In particular, it has been frequently used in the field of strategic management to not only map but also inform strategic management decision-making (Buckley, 2018; Hodgkinson et al., 2004; Huff, 1990; Laukkanen, 1994). Similar approaches sometimes appear under different names, but reference to it in the evaluation literature is relatively sparse.

'Causal mapping' is an umbrella term which includes the construction of theories of change, which can themselves be seen as causal maps. It provides a useful framework for constructing and testing theories from the data collected for an evaluation as well as for making deductions and drawing conclusions and also suggests a range of tools for gathering primary evaluation evidence. It provides ways to deal with unstructured and unexpected evidence, and if required, to combine it with more structured evidence. Various causal mapping approaches provide explicit methods for gathering and analysing data, but overall, causal mapping is less 'another method' than it is an approach that sheds new light on what evaluators have always done when they collect, assemble and analyse causal evidence.

Later in this chapter we will compare the original OIUK ToC (which can be considered to be a kind of causal map) with evidence provided by a corresponding QuIP study (another kind of causal map) and see how this helps answer some of the evaluation questions as well as illustrate some of the general ideas associated with causal mapping.

QuIP as causal mapping

The Qualitative Impact Protocol (QuIP) methodology (Copestake et al., 2019) is used to collect primary data from intended beneficiaries about their perception of change over a specified period in selected domains of their lives. The stories are collected using a process of partial 'blindfolding' that entails explicitly avoiding any reference to the specific intervention being evaluated at the point of data collection. In most applications of QuIP, the interviewers do not know who has commissioned the evaluation, nor the Theory of Change being tested by the study. The purpose of a QuIP study is usually to gather data on changes experienced over the period of the programme's implementation, and crucially, to capture intended beneficiaries' perceptions of the main causal drivers of these changes. Respondents are asked open-ended questions about changes in relevant areas of their lives, such as health, work and wellbeing.

Respondents (in individual and group interviews) are asked questions about changes in key aspects of their lives, the causes of these changes, the causes of the causes and so on: a form of elicitation we call 'causal back-chaining'. When analysing the interview data, the analyst (typically not blindfolded) reviews what the different sources are saying, and bit by bit (inductively, iteratively) tries to identify the common elements in their narratives using causal factor labels, such as 'health' and 'amount of exercise'. While respondents are invited to share their experiences and perceptions of change across predetermined well-being domains relevant to the programme's Theory of Change, other important outcomes may emerge from their narratives which were not envisaged by the commissioner; to this extent, the QuIP can be considered a form of goal-free evaluation (Scriven, 1991). Different respondents will, of

course, have different experiences and perceptions, and will not always use exactly the same phrases to express their causal narrative. Therefore, it is an exciting and creative challenge to code and curate a list of causal factors through what can be viewed as a specialized form of thematic qualitative data coding and analysis. We use software designed explicitly for this task, Causal Map¹. To our knowledge, this is the only software designed explicitly for the qualitative 'coding' of narrative text to create a one-to-one correspondence between sections of text which contain causal claims.

The causal stories collected using QuIP mostly deal with actual events which happened to the respondents rather than with general events or phenomena. The explanations given often take the form of changes in one factor explaining changes in another ('improved' seeds, 'increased' income, and 'the early arrival of rains' leading to 'increased' yields, for example), or they mention specific events such as 'support/guidance from organization X', with the implicit assumption that, in another scenario, these events might have been absent.

Analysing a causal map

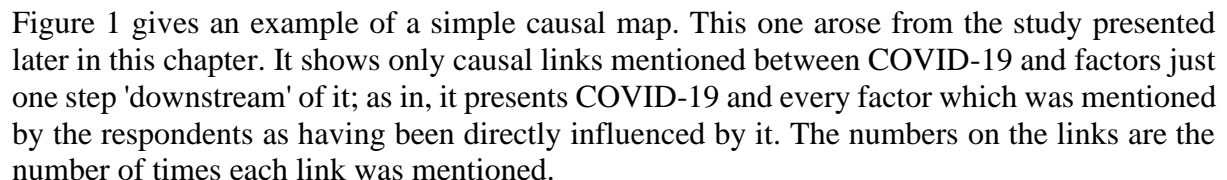
One advantage of causal mapping as a research and evaluation technique is that while the results of ordinary qualitative research on texts is usually more text (with perhaps some tables to show the frequency of occurrence of particular themes or combinations of them), the *main products* of causal mapping are graphical causal maps. They organize and visualize a potentially very confusing heap of interrelated causal claims in a way that is relatively intuitive and easy to understand. It can also be directly queried in order to answer research questions like the evaluation questions in the study presented later in this chapter. Furthermore, while a 'global' causal map resulting from a research programme can contain a large number of causal factors and links by applying filters and other algorithms, the map can be queried to answer different questions, for example, to simplify it, to trace specific causal paths from particular drivers or to particular outcomes, or to identify significantly different sub-maps for groups of sources with different characteristics. With certain assumptions, it is possible to ask and answer questions such as, 'Which factor has the widest influence?' or 'Which factor leads to the most positive outcomes?'.


Figure 1 gives an example of a simple causal map. This one arose from the study presented later in this chapter. It shows only causal links mentioned between COVID-19 and factors just one step 'downstream' of it; as in, it presents COVID-19 and every factor which was mentioned by the respondents as having been directly influenced by it. The numbers on the links are the number of times each link was mentioned.

¹ www.causalmap.app

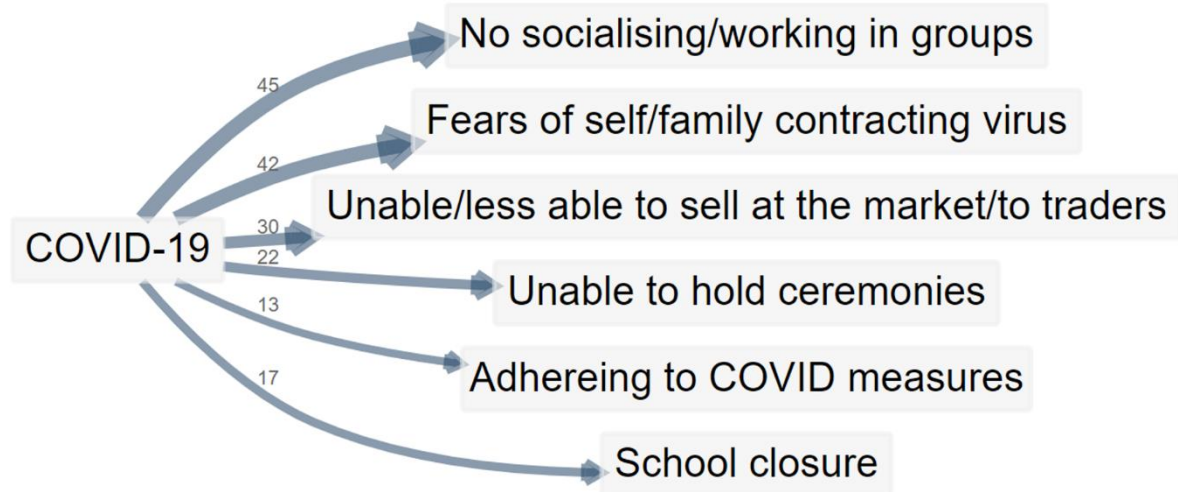


Figure 1. Causal map showing the causal factor 'COVID-19' as well as factors one step downstream of it; simplified to show only the most frequent factors.

Making deductions from a QuIP causal map and comparing it with a Theory of Change

A QuIP study like the one presented here aims to be able to give the evaluation commissioner sufficient information to understand what changes the respondents perceive as having been important in their lives, to what extent they mentioned the intervention as being a driver of any of those changes, and in relation to other drivers and outcomes. The empirically derived causal claims can help to validate or challenge the Theory of Change, determine whether there are unexpected drivers and outcomes (positive or negative), and consider whether this suggests ways in which the Theory of Change could be modified to improve this or similar interventions in the future.

Main findings from the OIUK study

Overview of the programme under evaluation

The themes in this chapter are illustrated with a midline evaluation of Opportunity International UK's (OIUK) intervention 'Roots of Change: Increasing the economic empowerment of women in Ghana and the Democratic Republic of Congo through rural financing'—a UK Aid Match project which has been running in Ghana since October 2018. OIUK is an NGO working in international development. The original report was written by Bath Social and Development Research in collaboration with Participatory Development Associates Ltd who conducted the fieldwork in Ghana. Research staff interviewed 48 women and conducted eight focus groups: four with men and four with women. The interview topics covered farming and other work, market access, income, savings, borrowing and spending, relationships within the household as well as the community, well-being, and self-esteem. The questions were framed in an exploratory manner to try to keep the conversation as open as possible; for example, the questions about farming started with this broad discussion starter: 'Please tell me about any changes in the food and cash crops your household grows over the last two years'. This was then followed up with optional probing questions such as, 'What is the most important reason for any change? Why did you make these changes? What happened as a result of that change?'.

The evaluation questions, and how the QuIP was used to answer them

Central evaluation questions relevant to this chapter were as follows:

1. Effectiveness/Impact: To what extent did positive (and negative) changes take place in important areas, and to what extent can these be attributed to the programme?
2. Relevance of the programme plan: Is the programme's Theory of Change well adapted to the realities on the ground from the perspective of key stakeholders?

The QuIP was used to answer these evaluation questions by assembling the stories of change told by respondents into a collective *causal map* (see Figure 2), using the web application Causal Map (causalmap.app). The two questions above can be operationalized as follows:

- Effectiveness/Impact: To what extent was the programme explicitly or implicitly mentioned as a driver in causal chains culminating in positive change in valued areas? (The aforementioned blindfolding of interviewers and interviewees is particularly relevant to questions of impact, as it helps mitigate the risk of confirmation bias, thereby increasing confidence in credibility of the causal claims linking the programme intervention to changes in valued areas of participants' lives).
- Relevance of programme plan: How do the causal maps generated from the analysis of respondent stories correspond to the original programme Theory of Change?

The OIUK Theory of Change as a causal map

The OIUK Intervention Theory of Change is presented in Figure 2.

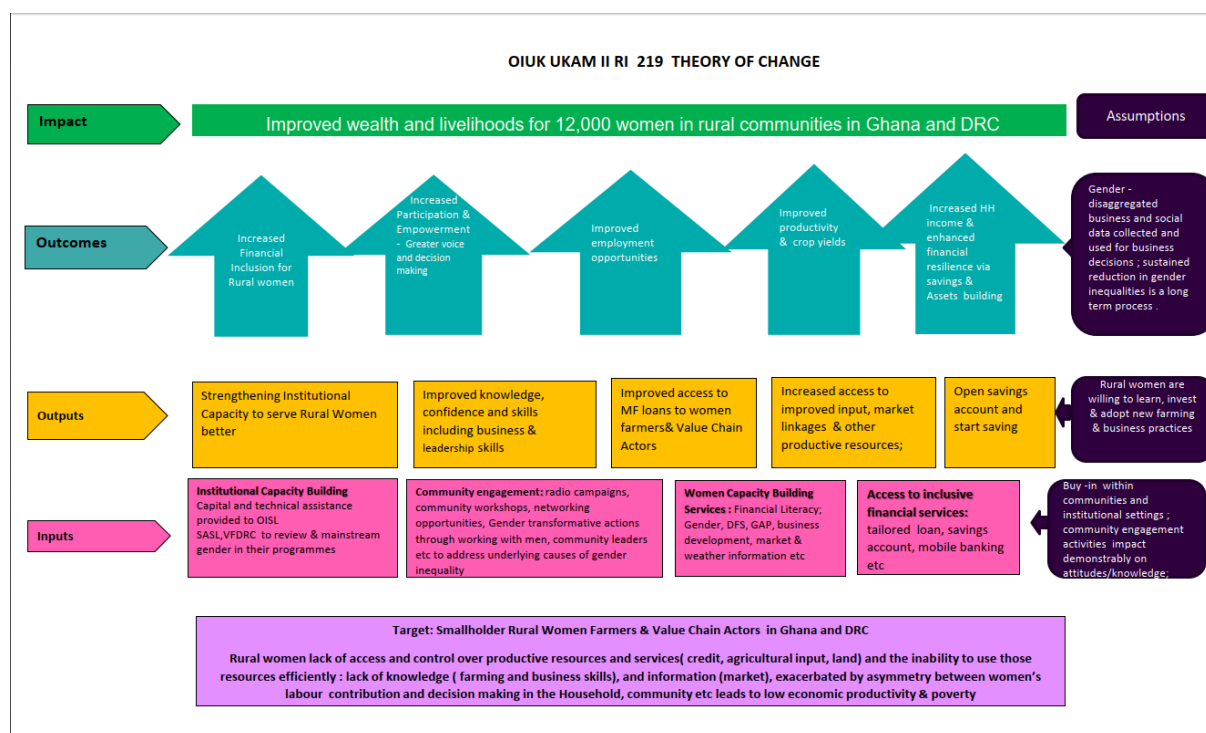


Figure 2. OIUK Programme Theory of Change

This ToC graphic is elaborated much further by OIUK in text form, but given the whole text is too long for this chapter, a shortened version follows: 'Our Theory of Change asserts that providing a combination of financial services, training and peer support will set off multiple, interlinking changes that will empower rural women in many areas of their lives. A better understanding of and access to financial services—combined with increased agricultural knowledge—will enable women to improve productivity, and purchase and sale options, which

will have a positive impact on immediate revenues as well as long-term income sustainability. [...] When family and community members observe the roles women are fulfilling, it will challenge their views regarding women's capabilities and skills. As women gain in self-confidence, increasingly positive feelings about their capabilities will inspire bigger dreams not only for themselves but also for their children's future roles in society.'

Overall, there is an implication that a set of complementary inputs collectively lead to outputs, which collectively lead to the outcomes via a set of reinforcing causal processes. As is often the case (R. J. Davies, 2018), the diagram makes this less complex by simplifying how the different elements are causally connected. For example, the items near the right-hand side concern savings. Their positioning presumably implies particularly strong causal links, probably from bottom to top, between these items in particular. In addition, the fact that the items within the outcomes, outputs and inputs rows are not clearly lined up with one another suggests that there may be implied causal links cutting across the diagram, so that, for example, 'Access to inclusive financial services' at the bottom right, might be ultimately linked, via various outputs, to the outcome 'Increased Financial Inclusion' at the top left. This vagueness in the diagram about causal connections can be seen as a weakness—making the programme ToC less evaluable, for example (R. Davies, 2012), but it can also be viewed as a strength. For example, the human mind can arguably get the overall gist of what is being asserted without being distracted by potentially dozens of connecting arrows; the representation can also accommodate potential synergies between different activities and outputs. 'Assumptions' are listed at the far right of the diagram—factors which are largely beyond the control of the programme. Again, in common with many real-life theories of change, the top level, 'Impact', is arguably more of a synthetic summary of the outcomes than a separate state or event which is caused by them; hence, it is perhaps not necessary or possible to assess or measure it separately from those outcomes (Goertz, 2020; Powell, 2017).

Ideally this ToC would be based on, or at least compatible with, insights from relevant programme theory. In practice this ToC is largely a theory of *action* (Patton, 1989), i.e. it focuses on causal factors which OIUK can influence, and we can assume that the existence of the causal connections implied in the ToC is supported by programme staff's experience with similar interventions.

Although underpinned by wider theory about interventions of this nature in this context, the OIUK Theory of Change is not expressed in the form of connections between theoretical variables but rather in terms of more or less concrete events or changes which are expected to happen. That is why the factors within it are expressed as concrete true/false events or propositions like 'improved capacity to serve rural women' or 'capacity to serve rural women is improved' and not as timeless variables of the form 'capacity to serve rural women' such as those we are likely to see in other forms of causal maps such as systems diagrams. Factors of the first form will be true or false at a some point in time which is implicitly or explicitly specified, e.g. the end of the programme, whereas factors of the second form are *variables* in the sense that they make take any of a range of (implied or specified) values at any time point.

The analysis

The analysis process involved identifying and coding causal links between causal factors such as 'Membership of savings group' and 'Purchase of farm equipment' which were identified through immersion in the complete set of narrative data. When joined together, these links constituted a very large global map with over 1700 causal links between causal factors and outcomes across a range of thematic areas. The overall map is too large for a reader to be able

to make much sense of, so filters and other queries are used to answer specific requests such as:

- show all the causal factors obtained from interviews with women on the theme 'farming' and other causal factors immediately connected to them;
- show only causal claims cited more than five times;
- show only factors mentioning the word 'farm', and so on.

In particular, a causal generalization of hierarchical coding (Richards & Richards, 1995) was used such that, for example, 'Gender sensitization' was coded as a subfactor of 'Support/advice from OIUK', in the form 'Support/advice from OIUK: gender sensitization'. This facilitated a second way to simplify maps, parallel to the process of simply excluding less frequent factors, in which less frequent and more detailed factors can be 'rolled up' into more frequent, higher-level factors.

First evaluation question: effectiveness/impact

Reflecting on the first evaluation question (effectiveness/impact), the causal maps generated from the coded interviews in this study *did* show some evidence of changes in the key areas in the OIUK Theory of Change, and we were able to identify drivers which explicitly linked to the OIUK programme.

The overview which follows exemplifies the kinds of summaries resulting from the causal mapping process. In the causal map figures, the boxes represent causal factors and the arrows between them represent links of causal influence. The numbers on the links denote the number of times each causal claim was made in the narratives.² Factors are given a darker background where they contain a particular search term.

Subject-specific searches were made once the whole text had been analysed, for example, on gender, as shown in Figure 3.

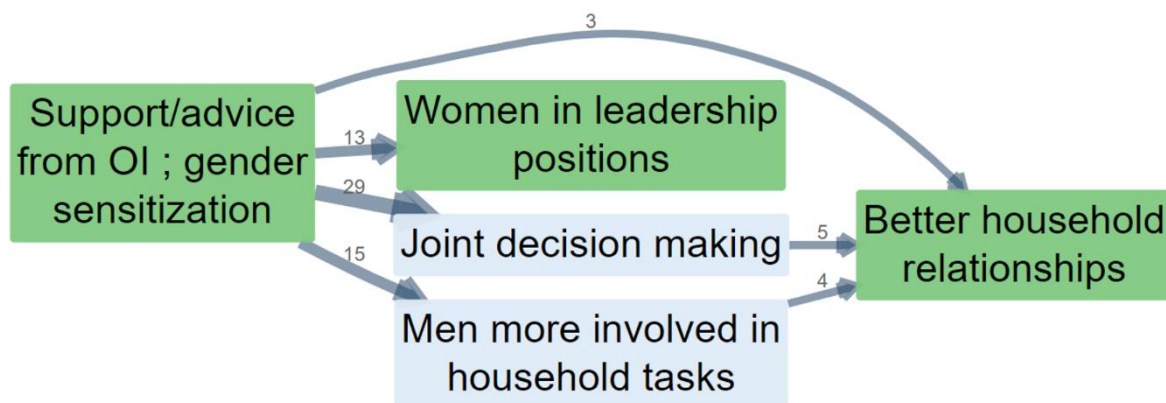


Figure 3. Causal map showing causal factors which include the words 'gender' or 'women' or 'relationships' as well as factors one step upstream or downstream of them, simplified to show only the most frequent factors and links.

Some women reported positive gender-related changes within the household in the form of increased joint decision-making and a more equal distribution of the workload. At the community level, they reported occupying leadership positions more often. However, other

² In these figures, the numbers represent the *number of times* the link was mentioned. It is also possible to calculate other metrics such as the *number of respondents* mentioning each link. The simplification process means that some factors may appear to be more than the specified number of links upstream or downstream, because intervening factors and/or links may be hidden.

respondents reported no change in gender relations or social norms, holding to the belief that certain tasks and positions are more suitable for men than women.

The richest material covered changes in agriculture and farming activities, the main reported outcome being increased income from farming activities (Fig. 4). This was driven by changes in agricultural practices leading to increased yield, including better access to information, inputs and equipment. This was complemented by an increase in prices and subsequent income. This improvement in agricultural practices and yield is attributed to support and advice received from several actors, including agricultural extension workers and OIUK partners. However, despite the inputs, not all respondents experienced this increase in yield and income, with setbacks attributed to bad weather conditions, pest damage, and lack of inputs and equipment in some cases.

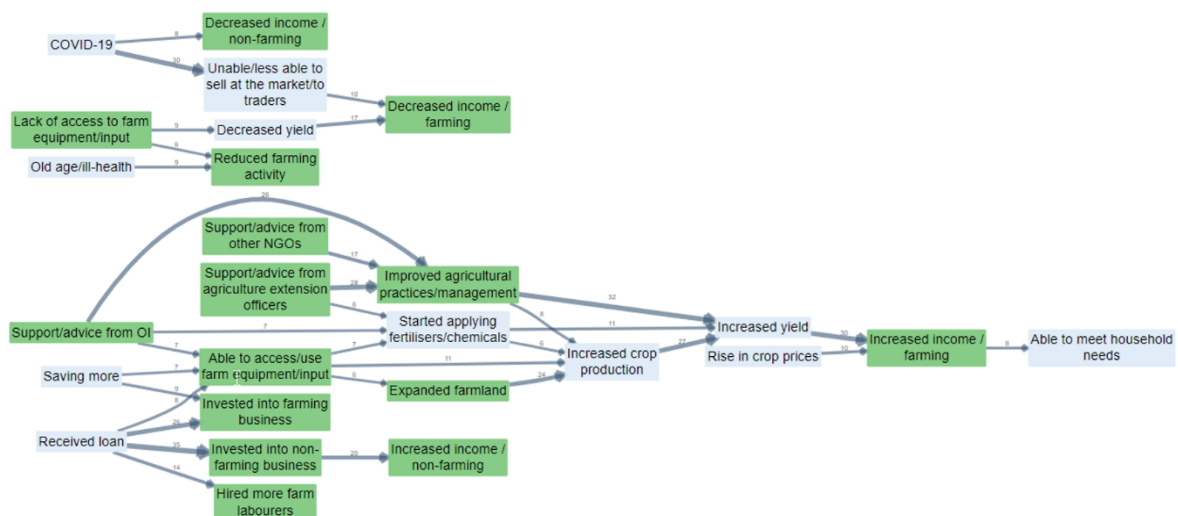


Figure 4. Causal map showing causal factors which include the words 'agriculture/agricultural' or 'farm' as well as factors one step upstream or downstream of them, zoomed out to the top level and simplified to show only the most frequent factors and links.

In the area of financial management, the respondents reported two main changes: the ability to save more and the need for less borrowing. The drivers of increased savings were increased income and membership of saving groups, and this was linked to long-lasting outcomes, including the ability to make business investments and pay for school fees. Borrowing less was not, however, always perceived to be a positive outcome—there were sometimes complex and ambivalent stories from different respondents. For some, it was a consequence of increased income, and associated with increased self-esteem linked to being more self-reliant; for others, it arose from the inability to repay loans and associated with reduced resilience to shocks. Coding and interpreting this kind of factor requires special care.

The Covid-19 crisis (Fig. 1) and resulting measures affected many dimensions of the programme, in both its implementation and in the areas it aims to impact. The respondents were asked specifically about the changes resulting from Covid-19 in order to identify its impact and isolate it from changes prior to the crisis. Respondents reported how the situation affected their well-being through not being able to meet with others for fear of contracting the virus. It also affected their financial situation by constraining group farming activities and market sales.

Second evaluation question: relevance

How do these findings help to inform the second evaluation question: Is the programme Theory of Change well adapted to the realities on the ground from the perspective of key stakeholders?

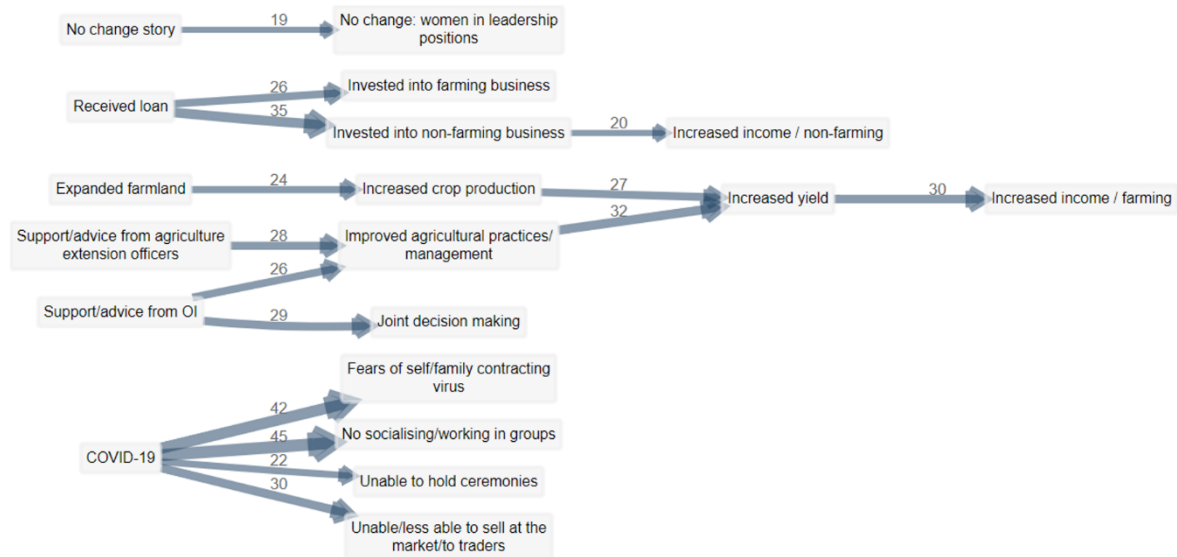


Figure 5. Causal map showing an automatic summary of all causal links. Hierarchical factors are 'zoomed out' to the most general level, showing the least detail, and only 15 of the most frequently-mentioned connections are shown.

Figure 5 shows a causal map generated automatically as a summary of all the causal links. First, hierarchical factors are 'zoomed out' to show only the most general level and the least detail. Then, of all the causal links remaining in the map at that point, only the 15 most frequently-mentioned are retained. At this top level, the main difference to the original ToC is of course the presence of the unforeseeable factor, Covid-19. On the other hand, the other factors on the right of this figure are broadly comparable with the outcomes in the original ToC. However, they are expressed in a more concrete fashion, for example, 'invested in farming business' compared with, for example, 'Increased financial inclusion for rural women'.

Comparing the original ToC with the empirical causal maps topic by topic helps to highlight both unexpected changes and areas where expected changes have not occurred. In this study there were domains where change was not as clearly articulated by respondents as had been expected in the programme ToC. But the most frequent finding was that the causal pathways as presented by respondents were variations or elaborations of those laid out in the programme ToC, with positive feedback loops helping to reinforce some of the outcomes in unexpected ways. In this section we consider how the causal maps contributed to a revision of the programme ToC following this mid-term review.

One of the programme ToC outcomes, which was harder to identify in the causal maps, was 'improved employment opportunities'. Evidence of new employment opportunities did not come out clearly in stories of change, rather changes in employment were strongly linked with changes in the potential of existing agricultural work, increased farming activities and income and thus enabling farmers to hire farm workers.

There was no evidence of job creation further along the agricultural value chain, for example, selling produce at markets. This highlighted the need for a clearer definition of how the outcome would be reached in the programme ToC, including the analysis of opportunities for the development of jobs outside agriculture, which would help to build the resilience of women.

There was also no mention of market linkages as a cause for change in farming income experienced by the beneficiaries. This can be explained by the fact that this component had not yet been implemented by the programme staff.

The causal maps from the study also reveal a different sequence in the programme ToC's expected causal mechanisms regarding gender equality and women's empowerment (see Fig. 3). The study identified four key drivers of change: joint decision-making, joint labour, better community relationships, and women occupying leadership positions. Some of these were articulated as (highest-level) outcomes in the programme ToC, therefore not articulating the follow-on positive impacts, including improvement in household relationships and reduced workloads for women. Joint decision-making is not just an outcome but is shown in some cases to be part of a longer causal pathway (see Fig. 3) which reinforces further positive outcomes which were not explicitly mentioned in the programme ToC: better community relationships, collective working opportunities and men being more involved in household tasks. This type of causal mapping elaborated further on the causal mechanisms taking place, going beyond the programme ToC, highlighting the additional positive outcomes that the programme did not expect and therefore did not monitor.

Looking at the agriculture-focused component of the programme, the programme ToC's assumptions are borne out in the causal maps: Good Agricultural Practices (GAP) training and access to improved inputs, market linkages and other productive resources all featured as key drivers of change. However, there is more detail about the consequences of improved knowledge of agricultural management and practices (see Fig. 4). This could be logically expected to result from the GAP training delivered but was not mentioned at the output level in the programme ToC. The causal map reveals that this type of support and advice, delivered by the programme as well as other stakeholders, played a driving role from an early stage in some of the most significant positive outcomes.

Regarding financial changes, the programme ToC assumes that the opening of savings accounts, access to loans, and financial training will lead to both increased savings and easier access to loans, leading in turn to improved financial inclusion and resilience. The causal maps confirm that the key driver of financial change is improved financial management resulting from the training and advice received, attributable to the OIUK programme.

However, contrary to the programme ToC, some of the intended beneficiaries reported borrowing less. Some of them linked this to negative drivers, including decreased income from farming, saving less and savings groups collapsing, but others also identified it as a positive change resulting from increased savings or income arising from investments.

The original programme ToC linked each level of results, collectively, to one another, and showed general connections among the components of the intervention but did not make these links explicit. The causal maps produced from the interviews helped to clarify how the different pillars of the programme are connected to one another.

How Theory of Change and causal mapping contributed to strategic thinking within the programme

Both the process of causal mapping illustrated above and the mostly positive outcomes it revealed generated high interest and positive feedback among staff in OIUK and its partner agencies. The submission of the report was followed by a presentation on both the QuIP methodology and the key findings of the study, and participants included the country-based and headquarters programme teams as well as staff running other programmes.

The programme teams were very responsive to the findings, taking in and reflecting on the fact that the positive changes expected had not been experienced by all intended beneficiaries but also noting that there were additional unexpected positive feedback loops which were acting to reinforce some of the programme ToC assumptions, but in different ways. The presentation also stimulated staff to reflect further on the consequences of negative changes and reasons for missing positive outcomes. Looking at the unexpected positive changes, the team reflected on adaptations such as supporting women in leadership positions and further monitoring of use of savings.

Assessing empirically how far this one relatively recent evaluation influenced the wider strategic thinking of the organizations involved is much more difficult. However, an integral part of an organization's strategic thinking is to develop, review and refine a body of 'middle-level theory' (Cartwright, 2020) or useful generalizations about how it can influence change in a range of different contexts, and an important mechanism for doing this is to learn systematically from specific cases of its application.

A strength of the QuIP is that a non-specialist can also see the plausibility of drawing these kinds of conclusions from a QuIP study. However, while a more technical discussion of the logic of how to make inferences with and from causal maps would go beyond the scope of this chapter, it is worth mentioning a few potential pitfalls that can arise from interpreting this kind of evidence.

Potential pitfalls in the interpretation of causal maps based on the QuIP

a. Beliefs about causation are not facts about causation

'Source S believes that C influences E' does not logically imply that C influences E, even when source S is the world's best expert on the subject matter (as the respondents in QuIP studies may or may not be). It is the job of the evaluator to critically discuss to what extent we can make such links from this intermediate feedback loop, triangulating against other evidence available (monitoring data and experience of local programme staff in short feedback loops, and applied research in long feedback loops).

b. Absence of a causal claim does not mean absence of a causal link

If Source S did *not* mention a link between C and E, does that mean there is no such link? Not necessarily. Due to the exploratory and semi-structured nature of QuIP interviews, the conversations arising in a QuIP interview and the causal chains within them, are, to some extent, random walks. Respondent R may mention a factor like 'flooded fields' somewhere in a causal chain, but respondent S mentions it nowhere. From this, we cannot conclude that flooded fields were not a factor in any causal link for respondent S. We don't even know if respondent S has fields which might get flooded. If they do, are they specific to this respondent or are they shared across a whole village? Part of a village? This problem with negative concepts and negative cases is well-known in qualitative research (Mahoney & Goertz, 2004). In this type of causal map, our sense of what is a 'case' is quite vague, and it is also, correspondingly, difficult to think of the causal factors as variables which are defined for every case (indeed, we usually do not start with a codebook from which we code deductively, rather factors are created inductively based only on what is contained in the statements). So although we can report '12 (out of 24) respondents mentioned a link between X and Y and that we believe this to be a significant story within the cases selected', we should hesitate to report this as some kind of percentage which would imply half the respondents did not experience this; we do not necessarily know if the other respondents are in fact aware of such a link but did not happen to

mention it, or even if X and/or Y *make sense* for them. Follow-up sense-making workshops (with no blindfolding) are a crucial element to raise and further investigate questions like this.

c. The problem of contexts and the transitivity trap

If (1) Source P [a woman farmer] says: 'I received a loan for farming investment (L), so I had more cash (C)', and (2) Source W [a woman wholesaler] says: 'I had more cash (C), so I bought more stock (S)', then can we (3) deduce that $L \rightarrow C \rightarrow S$, and therefore that (4) $L \rightarrow S$ (receiving a loan for farming investment leads to people buying more stock)?

The simple answer is no, we cannot, because the first part only makes sense for farmers and the second part only makes sense for wholesalers. In general, in causal mapping, we can only use the 'transitivity rule' (from $B \rightarrow C$ and $C \rightarrow D$, deduce that $B \rightarrow D$) *to the extent that the contexts of the first and second statement overlap*. The evaluator should discuss this overlap when making this kind of inference. In this case, the relevant contexts of farmers and wholesalers do not overlap, and therefore, the deduction is not valid. The transitivity trap is a potential danger for all forms of causal mapping and systems mapping, although it is rarely mentioned. Analysts have to be wary of where they might be falling into this trap and sensemaking workshops may be necessary to help verify these kinds of deduction.

d. Aggregation and generalization of findings

Each interview (whether with an individual, household, or group) constitutes one source, although the narratives presented in each may not be completely independent from each other. To make credible generalizations across a wider population of intended beneficiaries care is necessary both to select who to interview (Copestake, 2020) and to weigh up carefully how the evidence obtained from multiple sources can be aggregated to sustain wider generalization. Construction of causal maps incorporates simple frequency counts of how often a particular causal claim (or set of causal claims) is cited by the same source and across multiple sources. But there is no mathematical formula through which these citation counts can be converted into more general claims to wider truth. What the weight of evidence can do is (a) add to the range of causal factors to be aware of and (b) strengthen or undermine confidence about the potential relevance of prior understanding, including the programme's official Theory of Change.

Conclusion

This chapter illustrates the use of causal mapping to support a theory-based evaluation via a case study, which asked what the intended beneficiaries of an international development programme thought about the causal drivers of change in their livelihoods and lives. The evaluation shed light on how their perceptions matched up with both narrative and diagrammatic versions of the Theory of Change constructed by the organization intervening to support them. The specific programme we looked at had the goal of increasing the economic empowerment of women in Ghana. A mid-term qualitative evaluation used the Qualitative Impact Protocol (QuIP) to gather focused stories of change directly from programme participants. These stories were analysed and visualized using an approach called causal mapping and using a web application called Causal Map. This process involved identifying causal links between causal factors such as 'Membership of savings group' and 'Purchase of farm equipment', which were identified across the stories in an iterative process. When joined together, these links constituted a very large map with over 1,700 causal links, which presented an overall picture of change and causes of change related to each of the thematic areas. This

map was filtered and queried in different ways in order to answer some of the evaluation questions.

In terms of programme effectiveness and impact, the causal maps were able to identify many frequently mentioned causal pathways from the programme interventions to outcomes of interest, which is notable, as the qualitative interviewing was double blind ed: neither researchers nor interviewees knew the identity of the evaluation commissioner or the specific intervention being evaluated. In terms of programme relevance, we argue that the original programme Theory of Change can also be considered as a type of causal map, facilitating a direct comparison with the causal maps arising from the evaluation research. We highlight differences revealed by this comparison and discuss how this information was used to enrich the implementing agencies' strategic thinking by supporting evidence-based adjustment to the theory informing the design and operation of the programme and others similar to it.

Overall, the case study confirms the potential for evidence-based causal mapping to validate, modify and extend theories of change. It also illustrates scope for presenting such evidence with a 'broader brush' (corresponding to the original diagrammatic form of the organization's ToC) or in more detail (thereby permitting a more detailed assessment of specific causal assumptions underpinning the programme). Institutionalized through repeated use, we believe this form of analysis has the potential to inform strategic thinking through the incremental adjustment of the wider generalizations or middle-level theories that inform the kind of interventions that development agencies such as OIUK undertake.

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