SYSTEMS

RESEARCH & EVALUATION

Global Knowledge Initiative

Our world's greatest problems are systemic – entrenched and perpetuated by norms, policies, cultures, and resource flows. To enhance the ability of communities to thrive, we need to shift the systems that are perpetuating these problems to exist in the first place. The Global Knowledge Initiative (GKI) recognizes the critical value of taking a systems-driven approach to solving complex challenges in agriculture, health, environment and other critical sectors. When used to make sense of the world and how it works, systems approaches illuminate options, opportunities, and threats otherwise invisible. GKI helps international development professionals learn and apply a range of systems tools and methods to improve performance and, ultimately, impact.

What is a system?

A "system" is a set of actors and interactions that form a coherent whole, perform a specific function, and have a boundary that sets it apart from the broader context. Systems are comprised of four main components:

Boundaries: Parameters and limits that distinguish what's inside the system from what's outside the system (e.g., national, regional, sectoral)

Actors: Formal and informal elements within a system (e.g., individuals, institutions)

Linkages: Simple and complex relationships and their consequences (e.g., public-private partnerships)

Enabling Environment: Interrelated conditions that impact actors & organizations within a specific boundary (e.g., infrastructure, policies, culture, history, geography)

"[The fundamental rationale of systems thinking] is to understand how it is that the problems that we all deal with, which are the most vexing, difficult and intransigent, come about, and to give us some perspective on those problems [in order to] give us some leverage and insight as to what we might do differently." (Senge)

How does systems thinking enable better decision making?

No single solution or actor is sufficient to address truly complex challenges, be they in water, education, forced migration, etc. Systems tools help identify which actors to approach for collaboration. Beyond helping us identify needed partners, systems research and evaluation tools support decision making to:

- Enable users to consider unintended consequences. and evaluate actual trade-offs between alternatives.
- Help decision-makers clarify how and why challenges persist.
- Reveal contextual factors that are often overlooked.
- Allow testing of ideas before, during, and after implementation.

What happens when we don't take a systems approach?

- Unintended consequences catch us off guard if we don't use reliable methods to examine how things may change if we act.
- Linear thinking (the opposite of taking a systems approach) is like considering only one play on a chess board – it assumes there's only one path forward, thus masking the many possible routes to success.
- With any complex challenge (e.g., natural disasters, malaria, etc.) achieving long-term, sustainable impact is nearly impossible without taking whole systems into account.

GKI's Problem Solving Process

Taking a systems approach to problem solving, six elements occur in sequence, or occur continuously throughout the process.
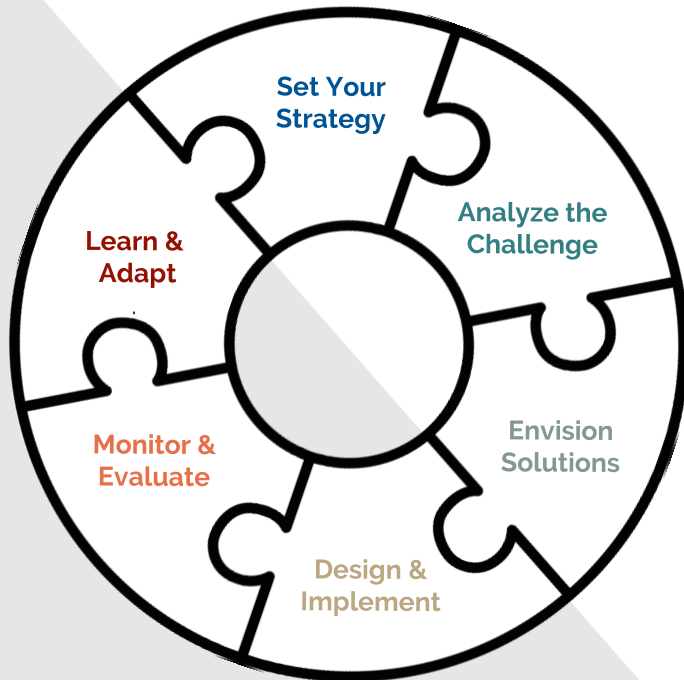
Set your Strategy: Define the problem. Determine how often, where and when the problem occurs. Establish who this problem affects.

Analyze the Challenge: Develop a deep understanding of the challenge and identify its root causes.

Envision Solutions: Creatively brainstorm a wide range of potential solutions. Think of translational and disruptive innovation.

Design & Implement: Establish a criteria to select the best solution and develop a plan with clear steps to execute the solution.

Monitor & Evaluate: Monitor change and impact over time. Determine what went wrong and what worked.

Learn & Adapt: Continually study the effects of the change and make improvements as necessary. This last step becomes the first step in your next iteration.

What is Unique About GKI's System Approach?

Fuels Collaboration: GKI's systems approach values understanding from all actors in the system. Incorporating information from a diverse group of system stakeholders shows how each stakeholder views and experiences the system differently.

Analyzes Coupled Systems: Innovation lives at the intersection of three analytical lenses: the problem system (in which the challenge occurs), the innovation system, and the context into which innovation is diffused. By looking through these multiple systems lenses you can see a robust representation of the interactions, tradeoffs and possibilities.

Looks at Past and Future: Systems thinking allows you to look forward into the future as well as backwards into the past. It compels us to consider not only what is happening now, but what has happened in the past and what may be possible in the future.

Flexible and Adaptive: GKI's systems tools and approaches can be tailored specifically to the users' needs, as well as their time and resource constraints.

Why is a Systems Approach Important for Social Impact and Problem Solving?

Problems are progressively becoming more complex and uncertain in nature. The scale and intricacies of today's most pressing issues call for new approaches to problem solving. Traditionally, social problems have been addressed through siloed and discrete interventions that cause unintended consequences in other parts of the system. This leads to a continuous band-aid effect rather than prevention. By contrast, a systems approach allows analysis of the entire system from a range of actors' perspectives, helping users understand the context of the problem and the dynamic relationships between actors. As a result, more holistic and viable interventions result.
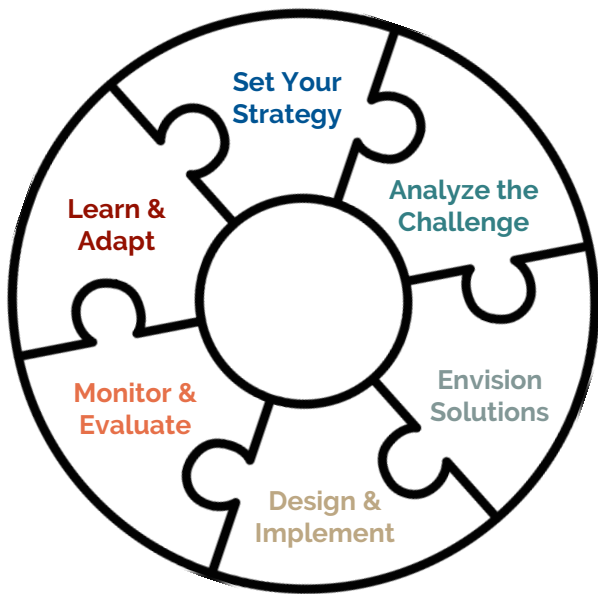
Using Systems Thinking & Practice At Every Stage

Without taking into account the broader system, it is easy to think very narrowly about defining your problem, conceptualizing potential solutions, and implementing your project. A narrow, linear point of view can therefore lead to misunderstanding of root causes; a lack of foresight into potential opportunities and challenges; and non-sustainable solutions. Conversely, using a systems approach ensures you understand the whole picture as well as how each part fits into the whole – like puzzle pieces in a puzzle. Demonstrated below are the ways you can employ systems approaches in every step of the problem cycle.

Set Your Strategy: Adopt a systems mind shift. Meet with stakeholders to define the problem and agree on a shared vison of the future. Define the system in which the problem lives; its boundaries, actors, linkages and the enabling environment.

Analyze the Challenge: Develop a deep understanding of the system through system mapping tools that define the complex interactions between actors. A systems approach can help to identify key leverage points within the system and anticipate unintended consequences.

Envision Solutions: Determine what potential solutions might look like. A systems approach allows one to find out-of-the-box solutions that focus at the intersection of many sectors and ideas, ultimately fueling disruptive changes in the system.

Design & Implement: A systems approach can assist in the development of a design & implementation strategy by identifying key factors that enable or thwart stakeholder action within a system. Understanding these factors can lead to more effective implementation.

Monitor & Evaluate: Track movement across all stages of the problem cycle from brainstorming solutions to achieving scale. Measurement of impact should include all participating actors and their affected environments. By understanding system leverage points, evaluators can identify priority variables to evaluate.

Learn & Adapt: Optimize program design though an analysis of outcomes. Optimization of a system can be reached through iteration. Once the system is optimized, adaptation must continue to occur as systems are dynamic and always changing.

A Sample of GKI's Systems Tools
A sample of some of the tools that GKI employs.
These tools can be applied at many stage of the problem solving process..

Tool Description

Three Horizons helps users develop a roadmap that clarifies the present challenge they seek to address within a system and the many possible futures in which it is resolved. Best facilitated in a workshop setting, the tool offers groups a way of seeing and comparing distinct journeys that lead to those future states.

A **systemigram** provides a visual representation of an entire system. It is built from a narrative that breaks down the challenge and the system(s) it is part of. This narrative is written in collaboration with key system actors to outline stakeholder and beneficiary relationships. A systemigram consists of nodes (actors, resources, events, etc.) and linkages that represent the relationships between nodes.

Influence & Incentives Matrix identifies and ranks key system stakeholders based on their relative levels of influence over activities occurring within the system, as well as their incentive to take action on a problem of focus. This tool is particularly helpful in understanding misaligned incentives, and for developing partnership / engagement strategies.

The **Enablers & Barriers Scoring Table** identifies what factors occurring in the system significantly enable or thwart stakeholders' ability to take action on a given challenge. The creation of a spider plot allows one to further compare the relative significance of various enablers and barriers, both in the present and the future. This insight can inform decision making on where to best invest / intervene in the system.

Tool Outputs

- Unpacks the current state of the problem users seek to solve.
- Demonstrates multiple possible futures and allows users to converge on their ideal future system.
- Identifies sets of innovations that can help users achieve the desired future system.

- Clarifies and visualizes a system's architecture & boundaries.
- Maps key actors, resources, events, and other phenomena within the system, as well as the relationships between them.
- Highlights feedback loops, missing linkages, duplicated efforts, time lags, and more.

- Identifies key stakeholders within a chosen system and ranks them on their relative levels of influence & incentive.
- Increases knowledge on stakeholder motivations, processes, and interactions.
- Provides insight on how to gain leverage in the system (i.e., small-scale actors with high incentive can combine to form collectively high influence).

- Analyzes roadblocks and opportunities that could make or break an intervention in the system.
- Provides decision makers with a clear picture of opportunities for investment and intervention by analyzing the present system and the possible future system.

4
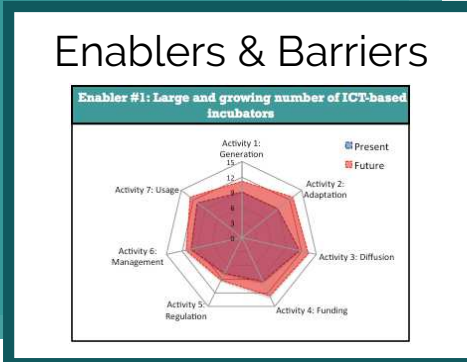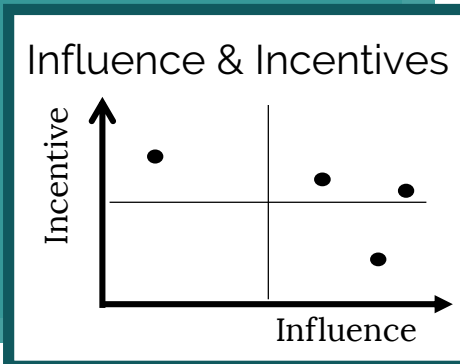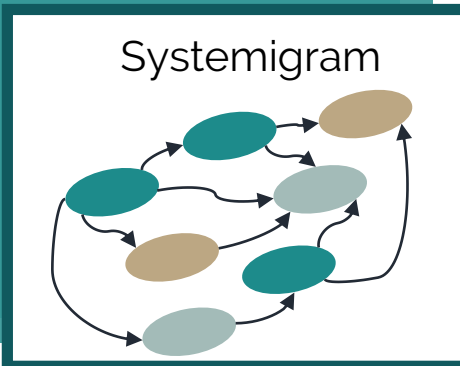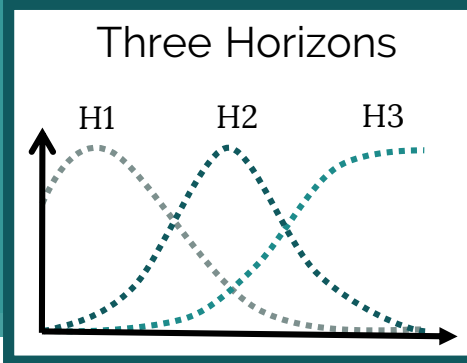
"Teaching a Man to Fish"

Traditional log frame approaches have taught us "if you teach a man to fish, you feed him for a lifetime". In our complex world, however, this no longer holds true. Our future is increasingly unpredictable, thus, simply teaching a man to fish is insufficient to assure he stays well-fed for a lifetime. Consider a few systems effects that could render the linear "teaching a man to fish" approach inadequate.

Bowman, Kimberly, John Chettleborough, Helen Jeans, Jo Rowlands, and James Whitehead. "Systems Thinking: An introduction for Oxfam programme staff." October 2015.

Waters may become polluted due to urban expansion or agricultural runoff.

Commercial fishers may overfish the water.

People may not be able to afford fishing supplies or a boat

The market for fish may crash.

Case Study of GKI in Action: USAID-Funded SPACES Consortium

The US Agency for International Development (USAID) has recently shifted its thinking, moving away from linear log-frames and toward more comprehensive systems approaches. The question then became, "What tools and methods should we use to bring systems into our programming?" To answer that question, USAID's MERLIN (Monitoring, Evaluation, Research and Learning Innovations program) funded a systems-focused consortium called SPACES (Strategic Program for Analyzing Complexity and Evaluating Systems). GKI is a part of this consortium along with Johns Hopkins University's Global Obesity Prevention Center, LINC, and Resilient Africa Network. Since 2016, SPACES has offered insight, advice, and technical assistance to USAID Missions and Bureaus to help them apply systems approaches at any stage in the project planning and delivery lifecycle. SPACES has worked on 7 different pilot projects with USAID, with more to come in the future. For example, we completed a systems evaluation of USAID's global healthcare supply chains, offering insights into both challenges and opportunities for improved efficiency and effectiveness moving forward.

Case Study: Flint, Michigan

The Flint, Michigan Water Crisis represents a situation in which a systems lens was not used to tackle a systemic challenge, resulting in a failure to solve the underlying problems. In attempt to answer Flint's budget deficit, the city switched water sources in 2014 from Lake Huron to the Flint River. The water treatment plant failed to install equipment capable of handling the corrosive water of the Flint River, leading to deterioration of the pipes, thus leaching lead into the drinking water. Directly after switching water sources, residents noticed the water had a brown color, strong smell, and was causing their children to become sick. Many lodged complaints with the city and began to only use bottled water. This feedback from stakeholders was ignored for more than a year, causing extreme damage to the pipes. Insight from residents (who are key system stakeholders) had the potential to stop the crisis immediately; however residents' perspectives were not considered. The city only acted after Hurley Medical Center released their findings on lead levels in children's blood samples. A linear approach to the situation resulted in the city switching back to Lake Huron for their water source; however, the damage to the pipes was already done, leaving the systemic problem unsolved.

Sokolow, Jessica. "The Flint Water Crisis: Using Systems Thinking to Understand Critical Failures." The Cornell Policy Review. August 28, 2017. Accessed November 06, 2017.

COLLABORATING WITH GKI TO INCORPORATE SYSTEMS INTO YOUR WORK

Whether you are considering employing some of GKI's systems tools, seeking to learn more about ways to incorporate systems methods in your work, or are hoping to learn the skills and approaches underpinning systems research and analysis, we are here to help. Named one of the world's top 100 social innovations for the next century, GKI enthusiastically embraces opportunities to share our models and methods with others who are passionate about collaborative innovation and development.

Contact us by emailing GKI Chief Operating Officer, Sara Farley at sara@gkinitiative.org.