USAID Ethiopia Resilience Learning Activity

RAPID FEEDBACK RESOURCE GUIDE

Submission Date: April 2023

Contract Number: 720066322C00001
Activity Start Date and End Date: August 5, 2022 to August 4, 2027
COR Name: Raheal Teshome

Submitted by: Patrick Sommerville, Chief of Party
LINC LLC
1201 Connecticut Ave NW, Ste 200J Washington, DC 20036
Tel: +1 (202) 640 5462
Email: psommerville@linclocal.org

ACTIVITY INFORMATION

Program Name:	USAID Ethiopia Resilience Learning Activity
Activity Start Date and End Date:	August 5, 2022 – August 4, 2027
Name of Prime Implementing Partner:	LINC LLC
Contract Number:	72066322C00001
Name of Subcontractors:	Environmental Incentives (EI), JaRco Consulting, WI-HER

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS I

1. RAPID FEEDBACK RESOURCE GUIDE 1

2. SOCIAL NETWORK ANALYSIS 1

2.1 What is Social Network Analysis? 1
2.2 When Might I Want to Use Social Network Analysis? 2
2.3 Ways to Use Social Network Analysis 2
2.4 What Resources are Required to use Social Network Analysis? 2
2.5 What Else Should I Know about Social Network Analysis? 3
2.6 List of External Resources on Social Network Analysis 3

3. CAUSAL LOOP DIAGRAMMING 5

3.1 What is Causal Loop Diagram 5
3.2 When Might I Want to Use a Causal Loop Diagram? 6
3.3 Way to Use Causal Loop Diagrams 6
3.4 What Resources are Required to Use Causal Loop Diagrams? 6
3.5 What Else Should I Know about Causal Loop Diagrams? 7
3.6 List of External Resources on Causal Loop Diagrams 7

4. ETHNOGRAPHY 8

4.1 What is Ethnography? 8
4.2 When Might I Want to Use Ethnography? 8
4.3 Ways to Use Ethnography 9
4.4 What Resources are Required to Use Ethnography? 9
4.5 List of External Resources on Ethnography 10

5. PARTICIPATORY SYSTEMS ANALYSIS 10

5.1 What is Participatory Systems Analysis? 10
5.2 When Might I Want to Use Participatory Systems Analysis? 10
5.3 Ways to Use Participatory Systems Analysis 11
5.4 What Else Should I Know About Participatory Systems Analysis? 13
5.5 List of External Resources Required to Use Participatory Systems Analysis. 13

6. SYSTEM DYNAMICS ANALYSIS 14

6.1 What is Systems Dynamics Analysis? 14
6.2 When Might I Want to Use System Dynamics? 14

6.3 How to Conduct System Dynamics Modeling? 14
6.4 What Resources are Required to Use System Dynamics? 15
6.5 What Else Should I Know about System Dynamics? 15
6.6 List of External Resources Required to Use System Dynamics Analysis 15

ACRONYMS AND ABBREVIATIONS

CLD	Casual Loop Diagramming
PSA	Participatory Systems Analysis
RF	Rapid Feedback
RLA	Resilience Learning Activity
SD	Systems Dynamics
SNA	Social Network Analysis
USAID	United States Agency for International Development

1. RAPID FEEDBACK RESOURCE GUIDE

Rapid feedback tools are monitoring and evaluation tools that provide feedback to program managers and decision-makers in a timelier way. Rapid feedback tools compress feedback loops so that program managers can adapt programming before it's too late.

This Rapid Feedback Resource Guide[1] has been compiled by the USAID Resilience Learning Activity (RLA) to provide resilience partners with basic background on various Rapid Feedback (RF) tools that they might utilize in their own programming, and direct them to additional resources. The five RF tools covered in this resource guide include:

- Social Network Analysis
- Causal Loop Diagramming
- Ethnography
- Participatory Systems Analysis
- System Dynamics Analysis

Additional tools and methods may be covered in future updates of this resource guide.

2. SOCIAL NETWORK ANALYSIS

To help identify actors best positioned to positively impact the network.

"An actor's position in a network determines in part the constraints and opportunities that s/he will encounter, and therefore identifying that position is important for predicting actor outcomes such as performance, behavior or beliefs."

- Analyzing Social Networks (2013)

2.1 WHAT IS SOCIAL NETWORK ANALYSIS?

A Social Network Analysis (SNA) is a visual representation of the structural characteristics of a network. Specifically, it shows the relationships among actors (individuals, groups, or organizations). Actors are represented via nodes and relationships are represented via edges. Attributes can be assigned to nodes (e.g., org type, sector, etc.).

For a link to the interactive map click here.

Relationships can be analyzed in both visual and mathematical terms. Social network analysis helps us identify actors, their relationships, and the factors that influence their interactions. Network analysis can highlight resource

[1] The Rapid Feedback Resource Guide was developed in-part by adapting the Local Systems Practice User Guide developed by LINC LLC.

flows and directions of influence. Because the relationships among actors is dynamic, network analysis is an ongoing process and that actively involves local people and organizations.

2.2 WHEN MIGHT I WANT TO USE SOCIAL NETWORK ANALYSIS?

SNA is most useful for capturing complex relationships, and for capturing the structural characteristics of a network. Beyond identifying central actors within a network, it can provide measures of how tightly interconnected the network is, how fragmented the network is, and to identify subgroups within a network. All of these measures can help to provide insights about strengths and weaknesses in communication, power structures, and network stability.

2.3 WAYS TO USE SOCIAL NETWORK ANALYSIS

SNA can be useful for both whole and individual actors. SNA provides a powerful platform for better understanding, a local system, decision-making on partner strategy, program design, and evaluation of progress during or at the conclusion of program activity.

Key Applications include:

- Systems mapping/ stakeholder analysis.
- Adaptive management
- Impact measurement
- Can be used by multiple sectors to better understand local systems.

2.4 WHAT RESOURCES ARE REQUIRED TO USE SOCIAL NETWORK ANALYSIS?

Resources required can range from just a few days of effort to several months or years. There are a number of variables impacting this, including:

- Systems mapping/ stakeholder analysis.
- Network size
- Will the network analysis be conducted at one moment in time, or in several iterations over the life of a program?
- Can all of the network members be defined in advance of the research?
- Can all of the network members be reached virtually, using online instruments, or will you need to conduct in-person interviews?
- In cases where network members are not connected to the internet, how advanced is the data collection system and personnel (including ability to handle nominations, vet potential network members, utilize tablets, and avoid naming redundancy)?
- How narrowly is the network defined?
- How sophisticated will the analysis be?
- The extent to which theory of change is explicitly linked to the research.

Resources Required Chart

Level	Preconditions/Goals	Time	Human Resources
Easy	• All network members defined in advance and connected to the internet. • Basic analysis. Integrated data collection and analysis platform.	1-3 weeks	1 designer/analyst/supervisor
Medium	• All network members defined in advance but not necessarily connected to the internet. • Basic-to-high level analysis. • 00-500 network members.	1.5 - 3 months	1 designer/analyst 1 supervisor 3 enumerators
Hard	• Some, but not all network members defined in advance. • Most respondents not connected to internet. • High level analysis. 100 - 500 network members.	3 - 5 months	1 designer 1 analyst Local experts 3-7 enumerators

As a general rule of thumb, the "difficult" category of network analysis conducted on a longitudinal basis will require overall resources similar to that of an impact evaluation. Time estimates given above start with research design and conclude with submission of SNA report.

2.5 WHAT ELSE SHOULD I KNOW ABOUT SOCIAL NETWORK ANALYSIS?

- SNA is a way of thinking about social systems that focuses attention on the relationships among actors in a system.
- SNA is a classic systems approach, measuring complex interactions of actors at multiple levels.
- SNA utilizes nodes (actors) and edges (relations).
- Attributes can be assigned to nodes (e.g. org type, sector, etc.).
- Analysis is conducted at the whole network and individual organizational level.
- ONA is a sub-set of SNA (organizational mode).

2.6 LIST OF EXTERNAL RESOURCES ON SOCIAL NETWORK ANALYSIS

Strengthening Local Systems through Network Analysis LINC

Learn more about how our company, LINC, applies Network Analysis to understand and map complex systems and strengthen local systems and actors.

PACT Organizational Network Analysis (ONA) Handbook (2011)

A practical guide to the ONA tool created for practitioners and development professionals. While it assumes the reader's general familiarity with networks, the handbook provides practitioners and managers with the information they need to understand how ONA works, and how best to incorporate it in their country strategy or program.

University of Michigan School of Information Social Network Analysis online course

Professor Lada Adamic of the University of Michigan teaches an online course that introduces basic concepts in network theory, discusses metrics and models, and ways to use software analysis tools to experiment with a wide variety of real-world network data. The online class utilizes Gephi, NetLogo and R tools to cover network theory, analysis and application to help learners observe and understand different networks as well as their structures.

Video on Network Theory (Link)

Created by Complexity Labs, this video provides a simple and tangible explanation of Network Theory and discusses the most common terms.

NGO Network Analysis Handbook: how to measure and map linkages between NGOs (Save the Children, 2011)

This handbook is designed to aid practitioners to understand what network analysis is; how network data is collected; how to create visual maps of the network, and how to analyze the network data for program/project development or evaluation.

Not everything that connects is a network (Overseas Development Institute, 2011)

This paper seeks to address the following questions: Are networks always the most appropriate vehicle? Where they are appropriate? How can we make the best use of them? The paper argues for a more rigorous understanding of networks' nature, particularly their value (and costs), and presents a revised Network Functions Approach as a model for rationalized investment in networks.

Learning about Analysing Networks to Support Development Work (2011)

This paper presents four cases where social network analysis was used in a development program. It focuses on the analysis of connectivity in real world networks, particularly in cases that were unintentional networks.

Catalyzing Networks for Social Change (Monitor Institute and Grantmakers for Effective Organizations, 2011)

This guide is for grant makers who are just beginning to explore and experiment with networks and for those who are further along and want to reflect on their practice.

A Bird's Eye View: Using social network analysis to improve knowledge creation and sharing (IBM Institute for Knowledge, 2002)

This guide provides four different network relationship dimensions which are important for effective learning. The research discusses and analyzes how applying these dimensions to important groups of people within an organization can facilitate and improve knowledge creation and sharing.

This guide provides four different network relationship dimensions which are important for effective learning. The research discusses and analyzes how applying these dimensions to important groups of people within an organization can facilitate and improve knowledge creation and sharing.

Social Network Analysis Handbook (International Rescue Committee, 2016**)**

This handbook provides a step-by-step guide to the application of SNA. The approach draws on Social Network theory, discussion-based tools, and graphical software applications.

Social network analysis of multi-stakeholder platforms in agricultural research for development: Opportunities and constraints for innovation and scaling (PLOS One, 2017**)**

This paper explores three multi-stakeholder platforms (MSPs) in Burundi, Rwanda and the eastern part of Democratic Republic of Congo (DRC). The researchers apply SNA and Exponential Random Graph Modeling (ERGM) to investigate the structural properties of the collaborative, knowledge exchange and influence networks of these MSPs, and compare them against value propositions derived from the innovation network literature. Results demonstrate a number of mismatches between collaboration, knowledge exchange and influence networks for effective innovation and scaling processes in all three countries. The results illustrate the potential of Social Network Analysis and ERGMs to identify the strengths and limitations of MSPs in terms of achieving development impacts.

3. CAUSAL LOOP DIAGRAMMING

To understand what part of the system to engage into change.

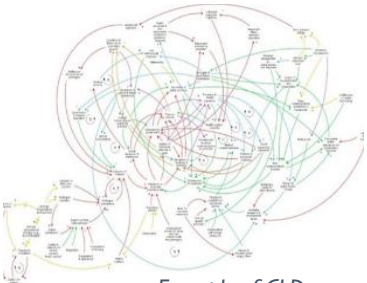
"When you are confronted by any complex social system, such as an urban center or a hamster, with things about it that you're dissatisfied with and anxious to fix, you cannot just step in and set about fixing with much hope of helping… You cannot meddle with one part of a complex system from the outside without the almost certain risk of setting off disastrous events that you hadn't counted on in other, remote parts. If you want to fix something, you are first obligated to understand… the whole system… Intervening is a way of causing trouble"

- On Meddling (1974, Lewis Thomas)

3.1 WHAT IS CAUSAL LOOP DIAGRAM

A Causal Loop Diagram (CLD) is a "snapshot of all relationships that matter." It is a visual representation of key variables (i.e., factors, issues, processes) and how they are interconnected.

These diagrams show variables represented as texts and causal relationships between them represented as arrows. Arrows indicate the direction of causality, the nature of the relationships (i.e., proportional or inverse), and whether there is any delay in an expected effects' occurrence.



Example of CLD

3.2 WHEN MIGHT I WANT TO USE A CAUSAL LOOP DIAGRAM?

When you want to model a dynamic system in a holistic manner -CLDs are used to conceptually model dynamic systems in a holistic manner, mapping how variables (i.e., factors, issues, processes) influence one another. We tend to think of issues in terms of simple, linear and independent cause/effect statements. This is partly because of the limited ability of language and the human mind to process interdependent series of complex cause-effect chains. CLDs offer a language that can capture and convey this complexity.

When data are not available to provide a precise characterization of a complex system - There are various qualitative methods to analyze a CLD to obtain critical insights about how a system works. For example, we can examine a CLD to uncover a system's underlying "feedback structures," which arise from interactions of factors, actors, and processes in a system over time. These structures may otherwise be difficult to identify as its parts may be separated by time and space. However, understanding feedback structures is critical as behavior and outcome patterns in a system are shaped and conditioned by them. This understanding enables us to differentiate between symptoms and root causes of problems and identify high and low leverage intervention points in a system. With such insights, we are better equipped to design effective strategies to engage with a system and anticipate as well as preempt unintended consequences. CLDs also show the natural constraints within the system, helping us develop more realistic expectations regarding our ability to bring about change.

3.3 WAY TO USE CAUSAL LOOP DIAGRAMS

A CLD is a powerful system thinking tool to characterize the operation of a complex system or a problem. A CLD visually maps key variables and their causal relationships. These variables can include: factors, issues, processes, and actors' behaviors and perceptions.

Key applications include:

- Characterize complex causal relationships between key variables.
- Uncover feedback structures and root causes that drive systemic outcomes.
- Identify system parts/variables separated by time and space.
- Consider the entire system together and recognize outcomes are a result of the entire system working together.

3.4 WHAT RESOURCES ARE REQUIRED TO USE CAUSAL LOOP DIAGRAMS?

There are no standard resource requirements for development of a CLD, as the amount of resources often depend on the consideration of a number of factors. Developing an initial map can typically take between 1 - 5 months depending on how many people are involved and the level of complexity and detail desired. Key considerations include:

- How complex is the learning question?
- What is the scope of the CLD?
- How detailed is the requested CLD?
- What is the extent of previous research and empirical knowledge about the subject of

investigation?

- How many CLDs will be developed?
- Will CLDs be periodically updated or maintained?
- Will the CLD development rely on literature review alone or also on group model building with stakeholders?
- If group model building is desired, how many stakeholders will be involved in the effort?
- How accessible are the stakeholders to provide input for iterations of the CLD?
- How sophisticated will the analysis be?

Resources Required Chart

Level	Preconditions/Goals	Time	Human Resources
Easy	• Problem and learning question defined. • Available information and/or working with a small number of stakeholders (less than 5). • High level characterization of key loops. • Approximately 20-30 or fewer variables.	1-2 months	1 senior analyst 1 junior analyst
Medium	• Parts of problem and learning questions defined. • Limited information and/or working with more than 5 stakeholders. • Detailed level of characterization of keep loops. • Approximately 30-50 variables.	3-4 months	1 senior analyst 1 junior analyst
Hard	• Problem and learning question not defined. • Limited information and/or working with more than 10 stakeholders. • Participatory modeling required. • Detailed level characterization of key loops. • Approximately 50 or more variables. • Additional systems analysis based on CLDs.	6 months or more	1 senior analyst 1 facilitator 2 junior analysts

3.5 WHAT ELSE SHOULD I KNOW ABOUT CAUSAL LOOP DIAGRAMS?

If and when data are available, CLDs can be transformed into stock and flow diagrams, in which each variable is represented by an appropriate mathematical equation, and various changes in variables of interest can be simulated to see the net effects in a system.

3.6 LIST OF EXTERNAL RESOURCES ON CAUSAL LOOP DIAGRAMS

Systems Thinking Applied: A Primer (ANSER, one of the LSP Consortium Partners).

Reference source on systems thinking for beginners that explains key methods of systems analysis, including causal loop diagrams.

Leverage Points: Places to Intervene in a System (Donella Meadows, 1999)

Seminal work by Meadows that identifies 12 types of levers within a system and discusses their effectiveness in bringing about change.

Business Dynamics: Systems Thinking and Modeling for a Complex World (John Sterman, 2000)

Key textbook in which a MIT professor discussed the system dynamics approach and its application to problem solving efforts in business, organizational, social and physical science domains.

Guidelines for Causal Loop Diagrams (Daniel Kim, 1992)

Offers some suggestions on the mechanics of creating causal loop diagrams, and general guidelines that should help lead you through the process.

Systems Grantmaking Resource Guide: Causal Loop Diagramming

Brief profile on Causal Loop Diagramming, and how it relates to systems grantmaking.

4. ETHNOGRAPHY

To better understand behaviors and norms within a system.

4.1 WHAT IS ETHNOGRAPHY?

Ethnography means 'writing about people' and is the primary tool for data collection and analysis among anthropologists, sociologists, and increasingly, historians and political scientists.

Cultural immersion: First developed and defined methodologically in the early 20th century by the anthropologist Bronislaw Malinowski (1922), the primary approach used by ethnographers is cultural immersion where the ethnographer lives with the community, group, or settlement under study, and participates in various aspects of the people's daily lives.

Smaller Sample Size: Due to the intense effort and time commitment required to build trust and gain access, ethnographic data collection and related analysis is usually based on a fewer number of respondents than survey-based research. The smaller sample size also suggests that ethnographic data is not easily conducive to quantitative or statistical analysis. Furthermore, the strength of ethnographic research is based on trust between respondent and ethnographer, and networks of trust between ethnographer and the community, and not usually based on random sampling. Hence, despite its greater accuracy and precision, ethnographic data collection and analysis is not easily scalable, generalizable, or transferable.

4.2 WHEN MIGHT I WANT TO USE ETHNOGRAPHY?

Researchers might want to use ethnographic data collection techniques to:

- Elicit data that is more accurate and precise, primarily due to trust-building between ethnographer and respondent.
- Access information that the respondents would not ordinarily share with external parties.

- Obtain information or responses that are not based on their own agendas or their perceptions of the ethnographer's focus and agenda.
- Observe real behaviors and lived experiences in addition to recalled responses.
- To compare real vs. reported behaviors.

4.3 WAYS TO USE ETHNOGRAPHY

Specifically, ethnographic techniques can be used to:

- Identify various actors, processes, and institutions commonly perceived as influential within a complex social process.
- Understanding local logics and rationale.
- Identify endogenous factors and contingencies.
- Key applications:
- Gain firsthand valuable insights into local complex dynamics.

4.4 WHAT RESOURCES ARE REQUIRED TO USE ETHNOGRAPHY?

The amount of resources, namely time, financial and human resources, needed to do ethnographic data collection and analysis will depend on a number of factors:

- Research questions and scope of field of inquiry.
- Availability of trained data collectors and barriers to building trust.
- Research design, either one-off deep analysis or analysis of factors over time.
- Level and type of analysis.
- Access to software and electronic means of data collection.

Ethnographic research requires sufficient amounts of paper, writing materials, and translators or knowledge of the language. However, in recent years, ethnographers are observing and recording their data using audio and audio-visual technologies that are easily available as apps on any smartphone or tablet. These recordings are then transcribed using human or software expertise, and then analyzed for patterns and trends, depending on the research question asked.

Key software that can be used for ethnographic research and analysis:

Social Network Analysis Network Analysis: Visone , UCINET, Gephi, SocNetV, Pajek

Qualitative Analysis: NVIVO, Dedoose, MAXQDA, R.

Quantitative Analysis: SAS, Stata, R.

Transcription Software: Dragon Nuance

- https://transcribe.wreally.com
- https://support.google.com/docs/answer/4492226?hl=en

4.5 LIST OF EXTERNAL RESOURCES ON ETHNOGRAPHY

Qualitative Methods in Business Research (Eriksson and Kovalainen , 2008)

Chapter in a textbook detailing ethnographic research including an overview on the methodology, ethical principles, conducting field work and analyzing and interpreting ethnographic research materials.

Ethnography: Problems and Prospects (Martyn Hammersley, 2006)

This article reviews a range of difficult issues that currently face ethnographic research, and offers some reflections on them.

Video on Ethnography (Link)

Created by the University of Utah's Sorenson Center for Discovery & Innovation, this video details the importance of conducting ethnographic research and how it can help craft a digital solution to target users.

Qualitative Research Methodologies: Ethnography (Scott Reeves, Ayelet Kupper, and Brian Hodges 2008)

This article reviews key features of ethnographic research.

Understanding Social Research: Ethnography (Alan Bryman, 2005)

This textbook gives an overview of the method and its methodology, the research process, analysis, interpretation and presentation of data, and finally the many uses.

5. PARTICIPATORY SYSTEMS ANALYSIS

To enable strategic actors to come together to gain a better understanding of their own system, create joint visions of how it could improve and agree on practical ways to do it.

5.1 WHAT IS PARTICIPATORY SYSTEMS ANALYSIS?

Participatory Systems Analysis (PSA) puts the emphasis on the system actors and the processes that allow them to interact, learn from each other and find feasible areas for collaboration. PSA is not a tool that we can use to analyze the system; instead, it is an approach where multiple tools and techniques (including the ones in this guide) can be used to help the actors analyze the system they belong to. PSA must also promote a cyclical movement between analysis and synthesis (zooming in and zooming out).

5.2 WHEN MIGHT I WANT TO USE PARTICIPATORY SYSTEMS ANALYSIS?

- When the overall objectives are clear (e.g. making a market system more inclusive and productive) but the specific problems and their root causes are not clear.
- When the implementation of solutions depends on the alignment of interests of several actors and their active engagement (e.g. collaboration, coordination and investment).

- When the objectives and solutions are clear, but the strategies and implementation priorities (what should be done first) are not clear and must be agreed upon by several system actors.
- When higher levels of trust and mutual awareness between actors are required to enable or unlock implementation (e.g. in highly volatile, conflict-ridden, hierarchical and traditional contexts).

5.3 WAYS TO USE PARTICIPATORY SYSTEMS ANALYSIS.

With a project team: Participatory analysis can be done by a project team internally. It can be done at any stage of the project cycle. For example, to select target populations, specific geographic areas within a larger region, an issue (children's health) or subsector (coffee).

With local system stakeholders: After the team has acquired a reasonable understanding of the system they are trying to influence; they should engage strategic stakeholders.

With donors: Participatory system analysis makes the project more appropriate for the needs of local stakeholders and increases their ownership and long-term engagement. It can also reduce the risks of delays, extra costs, and harmful impacts on people and the environment. This can have positive effects on the donors' overall assessment of the project and on their willingness to invest in it.

With policymakers: Participatory system analysis convenes a broad range of stakeholders and constituencies to produce information and evidence that can influence the design and improvement of policies. From the perspective of policymakers, strategies and initiatives for policy change that are the result of participatory systems analysis are more legitimate and have more political appeal than those that come from a project team.

Key applications:

- Collective understanding of the system.
- Collective visioning and planning.
- Trust building and communication between system actors (which enable smoother, more effective, more efficient implementation).

What Resources are Required to Use Participatory Systems Analysis?

Resources required will depend mainly on the nature of the issues/problems that the project sets out to address and the diversity of actors/perspectives and. Normally, issues/problems in a local system are complicated or complex. To accelerate the process you, here are some tips:

Prepare: do a good analysis within the team before you meet with the system actors.

Communicate: Use the analysis conducted with the team as a reference point for the collaborates.

Facilitation: Select the most engaging facilitators in your team to share the information. They must be able to break the ice with the participants in a short time.

Feedback: Mix different types of participants in small groups to discuss in depth about what they agree and disagree with the team's analysis and come up with broad strategies to address blockages and opportunities together.

Working groups: Take the lead and be proactive when forming and nurturing working groups to implement solutions. Invest heavily in follow-up calls and meetings with individual participants or small groups.

Resources Required Chart

Level	Preconditions/Goals	Time	Human Resources
Easy Complicated and low diversity i.e. vaccination programme for children in a small village	-The team can make significant progress doing their own analysis. -One-on-one interviews and focus groups can provide a significant volume of information that can lead to feasible and sustainable interventions.	1-3 days	1 facilitator with basic knowledge about the issue. If resources allow it, a support facilitator/observer
Medium Complicated and high diversity i.e. improvement of secondary education curriculum **Or** Complex and low diversity i.e. improving access of cane sugar from large plantations to international markets	-The team can make some progress on its own but requires more inputs from experts than in the "easy" scenario. -One-on-one interviews and focus groups can be done but real-time interactions gain importance. If the group is not very diverse, some decisions can be made via phone conferences and other virtual means. -In contexts of high diversity, workshop facilitation gains importance. Preparation, clear messaging, and facilitation skills become critical.	3-5 days per round It may require more than one round of analysis. Requires time for diverse actors to build trust and agree upon common objectives. Requires coaching and following up of working groups.	2 facilitators (1 lead and 1 support/observer) Thematic experts (depending on the issues that the participants raise and that cannot be addressed by facilitators)
Difficult Complex and high diversity i.e. improving the productivity of cocoa smallholder farmers (a crop with a high international trade	-The team must do its own analysis but mainly to identify strategic actors and prepare for potential conflicts. An ex-ante search for solutions may serve fundraising purposes but does little to put together a feasible, stakeholder-led action plan. -External experts are important, but it is important that they can interact with the system actors directly.	3-5 days per round It may require more than one round of analysis. Requires time for diverse actors to build trust and agree upon common objectives.	2 facilitators (1 lead and 1 support/observer) Thematic experts (depending on the issues that the participants raise and that cannot be addressed by facilitators

volatility) in a post-conflict, high migration context	-Interaction with people (from other systems) who have had experience in similar issues/problems can inspire key system actors to engage and invest. -One-on-one meetings (or meetings with similar types of actors) are important to find out the reasons why key actors are not participating or why they are hampering the process -Additional to very good workshop design and strong workmanship facilitation skills, it is necessary to have very good improvisation and conflict resolution skills/sensitivity.	Requires coaching and following up of working groups.	

5.4 WHAT ELSE SHOULD I KNOW ABOUT PARTICIPATORY SYSTEMS ANALYSIS?

It is a process. The final products, such as maps and work plans, are important to document the process but what is really important about PSA is the convergence, learning and trust-building that takes place as a result of the gathering and interactions between system actors.

- It is highly political. Actors will always prioritize the defense of their own interests and try to protect the status-quo if it benefits them or if it feels safer than untested solutions.
- It is highly influenced by cognitive biases and hampered by cognitive dissonance (the discomfort produced by new ideas that contradict existing ones).
- It can get messy and tense. PSA generates high levels of emotion. In most cases, it manifests in motivation to do things collaboratively; but it can sometimes manifest in conflict or resentment (especially when participants cannot voice their ideas/interests).

5.5 LIST OF EXTERNAL RESOURCES REQUIRED TO USE PARTICIPATORY SYSTEMS ANALYSIS.

Cynefin Framework (Snowden and Boone, 2007)

The framework is currently undergoing improvements but this article provides the basics.

The Operational Guide for the Making Markets Work for the Poor (M4P) Approach

A guide to thinking about who benitis, and who likely loses out.

Systems Practice Workbook (Omidyar Group)

This workbook aims to fill the gap between the promise of a systems approach for making social change and putting it into practice.

Participatory Systems Analysis an Introductory Guide (Tim Lynam, 2001)

This report provides a general overview of participatory systems analysis.

Participatory Systems Analysis Methods to Measure Impact (Karin Reinprecht, 2016)

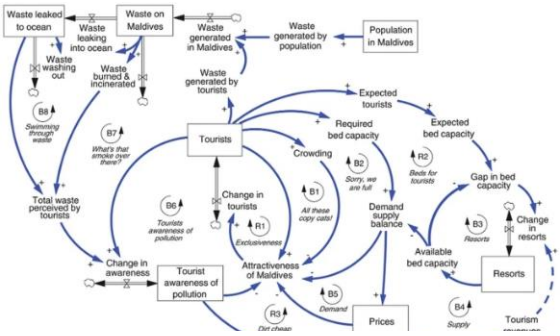
This report uses participatory approaches to understand the effect and impact of an International Labour Organization training intervention for rural women in Tanzania, Uganda and Kenya on their livelihoods.

6. SYSTEM DYNAMICS ANALYSIS

A computer-aided approach used for policy and strategy design.

6.1 WHAT IS SYSTEMS DYNAMICS ANALYSIS?

System Dynamics (SD) is a computer based modeling approach that aids in better decision making when encountering complex and dynamic systems, and provides tools and methods to model and analyze dynamic systems. Simulation modeling is used to and is applied to dynamic problems in complex social, managerial, economic, or ecological systems.



Full image can be found here.

The SD model consists of stocks and flows. Stocks are any entity (numerical value) that depletes or accumulates over time. Flows are the rate of change of a stock (this is usually a differential equation).

6.2 WHEN MIGHT I WANT TO USE SYSTEM DYNAMICS?

SD is most useful for aiding in developing "high-level strategic insights on dynamical questions". Systems Dynamics aids in thinking about dynamics as opposed to static models or individual events. It can help extensively play out the implications of an intervention, or theory. Through modeling you can produce outputs that show how different variables change dynamically. Modeling software can aid you to see how dynamics can emerge from feedback loops and as they change in strength and importance.

6.3 HOW TO CONDUCT SYSTEM DYNAMICS MODELING?

Conducting system dynamics modeling is listed below through six steps, this does not have to be done in sequential order, it is a process that allows you to jump back and forth.

Problem definition: a dynamical problem and system needs to be chosen, or a question (within the problem and system). With more experience the approach chosen will improve. Stakeholders and users of the system are often a part of the process of defining the problem.

Model conceptualization: with the use of causal loop diagrams, dynamic problems are mapped, and it will resemble boxes and connections.

Model formulation: the conceptual model will be fully specified and turned into quantified stock and flows. The specification process will entail you deciding what will be stocks, flows and what facts will affect flows. Additionally, equations that determine flow should be specified.

Validation and simulation: once the model is built, it's time to run the equations. This can be to explore the many scenarios, as part of validation or calibration.

Analysis: once model outputs are finalized, significant time should be spent to analyze, understand and present the results.

Interpretation: Once analysis is completed it is time to share and interpret the results with stakeholders and end users.

6.4 WHAT RESOURCES ARE REQUIRED TO USE SYSTEM DYNAMICS?

In order for researchers to conduct a systems dynamics analysis, you need to have access to modeling software. Current software for SD are listed below, these are the most commonly used for modeling is listed below:

- Dynamo
- iTHink
- STELLA
- Powersim Studio
- Vensim

6.5 WHAT ELSE SHOULD I KNOW ABOUT SYSTEM DYNAMICS?

Understanding what we want to model is important, it's critical that the target is defined. It is important to note:

- Modeling a whole system is not recommended.
- Sharing ideas with more experienced modelers is suggested regularly.
- It is important to think about what the outputs of the model will look like, you can sketch what the graphs will look like over time.

6.6 LIST OF EXTERNAL RESOURCES REQUIRED TO USE SYSTEM DYNAMICS ANALYSIS

Video on System Dynamics

Created by the System Dynamics Society this video highlights what Jay W. Forrester Professor of Management at the MIT Sloan School of Management, has to say about System Dynamics.

Loopy a Systems Dynamic Tool

This web based SD tool is an easy to use basic way to have a quick understanding of how to model dynamic systems. It can be used as a practice space, or it can be used to build simple models that can be shared.

On the Differences Between Theoretical and Applied System Dynamics Modeling (Vincent de Gooyert & Andreas Grobler, 2019)

This article gives a general overview of SD and provides evidence on the differences between theoretical and applied system dynamics modeling.

System Dynamics Modeling in Health and medicine: a Systematic Review(Negar Darabi & Niyousha Hosseinichimeh, 2020)

This article is a systematic literature review of Systems Dynamics and its application in health and medicine from 1960 to 2018.

Systems Dynamics Helps Farmers Escape Poverty Trap in Guatemala (Systems Dynamic Society, 2023)

This article highlights the successful application of system dynamics analysis through the implementation of policies supporting small-scale farming and counteract effects of climate change.

Online Course Catalog for Systems Dynamics

This catalog by the systems dynamic society is a comprehensive list of courses surrounding basic to advanced modeling and understanding systems dynamics.