Collaborative Innovation Tools

Top 10

GLOBAL KNOWLEDGE INITIATIVE

Photos courtesy of GKI staff: Sara Farley, Andrew Gerard, Amanda Rose

Tackling complex challenges together

The premier challenges of today—mitigating climate change, ensuring energy security, reducing food loss—are complex and multi-sectoral. They confound the efforts of single actors. Creating lasting solutions to these and other global problems requires the collective work of many problem solvers who pursue common goals and bring to bear their varied perspectives, resources, and areas of expertise. We call such work *Collaborative Innovation* and its pursuit is the driving force of the Global Knowledge Initiative (GKI). While Collaborative Innovation stands to solve many of the world's toughest challenges, it can also present a challenge in and of itself. Research has found that including diverse problem solvers can radically improve the chances of solving a challenge. Paradoxically, this very diversity can pose a bottleneck: experts from varied academic and cultural backgrounds have unique incentives, points of view, and terminologies, each of which renders working together a struggle. In the absence of shared goals or coordination between their competing interests, collaborative teams often fail to deliver solutions.

Progress on large, complex challenges demands that problem solvers—be they from the private sector, government, academia, or civil society—learn effective ways of developing and delivering upon a shared vision. Mastery of three vital and inter-related processes is essential—(1) **collaboration**, (2) **innovation**, and (3) **solving problems in teams**. The skills that underpin these three processes are those that propel Collaborative Innovation. First, collaboration calls on problem solvers to exchange ideas and resources. Second, innovation demands that problem solvers employ creativity in assessing opportunities and linking ideas from blueprint to scale. Finally, motivated problem solvers must solve problems in teams, which means aligning those resources gained through collaboration toward the innovation process. When provided with Collaborative Innovation tools, individuals and teams can enhance these processes and become more effective in creating sustainable, transformative solutions. In so doing they become powerful Collaborative Innovation Networks.

The last decade of research offers a compelling rationale for explicitly enabling the creation of collaborative networks; according to the UK's Royal Society, such networks "enhance the quality of scientific research, improve the efficiency and effectiveness of that research, and are increasingly necessary, as the scale of both budgets and research challenges grows." Further, by including implementers, funders, and community members from the beginning of the innovation process, researchers are better poised to ensure that the solutions they envisage may work on the ground, and that they have the support of the communities they seek to benefit.

Since its formation GKI has found that the use of Collaborative Innovation tools enables problem solvers to increase their effectiveness and impact. This compendium introduces the top 10 tools that GKI uses to jumpstart and sustain Collaborative Innovation networks and increase the number of effective, scalable solutions they deliver. Through training, facilitation, and analysis, these tools enable motivated solvers to smash through silos and bring together ideas, experts, and resources in ways that leverage their true value.

Building Capacity
A Malaysian researcher practices using a Collaborative Innovation tool for community-academia partnership.

Promoting Understanding
Researchers from Afghanistan and Pakistan unite to solve common challenges and build a research network.

Uniting Stakeholders
Representatives from across the agriculture value chain explore potential post harvest loss innovations in Nigeria.

The Global Knowledge Initiative's top tools

As a primer on the tools we use and the benefits they bring, GKI has compiled a list of our Top 10 Tools for Collaborative Innovation (CI). We have deployed these tools in a wide variety of global contexts, solving challenges in fields such as eco-health, agribusiness, and climate change, among scholars from places as diverse as Haiti, Tanzania, Pakistan, Rwanda, Kenya, France, Afghanistan, and the US.

GKI tailors the deployment of these tools based on the needs of the challenge at hand and the partners involved. GKI commonly uses Collaborative Innovation tools in trainings, facilitated workshops, in-depth research, and over the course of network formation, as highlighted below.

- **Training**: GKI provides trainings on these 10 tools, along with others, to build the capacity of researchers, policymakers, entrepreneurs, and other people to better collaborate, innovate, and solve problems in teams. GKI often uses a "training-of-trainers" format, enabling professionals in the developing world to train others on these crucial skills and methods.
- **Facilitated Workshop**: GKI's CI tools can also be used in the context of facilitated workshops. For example, GKI experts walk groups through segments of the Collaborative Innovation process, using various tools to move actors toward concrete outputs and outcomes.
- **Research**: GKI uses CI tools to conduct analysis on the actors, resources, and context surrounding a given challenge. With contextual research and insight organized according to these tools, GKI offers a way for members of complex networks to quickly learn about the context of the challenge they confront, enabling problem solvers to define a shared starting-point for collective action.
- **Network Formation**: CI tools also support GKI's work forging networks. For example, a tool might reveal unexpected overlap in the missions of network partners, or provide avenues for potential partnership. They also help network members work together effectively.

Watercolor world map image by Audrey DeFord

The wealth of tools that render innovation, collaboration, and problem solving in teams feasible makes selection of a best-of list exceedingly difficult. However, in a range of scenarios in some of the most resources-strapped, high-stakes contexts imaginable, GKI consistently finds that these top 10 offer value, insight, and effectiveness. We share these tools on the condition that those who experiment with them share their feedback with us so that together we may build an ever-improving treasure trove of tools to empower the world's 7 billion solvers. For more information on any one or a combination of tools, please contact GKI Co-Founder & Chief Operating Officer Sara Farley at: sara@gkinitiative.org. To learn more about the Global Knowledge Initiative, please see Annex I on page 25.

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Clarifying Global Challenges
Participants in Ghana map the Challenge of food waste and spoilage in Africa, identifying bottlenecks to progress and high-priority opportunities. Next page: A GKI expert trains participants on the Challenge Mapping process.

Collaborative Innovation Tools

1

Challenge Mapping

Challenge Mapping

Definition: a tool to parse complex challenges; a way to visualize opportunities and bottlenecks

Example

Reducing the incidence of food loss in the developing world means ensuring that 1/3 of human food fit for a plate actually reaches it. In a series of problem framing sessions, GKI helped experts—20 at a time—tear apart this complex phenomenon into more than 590 discrete aspects of food loss. These "sub-challenges" can then be analyzed to help clarify what levers for action can be activated in a large-scale initiative.

How does it work?

Challenge Mapping enables diverse groups to consider how they might solve a complex challenge. While the content of each Challenge Map is unique, the structure remains the same. Beginning with a shared challenge (or several shared challenges), the Challenge Map expands upward as participants ask: "Why do we want to solve this challenge?" Groups move downward by asking, "What's stopping us from solving this challenge?" Complex challenges are not monolithic: instead, there are many smaller issues that must be dealt with in order to deliver a comprehensive and successful solution. Challenge Mapping offers users a structured method for breaking large, unwieldy challenges into smaller, actionable sub-challenges. In doing so, and by phrasing all challenges as opportunities starting with "How might we…?", Challenge Mapping encourages users to generate creative options for solutions and explore how those options relate to one another. This structure helps establish shared rationales, as well as identify critical bottlenecks that might stymie efforts to generate and/or implement solutions.

What kind of impact can it achieve?

Challenge mapping allows members of diverse professional areas—business, government, education, etc.—to visually map how their work relates to solving a challenge or goal that can be viewed from many perspectives and beckons for many actions. Challenge Mapping (1) reveals opportunities for collaboration around shared problems; (2) clarifies highest-priority investments and critical partnerships required for problem solving; (3) identifies critical barriers to solutions; and (4) creates a path for action. Challenge Mapping has helped groups unpack their challenges around the world in instances ranging from a convening of Afghan and Pakistani scientists looking for areas of overlap in shared water, agriculture and climate challenges, to USAID's Higher Education Solutions Network (HESN) in which eight founding member Labs seek to unlock university resources for global problem solving. For Afghan and Pakistani scientists, Challenge Mapping revealed ample and diverse opportunities for cross-border collaboration and innovation. For HESN, Challenge Mapping highlighted opportunities for USAID to support the Labs as they work to meet concrete network goals.

Mapping International Endeavors

GKI worked with USAID's Higher Education Solutions Network (HESN), training researchers to map out their Labs' activities and think through potential needs and impacts. Next page: Lab members discuss the placement of activities on their individual strategic storyboards.

Collaborative Innovation Tools

2

Strategy Shaping

Strategy Shaping

Definition: a tool to visualize the activities, resources, and connections needed to achieve outcomes

Example

Strategy Shaping offers an important first step for new ventures; it allows entrepreneurs to think through different courses of action, working through what makes sense and what doesn't. GKI trained grantees from USAID's Saving Lives at Birth program to use Strategy Shaping to rapidly prototype the activities involved in their public health interventions, leading to stronger results on the ground.

How does it work?

Strategy Shaping, or Strategy Mapping, enables teams to visualize their mission by creating a map, collaboratively and in real time, which shows how the various parts of their project interact with one another. Participants begin by identifying their value proposition: the fundamental goal that sets their organization or product apart from others. From this starting point, participants use sticky notes to build a visual storyboard of how their goals can be achieved, starting with the activities that go into making their project possible. Iteratively, participants add resources, people, and organizations to illustrate how these pieces come together to make these activities happen; they also identify the outputs and outcomes resulting from these activities. By exploring the way that these resources, actors, activities, outputs, and outcomes fit together, teams create a logical model of how their project could work. The highly visual format of the Strategy Map enables diverse participants to easily understand the big picture of how an entire project runs, while the mutable nature of the sticky notes encourages participation, negotiation, and adjustment, enabling large groups to work collaboratively with ease.

What kind of impact can it achieve?

The Strategy Map provides a visually compelling story of how a project works, both now and in the future. As a result, it allows participants to notice connections between activities as well as potential resource overlaps that might not be obvious otherwise. It also exposes logical holes that may impede a team's perception of how their project works. For example, if your activities depend on a crucial resource, but you have no idea how to obtain it, then your team will be unable to achieve its goal. As a result, the Strategy Map forces teams to be honest and realistic about all of the activities, partners, and resources they need to achieve their desired outcomes. If shared with external partners, Strategy Maps can also enable people from other fields, backgrounds, or organizations to understand how an initiative operates and to what goals it aspires. By allowing for contributions from diverse stakeholders and perspectives, project leaders may get new ideas for partnerships or activities, which they would not have considered otherwise. Ultimately, the Strategy Map provides clarity to all members of an initiative on what must be done—and what partners and resources are needed—to achieve success.

Opening Eyes to Resources
During a GKI-designed "Resource Walkabout" in Air Papan, Malaysia, students take stock of each science, technology, and innovation related resources they observe in a community. Next page: an expert demonstrates one of many technologies used in the quality coffee value chain in Rwanda.

Collaborative Innovation Tools

3

The THICK Methodology

The THICK Methodology

Definition: a tool to take stock and make sense of science, technology, and innovation resources

Example

The THICK methodology can be used to gauge capacity for innovation at the level of a team, an institution, a sector, or even a nation. In Uganda, GKI experts developed and used the THICK methodology to measure the country's science, technology, and innovation resources. Better understanding of Uganda's resources enabled construction of a unique World Bank intervention to deliver needed assets.

How does it work?

The THICK Methodology is a tool that allows for the thorough identification and understanding of resources needed—and available—for science, technology, and innovation (STI) related activities. An acronym, THICK represents five types of resources crucial for promoting STI. T stands for Technology: the tools that individuals and organizations use, along with the knowledge to use them. Next are Human resources: trained experts and technicians capable of putting STI to work. I stands for Institutional and Infrastructure resources; these are the organizations, policies, and infrastructure that provide the structure needed for innovation to occur. C represents Collaboration and Communication resources such as mobile phones, Internet, and in-person forums that allow researchers, entrepreneurs, community members, and others to exchange ideas and knowledge. Finally, Knowledge resources constitute the information and indigenous knowledge that innovators require. Together, these THICK resources empower the use of STI; taking stock of these resources allows teams to understand what they have, and what they still need, to deliver solutions with collaborative innovation.

What kind of impact can it achieve?

THICK can radically augment teams' ability to solve problems by clarifying how to think about key resources as the focal point for partnership formation. By taking stock of the resources team's already have, they often discover that they have more tools and partners at their disposal than they appreciated. The rationale for new partnerships then becomes accessing/sharing available resources with potential partners. To use THICK effectively, first teams evaluate the THICK resources in their own institution/network by conducting a Knowledge Partnership Landscape Analysis (KPLA). To do this, team members use a special KPLA interview protocol to query individuals about resource needs and availability. In the case of the University of Rwanda (UR), a KPLA conducted in the Faculty of Agriculture evidenced the availability of at least 128 existing or past partnerships connected to needed STI resources. The analysis demonstrated that UR required additional expertise on coffee pests to solve a particular coffee-related challenge. Based on the KPLA's findings, GKI introduced UR to entomologists globally. Network Ecosystems (Tool 9) also draw on the THICK Methodology to map teams' resources.

Building Connections

At a GKI-run matchmaking session in Pakistan, researchers from Pakistan and Afghanistan unite to define and solve shared challenges despite political barriers. Next page: Administrators from Penn State University and the Nelson Mandela African Institute of Science and Technology meet to establish a joint initiative around eco-health.

Collaborative Innovation Tools

4

Matchmaking

Matchmaking

Definition: a tool to match partners based on strengths, resources, goals, values, and other strategic characteristics

Example

In early 2012, Penn State University's Huck Institutes of Life Sciences sought a local university partner for a long-term eco-health program. After analyzing the Huck Institutes' resources, needs, and plans, GKI identified Tanzania's Nelson Mandela Africa Institute of Science and Technology as a possible match. GKI brokered a meeting in Tanzania between administrators from both institutions, helping the two visualize collaborative potential. In 2013, joint activities began.

How does it work?

Whether forging a partnership between individuals, groups, or institutions, a number of considerations guide GKI's matchmaking activities. In any partnership, a shared vision and values, aligned incentives, and the availability of needed resources prove essential. GKI works with problem-solving teams to clearly articulate what they hope to achieve, how they envision a partner helping them to meet goals, and what resources they would need to be successful. GKI then leverages its global network of content and process experts—researchers, business professionals, development practitioners—and conducts research on potential partners outside of its network to identify the smartest match. After identifying potential partners, GKI brokers partnerships either through in-person or virtual meetings. These matchmaking sessions are dynamic, exciting, and highly choreographed. GKI will work with partners until their network can stand on its own, by organizing initial meetings and assisting in structuring the partnership. Based on the network's needs, GKI either steps out once the collaboration is firmly formed, or continues to assist the new partners through Network Management (Tool 6).

What kind of impact can it achieve?

Finding the right partner, at the right time, can transform efforts and yield great success. In the case of PSU and NM-AIST, intelligent matchmaking enabled both partners to work effectively on eco-health initiatives. PSU gained a high-quality, professional partner in Africa, while providing NM-AIST with resources the young university would not have been able to access otherwise. In other cases, GKI-brokered partnerships have allowed partners to take on activities that would not have been possible otherwise. In one example, GKI structured a partnership between Kenyatta University's (KU) Dr. Kennedy Mwetu and a team at ICRAF (World AgroForesty Centre) around rainwater harvesting research. Both teams wanted to conduct empirical research on return on investment for rainwater harvesting structures in Eastern Kenya. The KU-based team had incredible talent, but lacked the infrastructure and logistical resources available at ICRAF; as a result of the partnership, they gained access to ICRAF's data, logistical prowess, and research sites. ICRAF benefited from Mwetu's field research expertise, along with his experience in Eastern Kenya. Together, they conducted successful field research in 2013, and continue to collaborate. Likely, without GKI's matchmaking, this partnership would not have emerged.

Seen, Heard, Respected
Students from the Universiti Teknologi Malaysia observe a fisherman in the rural village of Air Papan as he demonstrates the techniques that he uses to haul in fish, gaining insight into his life and occupation. Next page: An empathy map is a powerful tool that prompts team members to think critically about the needs and preferences of the people they hope to help.

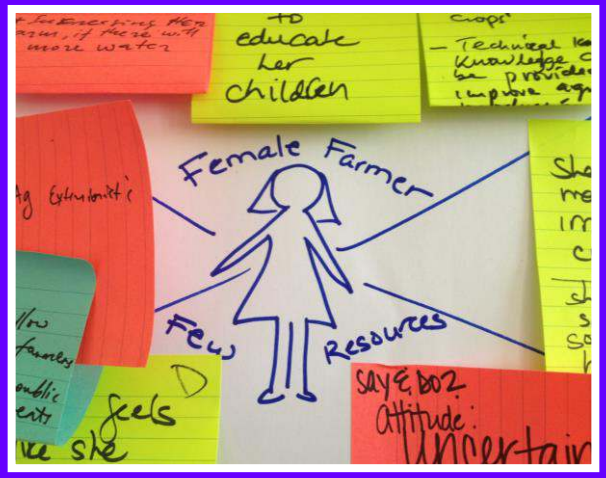
Collaborative Innovation Tools

5

Empathizing with Users

Empathizing with Users

Definition: a tool to create demand-driven solutions by understanding user needs and perspectives



Example

Rice paddy fields in the community of Air Papan, Malaysia are drying out. To help solve this problem, researchers from the Universiti Teknologi Malaysia (UTM) learned to start empathizing with the users of the paddy field, gaining deep insight into how community members perceive this issue. This perspective has allowed researchers to work with community members to help co-create desirable solutions.

How does it work?

"Empathizing with users" is a way to gain deep insight into *who* we are designing solutions for and with. While working to empathize with users, team members seek to understand what potential users want, need, and aspire to, in addition to understanding what they have to offer, what they dislike, and how they perceive the problem. To gain these insights, GKI uses a number of techniques. In Air Papan, Malaysia, UTM researchers and students used both a GKI-designed interview protocol and thoughtful, structured observation to assess how individual paddy farmers understand the challenge of their quickly drying fields. Researchers and students sought to see, hear, and respect the community by understanding how a particular challenge affects many different individuals, while also reserving judgment and respecting each community member's point of view. GKI also helps researchers empathize with users by using a visual thinking tool called Empathy Mapping, shown above. Empathy Maps, completed after interviews are conducted, provide a template for researchers to map out the feedback from their users, creating an archetype of the thoughts, feelings, and experiences of each hypothetical user.

What kind of impact can it achieve?

Why empathize with users? All too often, researchers or entrepreneurs develop brilliant technologies, only to find adoption levels low and impact lagging behind expectations. For solutions to take hold and scale, they must be driven by the desires of the user, not just a donor, researcher, or entrepreneur. Empathizing with users empowers innovators to correctly perceive users as indispensable partners in designing, implementing, and assuring the success of a solution. Working to deeply understand the needs, circumstances, strengths, and desires of these users helps innovators to generate solutions which users will find desirable, and which will therefore be more sustainable. This is why empathy stands as a key tenet of the human-centered design philosophy. In the Kenya LINK program, Kennedy Mwetu interviewed dryland farmers and created Empathy Maps as part of a Collaborative Innovation Strategy (Tool 8), allowing his team to gain new insights about constraints facing farmers. Simply put, empathizing with users can make the difference between a project where partners come together to develop sustainable solutions—be they for rice in Malaysia or dryland agriculture systems in Kenya—and one where teams put their energy and expertise toward a solution that can never work, because it is neither needed nor wanted.

Maintaining Network Relationships

In-person meetings represent an important time for collaborators in international networks to build trust. Here, members of GKI's LINK Rwanda team come together to make field observations during a meeting in Rwanda. Next page: LINK Rwanda partners gather together a year later to publicize their efforts and hone network activities.

Collaborative Innovation Tools

6

Network Management

Network Management

Definition: a tool to manage complex networks of individuals collaborating to solve shared problems

Example

Starting with the coffee research challenge of one researcher at the University of Rwanda, GKI built a network of universities on four continents. To make sure this network successfully collaborated, GKI managed network activities and communication. Using bi-monthly and quarterly updates, conference calls, physical meetings, and monitoring and evaluation tools, GKI coordinates research undertaken at labs and coffee farms around the world.

How does it work?

Managing problem-solving teams in a single location is difficult; managing teams working to innovate across distance, time zones, culture, and language is a daunting task. After establishing smart matches (see Tool 4, Matchmaking) successfully managing such a network requires a process that includes planning for how the network will work together (see Tool 8, CI Strategy), training the team on collaboration skills, deciding which communication tools the team will use, carefully monitoring activities, and making sure team members communicate clearly and effectively. To help with deciding which communication tools to use, GKI offers network members a Collaborator's Toolkit. Depending on the technological infrastructure available to team members, they can use basic tools such as email, or more complex project management platforms. A network manager, either a GKI staff member or someone trained by GKI, aggregates team member updates and shares them with all group members on a bi-monthly basis to help team members communicate clearly. Having a specific person take on these network management responsibilities can be immensely important to network success.

What kind of impact can it achieve?

Simply put, carefully managing dispersed networks can make the difference between an expensive, inefficient group of disconnected actors and a network that—despite its physical distance—innovates strategically, efficiently, and as a single unit. Throughout GKI's LINK (Learning and Innovation Network for Knowledge and Solutions) programs in Rwanda, Afghanistan-Pakistan, and Kenya, managing communication between teams has proved one of the most important differences between inefficient "business as usual" development projects and well-functioning networks working toward success. Combined with a robust Collaborative Innovation Strategy (Tool 8), STI Context research (Tool 7), training on collaboration, and a robust THICK analysis (Tool 3), strong network management enables the LINK program to successfully leverage the expertise of hundreds of researchers and innovators around the world at little cost and great efficiency. Strong network management provides teams with a structure for communication and collaboration, and makes sure they stay on track: it is essential to the success of dispersed, collaborative networks. To this end, GKI now trains network facilitators globally.

Context for Innovation

Tools to analyze the resources of a context ripe for collaboration are many. Here a Burundian science teacher elucidates STEM teaching resources as part of an East African curriculum harmonization analysis undertaken by GKI and the World Bank. Next page: GKI's Sara Farley shares an STI Context Analysis report with a stakeholder on the ground in Rwanda.

Collaborative Innovation Tools

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STI Context Analysis

STI Context Analysis

Definition: a tool to clarify the context in which science, technology, and innovation (STI) take place

Example

Too often, teams begin work on a problem without taking stock of work that has already been done, and the contextual factors bearing on the challenge. As part of LINK Rwanda, GKI conducted an extensive investigation of Rwanda's coffee sector and science, technology, and innovation features. As a result, the LINK team was able to develop a solid strategy for action, and understand what partners they needed.

How does it work?

Innovation does not occur in a vacuum. As problem solvers put their expertise in science, technology, and innovation (STI) to work in the developing world, they must contend with a range of contextual factors that stand to help, hinder, or otherwise alter the trajectory of their innovation. The STI Context Analysis framework allows teams working in a particular geography or problem space to gain a better understanding of the pitfalls and opportunities they face by looking at their challenge on multiple levels. In developing an STI Context Analysis, GKI first examines the context for innovation at the national level, examining key components of the national innovation system. Next, we drill down to conduct a sectoral analysis, taking stock of the inputs, framework conditions (policies, market forces, tax regimes, infrastructure, etc.), interactions, and actors (individuals and institutions) that bear on a particular challenge, inclusive of potential outputs and outcomes. This analysis provides key information on the results of past efforts, in addition to helping identify key stakeholders. Armed with these insights, teams can make better choices about how to proceed toward delivering relevant, sustainable solutions.

What kind of impact can it achieve?

The STI Context Analysis delivers a thorough understanding of the way socio-economic, STI, and market influences—as well as past efforts—can improve problem solving in a specific country context. This information is crucial for outside researchers who hope to build effective partnerships and solutions in developing countries. For example, imagine a researcher looking to partner with an NGO in Rwanda to pilot an innovative coffee processing technique. An analysis of all NGOs working in the coffee sector might reveal that some have a poor track record of collaboration, or that only one has access to the necessary equipment. Governments and other high-level actors who wish to better understand the context surrounding a specific challenge will also find a Context Analysis helpful. In the East African Community, GKI conducted in-depth research into each country's secondary education system, providing specific suggestions for how governments could work together to ensure that math and science education supported regional economic goals. In this way, the STI Context Analysis can empower concrete action toward promoting innovation.

Moving toward Solutions

A Collaborative Innovation Strategy allows teams to work together to solve a common challenge. Here, Alan Spybey of KickStart International explains a potential prototype for rainwater harvesting to members of the LINK Kenya team. Next page: a GKI visualization of a potential solution to the LINK challenge.

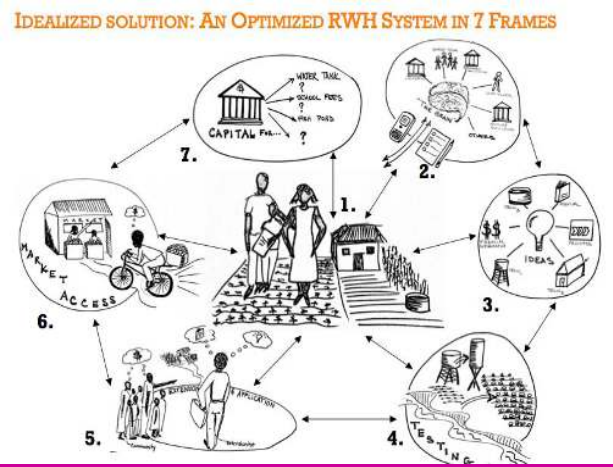
Collaborative Innovation Tools

8

Collaborative Innovation Strategy

Collaborative Innovation (CI) Strategy

Definition: a tool to create a strategy for tackling challenges through a collaborative network



Example

At Kenyatta University, GKI guided Dr. Kennedy Mwetu's team through a Collaborative Innovation Strategy. Team members interviewed potential rainwater harvesting users in Kenya's drylands, prototyping solutions based on their needs. By analyzing the resources available and needed, members were able to identify partners needed to implement their chosen solutions. This Strategy continues to guide networking and implementation activities.

How does it work?

At its essence, GKI's Collaborative Innovation (CI) Strategy acts as an integrated tool for project design, network development, and implementation, helping teams navigate the pathway of collaborative innovation. It represents a unique integration of proven approaches from innovation systems theory, human-centered design, and strategic planning. Conceptualized as a roadmap for partners, the Strategy provides network members with a common process for creating and implementing a shared solution to a challenge. Once a core team has identified a challenge requiring a collaborative solution, the CI Strategy helps them walk through the steps needed to design and implement a solution. The Strategy starts by asking team members to empathize with users (Tool 5), then moves to identifying solutions based on user needs, understanding the business model of potential solutions, outlining partnership needs, and finally designing an implementation strategy for the network to follow. GKI facilitates the CI Strategy in workshops that allow teams to iteratively modify decisions. The Strategy helps teams make decisions on their innovation's direction, then provides a clear blueprint for implementation.

What kind of impact can it achieve?

Because of the CI Strategy's focus on both design and implementation, it demonstrates impact at multiple stages of the innovation process. First, it helps teams come to form a common understanding of what users need, and how team strengths can help meet those needs. In LINK Kenya, Dr. Mwetu's team was able to gain unique insight on the challenges of decision-making and financing for rainwater harvesting by meeting with stakeholders in agriculture, finance, and development. Using these insights, as well as outside expertise, the team rapidly prototyped solutions, and identified with whom they would need to collaborate to develop business models for rainwater harvesting technologies. Once a way forward is identified, the Strategy then helps teams implement their plans. For Dr. Mwetu's team, the CI Strategy led them to work with KickStart International, an NGO that co-wrote grants with Mwetu and shared its expertise in business modeling. It also led them to Dr. Mick O'Neill, a dryland water expert at New Mexico State University who volunteered to join Mwetu's team in Kenya for field research. Through the CI Strategy, Mwetu's team successfully expanded to meet clear project priorities.

Visualizing Resource Priorities

At a GKI-designed Knowledge Café, facilitators from USAID use boards to collect the resources and resource needs of university teams, empowering collaboration. Next page: a Network Ecosystem map illustrates the resource landscape around a given challenge.

Collaborative Innovation Tools

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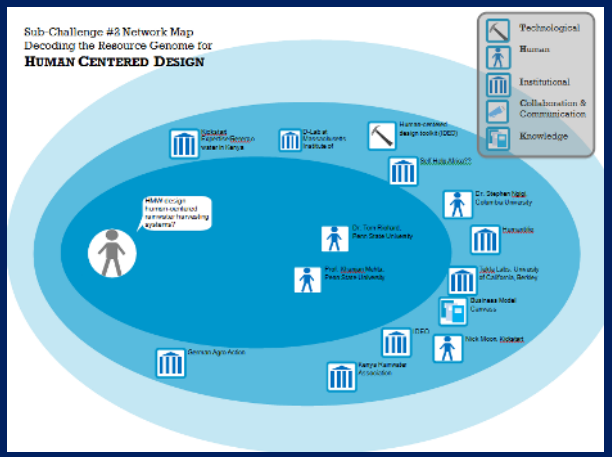
Network Ecosystems

Network Ecosystems

Definition: a tool to map available and needed resources around a given challenge



Example

USAID's Higher Education Solutions Network (HESN) consists of eight labs, each composed of partners at many universities and each committed to solving development challenges through the application of research expertise. By using network ecosystems to map the resources available across the network, each lab was able to locate HESN resources that could be easily leveraged for specific challenges.

How does it work?

A "network ecosystem" visually represents the relative availability of resources needed to solve a problem. It maps those resources that teams have, those that they lack but could potentially access, and those that they need, allowing team members to quickly identify THICK (Tool 3) resource needs that merit outreach. The network ecosystem map is composed of three rings, all oriented around a guiding challenge selected by a team. The center ring represents the resources needed to solve this challenge that the team already has at its disposal. By taking stock of these resources, teams see those resource areas in which they are strong, and can compare them to areas where they are weaker. The second ring shows those resources that the team does not yet have, but which the team can locate. Team members may intuitively know how to access these resources, or may identify where they are by conducting a Knowledge Partnership Landscape Analysis (Tool 3) on potential partners. Finally, the outermost ring shows resources the team still needs for which the locations are not known; accessing these resources requires researching potential partners who can bring them to bear on a challenge.

What kind of impact can it achieve?

The premier challenges of the 21st century demand the work of committed problem solvers; however, the good intentions of network members are not enough. Networks need resources to deliver scalable solutions on the ground where they are needed. GKI designed the network ecosystem to aid teams in identifying exactly what resources they need, so that they can reach out intelligently to potential partners who either have those resources, or the capacity to obtain them. Network ecosystems force teams to be specific, so that they know exactly how to go about filling their resource gaps. As teams analyze the landscape of available and needed resources, they build a picture of the key stakeholders necessary to bring on board to solve the challenges that they face. By identifying partners who have needed resources, network ecosystems facilitate targeted outreach, increasing efficiency by allowing team members to identify what they need, and enabling them to deliver and scale their solutions. When used on its own or as part of the Collaborative Innovation Strategy (Tool 8), this tool allows teams to structure new partnerships strategically around resource needs, avoiding duplication.

Creating Solution-Focused Convenings

GKI designed and co-hosted with Pennsylvania State University the inaugural Africa Collaboration Colloquium, which brought together over 80 global problem solvers to address food security challenges. Next page: Fred Kabi, a challenger from Uganda, Challenge Maps with GKI's Sara Farley at a Collaboration Colloquium.

Collaborative Innovation Tools

10

Collaboration Colloquium

Collaboration Colloquium

Definition: a tool that gathers experts to spark strategic collaboration around specific challenge areas

Example

Uganda has a growing dairy sector and a dire youth unemployment challenge. Through facilitated matchmaking at the 2012 Africa Collaboration Colloquium, researchers from Penn State University and Makerere University found each other and discovered a shared opportunity to meet Ugandan dairy's demand for feed and train youth to start haymaking ventures. This team is already seeing success!

How does it work?

Collaboration Colloquia break the mold of the standard conference format. Rather than a collection of presentations, the Collaboration Colloquium has one clear goal: spark partnerships to tackle pressing development challenges. GKI and partners structure each Collaboration Colloquium around a particular challenge area, such as African food security, dairy value chains, or growing the East African coffee sector. For each event, GKI identifies and selects a series of "Challengers"—individual researchers or entrepreneurs working on the ground to solve a specific challenge within the larger challenge area. GKI identifies individuals to attend the event with strategic interests in partnering with the selected Challengers and other participants. With the goal of seeding collaborative partnerships that can continue beyond the event itself, Colloquium activities—including Challenge Mapping (Tool 1), resource stocktaking (see Tool 3), and facilitated matchmaking (Tool 4)—shine a spotlight on those Challengers, enabling radical progress toward their challenges. GKI often identifies sponsors to offer a Challenge Prize to incentivize ongoing collaboration between newly formed partners.

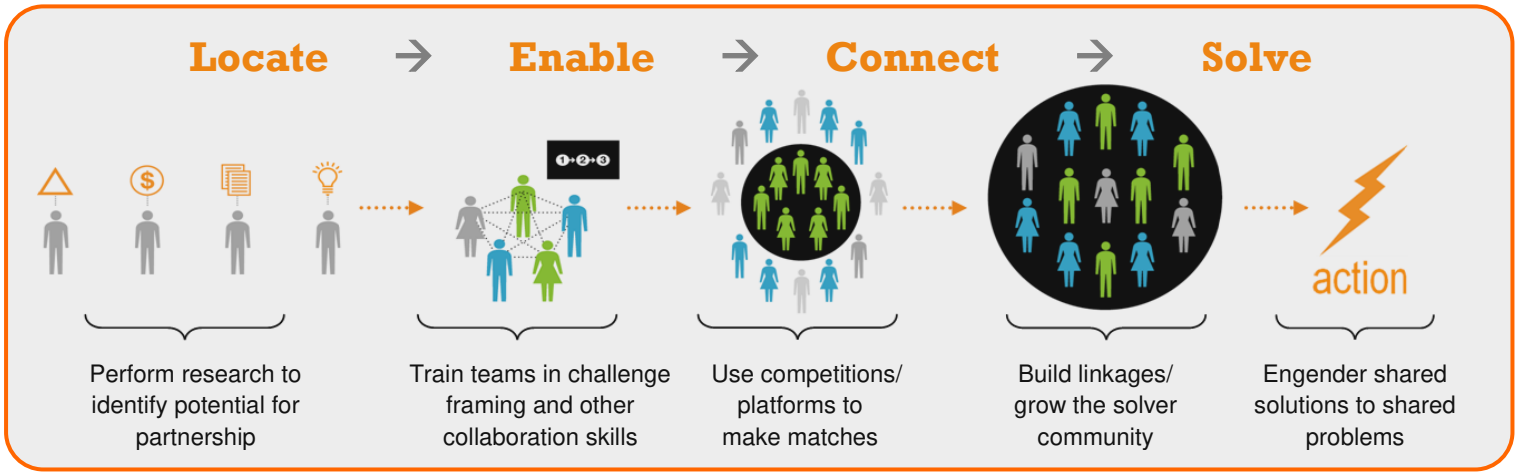
What kind of impact can it achieve?

Collaboration Colloquia have the power to create transformative partnerships between individuals who may have not connected or understood their strategic opportunities under different circumstances. With explicit focus on the individuals tackling challenges on the ground, Collaboration Colloquia bring together diverse groups of solvers to collectively focus on actionable challenges that already have champions. For instance, at the 2012 Africa Collaboration Colloquium (ACC), seven vetted Challengers—African scientists, each poised to solve a crucial food security problem—served as focal points for partnership planning and matchmaking. Over 50 participants hailing from 17 institutions joined the African Challengers for this event. Representing expertise in diverse fields such as agronomy, engineering, and business, participants crossed disciplinary and geographic divides to determine how to put their resources to work for shared solutions. The Challenge Prize offered at the ACC spurred a partnership between PSU and Makerere University on dairy value chains, and resulted in a new training program and job opportunities for young Ugandans and Kenyans.

Annex 1: Background on GKI

Our Start: The Global Knowledge Initiative (GKI) originated from the 2008 Higher Education Summit for Global Development convened by the US Secretaries of State and Education and the Administrator of the US Agency for International Development. Attended by more than 200 university presidents, heads of technology firms, and philanthropists, the Summit called for a "clearinghouse for resources & information to help build knowledge partnerships that can tackle development challenges." Five years later, we've trained hundreds of innovators globally, delivered solutions to challenges in agriculture, water, and climate, and built processes and tools that equip our partners to build networks that solve problems.

Our Process: We address developing country-based challenges pertinent to science, technology, and innovation (STI) by helping solvers: **Locate** and render accessible critical resources—technical, human, institutional, knowledge-based—required for collaborative problem solving; **Enable** partners to collaborate effectively through trainings and competitions; and **Connect** with the global network of problem solvers to bring solutions to scale. Dubbed "one of the world's top 100 innovations for the next century" by the Rockefeller Foundation (2013), this approach effectively delivers solutions to some of the world's toughest challenges.



Our Approach

We work with a continuum of partners. GKI takes an innovation systems approach. We engage a diverse array of actors—universities, firms, governments, professional societies—as a means to empower people within institutions to spur systemic change.

We clarify the context for collaboration. For universities, firms, and organizations seeking to explore new partnerships in new geographies, our research and analysis provides an understanding of the context, community, needs, and opportunities for collaborative activity. We analyze national, sectoral, and institutional problem spaces to illuminate contextual factors that matter.

We frame and map the challenge space. Complex and multi-disciplinary challenges must be unpacked and framed correctly to enable action by diverse problem solvers. GKI facilitates challenge framing and mapping to promote clear communication and foster collaboration.

We cultivate talent. GKI connects problem solving and capacity building by facilitating and training on key skills for "collaborative innovation." We train on three skill areas: (1) how to collaborate, (2) how to innovate, and (3) how to solve problems in teams.