COLLABORATIVE CROP RESEARCH PROGRAM

THE McKNIGHT FOUNDATION

Theory of Change Guidelines

Collaborative Crop Research Program
Integrated Monitoring, Evaluation, and Planning
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I. What is a Theory of Change?

A ToC is a product and a process where stakeholders develop, monitor, research, utilize, and evaluate theories. This enables learning by explaining mechanisms of how, why, and in what context an intervention achieves or contributes to impact.

A Theory of Change (ToC) has three main objectives[1]:

- To ***describe*** what the project intends to do
- To ***explain*** why interventions will lead to outcomes
- To ***reflect*** on the role of the intervention within a larger system

Some projects might not get much further than the description stage at first, where they are able to achieve collaborative clarity and coherence around a vision, but they should continue to work on the other objectives.

Because the CCRP funds action-research, projects should address certain elements within the theory of change, such as evidence, theories, and testing alternatives. The following table describes how a research and learning lens informs ToCs in the CCRP and highlights the need for the *explanatory* and *reflective* dimensions to be embedded.

Research	**Implications for ToCs of research initiatives**
A research perspective is fundamentally an explanatory and reflective frame of mind, not just based on a set of activities (description)	Include questioning, complexity, uncertainty, evidence – including how a model or approach is working
Based on accumulated knowledge	Current understanding is included or examined
Explicit about assumptions, evidence, new ideas	Arrows (X leads to Y) have a status, such as showing that a relationship is: • Assumed: need to provide justification • Known: provide evidence • Open hypothesis: include research questions that will be explored
Aims to test hypothesis, often by examining counterfactuals	Alternatives or branches explored in the ToC (if A then X, if B then Y)
Answers to questions change what we think	ToC gets updated

[1] Maru et al., 2018

The CCRP also uses the ToC to anchor the monitoring and evaluation (M&E) work of the project. The evaluation questions of a project are usually generated by examining the hypotheses and assumptions embedded in select arrows in the ToC.

Because research and M&E share many of the same methods to sample, gather, and analyze data (e.g. surveys, interviews, focus groups, case studies, etc.), there are many synergies and overlap between the research and evaluation process. Often, the objectives of research are different from those of M&E. Research often focuses on production of outputs for example new insights, knowledge, technologies, and/or methods. Evaluation, on the other hand, tends to focus on the use of those outputs (outcomes) by stakeholders. Evaluation is the process of judging if the output was effective or not and why. However, some projects frame their research in terms of learning from the use of outputs and in those cases, research and evaluation can overlap. The point of convergence comes when evaluation is trying to contribute to "global" knowledge, such as contributing to a body of knowledge on underlying principles and mechanisms that are relevant to a global audience, not just local stakeholders. The following table provides a schema to think about local and global knowledge and research and evaluation objectives. Note that participatory processes can take place at any level, and that these are not separate, but rather, overlapping categories.

	Local Knowledge	**Global Knowledge**
Research Objectives	What options work in which contexts	Why options work in different contexts (underlying principles and mechanisms)
Evaluation Objectives	If and why activities/outputs contribute to intended and unintended outcomes (utilization-focused)	How and why models, strategies and/or approaches work or don't work…convergence between research and evaluation

As an example, a Farmer Research Network's research questions may be focused on validating known mechanisms (e.g. legumes improve soil health) within local contexts. For that project, their contribution to "global" knowledge may be more focused on the evaluation of the project's model or process. Each CCRP project team should consider the most suitable options for how they use research and/or evaluation questions to contribute to global and local knowledge.

Ideally, the local and global should feed into each other, and not be binary choices. Projects should feel they are both contributing to and benefiting from global knowledge, as depicted in the following infinity diagram. Often the connections between the global and local are made at

the regional or program level.

The ToC is not meant to be a static document developed during the inception phase. It should be an anchoring document that is referred to and adapted in response to at least annual reflection and learning.

II. Components of a ToC

The components that the CCRP suggests using in the ToC are described below. There is a lot of diversity in how the terminology is used, this is how the CCRP is using them. They are listed in the order that we have found useful when facilitating a ToC: start with the future vision of success, then reflect on the current situation, and finally build a strategy to bridge the two states. Feel free to experiment, these are guidelines, not a recipe.

- ***Context/ diagnosis*** reflects the current situation of where the project intendsto intervene. Usually this could capture:
  - The most salient characteristics of the participating population, including key elements of their diversity, not all farmers are the same
  - The agroecosystem
  - The state of knowledge on a topic and why it is important
  - Relevant external factors.
- ***Impacts*** are broader, longer-term changes in the wellbeing of farm families and communities, as well as in the environment, to which the project hopes to help contribute. Often it will be beyond the scope of the project to measure longer-term impacts, but it is important to consider them during strategy development, to make sure that the strategy is responding to the vision for long-term change.
- ***Outcomes*** are the results of the interventions, and there are often chains or hierarchies of outcomes, usually intermixed with outputs. This is where the mechanisms of change

should be made explicit, usually in the arrows connecting outputs to outcomes or among outcomes.

- ***Outputs*** are the tangible results or products of the activities that are under direct control of the project.
- ***Arrows*** between and among the different component areas reflect assumptions, hypothesis, questions, and theories. The key arrows should be explained, either in the visualization, through numbering, and/or footnotes that accompany the document.

The following table shows some of the ways these components contribute to the different ToC objectives.

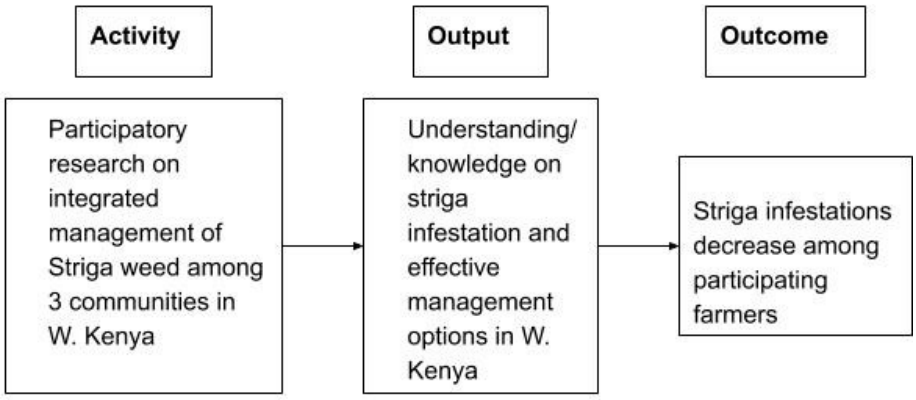
ToC Objective	**ToC components**
Descriptive	Context, outputs, outcomes, impacts (maybe activities)
Explanatory	Arrows: research and evaluation questions, accompanying notes, assumptions, theories Outcome hierarchies: how outcomes (including in combination) lead to other outcomes, and/or how combined outcomes lead to impacts.
Reflective	Assumptions, feedback loops, context

III. ToC Purposes

1. To ***describe*** what the project intends to do

In the case of the CCRP, the ToC is particularly useful for describing how research and development are connected. The ToC demonstrates how the research process is expected to lead to research outputs (e.g. new knowledge, new technologies, new processes), and then how these outputs are expected to contribute to development outcomes--i.e. positive changes for people.

Figure 1: Descriptive ToC example



2. To ***explain*** why interventions will lead to outcomes

A theory is an explanation of why something happens. Since the CCRP is a research program, the project might have hypothesis(es) based on local knowledge and previous experience as well as established theories. Projects should review and cite relevant global literature to connect their work to established theories and on-going research dialogues. The assumptions often reflect this work.

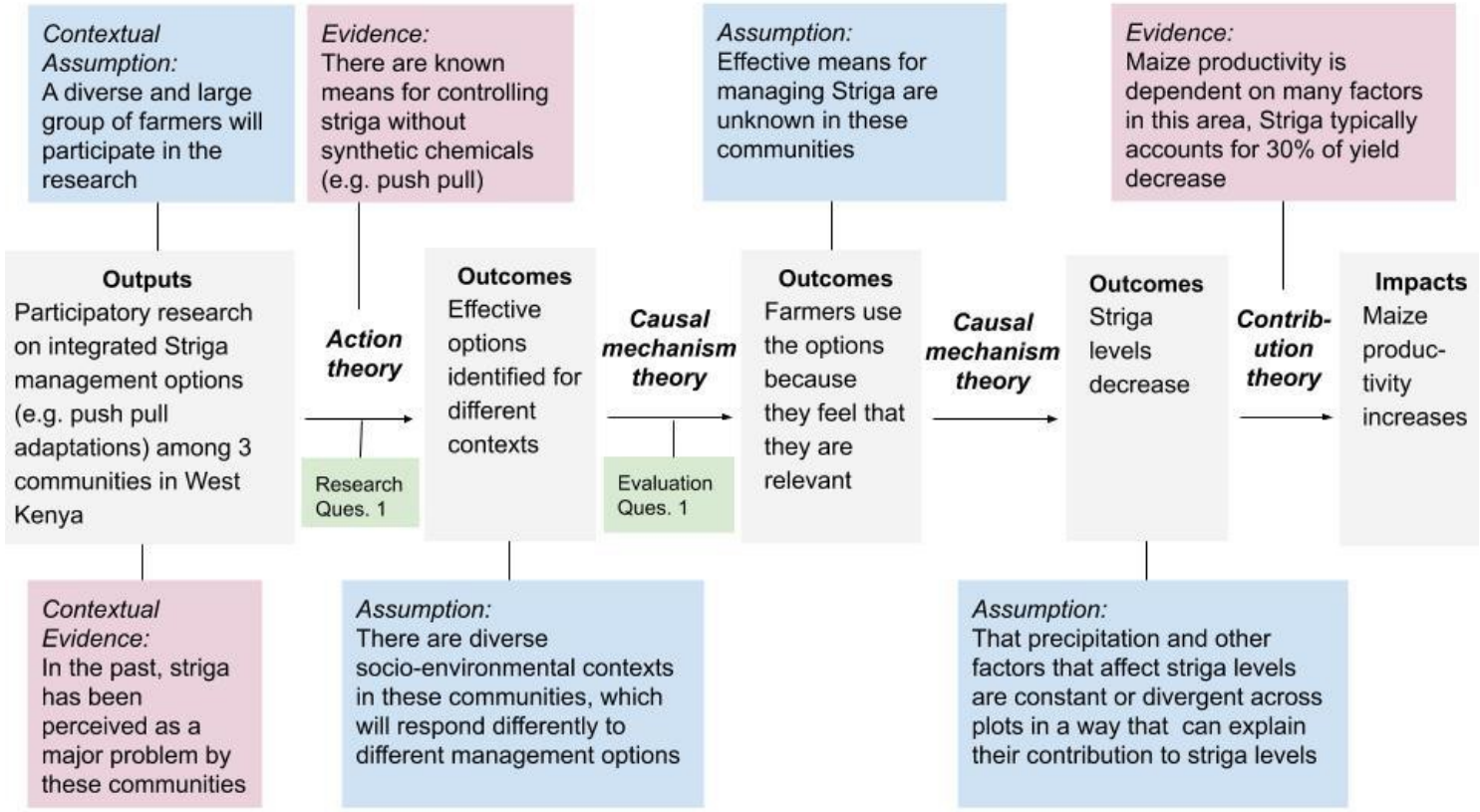
It is important to make mechanisms of change explicit and support them with existing evidence and/or collect and analyze evidence during the project. Explanations can include causal, contribution, and/or contextual mechanisms.

- A causal mechanism shows that A causes B, sometimes it is referred to attribution in evaluation.
- Contribution shows how outputs interact with a number of other factors to contribute to change.
- Contextual mechanisms are ones that show under what conditions a given intervention is likely to lead to change.
- Action theory refers to how the program interventions "trigger the change process."[2]

Figure 2 puts forth testable hypothesis on how change happens and draws on existing evidence and knowledge. In this example, the theory relies heavily on causal mechanisms, such as assuming that evidence will influence behavior change in farmers, that might have to be revised later. The evaluation question is probing that relationship. If it turns out behavior change is more complex, the ToC and subsequently the project strategy should be revised accordingly. Conversely, Figure 3 provides some of the contextual understanding to support the hypothesis that evidence will change farmers behavior: they are worried about striga, they are looking for new management options. It also points to factors that might inhibit uptake: there is not a lot of manual labor available, does a push pull system require more or less labor? There are chemical subsidies available, will that deter farmers from using non-chemical options? These are additional questions that a project might want to explore and are not fully captured in any of these figures.

[2] Rogers, Patricia; https://www.betterevaluation.org/en/blog/using_theories_of_change_effectively

Figure 2: Explanatory ToC example



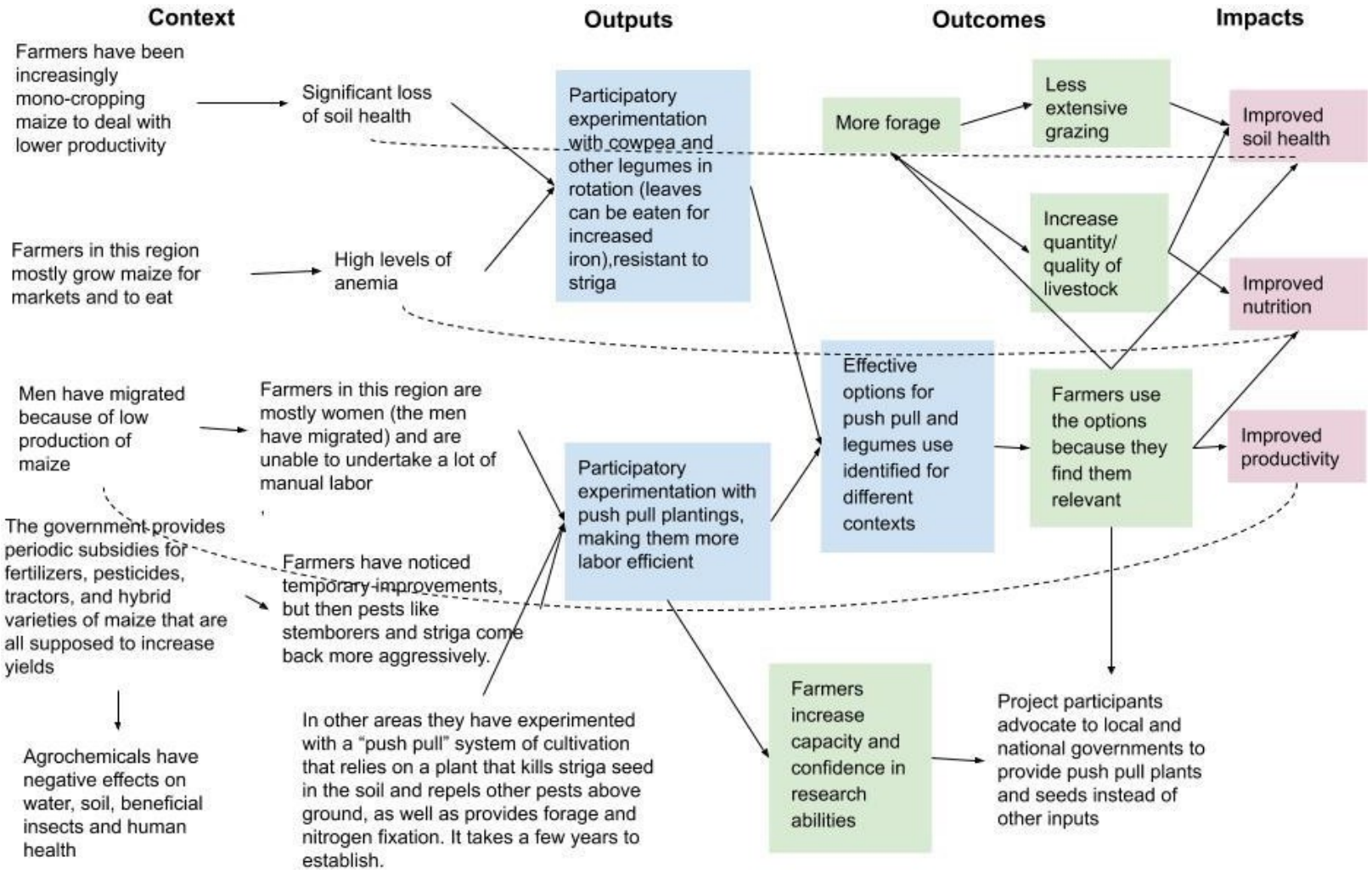
In the table below possible local and global research and evaluation objectives are mapped out based on the example presented in Figure 2.

	Local Knowledge	**Global Knowledge**
Research objectives	How can push pull technologies be adapted to W. Kenya?	Further understand the mechanisms by which push pull system works or doesn't
Evaluation objectives	Are farmers using the new options? Who? How? Why?	Do farmer perceptions of relevance affect their willingness to use new technologies?

3. To ***reflect*** on the role of the intervention within a larger system

The diagnosis, context, and assumptions provide an important opportunity to reflect on the structural factors that affect the project, e.g. the political environment, and other social and environmental factors such as other programs, initiatives, and conditions in stakeholders' lives. The following example (figure 3) shows feedback loops in dashed lines as well as some of these other factors. The feedback loops in this example demonstrate how the outcomes might affect the context. Figure 3 does not take it for granted that Striga is the problem, but rather contextualizes it within the larger environment of rural farmers in the context section. The arrows in Figure 3connect the output (participatory experimentation) to the outcome (farmers increasing their confidence and capacity to undertake research). This is an example of evaluating the model, not just the research on Striga. In this case, the learning about the model could contribute to important global conversations about how to best achieve sustainable systems change.

Figure 3: Reflective ToC example



Often it will be hard to extensively visualize the complex system influencing a project's work. An option is keeping the project ToC focused on key elements but provide accompanying documents such as visualizations or narratives that describe and contextualize the larger system(s).

IV. Process of constructing a ToC

- **Diverse stakeholder perspectives** are important for identifying unintended effects and assumptions in the ToC. Including all the actors who are affected by the project from the beginning also increases their ownership of the intervention(s). This does not mean that all stakeholders need to be in an office together working on a PPT. Conversations should be facilitated in different ways depending on the audience; in particular, be aware of jargon and language use when talking with specific stakeholders. With some stakeholders, constructing a systems map doing past, present, and future visualizations can be more productive ways to facilitate the conversation than talking about a "theory of change". For some tips, see appendix 2.
- The ToC is not just the visualization, it is also the **accompanying knowledge and ideas** that it reflects, which should also be documented. Often, for complex interventions, a series of nested ToCs and/or narratives will be needed, and/or several types of diagrams will be important to communicate with different audiences. When using multiple documents, it is essential to maintain coherence and document how they all relate to each other.

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Appendix 1: ToC Assessment Tool (ToCat)

This rubric can be used to help teams assess the strength of their ToC

Aspect	Criteria
Realistic, clear, and insightful communication of the key factors and processes that will effect change [Description+ Explanation]	Weak: Overly simplistic and linear with "magic" jumps from one box to another without indicating mechanisms and conditions for change, or the inherent risks and assumptions. No connections among pathways to indicate interconnections. ToC is informed by only a small group of people. OR Over-detailed: too many elements, many of them not essential for change. A confusing hairball of arrows and boxes language has too many abbreviations and/or jargon and/or too wordy to be understood by key stakeholders.
	Underdeveloped
	Good
	Excellent: The arrows, boxes, and questions explicitly indicate what the key assumptions, mechanisms, levers, and conditions necessary for change are. Context/ diagnosis and research and evaluation questions are included in the diagram. ToC is informed by wide group of stakeholders with a diversity of perspectives. The arrows are used judiciously to indicate key moments of change. There are clear channels of action and impact that correspond with objectives and questions. Wording is clear and succinct. There is focus without oversimplification. It is clear who the target population is.
Systems aware: Is the project focused only on a problem or also aware of systems? [Reflection]	Weak: The ToC focuses only on a specific problem and does not mention some of the key system interactions that are needed for change. Only linear change is shown.
	Underdeveloped
	Good
	Excellent: The ToC contextualizes the research and development project within a system and endeavors to contribute to system change instead of just problem-solving where appropriate. Includes other interventions and contributions. Visualizes feedback loops and contributions from other factors and initiatives; if-then logic.

GLOCAL: Are connections made between local and global levels? [Reflection]	Weak: Either the ToC is excessively local, only focused on local impacts, or excessively global concerned only with vague and broad outcomes.
	Underdeveloped
	Good
	Excellent: Takes into account how conditions, information, and resources flow from local to global, and global to local. Global theory is reflected as well as local change. Looks for both anticipated and unanticipated interactions, both positive (mutually reinforcing) and negative (disjointed and nonaligned) externalities at local and global levels.

Appendix 2: Tips on facilitating a ToC

These tips are grounded on years of practical experience by CCRP projects and regional teams but should be modified and adapted to the specific context and conditions.

Who should participate?

Developing a theory of change offers the opportunity to focus on the project's overarching goals rather than the day-to-day activities and other narrow details. The ToC diagram, a visualization of the changes the project team thinks will occur and how those goals might be achieved, should always be **created as a group.** The multiple perspectives make the diagram and the ideas it represents more complete, leading to a richer understanding of how project success will look while creating buy-in and shared meaning among stakeholders. If there are more than 8 active participants, or participants from very distinct backgrounds, it can be helpful to **construct the ToC over multiple sessions with different groups**, to increase participation and comfort. At the end of the sessions, the ToC can be compared to other versions and adjustments made based on new learning. Some groups may find it easier to do a mapping exercise of how their community or household was in the past, is today, and what they want for the future. This can easily be incorporated into the final ToC. Alternatively, other groups might want to start with a systems map, and later add the change they are looking for and whatlevers for change they will work with.

The Dual Role of Facilitator and Participant

Because a ToC brainstorming session brings together a variety of stakeholders who may have a wide range of opinions and ideas, it is important to designate a facilitator. The facilitator's level of involvement may change throughout the course of the session, as described in the steps below. Regional team members usually act as *de facto* facilitators of this process even though they play a much more active role than "true" facilitators. These team members make ideal facilitators because they are able to ask important questions based on their content knowledge

and interest in the project. However, balancing the role of facilitator and participant can be tricky. The same concerns may apply when a Principle Investigator or project leader facilitates the ToC meeting. In these cases, it is crucial to consider power dynamics between and among the various participating stakeholders. Full and equal participation can be encouraged by:

- Having participants write their own ideas on cards.
- Requiring facilitators to indicate when they are speaking as a participant and when as a facilitator.
- Repeatedly inviting participants to interact with and modify the diagram.
- Allowing for some uncomfortable silences to encourage other people tospeak, especially during the latter portion of the meeting.

Facilitation can involve initiating the ToC brainstorm session, writing down what people say, and building consensus around how concepts are grouped and described. Participation includes raising questions or concerns, helping the group think through their ideas, and identifying assumptions. This appendix gives some tips on how to handle the facilitating role to maintain general consistency across the program and to give new facilitators ideas. You will quickly develop your own style with a great deal of variation across groups. Most importantly, adapt to the specific situation.

Getting started

Often the impulse is to start with the proposal and workplan as a jumping off point, which can work with certain groups. However, it is usually more productive to start with bigger picture conversations rather than with the proposal's list of products and activities. Often people are tempted to “jump to the solution”: they fixate on a preconceived solution because they want to reassure donors (and sometimes themselves) that they have a winning strategy. But in many cases the solutions won’t actually solve the problem because they are based on unexamined assumptions about a vision of success that may not have been thoroughly explored.

It is recommended to start with brain-storming the diagnosis of the current situation, reflecting on the current situation, and then transitioning into ideas about what needs to be changed and the medium and long-term vision(s) of success. Often used in **participatory monitoring and evaluation**, this approach easily translates into a visual facilitation technique for participants who connect more to pictures than words.

A farmer in front of a past, present and future drawing that can inform ToCs. Photo credit: Steve Vanek, Grupo Yanapai, Casillapata, Peru. 2013

When conversation begins with a vision of success, the group is more likely to scrutinize the assumptions around how change will happen. The idea of a ToC brainstorming session is to help people examine the vision and work backwards to see if the products still apply. This approach can help uncover serious weaknesses in project design that otherwise might have stayed hidden had the conversation started with products or activities. Focusing first on the vision of success can also reveal areas of consensus upon which the group can build.

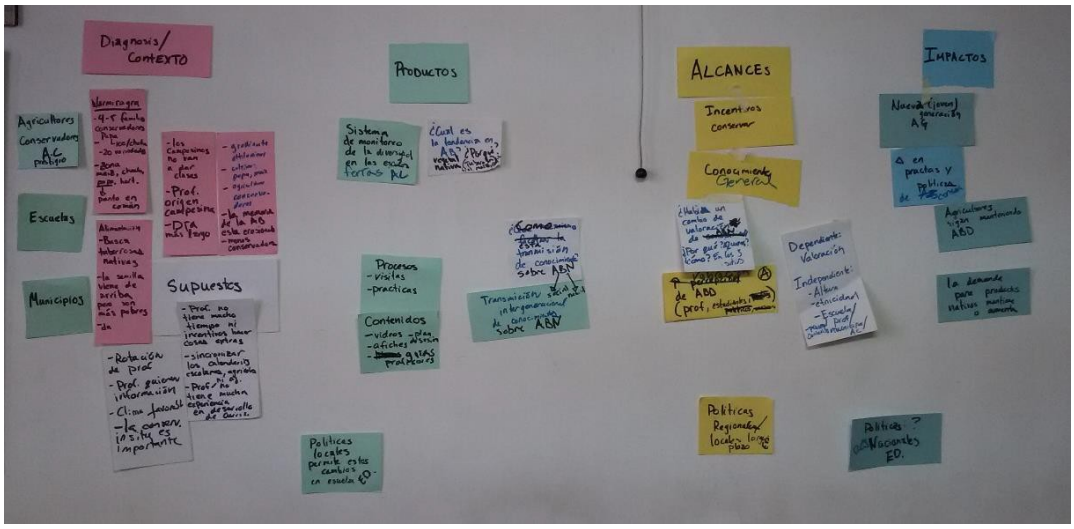
Suggested Steps for the Facilitator

Reflection takes time. Plan for the session to take a **whole day**, Dedicate the morning to developing and discussing the ToC and the afternoon to focus on drafting evaluation questions and re-visiting research questions for the ToC.

It is helpful not to over-structure conversation and activities; rather, by allowing participants to examine a wide range of ideas and topics, the facilitator will help to develop a comprehensive theory of change. It is important to dedicate time and energy to this process because the ToC serves as the anchor for each project. You can use a whiteboard or butcher paper as a backdrop. We recommend using large, colored notecards (10 cm x 17cm, 4-5 different colors) that can be easily moved around and grouped in different ways as necessary.

Phase 1: ToC

1. As participants are taking turns talking about what they think the project will accomplish, **listen for diagnosis, outputs, outcomes, and impacts, as well as, assumptions, theories, and questions.** Use various card colors and shapes, different colored markers and/or symbols or numbers. Participants will probably also mention some activities. Write these on a separate color; later you'll explain that these are organized differently, as discussed in the next step. The **assumptions, theories, actors/ population, definitions, and key questions** can be organized on different pieces of paper or on the main wall if there is space. Some groups will be better at referencing existing theories and learning, including from their previous work, that informs the theory of change. Other times the facilitator will have to be more active in prompting participants to reflect on why they think one thing will lead to another. For example, asking participants if a connection between an output and an outcome is based on existing knowledge (local, academic etc.) or if is it a hypothesis they want to explore. In the final ToC, the arrows can be numbered, and footnotes included and updated over time about what theories and knowledge the project is drawing from.



In this session, the diagnostic issues are in pink, outputs in green, outcomes in yellow and impacts in blue. Research and evaluation questions are on white cards.

2. As certain pathways of change become evident or the same ideas are repeated, **start taping the cards on the wall** so participants can visualize what's being said and the channels of change that are emerging. You can group products on the top, then outcomes, then impacts, or you can position them from left to right, like a familiar logframe. But encourage feedback loops and going from output to outcome to output if that makes sense or putting in many outcomes that are contingent on each other. Each technique has pros and cons. Showing the temporal relationships between outcomes and impacts is important. Some outcomes will be short term, while others will be longer term; impacts, however, are almost always long term. Often it is helpful to place outcomes and impacts in such a way to represent the time frame--the farther they are from products, the longer time to achieve them. Likewise, the products can have a spatial representation to indicate timeframes. If people mention specific activities, arrange them above the products but let them know they don't have to include activities in their final ToC, which doesn't need that level of granularity. Use cards to explain what is happening in the arrows, including questions, assumptions and theories. It might make more sense to have impacts in the middle with contributing factors in a constellation around them, the feedback loops might have a different spatial structure, within a more temporal orientation. People shouldn't be confined by a linear orientation.

3. When the time seems right, you will want to pause the conversation to **explain what you're doing: mapping out how the group is saying change will occur**. Explain that though some of the impacts won't happen during the life of the project and the project team doesn't intend to measure them, you are grouping impacts so everyone

remembers what the group is trying to accomplish in the long run, allowing everyone to see how different components flow into each other. The context will also keep changing but try to represent the most salient points of the current situation. Explain that outputs and outcomes are more or less flexible, and everyone should keep in mind that if something isn't working as the project unfolds, they should try something else, and update the ToC accordingly. The important thing is to keep an eye on what the current situation (context/ diagnosis) and the desired change (success) looks like as it is represented by the impacts.

4. **Point out the 2-4 main channels of change emerging**. These channels usually end up corresponding to the project objectives. You can use symbols, other colors, or simply placement of the cards to illustrate the channels. We also recommend using arrows to make connections between and among outputs, outcomes, and impacts. As the conversation continues, you will find it necessary to rearrange cards, take some out, add some, indicate where more thinking is needed, etc. However, don't act unilaterally; always work with the group to arrive at a consensus about how ideas relate to each other. Careful thought about the grouping of ideas around pathways or channels is important for the ToC because they add clarity and focus. Try to neither overburden or oversimplify the cards, they should have around 5-10 words. The work of the group is intense in terms of unpacking their ideas, examining them, and then communicating the final vision effectively.

5. As people start to see how the process works, you can **pull back as the facilitator and let participants start using the diagram to explain or modify their thinking**. Different participants will have different views, so you should encourage them to write their own ideas on the appropriately colored cards and place them on the diagram. Further discussion can lead to some consensus. Participants should also feel invited to rearrange the cards that you placed. If participants don't start interacting with the diagram, you'll need to continue writing and placing cards to make sure the ToC is reflecting the conversation. This is where the **discussion will become more critical**, examining "miracles", where a modest outcome magically leads to the most ambitious of outcomes. Returning to existing literature, knowledge, and theories to provide evidence for this theory of change. Also, **explore alternative scenarios** – what ifs about different research objectives or areas of work -- even if the objectives are unlikely to change, it is good to explore different options to make sure the plan that emerges is solid.

Phase II: Evaluation questions

6. Use an asterisk, number, or some other symbol to **indicate places in the ToC where outputs or outcomes will need corresponding research questions**.

7. As the conversation begins to wind down and people feel comfortable with the direction of the ToC, **direct the discussion toward evaluation questions**, e.g. "If we think this product leads to this immediate outcome, how are we going to know that happened? For whom? Why?" Then examine the arrows between the products and the outcomes. You want to help people think about the questions that will ultimately be asked (e.g. did farmers' knowledge or practice change because of the introduction of this technology/ product?) and how they'll be answered. During this time, introduce the general framework of the M&E plan. The group should decide on the evaluation questions, and brainstorm some initial ideas about methods, indicators, means of verification, and implications for the budget and team.

The ToC belongs to the group, so they should be encouraged to take a photo of it to refer to as the project continues. The project team will need to transcribe it, provide supplementary material, and send it to the RT along with M&E plan and revised workplan. At the end of the discussion, make sure everyone agrees on a convenient date (two-four weeks later is usually sufficient) by which they can deliver the document.

Google Drawings is one software that can facilitate the drawing and sharing of a ToC visualization.