ACDI VOCA

Expanding Opportunities Worldwide

Systems Diagnostic Tool

Understanding System Health

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Acknowledgements

The framework has been developed and drafted by Ydun Donahoe, Dun Grover, and Hayden Aaronson. It is based on interpretive structural modeling and MICMAC (Cross-Impact Matrix Multiplication Applied to Classification) analysis developed by Michel Godet Ahmad, Mahmood, Xiao-Wei Tang, Jiang-Nan Qiu, and Feezan Ahmad.[1] Thank you to the many ACDI/VOCA staff, partners, and stakeholders that contributed to the testing and implementation of this framework in Colombia, Ghana, Honduras, Serbia, and Tajikistan. Please direct any questions to Ydun Donahoe at ydonahoe@acdivoca.org.

[1] Michel Godet Ahmad, Mahmood, Xiao-Wei Tang, Jiang-Nan Qiu, and Feezan Ahmad. 2019. "Interpretive Structural Modeling and MICMAC Analysis for Identifying and Benchmarking Significant Factors of Seismic Soil Liquefaction" Applied Sciences 9, no. 2: 233. https://doi.org/10.3390/app9020233

Introduction

Where to intervene is one of the most critical challenges a project will face. The diagnostic approach[2] is based on the idea that there may be many reasons why an economy does not grow inclusively that are distinct to that country and context. **The Systems Diagnostic is a Signature ACDI/VOCA Tool designed to help make sense of how systems function and to identify factors that provide high areas of leverage for broader systems change.**

> **Systems Change** - Changes that scale beyond a few individual parts to the entire system and includes profound shifts in how the whole system functions, including less-observable changes that endure across time horizons extending from years to decades.
>
> **Factors** - Factors are defined as a circumstance, attribute, or influence that contributes to a result or outcome in a market system. A project that envisions an improved policy system for high-quality horticulture products, for instance, may find that factors influencing this outcome are the legal and regulatory framework (e.g., food safety), institutional capacity, laboratory services, extension and information services, among others.
>
> **Structural Analysis** - Structural analysis models system factors and factor relationships to categorize and prioritize system factors and, importantly, identify where to intervene to maximize impact and transform the system.

The Diagnostic[3] provides a methodology for selecting high-leverage factors that are the backbone for our market and food systems change strategies. While most of ACDI/VOCA's work focuses on market and food systems, the Diagnostic can be used to understand any type of complex system. ACDI/VOCA must be systemic in all parts of our work—not just how we transforms markets, but also how we transform social systems. The Diagnostic can be used to explain how gender and other social systems need to change to be more inclusive and equitable.

> **Benefits of the Systems Diagnostic**
>
> - ✓ Improves decision making and increases the potential for interventions to contribute to systems change
> - ✓ Identifies emergent opportunities to pilot or integrate learnings into activities
> - ✓ Can be used during multiple points of the project life cycle to adapt program and partnership strategies

Principles of the Systems Diagnostic

The approach used in this Diagnostic goes beyond just looking at individual actors' behaviors in a system to looking at the system as a whole. We explore how factors, from power dynamics to networks, are driving the overall system performance. This broader view helps us see beyond immediate behavior changes and consider deeper, more impactful changes.

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[2] ACDI/VOCA's diagnostic method using structural analysis methodology was originally piloted and developed under the USAID Transforming Market Systems (TMS) Activity in Honduras by a team including a local university – the National Autonomous University of Honduras – with the support of Dun Grover and Jeff Walters.

3 The diagnostic method is based on the structural analysis method of M. Godet et al. and the growth diagnostic method of Haussman et al.

Principle 1: Diverse perspectives are needed to make sense of the system as a whole.

Engaging diverse perspectives of both internal and external stakeholders is core to making sense of a system. Understanding how a system functions is not just the domain of experts, but also considers the perspectives of participants and actors in the system. *Who gets to decide what is or isn't part of the system? Are they the right people?* These questions improve the legitimacy and the completeness of systems assessments.[4] Systems are not machines. They are constructs of people; if we don't understand the values and beliefs of people that created these systems, then we aren't understanding the system at all, we are solely projecting our own beliefs of what the system is.

Principle 2: Focus on the interactions between parts of a system.

There is a saying that systems are more than the sum of their parts; they are the product of their interactions. This is because no single issue or cause exists in isolation. That issue is linked, directly or indirectly, to everything else in the system. Imagine the issue of crime. Is crime the issue? Or is it lack of jobs? Or lack of education? Or all of the above? Or more likely, it is how the educational system is preparing youth with skills for employment in the jobs the private sector requires. Its failure to do so creates a larger underemployed population of youth, who are disillusioned and—without access to a better opportunity—choose to engage in local gangs and crime. The prevalence of crime and gangs might deteriorate the quality of education and reinforce this cycle. You can see, it is not only one thing but how those many things are interacting together as a complex whole. The Diagnostic is about making sense of these complex dynamics.

Principle 3: Focus on a few strategic things. (Don't do it all.)

Projects applying a systems approach typically do not address all factors. Instead, they will tend to influence a few strategic factors with the expectation others will change. This is because factors are interrelated; some have a more significant influence (and less dependence) on others. Prioritizing these root causes, leverage points, or other terms for strategic factors is often essential to helping make systems assessments manageable. As we define the interactions between priority factors, we can then use tools like root cause analysis and causal loop diagramming to get at what strategic areas we want to influence.

Principle 4: Systems assessments are required during multiple points of the project life cycle.

Teams must integrate systems assessments into their regular project cycles. Assessments should be conducted in practical ways to inform programmatic decision-making, avoiding overwhelming project teams, undermining local capacity, and taxing clients' patience. Furthermore, our understanding of systems will inevitably change over time as we learn and discover more about the system. This learning will require us to make changes about who and what we are assessing to improve the validity of our system assessment over time. These changes will shift how we define the system and subsequently the areas in which we hope to intervene to influence systems change.

4 Bob Williams. Systemic Evaluation Design. A Workbook Retrieved from: http://bobwilliams.gumroad.com/l/evaldesign

Principle 5: Systems change outcomes happen at different levels.

There is a range of theories and definitions of different kinds of outcomes, but we should consider our own. Systems change at different scales: (1) the individual level of households, organizations, etc.; (2) the meso-level of communities, networks, supply chains; (3) the institutional level of the public, private and cultural institutions, etc.; (4) and the meta-level of societal values, belief, etc. Generally, the higher the level in the system, the more significantly the systems change.

Applications in the Field

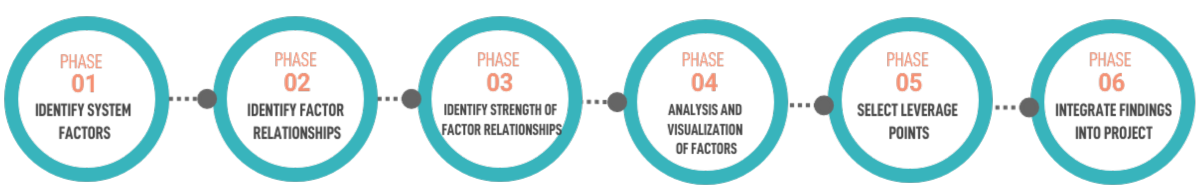
ACDI/VOCA has integrated the Systems Diagnostic Tool into its inclusive systems approach in Colombia, Ghana, Honduras, Serbia, and Tajikistan. Insights from diagnostics are interpreted by ACDI/VOCA's project teams into initial system change strategies, which identify places to intervene in the system for greatest impact. Equipped with this knowledge around intervention points and system dynamics, teams develop workplans, activities, learning agendas, and partnerships that are guided by a clear vision for systems change. While ACDI/VOCA typically uses the Systems Diagnostic during project inception, projects can apply it at any point in the program cycle, such as part of annual or mid-term reviews or after a significant shock that disrupts systems. Examples from these diagnostics are provided throughout the methodology section below.

Methodology

The Diagnostic starts by prioritizing the most relevant determinants of change within a system (e.g., policies, practices, resource flows, relationships, power dynamics, and mental models). Relying on formative systems analyses (e.g., value chain/end market analyses; political economy analysis; gender, youth, and social inclusion analyses, etc.) as well as participatory systems analysis methods, such as whole-system-in-the-room (WSR), the Diagnostic identifies a shortlist of factors that are then prioritized by a group of system analysts. The Diagnostic then applies structural analysis to understand the relationships and causality between systems factors. Final systems change strategies are co-created with key stakeholders to ensure feasibility and buy-in to the vision for change.

The stages of the diagnostic process can vary based on a project's preferred approach and timeline. The Systems Diagnostic, using the structural analysis methodological framework, proceeds in six phases:

Graphic 1: The six phases of the Systems Diagnostic.



Each phase is comprised of one or more steps, for a total of 10 steps. An overview of all steps is found in Graphic 2 and explained in detail in this section. While this framework aims to succinctly present the core requirements and considerations for each step of the analysis, in practice, the complexity and implementation plan of each step will vary depending on the scope, timeline, and needs of each unique project. A selection of examples from ACDI/VOCA's projects illustrate considerations for implementation.

Graphic 2: Overview of the 10 steps to complete all six phases of the Systems Diagnostic.

Step 1 – Frame the goals.

Identify the set of goals to influence or achieve with structural analysis and bound the system.

Outputs:

- Prioritized outcomes and systems identified.
- Relevant system actors identified.
- Information inputs needed to design stakeholder engagement plans identified (Step 2).

Step 2 – Listen to stakeholders and review the literature.

Learn about outcomes or issues from a variety of perspectives and begin building relationships with potential project partners that have high interest and influence in system outcomes.

Output:

- Understanding of priority outcomes in the system is improved.
- Relationships developed with key system actors (potential project partners).
- Quality information from diverse perspectives available to identify system factors (Step 3).

Step 3 – Identify key factors.

Identify the key factors that form the system underlying the priority outcomes.

Output:

- Comprehensive list of system factors refined.
- Factor definitions and their context domains drafted.

Step 4 – Find interactions between factors.

Discover factor interrelationships and understand the deeper causal structures that underly system performance.

Output:

- A set of direct, causal factor relationships is organized into the Factor Relationship Matrix.
- The polarity (+/-) of direct, causal factor relationships is organized into the Polarity Matrix.

PHASE 03
IDENTIFY STRENGTH OF FACTOR RELATIONSHIPS

Step 5 – Rank the strength of pairwise influences and complete the pairwise relationship matrix.

Enlist experts to validate and evaluate the set of factor relationships produced in Step 4. Enter the final influences scores into the Pairwise Strength Matrix.

Output:

- The strength of direct, causal factor relationships in the system is known and recorded in the Pairwise Strength Matrix.
- Direct influence and dependence scores are calculated from the Pairwise Strength Matrix.
- Factors are ranked by direct influence and dependence scores.

PHASE 04
ANALYSIS AND VISUALIZATION OF FACTORS

Step 6 – Score factors according to their influence and dependence on other factors in the system.

Determine each factor's indirect influence and dependence scores using the MICMAC technique.

Output:

- Six MICMAC reports are available.
- Factors are ranked by direct and indirect influence and dependence scores.
- Initial visualizations of system interactions and causal structures are available.

PHASE 05
SELECT LEVERAGE POINTS

Step 7 – Categorize factors by leverage.

Use comparative ranking to categorize factors into tiers based on their indirect influence and dependence scores.

Output:

- Factors are categorized by tier.
- Leverage point factors are identified.

Step 8 – Causal loop analysis of leverage point factors.

Develop causal loop diagrams and causal flow diagrams for each leverage point factor to visualize system dynamics.

Output:

- Causal loop and causal flow diagrams are available for each leverage point factor.

Step 9 – Conduct a Systems Change Strategy Stakeholder Workshop.

Facilitate a participatory discussion with stakeholders.

Output:

- Stakeholder validation of leverage point factors and determination of feasibility and strategies for influencing systems change.

PHASE 06
INTEGRATE FINDINGS INTO PROJECT

Step 10 – Integrate findings into systems change strategy and learning agenda.

Complete systems change strategy templates for each leverage point to guide the design and management of partnerships and pilot initiatives as well as the key learning questions we will continually monitor.

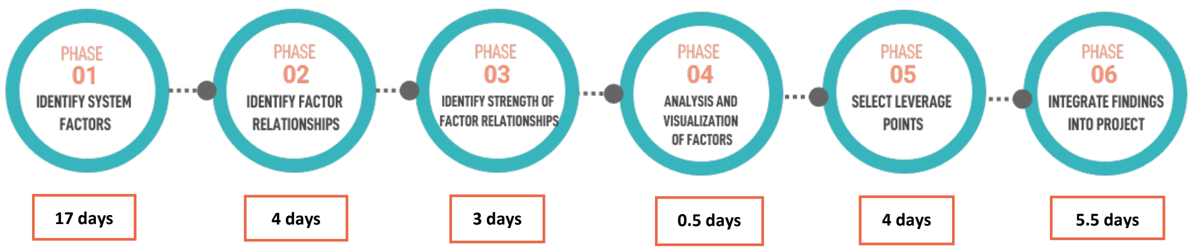
Output:

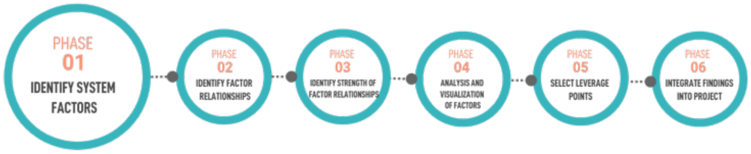
- Improved understanding of the system is incorporated into activities, workplans, theory of change, partnership strategy, and other practical applications of the findings, including the learning agenda or pilot projects to test learnings about the functioning and dynamics of the system.

Team Roles – It is recommended that the Diagnostic be led by a team of systems analysts comprising a mix of either technical leads, project component or systems leads, and local research and learning partner staff or outside experts. The team should include diverse technical perspectives, including a gender, youth, and social inclusion (GYSI) technical expert. The team should be comprised of three to five team members, including a team leader to coordinate work.

Level of Effort – A comprehensive Systems Diagnostic with a team of five systems analysts, including one lead analyst, would require 32 days level of effort (LOE) at the inception phase of the project. The allocation of 32 days LOE by phase is provided below in Graphic 3, and a more detailed breakdown of LOE is provided in Annex 1 for two types of diagnostics: comprehensive (32 days LOE) and lighter touch (18 days LOE).

Graphic 3: LOE estimates by phase to complete a comprehensive, startup Systems Diagnostic.





Phase 1: Identify System Factors

Step 1 – Frame the goals.
Identify the set of goals to influence or achieve with structural analysis and bound the system.

Outputs:
- Prioritized outcomes and systems identified.
- Relevant system actors identified.
- Information inputs needed to design stakeholder engagement plans identified (Step 2).

Step 2 – Listen to stakeholders and review the literature.
Learn about outcomes or issues from a variety of perspectives and begin building relationships with potential project partners that have high interest and influence in system outcomes.

Output:
- Understanding of priority outcomes in the system is improved.
- Relationships developed with key system actors (potential project partners).
- Quality information from diverse perspectives available to identify system factors (Step 3).

Step 3 – Identify key factors.
Identify the key factors that form the system underlying the priority outcomes.

Output:
- Comprehensive list of system factors refined.
- Factor definitions and their context domains drafted.

Step 1 | Identify system objectives and bound the system.

The systems analysts begin by articulating and agreeing on the project's development objective(s). Objectives, in most cases, are determined by the donor or stated in the high-level theory of change (TOC) of the project. Next, we define systems by the set of functions that comprise it and relate how improved functions of the system help achieve the development objective. This framing will make it more evident what actors and factors are part of the analysis.

Best practices and tips for framing systems assessments:

- To assess a system, start by defining the system that is changing.
- Bound the system by defining who and what we consider to be part of the system.
- Make assumptions about the system explicit and ensure equitable representation from women, youth, people with disabilities, or other marginalized social groups.
- Effective participation requires a degree of common or shared framing of the system.
- System boundaries *will* and *should* change over time as we learn more about the system.

Define How the System Functions. Articulate a clear set of impacts we want to achieve. Impact is often determined by the project's target group (or participant group) and an outcome we want to achieve for them, such as increased employment for disadvantaged youth in Colombia. Next, define the *function* of the system that generates that impact. Functions in the spice sector, for example, would include inputs, extension services, market information services, processing, standards, and regulations, etc. Take time to define the system's functions and think through multiple perspectives for why diverse actors engage in the system. For example, input suppliers in the spice sector may include government laboratories, public or private sector nurseries, and pruning service providers, among others. Systems function for different people in different ways. Their interests in each function will change how they value change in the system. Differences in participants' views of functions (particularly among men, women, and youth as well as different system actors) have implications for the sets of actors, what issues to consider, and how change in a system is valued. For example, women food vendors may highly value both the economic benefits as well as the social benefits of participating in a market system.

Bound the System. Bound the system by defining who and what we consider to be part of the system. Boundaries may seem straightforward, but they are much more complex to define. Systems may be bound by sector, demographic, and other considerations. Take an agricultural input system. It may seem evident that distributors and retailers are part of that system. But are seed growers, regulators, transporters, and financiers part of the input system? These are the decisions that technical teams and managers must make when assessing the system. There may be no correct answer. But it is essential to be explicit about our assumptions.

Note On Sectors. Many system-level change initiatives are developed in the context of a select sector or economic activity (i.e., the donor would like a systems approach to address a given need, often with an explicit statement to work in a particular industry or on a specific problem). However, sectoral boundaries leave out important parts of the multiple systems they cut across. If we bound a system by the value or sector, such as defining a "maize system," we recommend following the guidance of a recent paper[5] on assessing systems change to go beyond the primary system and consider the supporting systems. However, **our preference is that we bound systems by the function it serves for actors within that system**. This makes it more likely that we will consider the relevant conditions for the system to change and not exclude (or create blind spots about) those parts simply because they fall in a parallel sector or activity. Orienting our understanding around system function is also a helpful practice to start to see systems more holistically and understand areas for leverage. Note that the United States Agency for International Development (USAID) provides guidance on bounding systems through its Practitioner's Guidance To Assessing Systems Change.

Define the Factors in the System. Starting to define the factors (i.e., aspects of the system that if altered or addressed could lead to desirable system change) is also part of bounding systems.[6] These factors can be considered constraints or anything that prevents the system from achieving its purpose or goal. Many factors are discovered or revealed throughout implementation, explaining why boundaries must shift over time. Find more guidance on identifying factors in Step 3: Identify Key Factors.

Identify System Actors. Define who is and isn't part of the system. This can be challenging since complex systems are interconnected. **We suggest following the rule that if we remove that actor from the**

[5] Hans Posthumus, Adam Kessler, et al. (2021). *A Pragmatic Approach to Assessing System Change.* DCED
[6] The topic of factors is discussed further in the outcomes section of this document.

system, and the system doesn't function or its function is significantly different, we should consider that actor as part of the system. Once goals, systems, and actors are identified, you will know the required range of diverse perspectives from system stakeholders to undertake a comprehensive analysis of the system. The scope and complexity of the systems and stakeholders in this step affect the scope and complexity of the analysis, such as the level of stakeholder engagement in Step 2.

Outputs:

- → **Prioritized outcomes and systems identified**
- → **Relevant system actors identified**
- → **Information inputs needed to design stakeholder engagement plans identified (Step 2)**

Roles & LOE:

- → **Lead analyst facilitates team meeting with systems analysts to get consensus and take decision on outputs (1 day)**

Practical Example 1: Identifying objectives and gathering diverse perspectives in Colombia

The Youth Resilience Activity (YRA) in Colombia, funded by USAID and implemented by ACDI/VOCA, prioritized the outcome of improved youth psychosocial and life skills. When deciding what parts of the system to include, YRA considered multiple social and environmental sub-systems impacting youth's positive development: (1) health; (2) mental health and case management service systems (CSO/NGO, public, and private providers); (3) infrastructure, including physical spaces for recreation and extracurricular activities (public and private sector); (4) policy and regulatory systems (youth councilors, public policy, etc.); (5) norms and behaviors (shifting mental models, communications and social behavior change initiatives, etc.); (6) familial and peer support networks; (7) education; and (8) workforce development and labor market systems. To inform its initial understanding of the issues affecting youth resilience, YRA conducted several complementary studies during project inception: risk assessments, economic analysis, network analysis, and gender and social inclusion analysis.

Step 2 | Listen to stakeholders and review the literature.

The systems analysts should conduct a thorough literature review and participatory, multi-stakeholder engagement to gather insights on the system from different perspectives. If the project has already carried out a comprehensive inception phase analyses, then this step may not be needed. Multi-stakeholder engagement can take many forms, including stakeholder consultations and key informant interviews, WSR, and focus group discussions. (See the below list of ACDI/VOCA's participatory systems analysis methodologies.) Facilitating dialogue among participants during workshops helps provide deeper insight into the topics being explored beyond common, surface-level explanations. While this step is focused on learning about the system from a diverse and complete set of key system actors, it is simultaneously an opportunity to begin building relationships with potential project partners.

ACDI/VOCA typically prioritizes partners with high levels of interest in a system outcome and a high level of influence in moving the change forward. **ACDI/VOCA also seeks to bring in diverse and marginalized voices into these conversations**, as constraints to systems performance are typically disproportionately experienced by and impact these groups. We have found that to have meaningful participation from these groups, power dynamics within stakeholder processes need to be well understood and accounted for. One tactic to consider is to include key stakeholders, such as youth, in early-stage research that they are bringing into participatory workshops so that they feel empowered and equipped to participate and share relevant knowledge based on their involvement in earlier analyses.

Note: *The idea is not to limit your understanding of the system to things you already know (i.e., your expertise) or have experienced before, especially as an outsider.* ***It is most important to have systems actors define what matters to them****. Similarly, when conducting literature reviews, we need to be acutely aware that systemic biases may contort our representation of the system.* ***The types of literature you may consult should be diverse****. For example, consider both economic and socio-anthropological literature as well as newspapers and media to uncover diverse perspectives of the system.*

ACDI/VOCA's Participatory Systems Analysis Tools & Methodologies

ACDI/VOCA has a suite of participatory systems analyses methods that are useful for bringing in a diverse range of stakeholders and perspectives to discuss the most important factors and key actors underlying the systems performance.

1) Whole-System-in-the-Room – Large workshop structured around FSG's framework for the following conditions for systems change: (1) behaviors and practices; (2) relationships and networks, stocks and resource flows (knowledge, people, natural resources, etc.); (3) diversity of elements (products, services, etc.); (4) standards and policies; and (5) power dynamics.
2) USAID's 5Rs Framework – Smaller focus group to analyze the five key dimensions of systems: results, roles, relationships, rules, and resources.
3) Root Cause Analysis – Smaller focus group discussion that is an excellent tool for thinking through every probable or likely factor or issue that is at play in the system. The root cause analysis should first be done internally within the project and then again with other external stakeholders.
4) Three Horizons Framework – Aids teams in thinking about current assumptions, emerging changes, and possible and desired future outcomes.
5) ACDI/VOCA Technical Strategy Worksheet – The technical strategy worksheet is useful for new business teams to bring in outside stakeholders to develop a high-level technical strategy.
6) Market Actor Focus Group Discussion Guides – The focus group discussion guides provide questions that probe at systems-level trends around competitiveness, resilience, and inclusion.

Output:

→ **Understanding of priority outcomes in the system is improved.**
→ **Relationships are developed with key system actors (potential project partners).**
→ **Quality information from diverse perspectives is available to identify system factors (Step 3).**

Roles and LOE:

→ **Systems analysts carry out literature review. (5 days)**
→ **Systems analysts conduct participatory systems analyses. (5 days)**
→ **Systems analysts prepare for and conduct the whole-system-in-the-room workshop. (3 days)**

Practical Example 2: Whole-System-in-the-Room Workshops in Ghana and Tajikistan

The Feed the Future Ghana Market Systems and Resilience Activity and the Market Driven Rural Development Activity in Tajikistan, both funded by USAID and implemented by ACDI/VOCA, engaged with a diverse set of system stakeholders through a series of locations (Ghana) or sector-specific (Tajikistan) systems workshops. Workshop participants were strategically selected to represent the whole set of system actors. Each workshop held breakout sessions comprised of six discussion groups with each group assigned to discuss a key determinant of system functioning: (1) behaviors and practices; (2) relationships and networks; (3) resource flows; (4)diversity of elements; (5) standards and policies; and (6) power dynamics. (See Step 3 for details on each determinant.) Facilitators synthesized systems determinants worksheets and discussion notes from multiple workshops into a comprehensive set of system factors for their respective system determinant. Systems Determinants Worksheet Guide and Template: Microsoft Word and Excel.

Step 3 | Identify key factors.

There are two suggested frameworks that ACDI/VOCA uses to analyze market or food systems to determine the key factors of system performance: USAID's 5Rs Framework and FSG's Determinants of System Performance Framework.

1. ***USAID's 5Rs Framework.*** The 5Rs highlight the five key dimensions of systems: results, roles, relationships, rules, and resources. For more, see 5Rs Framework in the Program Cycle.
2. ***FSG's Conditions of System Performance Framework.*** The framework identifies the core determinants of system performance: (1) behaviors and practices; (2) relationships and networks, stocks and resource flows (knowledge, people, natural resources, etc.); (3) diversity of elements (products, services, etc.); (4) standards and policies; and (5) power dynamics. Each determinant is described below in Table 1 and accompanied by illustrative factors.

Table 1: Determinants of System Performance

DETERMINANT	GETTING TO THE DESIRED CHANGE	DEFINITION OF THE DETERMINANT	ILLUSTRATIVE FACTORS
Behaviors and Practices	What new practices and actions are needed to achieve the desired change?	This determinant refers to the new practices and behaviors that need to be in place, and the market actors that need to apply them, to achieve the desired change. New practices may include new management practices or technologies adopted by organizations or new habits or behaviors adopted by individuals.	Formalization of Business Practices Integrated Service Delivery
Relationships between actors (Networks)	How can the interactions between stakeholders be improved to	This determinant refers to actors interacting in different ways to achieve the desired change. Relationships consider how individual actors communicate, coordinate,	Market Information Family and Friends

	achieve the desired change?	collaborate, and compete as part of networks. The quality of these interactions has a significant influence on the functioning of the system.	
Voice and agency	How do diverse populations express opinions, make decisions, and act on them?	This determinant refers to how diverse populations express opinions, make decisions, and act on them across different levels of systems—from individual and household to markets and broader society/the public sphere.	Youth Agency
Access to resources	What access to resource flows is needed to achieve the desired change?	This determinant refers to the flow of resources into a system to achieve the desired change. Systems depend on resources such as people, money, knowledge, infrastructure, natural resources, and others to function.	Transportation Infrastructure Entrepreneurship Support Services
Diversity and composition	What diversity of elements is needed in the system to achieve the desired change?	This determinant refers to the level of diversity in a system to achieve the desired change. Diversity can include the variety of people, practices, channels, products, services, or other important elements of a system. The level of diversity in a system enables it to innovate and adapt better to change.	Diversity of Financial Products Access to Agricultural Inputs
Standards and Policies	What changes in rules and policies are necessary to achieve the desired change?	This determinant refers to changes in policies and rules to achieve the desired change. These rules include laws and regulations, whether formal or informal, that govern behaviors within the system. Rules include the mechanisms (legal and social) that enforce sanctions and shape incentives for behaviors in the system.	Adoption of Grades and Standards Food Safety System
How power is distributed and exercised (Power Dynamics)	What redistribution of power is necessary to achieve the desired change?	This determinant refers to changes in power within the system to achieve the desired change. Power refers to authority and influence over others. Power can be based on position in a hierarchy; having specific knowledge, information, or relationships with others; and/or the ability to coerce or reward others.	Crime and Violence Institutional Confidence and Trust

Mental models or subconscious, values, beliefs	How do system actors' beliefs influence the system?	This determinant refers to deeply held beliefs and assumptions and "taken-for-granted" ways of operating that influence how we think, what we do, and how we talk.	Perceptions of Entrepreneurs Value/respect business owners

Depending on the system, it may make sense to use other frameworks or overlay them. For example, USAID's Positive Youth Development (PYD) framework could be overlayed when considering systems and outcomes such as youth inclusion or resilience.

An integrated structure for stakeholder engagement and identification of system factors makes selection of key factors quicker and easier. It may be the case, as it was in Ghana and Tajikistan (See Practical Example 2), that it makes sense for system workshops to be organized around the Conditions of System Performance Framework. Using ACDI/VOCA's System Determinants Worksheet Guide and Template when facilitating workshops with stakeholders, participant perspectives are compiled for each determinant and factors are defined, discussed, and distilled during and after the workshops by participants and project staff. The template includes tabs to track and organize factors.

Tips for Identifying Factors:

- Draw on all information from previous steps to identify system factors, including inception analyses and literature reviews.
- **Define factors without the use of adjectives or direction**, such as using "Access to Financial Services" rather than "Increased Access to Financial Services" or "Good Financial Services."
- The process of defining factors is iterative. For example, two factors may be considered distinct during Phase 1 of the Diagnostic, but further evaluation (during Steps 4, 5, or 8) may reveal a close interrelationship whereby the two similar factors can be considered as one combined factor in the analysis. For example, one project grouped three variables, drug use, physical and psychological violence, and theft (which were interdependent on each other and had similar relationships with other factors in the system) as a single, higher-level factor: crime and violence. Similarly, with additional context, another project redefined the factor inclusion and discrimination as respect and valuing diversity.
- **As a rule of thumb, aim for 15 to 20 factors**. The intention at this phase is not to reduce the factors to those you perceive as the most important, but to develop as complete a list of factors as possible.
- For each factor, articulate the factor definition and context domain. Context domain is defined as the circumstances that provide a common understanding of the factor. Table 2 below provides an illustrative list of definitions and context domains for a selection of factors.
- There is a tendency for systems approaches to be viewed as synonymous with behavior change. Shifts in behaviors (and practices) are indeed part of systems change, but there are almost always other *types* of necessary outcomes.

Table 2: Illustrative Factors with Factor Definitions and Context Domains

FACTOR	DEFINITION	CONTEXT DOMAIN
Youth Skills Development	Public, private, or civil society initiatives related to identifying youth skills gaps and developing and honing youth skills.	Asset – Initiatives can consist of training, education, and experiential learning exercises where youth learn leadership, psychosocial, and/or life skills; gain education competencies; acquire business, entrepreneurial, and financial literacy skills; and learn about sexual and reproductive health.
Entrepreneurship Support Services	The ecosystem of organizations providing incubation, acceleration, and business development services.	Enabling Environment – Availability of accessible, affordable, and valuable services that equip stakeholders with the expertise, finance, management capacity, and networks to stimulate entrepreneurship and innovation.

Output:

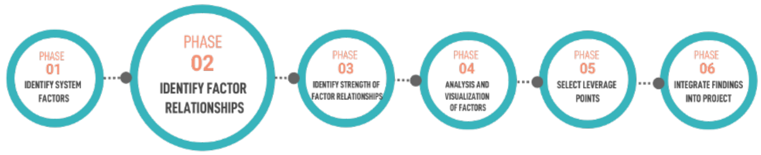
- → **A comprehensive list of system factors is refined.**
- → **Factor definitions and their context domains are drafted.**

Roles and LOE:

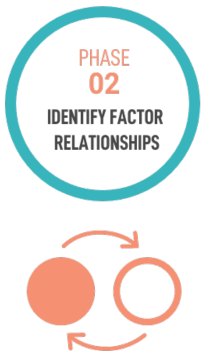
- → **Lead analyst drafts factor definitions and context domains. (1 day)**
- → **Systems analysts review and meet to discuss key factors. (1 day)**
- → **Lead analyst revises and finalizes key factor list. (1 day)**

Practical Example 3: Factor Coding Method in Colombia, Ghana, Honduras, Serbia, and Tajikistan

ACDI/VOCA-led projects in Colombia, Ghana, Honduras, Serbia, and Tajikistan identified the list of key factors using an open coding method wherein analysts (a) reviewed stakeholder WSR and systems worksheets, reports, and narratives; (b) created a list of factors and definitions; (c) compared, merged, or selected factors as new perspectives were made available; (d) identified the context domain for selected factors; and (e) re-analyzed and re-labeled factors as necessary following internal review with a wider range of technical experts.



Phase 2: Identify Factor Relationships



Step 4 – Find interactions between factors.

Discover factor interrelationships and understand the deeper causal structures that underly system performance.

Output:

- A set of direct, causal factor relationships is organized into the Factor Relationship Matrix.
- The polarity (+/-) of direct, causal factor relationships is organized into the Polarity Matrix.

Step 4 | Find interactions between factors.

The next step requires identifying the causal relationship across each factor using the Factor Relationship Matrix. (See Factor Relationship Matrix template.) The Factor Relationship Matrix is illustrated below with all factors listed in the same order on each axis. Starting with factors listed on the left-hand side (rows), begin with the uppermost factor, Factor A, and move downward (rows). For each Factor (rows), proceed by determining if the factor directly influences each factor in the row. To do this, systematically compare pairs of factors to identify their influence, also referred to as pairwise influence. Pairwise influences must meet certain conditions (listed below) to be considered direct and causal. Only these direct, causal pairwise relationships are carried forward in the structural analysis.

Evaluate (based on your understanding of the system) each pair to see if they meet three conditions:

1. Evaluate whether Factor A influences Factor B (and that the relationship is not the inverse where B influences A).
2. If Factor A influences Factor B, evaluate whether Factor A's influence on Factor B is **causal** and not a simple correlation.
3. If Factor A influences Factor B, and the relationship is causal, evaluate if Factor A influences Factor B **directly** and is not an indirect influence. An indirect influence would be a case where Factor A influences Factor C, which then influences Factor B (i.e., Factor A does not directly influence Factor B).

If all three conditions are met for the pairwise relationship, then conclude that factor A has direct, causal influence on Factor B. The pairwise influence of Factor A on Factor B thus moves into Step 5 of structural analysis.

Continue evaluating all factors along the top (columns). Table 3, Factor Relationship Matrix Guidance, illustrates the process: Starting with Factor A (row), does Factor A (row) have a direct, causal influence on Factor A (column)? Does Factor A (row) have a direct, causal influence on Factor B (column)? Does Factor A (row) have a direct, causal influence on Factor C (column)? And so on, for each factor (column).

"N/A" indicates that the entry is "not applicable" because factors do not have direct, causal influence on themselves.

Table 3: Factor Relationship Matrix Guidance

On: / Influence of:	FACTOR A	FACTOR B	FACTOR C	(CONTINUE LISTING ALL FACTORS)
FACTOR A	N/A	A influences B?	A influences C?	…
FACTOR B	B influences A?	N/A	B influences C?	…
FACTOR C	C influences A?	C influences B?	N/A	….
(CONTINUE LISTING ALL FACTORS)	…	…	…	N/A

Using an example from the Feed the Future Ghana Market Systems and Resilience Activity, in Table 4 below, the factor Water Management (row, italicized) does not have a direct, causal relationship with any other factors (column). The factor Agricultural Extension and Information Dissemination (row, in bold) has a direct, causal relationship on Water Management, Use of Improved Agricultural Inputs, and Certification of Agricultural and Food Products, notated with the code "D" and light red fill in the corresponding cells.

Table 4: Feed the Future Ghana Market Systems and Resilience Activity Factor Relationship Matrix: A subset of the project's direct, causal relationships is coded using "D" and shaded.

On: / Influence of:	WATER MANAGEMENT	AGRICULTURAL EXTENSION AND INFORMATION DISSEMINATION	COMMERCIAL-IZATION OF RESEARCH	USE OF IMPROVED AGRICULTURAL INPUTS	CERTIFICATION OF AGRICULTURAL AND FOOD PRODUCTS	FINANCIAL SERVICES	STORAGE AND WARE-HOUSING
WATER MANAGEMENT							
AGRICULTURAL EXTENSION AND INFORMATION DISSEMINATION	D			D	D		
COMMERCIALIZATION OF RESEARCH		D		D			
USE OF IMPROVED AGRICULTURAL INPUTS							
CERTIFICATION OF AGRICULTURAL AND FOOD PRODUCTS		D					
FINANCIAL SERVICES	D			D			D
STORAGE AND WAREHOUSING					D	D	

Note: *When determining correlation, you should consider the nature of the relationship as it exists within the current context and not within an ideal scenario of a healthy system.*

Practical Example 4: Factor Labels and Definitions in Colombia

The Youth Resilience Activity in Colombia initially determined that Education Access had a direct, causal influence on Youth Agency. The thinking was that greater access to education would directly influence youth's capacity to act independently and make their own choices. After some debate, analysts determined the relationship was indirect, whereby education access indirectly influences youth agency through youth skills development. Since the relationship between Education Access and Youth Agency was deemed indirect, the factor relationship did not meet the three conditions for pairwise relationships and was not carried forward in the structural analysis process.

Next, for each direct, causal pairwise relationship, enter the relationship polarity as Increases (I) or Decreases (D) in the square Polarity Matrix (Polarity Matrix template). The Polarity Matrix is illustrated below in Table 5 with an example entry showing that Factor B (row) has a direct, causal influence on Factors A and C (columns). Both of those influences are increasing (I), meaning that increasing or improving Factor B (row) will increase or improve Factors A and C (columns).

Table 5: Polarity Matrix Guidance

On: Influence of:	FACTOR A	FACTOR B	FACTOR C	(CONTINUE LISTING ALL FACTORS)
FACTOR A	N/A			…
FACTOR B	I	N/A	I	…
FACTOR C			N/A	….
(CONTINUE LISTING ALL FACTORS)	…	…	…	N/A

Using the same example from the Feed the Future Ghana Market Systems and Resilience Activity, enter the polarity of each pairwise relationship from the Factor Relationship Matrix in Table 4. As demonstrated in Table 6, all pairwise relationships are determined to be increasing (I).

Table 6: Feed the Future Ghana Market Systems and Resilience Activity Polarity Matrix

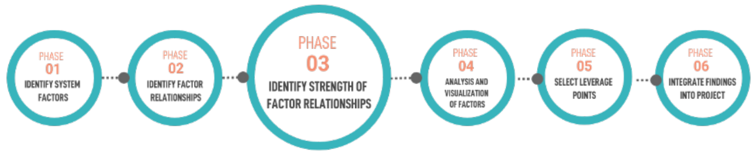
On: Influence of:	WATER MANAGEMENT	AGRICULTURAL EXTENSION AND INFORMATION DISSEMINATION	COMMERCIAL -IZATION OF RESEARCH	USE OF IMPROVED AGRICULTURAL INPUTS	CERTIFICATION OF AGRICULTURAL AND FOOD PRODUCTS	FINANCIAL SERVICES	STORAGE AND WARE-HOUSING
WATER MANAGEMENT							
AGRICULTURAL EXTENSION AND INFORMATION DISSEMINATION	I			I	I		
COMMERCIALIZATION OF RESEARCH		I					
USE OF IMPROVED AGRICULTURAL INPUTS							
CERTIFICATION OF AGRICULTURAL AND FOOD PRODUCTS		I					
FINANCIAL SERVICES	I			I			I
STORAGE AND WAREHOUSING					I	I	

Output:

- → **A set of direct, causal factor relationships is organized into the Factor Relationship Matrix.**
- → **The polarity (+/-) of direct, causal factor relationships is organized into the Polarity Matrix.**

Roles and LOE:

- → **Lead analyst prepares factor relationship and polarity matrices and distributes them to systems analysts to complete. (1 day)**
- → **Systems analysts complete the matrices. (1 day)**
- → **Lead analyst compiles all the completed matrices. (1 day)**
- → **Systems analysts meet to review matrices and come to consensus on factors where causal relationships differed. (1 day)**



Phase 3: Identify the Strength of Factor Relationships

Step 5 – Rank the strength of pairwise influences and complete the pairwise relationship matrix.
Enlist experts to validate and evaluate the set of factor relationships produced in Step 4. Enter the final influences scores into the Pairwise Strength Matrix.

Output:
- The strength of direct, causal factor relationships in the system is known and recorded in the Pairwise Strength Matrix.
- Direct influence and dependence scores are calculated from the Pairwise Strength Matrix.
- Factors are ranked by direct influence and dependence scores.

Step 5 | Rank the strength of pairwise influences using the pairwise relationship survey and complete the pairwise relationship matrix.

A broader group of three to five experts (separate from the core team, although it could include core team members) validate the set of relationships and evaluate the strength of each pairwise relationship. Respondents rate the strength of relationships through a survey (see Pairwise Relationship Strength Survey template). The survey combines inputs from the Factor Relationship Matrix and Polarity Matrix to rate the strength of factor relationships. Experts responding to the survey are typically internal to the project and include component leads, technical team staff, select MEL staff, and/or project partners, home office technical teams, among others.

The selected experts determine first whether they agree that a direct, causal pairwise relationship exists. If the relationship exists, experts then rate the influence of Factor A on Factor B as weak (1), moderate (2) or strong (3). The number of experts engaged will vary based on a project's confidence level in the data and the timeline for the survey. Ensure at least five experts rate each pairwise influence to ensure quality data collection.

Use the arithmetic mode to determine the final factor influence score from the survey responses. For example, the final factor influence score would be strong (3) in the case where seven experts rated a factor influence as follows: 2, 2, 2, 3, 3, 3, 3. In cases where the influence ratings have significant deviation in response scores (e.g., in the case of a mix of strong ratings and "no relationship" ratings), review these survey results and consider further discussion with survey respondents to reassess and agree to a final assessment of the strength of each pairwise relationship.

Enter the final influence scores into the Pairwise Strength Matrix (see Pairwise Strength Matrix template), commonly referred to as a cross-impact matrix. Influence scores are entered in numerical format. Table 7 illustrates the Pairwise Strength Matrix with an example of Factor B (row) having a strong (3) influence on Factor A (column) and moderate (2) influence on Factor C (column).

Table 7: Pairwise Strength Matrix Guidance

On: Influence of:	FACTOR A	FACTOR B	FACTOR C	(CONTINUE LISTING ALL FACTORS)	SUM:
FACTOR A	-			…	Factor A influence score
FACTOR B	3		2	…	Factor B influence score
FACTOR C			-	….	Factor C influence score
(CONTINUE LISTING ALL FACTORS)	…	…	…		Factor (i) influence score
SUM:	Factor A dependence score	Factor B dependence score	Factor C dependence score	Factor (i) dependence score	

As a rule, the matrix should be 15 to 25 percent full for subsequent steps to yield reliable analysis[7] of each factor's indirect influences and dependencies (Step 6). Manually calculate the sum of each row to determine the influence score for each factor. Manually calculate the sum of each column to determine the dependence score for each factor. Use absolute values since the magnitude of influence and dependence matters, not the direction (or polarity) of the influence. These influence and dependence rankings account for direct influences only. The calculation of indirect influences will take place in the next step, Step 6.

Output:

→ **The strength (weak, average, strong) of all direct, causal factor relationships in the system is assessed.**

→ **The strength (weak, average, strong) of direct, causal factor relationships in the system is recorded in the Pairwise Strength Matrix.**

→ **Direct influence and dependence scores are manually calculated from the Pairwise Strength Matrix.**

→ **Factors are ranked by direct influence and dependence.**

Roles and LOE:

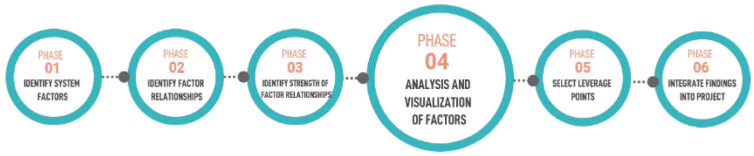
→ **Lead analyst sends out the Pairwise Strength Matrix to all systems analysts to complete. (1 day)**

→ **Lead analyst prepares the pairwise relationship survey. (0.5 day)**

→ **Systems analysts and experts complete the pairwise relationships survey. (1 day)**

→ **Lead analyst compiles survey results. (0.5 day)**

[7] Godet, Michel. From anticipation to action: A handbook of strategic prospective: Michel Godet 277 pages, Paris, UNESCO Publishing, 1994



Phase 4: Analysis and Visualization of Factors

Step 6 – Score factors according to their influence and dependence on other factors in the system.

Determine each factor's indirect influence and dependence scores using the MICMAC technique.

Output:

- Six MICMAC reports are available.
- Factors are ranked by direct and indirect influence and dependence scores.
- Initial visualizations of system interactions and causal structures are available.

Step 6 | Score factors according to their influence and dependence on other factors in the system.

ACDI/VOCA uses a free open-source software MICMAC[8] (Impact Matrix Cross-Reference Multiplication Applied to a Classification) technique to determine *indirect* relationships and feedback between system factors. The MICMAC process entails iteratively multiplying all factor relationships to determine the indirect influences and dependencies of systems factors. In comparison, analysis of only direct relationships between system factors provides a useful yet simpler snapshot of system interactions. In other words, structural analysis using the MICMAC method enables more complex analysis that includes not just direct relationships (see Step 6), but also indirect relationships between system factors.

MICMAC software is used to rank and visualize direct and indirect influence and dependence and the most important causal links between system factors. The ranking of factors is based on criteria including the following:

- **Influence:** Measures each factor's influence on the system. The most influential factors have the greatest effects on the evolution of the system. Influence considers both direct effects and indirect influences on other factors in the system. The higher the influence the more important the factor.
- **Dependence:** Measures each factor's sensitivity to changes in other factors. In other words, changes in them depend significantly on changes in other factors. Influential factors may also be highly dependent on factors. The higher the dependence the less likely the factor is a candidate for direct intervention because their long-term performance is defined by other factors.

Using the Pairwise Relationship Matrix, MICMAC software allows users to run six useful reports that provide a deeper understanding of the relationships of key factors within the system that inform our

[8] Arcade and Godet contribute the structural analysis with MICMAC (Impact Matrix Cross-Reference Multiplication Applied to a Classification) that represents a structural analysis based on comparing the hierarchy of issues in the various classifications (direct, indirect, and potential).

selection of leverage points and our overall systems change strategy. A description of each report is provided in Table 8 and examples of reports exported from MICMAC are provided in Annex 2. The most important report is the Indirect Influence and Dependence Map because it considers indirect influences and dependencies between factors (not just direct influence or dependence) and plots factors according to their relative degree of influence and dependence on other factors. Step 7 will detail how to use the Indirect Influence and Dependence Map to identify leverage point variables, the variables with high influence and low dependence on other factors in the system.

Table 8: Influence and Dependence Classifications and Mapping using MICMAC

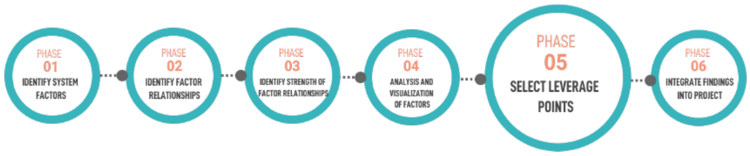
REPORT NAME	REPORT OUTPUT
Influences Classification	Produces two ranked lists of system factors according to their influence on other factors: (a) ranking of factors according to their direct influence, and (b) ranking of factors according to their direct and indirect influences.
Dependence Classification	Produces two ranked lists of system factors according to their dependence on other factors: (a) ranking of factors according to their direct dependence, and (b) ranking of factors according to their direct and indirect dependencies.
Direct Influences Graph	Visualizes all direct influences between factors and rates influences as very weak, weak, moderate, moderately strong, very strong.
Indirect influences Graph	Visualizes all direct and indirect influences between factors and rates influences as very weak, weak, moderate, moderately strong, very strong.
Direct Influence and Dependence Map	Classifies factors into quadrants according to their degree of direct influence and dependence on other factors.
Indirect Influence and Dependence Map	Classifies factors into quadrants according to their degree of direct and indirect influence and dependence on other factors.

Output:

→ **Six MICMAC reports are available.**
→ **Factors are ranked by direct and indirect influence and dependence scores.**
→ **Initial visualizations of system interactions and causal structures are available.**

Roles and LOE:

→ **Lead analyst produces MICMAC reports (0.5 day)**



Phase 5: Select Leverage Points

Step 7 – Categorize factors by leverage.

Use comparative ranking to categorize factors into tiers based on their indirect influence and dependence scores.

Output:
- Factors are categorized by tier.
- Leverage point factors are identified.

Step 8 – Causal loop analysis of leverage point factors.

Develop causal loop diagrams and causal flow diagrams for each leverage point factor to visualize system dynamics.

Output:
- Causal loop and causal flow diagrams are available for each leverage point factor.

Step 9 – Conduct a Systems Change Strategy Stakeholder Workshop.

Facilitate a participatory discussion with stakeholders.

Output:
- Stakeholder validation of leverage point factors and determination of feasibility and strategies for influencing systems change.

Step 7 | Categorize factors by leverage.

Use comparative ranking to categorize factors into tiers based on their indirect influence and dependence scores. The four tiers of factors, according to their combined influence and dependence scores, are categorized as follows:

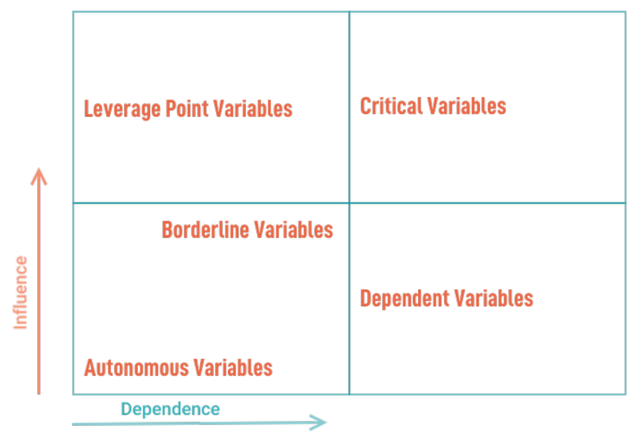
1. **Leverage point factors:** **High influence; Low dependence.** These factors are places to intervene in the system. Leverage factors are the factors with the greatest influence and least dependence on other factors. Once changed, they are likely to change other parts of the system. Unlike relay factors, leverage factors tend not to change based on other factors in the system (reflected in low dependence scores) but tend to be steady.
2. **Critical or relay factors:** **High influence; High dependence.** These factors are highly influential but also highly dependent on other factors in the system, which makes them both volatile but important for how the system performs.
3. **Borderline (and autonomous) factors:** **Low to moderate influence; Low to moderate dependence.** Borderline factors have moderate influence and moderate dependence on other factors in the system. These factors may function as leverage point factors or critical or relay factors in certain contexts, or they may function as autonomous or dependent factors in other contexts. Autonomous factors, also grouped into this category, have low influence and low

dependence on other factors in the system. They are relatively disconnected from other factors and tend to be considered context factors.

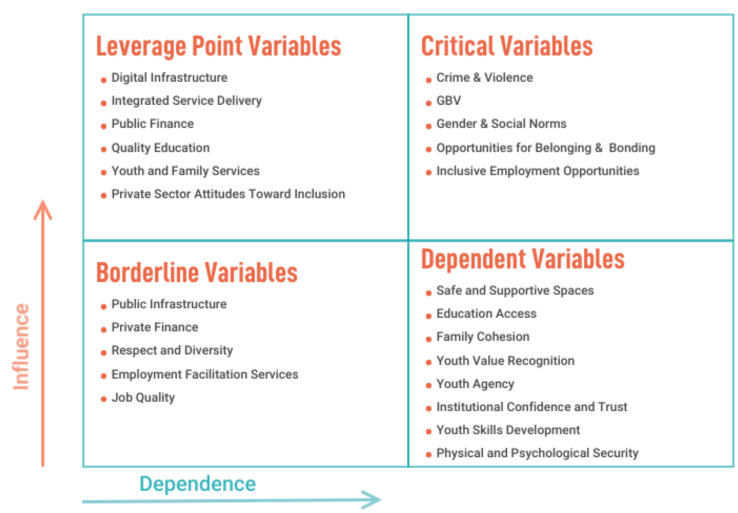
4. **Dependent factors:** **Low influence; High dependence.** These factors have low influence but high dependence on other factors in the system. These factors will change with leverage points and critical or relay factors. These factors are often the best measures for if the system has changed given their high dependence. For example, sustainable water management practices could be a dependent variable that could quickly change if we can influence the entrepreneurship ecosystem to generate water management user groups and service providers that scale up sustainable water use practices.

The four tiers of factors correspond with the four quadrants of the Indirect Influence and Dependence Map (Step 6, MICMAC report). Graphic 3 identifies the quadrant that each tier of factors aligns with based on their relative levels of influence and dependence. Factors in the upper left quadrant, for example, represent leverage point factors because they have the highest influence and lowest dependence. Graphic 4 provides an example from the Youth Resilience Activity in Colombia with the system factors categorized by tier and corresponding MICMAC quadrant.

Graphic 3: Aligning categories of factor tiers with MICMAC quadrants



Graphic 4: Example from the Youth Resilience Activity in Colombia with factors categorized into quadrants according to their influence and dependence scores



While the emphasis of the analysis has been on tests for influence and dependence to determine leverage points, there are additional tests to consider. Project teams could consider an additional criterion in the classification process: centrality[9]. Centrality is a different network perspective on influence that looks at the centrality of a factor in the system, measured by where the factor lies on the path between all other factors. The higher the centrality score the more critical the factor is in the system because influence (and dependence) flows through them. A high centrality score may indicate that a variable is even more important to the performance of the system than a factor with high influence and low dependence. For factors on the cusp between tiers (or quadrants), teams could use the centrality score to adjust or validate the factor classification.

Table 9 provides a summary of tests to inform selection of leverage points and provides the case of electricity disruptions to explain how these tests might work from observation (rather than in depth primary analysis). In addition to influence and dependence tests, additional tests proposed are centrality, relative intensity, correlation in movement, and bypassing obstacles. Each test helps us learn more about the factors and their role in the system.

Table 9: Influence, dependence, and additional tests to inform selection of leverage points

TEST		DISCUSSION	EXAMPLE OF ELECTRICITY SYSTEM
Influence	The factor must have a high degree of influence (direct and indirect) on the other factors.	If one factor is the main cause of the private sector's ability to survive shocks, grow, and create inclusive economic opportunities, its influence must be pervasive on other factors throughout the system.	We might find, for example, that renewables has a large influence on whether firms have backup generators, their demand for energy from the grid, etc. It could be a factor that has a large *influence* on the energy system and, thus, passes the first test as a point of leverage.
Dependence	The factor must have a low level of dependence (direct and indirect) on the other factors.	The factor should not be easily influenced by other factors, so that it operates more independently and changing this factor won't depend on changing many other factors to have an outsized influence on the system.	We might find, for example, that renewables is also dependent on a number of factors, including an enabling regulation, the structure of the grid, etc. In this case, it is a factor that has a high degree of dependence, which means it has *less leverage* than we would want.
Centrality	The chain of causality between this factor and other factors should be as short as possible.	The distance between this factor and all other factors should be as short as possible, such that changing this factor has a more immediate influence on other factors without a long (and uncertain) chain of influence.	If we find that in understanding other factors related to energy production, distribution, etc., that renewables is a core factor related to each, then we would say this issue has a high degree of centrality and therefore it is a factor that has *high* leverage on the system.

[9] The platform, Kumu, accepts matrix uploads and from them can produce Betweenness Centrality analysis.

Relative Intensity*	Actors with lower intensity in that constraint should be more likely to perform better in system.	If the factor is a binding constraint, there should be evidence that actors that are relatively higher or lower in intensity in that factor will have different performance.	If we find that enterprises in the system that have renewable energy tend to perform better in terms of lower costs, fewer disruptions, etc., we will find that renewables passes the test in terms of relative intensity, suggesting it is a point of *leverage* for change.
Correlation in Movement*	Movements in the factor or constraint must produce significant movements in the objectives.	If the factor is a binding constraint, and if we see a change in that factor over time, we should observe improved performance in the system over time.	Similarly, if we see that the adoption of renewables is associated with improved performance of the enterprise, then this would be a signal that renewables is a binding constraint in the system.
Bypassing Obstacle*	Actors in the system should be actively trying to bypass the constraint.	If the factor is a binding constraint, there should be evidence of behaviors of actors in the system trying to bypass the constraint. These behaviors are often sub-optimal but reflect intentions.	If we see that firms without renewables depend on the electrical grid and are relying on backup generators to maintain operations, this suggests that actors are trying to bypass limited access, even if it is more expensive, etc.

** These are new tests added to the diagnostic based off growth diagnostic methodology.*

Output:

- → **Factors are categorized by tier.**
- → **Leverage point factors are identified.**

Roles and LOE:

- → **Systems analysts discuss to come up with a short-list of leverage factors (1 day)**

Step 8 | Conduct causal loop analysis of leverage point factors. (Optional)

Note: *Causal loop analysis of factors is an optional step to further visualize system dynamics. The analysis is best suited for those with existing experience with Kumu or other mapping platforms. Alternatively, additional LOE could be added to the scope of work for a staff member to be trained to carry out this step.*

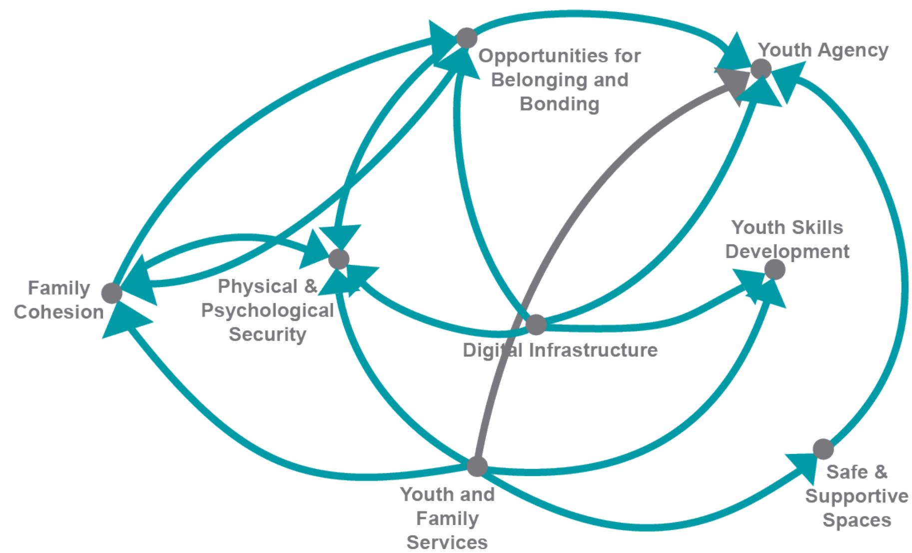
Develop causal loop diagrams and causal flow diagrams for each leverage point factor to visualize system dynamics. Group the highly interlinked factors and pairwise influences for leverage point factors[10] to enable an analysis and interpretation of the broader causal story behind how these sub-groups of factors interact together to influence a broader trend in the system.

[10] Kumu offers users the ability to group and visualize pairwise relationships.

Practical Example: Causal loop analysis from the Youth Resilience Activity in Colombia

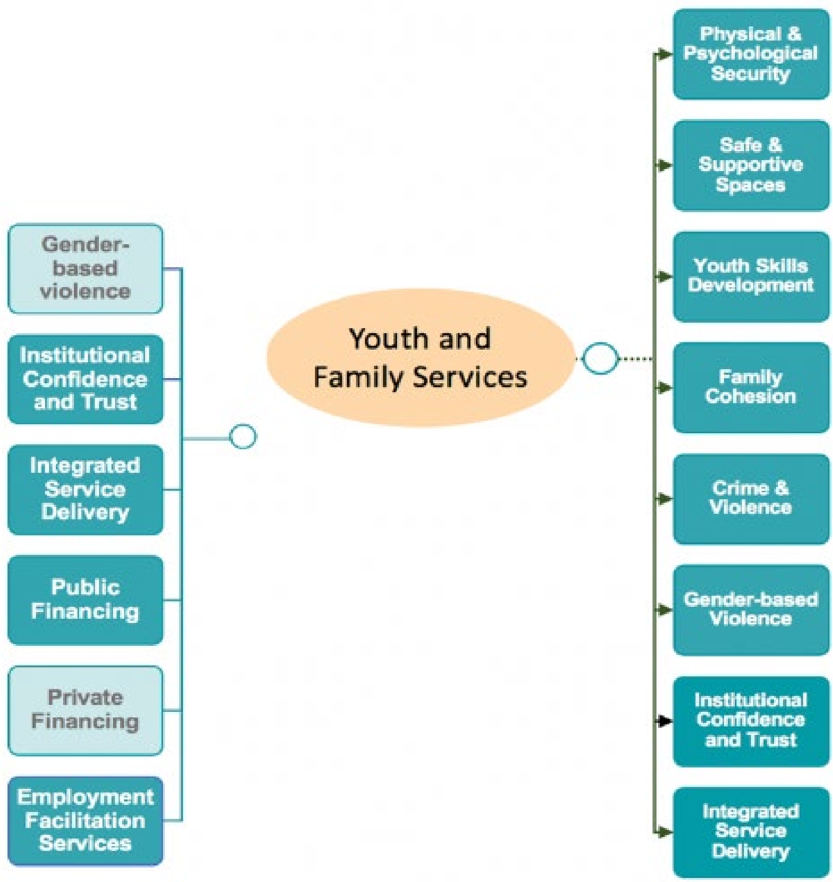
The Youth Resilience Activity (YRA) team identified that the factors with the strongest influence on the leverage point factor, Youth and Family Services, are like those for the leverage point factor, Digital Infrastructure. Since both are leverage points that influence Youth Physical and Psychological Security, Skills Development, and Agency in the System, the team considered what this similarity meant for programming. A few of the questions the team considered were: Do you believe that digitalization is critical for the delivery of youth and family services? In your opinion, is the scale of youth and family services dependent on digital services? For the current YRA programming, do we need to pilot or adapt what we are doing to test and validate the impacts of digitization of youth and family services? What are some of the context factors or limitations to digital services for youth? A causal loop diagram (Graphic 5) for Youth and Family Services demonstrates factor interactions with both Youth and Family Services and Digital Infrastructure.

Graphic 5: Youth Resilience Activity's causal loop analysis of the leverage point factor, Youth and Family Services



In addition, summarize the interactions between leverage points and the factors directly influencing them as well as the factors they directly influence into causal flow diagrams. Graphic 6 illustrates that five factors influence Youth and Family Services and, in turn, Youth and Family Services influence eight factors. These visuals complement the causal loop diagrams and support uptake and understanding of the causal chain by staff and stakeholders. Coupled with the MICMAC reports, this step further breaks down complex connections into a hierarchy of relationships and visual patterns that help explain how the current system functions.

Graphic 6: Causal Flow Diagram, example from the Youth Resilience Activity for the leverage point factor, Youth and Family Services. Darker shades represent strong influences and lighter shades indicate weak influences.



Output:

→ **Causal loop and causal flow diagrams are available for each leverage point factor.**

Roles and LOE:

→ **Lead analyst prepares causal loop and causal flow diagrams for each leverage point. (2 days)**

Step 9 | Conduct a systems change strategy stakeholder workshop.

The systems analyst team should conduct several sequential systems change strategy workshops to present the principal findings of the diagnostic to key systems stakeholders. These should be a series of smaller workshops with key systems actors that have strong contextual (including around gender and social inclusion) knowledge around a particular leverage point (and were most engaged during the whole-system-in-the-room workshop) and will likely be key partners moving forward. As facilitators, we should aim for system stakeholders to feel ownership over the systems change strategy to be fully committed to partnering with ACDI/VOCA and other system actors to influence change. Stakeholders should also be invited to annual pause and reflect sessions to review the systems change strategy logic and make revisions over the life of the project.

The causal flow diagrams should be presented to stakeholders during the workshop to provide stakeholders an opportunity to zoom in again and revisit nuances of leverage point factors and their relationships and prompt dialogue on the findings. Another way to facilitate the stakeholder workshop is to take a leverage factor, find the top three influences for that factor, and then gather perspectives on how to change that factor. The team should make iterative changes to the causal loop/flow diagrams during the workshop, as this will form the backbone for the project's systems change strategy.

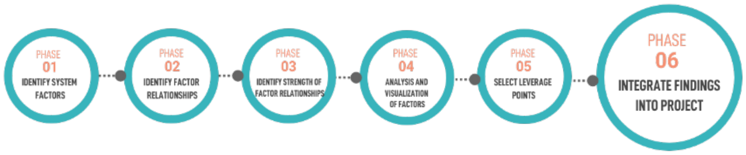
A second objective of the systems change strategy workshop is to determine how feasible the systems change strategy is. If there is no momentum for change by stakeholders around the leverage point, or no system actors with a high motivation or skill to influence change, then it will be necessary to revisit the feasibility of the strategy. Conducting a trends analysis is a good way to look backward to see where change has occurred and to discuss the dynamics behind that change to determine if our forward-looking systems change strategy is feasible.

Output:

→ **Stakeholders validate leverage point factors and discuss feasibility and strategies for influencing systems change.**

Roles and LOE:

→ **Lead analyst facilitates conversation with stakeholders. (1 day)**



Phase 6: Integrate Findings into Project Design and Strategy

Step 10 – Integrate findings into systems change strategy and learning agenda.

Complete systems change strategy templates for each leverage point to guide the design and management of partnerships and pilot initiatives as well as the key learning questions we will continually monitor.

Output:

- Improved understanding of the system is incorporated into activities, workplans, theory of change, partnership strategy, and other practical applications of the findings, including the learning agenda or pilot projects to test learnings about the functioning and dynamics of the system.

Step 10 | Integrate findings into systems change strategy and learning agenda.

The final output from the Diagnostic is a completed Systems Change Strategy template for each leverage point. The Systems Change Strategy provides a roadmap that guides the design and management of partnerships and pilot initiatives as well as the key metrics and learning questions the project will continually monitor and assess to track evidence of systems change. The strategy begins by defining a systems change objective (SCO) or outcome statement that concisely articulates a vision for how the system will function by the end of the project. Ideally, this should be defined during the stakeholder workshops in Step 9 and revised during annual pause and reflect sessions. The leverage points, or intermediary systems changes, describe the entry points where there is momentum for change and the partnership portfolio describes the type of partnerships needed to influence that change. It is important that the strategy commits to monitoring and assessing systems-level indicators that will provide both short-term evidence that we are on the right track as well as longer term evidence of systems change outcomes. Table 10 provides an example of a basic systems change strategy.

Table 10: Basic Systems Change Strategy Example

SYSTEMIC CHANGE OBJECTIVE (SCO)	LEVERAGE POINT (LP): Opportunities where we could intervene or actors or issues that are amenable to change	PARTNERSHIP PORTFOLIO: Describe the portfolio of partnerships that will contribute to the specific leverage point	METRICS: What type of changes would you expect to take place? Articulate short-term sentinel and long-term transformational changes.
Supply chain actors engage service providers in agricultural extension and	LP 1: Outgrower networks coordinate extension services and trainings for their members.	Support outgrower networks to facilitate partnerships with ICT4AG firms/input companies/equipment	**Sentinel –** % of outgrower networks with plans to coordinate extension for their members

information services.		dealers that deliver extension services to members	**Transformational -** % of outgrower networks coordinating extensions services for their members
	LP 2: Supply chain firms invest in digitalization of ag extension.	Supply chain firms digitalize operations to support smallholder famers' production	**Sentinel -** % of supply chain firms planning to digitalize operations **Transformational -** % of supply chain firms adopting digital platforms to provide extension information

Guidance on Developing Systems Change Objectives:

- Systems change objectives and leverage points should not be articulated as impact or results statements, such as "increased smallholder income" or "increased SME employment," but provide a clear vision for how and what part of the system will change.
- While behavior changes are important, changes in relationships, voice/agency, power dynamics, rules, diversity in composition, etc., are often more important.

Practical Example: Adapting Programming to Focus on Leverage Factors in Ghana and Serbia

The Feed the Future Ghana Market Systems and Resilience (MSR) Activity concluded the Systems Diagnostic with eight leverage factors identified and recommendations for how the project could target each. Using entrepreneurship support services as an example, MSR aims to use its convening power to bring together entrepreneurship support organizations to develop a road map for strengthening the quality, outreach, and diversity of support services to agricultural entrepreneurs. MSR looked to partners or coordinates with existing entrepreneurship support organizations to address interconnected factors that are influenced by entrepreneurship support services, including the certification of agricultural products and trusted commercial relationships. MSR also used findings from structural analysis to develop systems change outcomes for leverage factors and other high-priority factors. MSR's systems change strategy also includes partnership portfolios, short- and long-term indicators to track progress, and learning questions that inform the overall strategy.

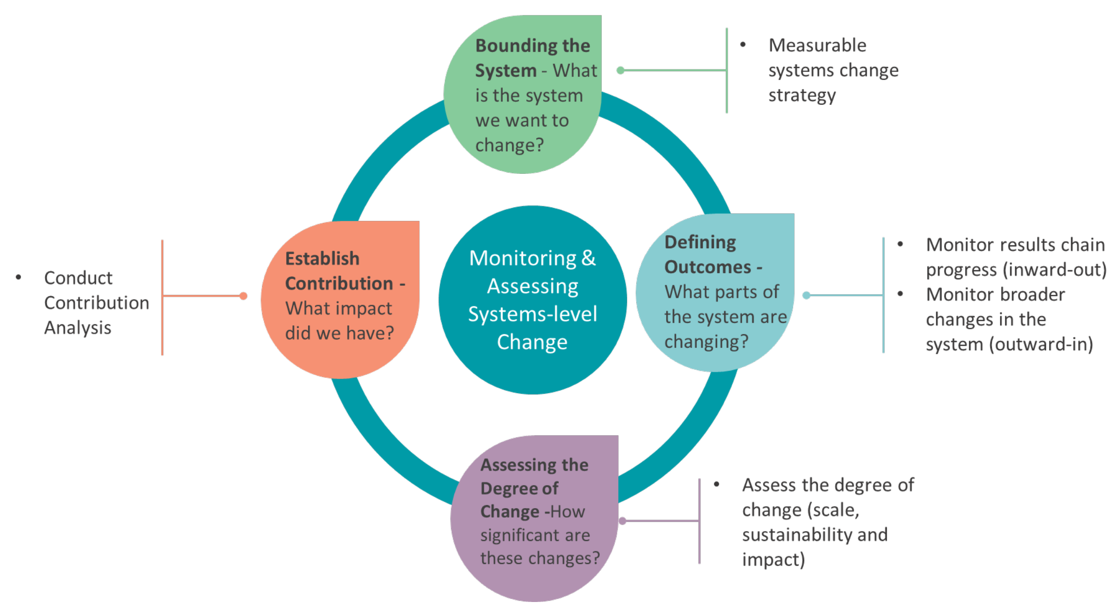
For the Big Small Businesses Project in Serbia, funded by USAID and implemented by ACDI/VOCA, workforce availability emerged as a leverage factor for the growth and development of the equipment and machinery sector due to its high influence and low dependence on other system factors. Equipped with this improved understanding of system dynamics, the project focused work plan activities directly on workforce availability, in particular the availability of engineers and technical workers and the factors influencing availability, such as the lack of feedback loops between the education system and private sector leading to skills mismatches. Specifically, these activities include the development of a rapid prototype development hub in collaboration with the Academy of Technical and Vocational Studies and the Center for Business and Innovation Support, which will provide a needed service to SMEs in the equipment and machinery sector, but also give students real world experience.

- Not all outcome statements need a single actor or agent for change. For example, we could formulate the outcome statement: "New regulations protect the input supply chain from counterfeits."
- An SCO should be as realistic and evaluable as possible, considering largescale systems change over a five-year project life cycle is unlikely. Over time, SCO statements tend to get more specific as the context and capacities and motivation of partners are better understood.

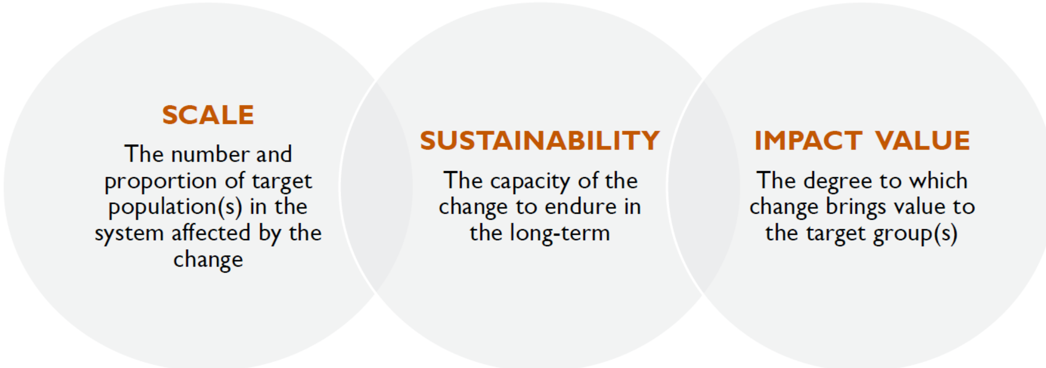
Monitoring and Assessing Progress through our Systems-MEL Framework

ACDI/VOCA follows the below systems-MEL methodology derived from USAID's Assessing Systems MEL guidance to assess whether our systems change strategy is delivering the intended results. Through our monitoring and learning efforts, if we are not able to observe any momentum with our partnership portfolios and their targeted leverage points, it is likely we need to revisit our strategy and shift to a new leverage point or new systems change outcomes where we think there is greater potential for change. To do this, we need to be able to monitor our strategy and have targeted learning questions and indicators that provide feedback to determine whether we are on course.

MONITORING, EVALUATION, & LEARNING METHODOLOGY | SYSTEMS BASED MEL METHODOLOGY



Assessing the Degree of Change – USAID guidance recommends assessing outcomes by degrees of change across three criteria: **scale, sustainability, and impact value** by establishing rubrics to monitor and track progress against the expected degrees of change over time. Systems change rubrics describe different performance levels according to various systems change outcomes. If possible, engage stakeholders in the assessment of outcomes, whenever possible, to give credibility to the assessment and ensure the impacts of changes are meaningful to them. Reflect on each of the outcomes collectively and look for evidence that other parts of the system are changing, and the functionality of the system has improved to assess whole-of-system change.



Establishing Contribution – USAID's guidance recommends establishing the causal links between the observed outcomes and the specific program interventions by including evidence to substantiate contribution with a degree of certainty. This should not happen at the end of the project but regularly when outcomes are observed. This stage requires exploring the causes behind outcomes and the program's contribution to the outcome.

Output:

- → **Incorporate the findings from the stakeholder workshop (Step 9) into a systems change strategy.**
- → **Monitor and regularly assess the effectiveness of the systems change strategy following USAID's systems-based MEL methodology.**

Roles and LOE:

- → **Lead analyst and component leads integrate findings into programming. (5.5 days)**
- → **MEL team lead and component leads monitor and assess ongoing systems changes. (Ongoing)**

Annex 1

Inception Phase Systems Diagnostic

PHASES AND STEPS	LOE
Identify System Factors - Frame the Goals (1 day) - Literature Review (5 days) - Participatory Systems Analysis/KIIs (optional) (5 days) - Whole System in the Room Workshop (3 days) - Identify Key Factors (1 day for Lead Analyst and 2 days for the research team)	17
Identify Factor Relationships	4
Identify Strength of Factor Relationships	3
Analysis and Visualization of Factors	.5
Selecting Leverage Points	4
Integrating Findings into Systems Change Strategy Template	5.5
TOTAL	**32 DAYS**

Subsequent Diagnostics over the life of the project would require significantly less LOE.

Abbreviated Systems Diagnostic

PHASES AND STEPS	LOE
Identify System Factors - Whole System in the Room Workshop (2 days) - Revise Key Factors (1 day for Lead Analyst and 2 days for the research team)	5
Identify Factor Relationships	4
Identify Strength of Factor Relationships	2
Analysis and Visualization of Factors	1
Selecting Leverage Points - 1 day for team meeting - 3 days to draft report	4
Integrating Findings into Systems Change Strategy Template	3
TOTAL	**18 DAYS**

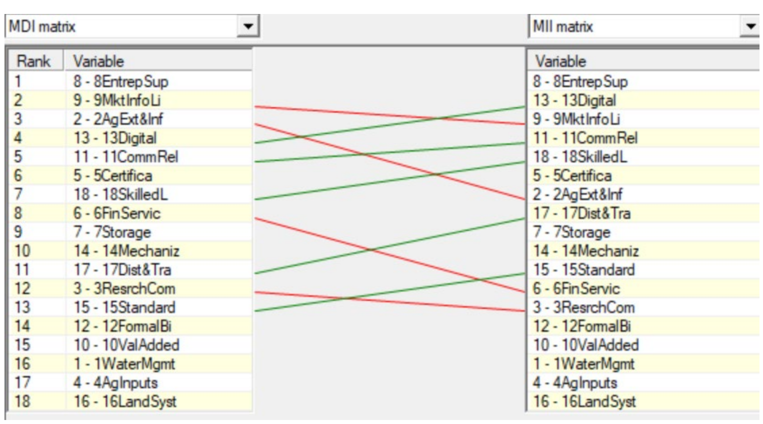
Annex 2

A description and example output report is provided for each of the six MICMAC reports recommended as part of the structural analysis (Table 1).

Table 1: Influence and Dependence Classifications and Mapping using MICMAC

Report Name	Report Output
1) Influences Classification	Produces two ranked lists of system factors according to their influence on other factors. (a) Ranking of factors according to their direct influence. (b) Ranking of factors according to their direct and indirect influences.
2) Dependence Classification	Produces two ranked lists of system factors according to their dependence on other factors. (a) Ranking of factors according to their direct dependence. (b) Ranking of factors according to their direct and indirect dependencies.
3) Direct Influences Graph	Visualizes all direct influences between factors and rates influences as very weak, weak, moderate, moderately strong, very strong.
4) Indirect influences Graph	Visualizes all direct and indirect influences between factors and rates influences as very weak, weak, moderate, moderately strong, very strong.
5) Direct Influence and Dependence Map	Classifies factors into quadrants according to their degree of direct influence and dependence on other factors.
6) Indirect Influence and Dependence Map	Classifies factors into quadrants according to their degree of direct and indirect influence and dependence on other factors.

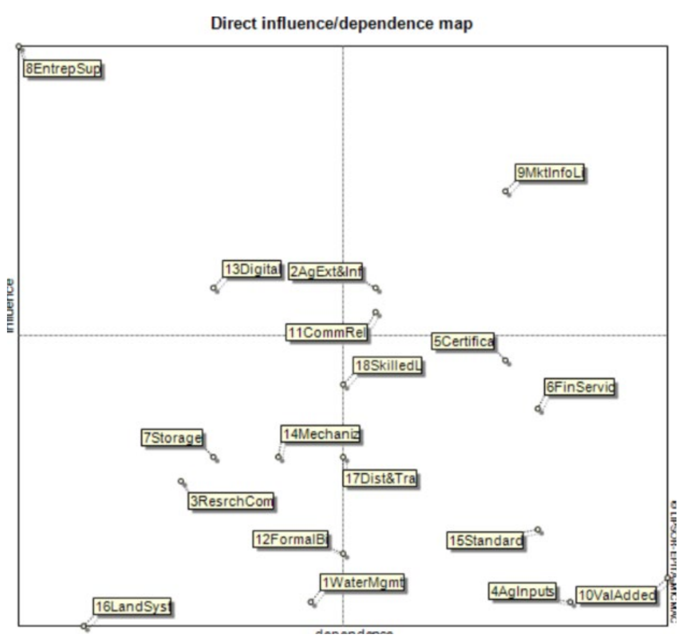
1. **Influences Classification** – Produces two ranked lists of system factors according to their influence on other factors. (a) Ranking of factors according to their direct influence. (b) Ranking of factors according to their direct and indirect influences.



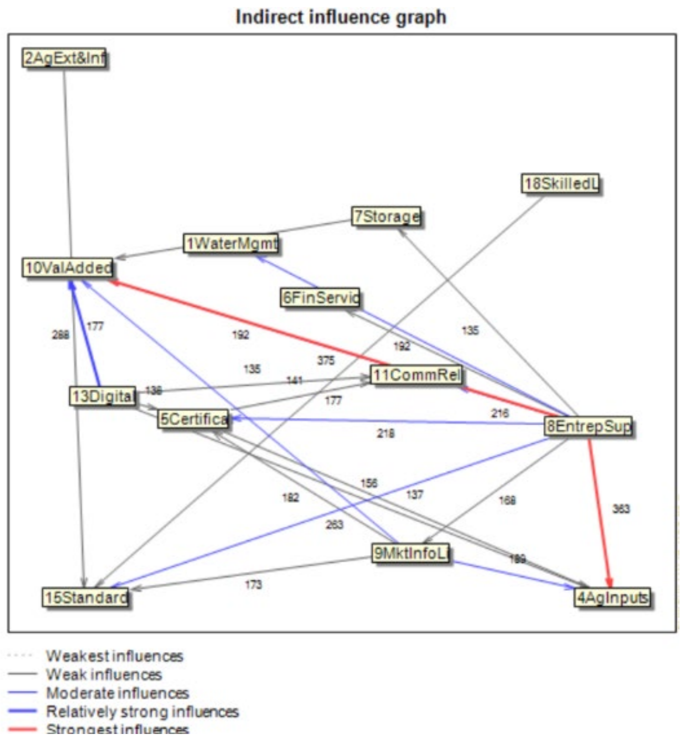
2. **Dependence Classification** – Produces two ranked lists of system factors according to their dependence on other factors. (a) Ranking of factors according to their direct dependence. (b) Ranking of factors according to their direct and indirect dependencies.

Rank	Variable (MDI matrix)	Variable (MII matrix)
1	10 - 10ValAdded	10 - 10ValAdded
2	4 - 4AgInputs	15 - 15Standard
3	6 - 6FinServic	4 - 4AgInputs
4	15 - 15Standard	5 - 5Certifica
5	5 - 5Certifica	11 - 11CommRel
6	9 - 9MktInfoLi	6 - 6FinServic
7	2 - 2AgExt&Inf	9 - 9MktInfoLi
8	11 - 11CommRel	2 - 2AgExt&Inf
9	12 - 12FormalBi	12 - 12FormalBi
10	17 - 17Dist&Tra	1 - 1WaterMgmt
11	18 - 18SkilledL	17 - 17Dist&Tra
12	1 - 1WaterMgmt	14 - 14Mechaniz
13	14 - 14Mechaniz	7 - 7Storage
14	7 - 7Storage	18 - 18SkilledL
15	13 - 13Digital	3 - 3ResrchCom
16	3 - 3ResrchCom	13 - 13Digital
17	16 - 16LandSyst	16 - 16LandSyst
18	8 - 8EntrepSup	8 - 8EntrepSup

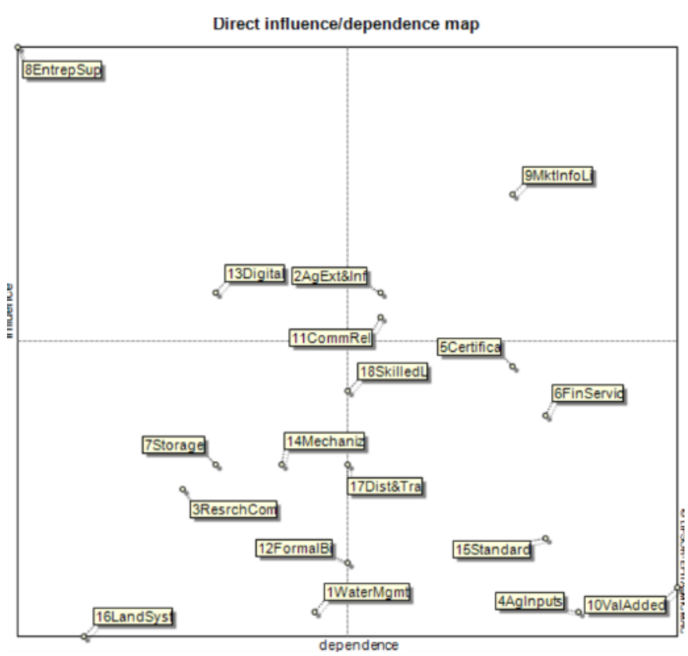
3. **Direct Influences Graph** – Visualizes all direct influences between factors and rates influences as very weak, weak, moderate, moderately strong, very strong.



4. **Indirect influences Graph** – Visualizes all direct and indirect influences between factors and rates influences as very weak, weak, moderate, moderately strong, very strong.



5. **Direct Influence and Dependence Map** – Classifies factors into quadrants according to their degree of direct influence and dependence on other factors.



6. **Indirect Influence and Dependence Map** - Classifies factors into quadrants according to their degree of direct and indirect influence and dependence on other factors.