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The Learning and Innovation Network for Knowledge and Solutions (LINK) Program

Solving the World's Toughest Development Challenges through Collaborative Innovation

Overview: The Learning and Innovation Network for Knowledge and Solutions (LINK) Program

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Today's complex development challenges require that individuals and institutions work across borders and geographies in ways and at rates never before required. While collaboration offers a way forward, too often those who need critical resources — technologies, knowledge, human resources — to solve specific challenges cannot find and collaborate with those that have them. The Global Knowledge Initiative (GKI) designed its LINK program to address this need. We catalyze purpose-driven networks to deliver implementable solutions to development challenges pertinent to science, technology, and innovation (STI). The LINK process — informed by deep insights gleaned through a global needs analysis — involves four core functions: activating communities of practice, locating resources, enabling sustainable partnerships by learning shared tools and processes for collaborative innovation, and connecting people and resources together into durable purpose-driven networks: "**Activate, Locate, Enable, Connect to Solve."** Designed as a replicable, learnable process, LINK offers a way to realize GKI's vision for global impact: **aligning the world's resources and partners to increase the speed, reach, and relevance of innovation,** thereby magnifying the power of the world's 7 billion solvers.
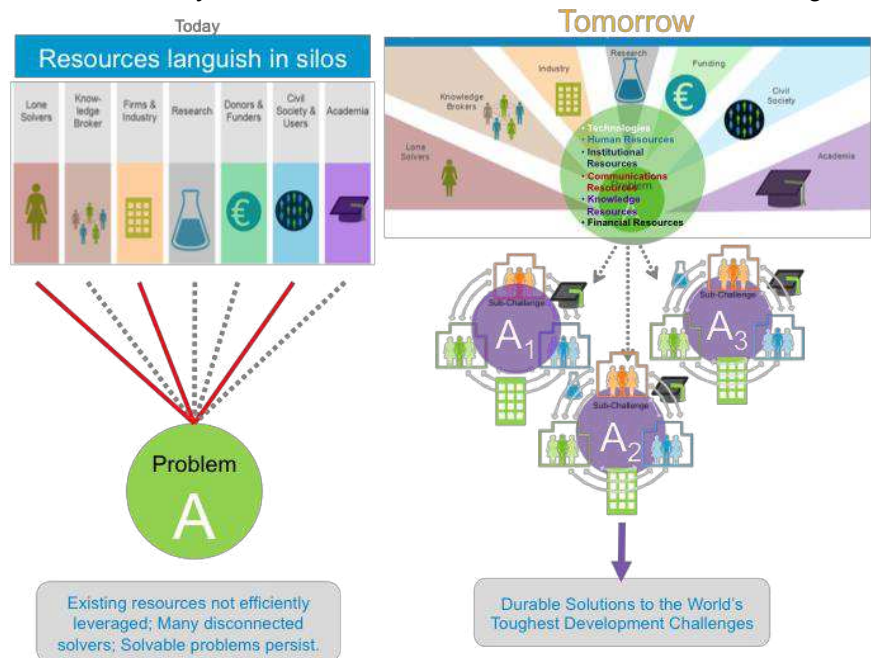

Figure I: GKI designed LINK to achieve benefits, not just for immediate project participants, but for system-wide actors.

We are demonstrating the impact of LINK through pilot initiatives in Rwanda, Kenya, Malaysia, and Afghanistan-Pakistan with the US. The success of these LINK pilots, explored in this document, exhibit the viability of the program's straightforward and scientific approach to (1) **forging**, (2) **optimizing**, and (3) **sustaining** purpose-driven networks to tackle development challenges pertinent to STI. Building off of these initial successes, we seek partners with whom to scale LINK in East and Southern Africa and South Asia and to pilot LINK in Latin America. The following section offers a brief overview of the **"Activate, Locate, Enable, Connect to Solve"** process, results from the LINK pilots, and our plans for achieving our global impact. Additional information is available upon request.

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How do we choose? GKI works on challenges that align with these criteria:

(1) The problem constitutes a **shared concern** for developing and developed country partners;

(2) The problem relates to **science, technology, & innovation**;

(3) Solving the problem will **improve the lives of thousands, if not millions**;

(4) The problem is germane to the lives of those **people living on less than $2/day**;

(5) Solving the problem **deepens capacity** for science and engineering training, research, and innovation;

(6) A pre-identified **community of implementers** commits to implementing the solution within 3 years.

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LINK Activities and Goals

The LINK **"Activate, Locate, Enable, Connect to Solve"** process upholds a systems-based approach to resource identification, network design, and problem solving. GKI maintains a nimble and iterative approach to LINK that emphasizes learning and adaptation. As such, we do not always execute the presented activities sequentially.

1
Activate

Activating Systems for Impact*

Goals: *Mobilize a community of practice to spearhead activities to solve development challenges ripe for collaborative innovation. Equip a large, diverse group of trainers and potential Challengers (individuals/teams pursuing solutions to specific challenges) with collaborative innovation skills*

Timeline*: Approximately 1-5 months*

- **Mobilize cross-sectoral community of practice to spearhead collaborative innovation.** GKI works with universities, governments, businesses, and donors to facilitate a dialogue aimed at identifying priorities for collective action. Choosing among competing demands requires facilitation, especially in resource-constrained environments. GKI facilitators are skilled in building shared vision across diverse stakeholders. The community of practice defines challenge domains/ themes for which solutions will be sought. Based on these priorities, GKI and stakeholders collect data to focus action.

- **Train trainers and potential Challengers in the collaborative innovation process,** which includes: challenge identification and mapping; analyzing the challenge context; and identifying critical resources and partners for collaborative problem solving. GKI employs a training-of-trainers approach to expose an expanding number of potential "solvers" to essential collaborative innovation processes and tools, such as those found in GKI's Collaborative Innovation Toolkit
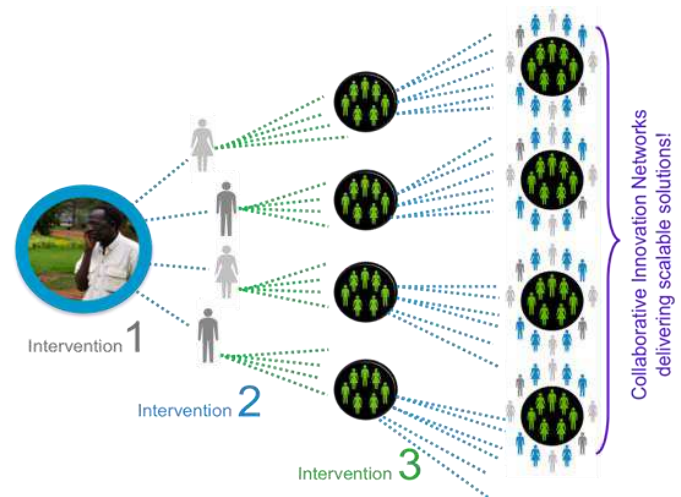

Fig. 2. Through training of trainers, we build a critical mass of individuals equipped to tackle challenges through collaborative innovation

* *Note: Individual LINK Challenges may not always require an "Activate" phase. "Activate" proves especially helpful to governments and/or donors interesting in galvanizing collective action for high-level priorities. Challenges for which a specific focus and team of proponent already exists may no require an "Activate" phase and can begin with "Locate."*

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Locate

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Locating Partners & Resources

Goal: *Identify challenges ripe for solutions as well as existing partners and resources that can be tapped to develop, refine, and implement solutions.*

Timeline: *Approximately six months*

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- **Identify and map challenges ripe for solutions** as submitted by local actors who are poised to support solution generation in the defined challenge domain. Through stakeholder workshops, GKI and trainers use design tools to source and frame participants' sub-challenges. GKI then broadcasts a call for Requests for Engagement to potential Challengers from business, academia, and government.
- **Vet submitted challenges**. An international Technical Committee vets requests, selecting challenges for further engagement based on scientific merit and relevance to development.
- **Analyze existing science, technology, and innovation resources** that can be applied to these challenges and partners already active in this space. Using the "THICK methodology" that accounts for Technological, Human, Institutional, Collaboration and Communication, and Knowledge resources, GKI works with Challengers to take stock of baseline STI resources available as well as those needed to address selected challenges.

Fig. 3. Mapping the Genome of a Challenge: GKI's 3-Level LINK Analysis

National STI Context: Review of National STI Policy; STI Skills and Learning Opportunities; Orientation to Existing Knowledge Networks and STI Interactions; Knowledge Infrastructure; Science Entrepreneurship and the Private Sector

Sectoral Analysis of the Challenge: A recent history of innovation in the sector; Business and economic context; Institutional profiles; Beneficiary profiles as well as diagnosis of scientific resources

Institutional Analysis of the Challenge: Interview and survey-based analysis of critical STI resources at play to enable or hinder collaborative innovation at the level of the institution and the team presenting the challenge to be tackled

Example:
Click here to see the Rwanda LINK Analysis

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Enable

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Enabling Solution Generation

Goals: *Support Challenger teams as they create purpose-driven networks; train network members in collaborative innovation skills to enhance impact; facilitate collective effort to generate shared solutions.*

Timeline: *Approximately 1-2 months*

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- **Train LINK Teams** of local stakeholders in additional collaborative innovation process skills, including: building networks; triaging challenges across networks; designing sustainable solutions.
- **Triage high-priority sub-challenges to potential solvers and test/refine solutions.** Tapping GKI's global network of solvers, we alert the highest potential solvers

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to the selected challenges and sub-challenges. The triage process makes smart use of (1) GKI's distributed network of networks and (2) information & communication technologies to tap likely solvers wherever they are. Submitted solutions are tested and refined as they are identified per metrics set by Challenger Teams with GKI.

4 Connect — Connecting Networks for Impact

Goals: *Bring together collaboration puzzle pieces, connecting efforts of Challenger and solver teams to evaluate progress; delineate steps required to achieve solution; test, refine, and scale until achieve "success", as defined previously in the process.*
Timeline: *Approximately 12 months*

- **Piece together sub-challenges to ascertain full scope of progress achieved.**
  Through regular Collaboration Colloquia, GKI and partners determine what steps remain to achieve a sustainable solution to the challenge. Collaboration Colloquia offer a backdrop against which we can identify themes and needs across LINK teams / projects. These events are suited to the integration of "hackathons" to source ideas and solutions in real-time from broad stakeholder communities and "the crowd" on particularly thorny sub-challenges.
- **Serve as network facilitator to maintain momentum as teams scale solutions to achieve long-term impact.** GKI provides backstopping, communications, and resource identification to teams as they move closer to solutions. Committed to supporting learning throughout LINK, GKI also catalogues users' insights to identify opportunities for refinement and enhanced impact, and communicates these insights to Challenger Teams and policy leaders.

Focus: LINK Rwanda

Contributing to enormous economic gains for Rwanda's smallholder farmers, the emergence of Rwanda's specialty coffee industry in the last decade offers a spectacular development success story. As the sector grew, though, coffee roasters began encountering a mysterious potato odor—called the "potato taste defect"—emanating from Rwandan beans. Since January 2011, GKI's first LINK winner, Dr. Daniel Rukazambuga, an entomologist at the National University of Rwanda, and his team have worked with GKI to eliminate the defect.

Compelled by urgency of this challenge, an international team traveled to Rwanda in early 2012. Made up of Rwandan researchers, GKI experts, Dr. Christian Cilas from CIRAD in France, and Dr. Thomas Miller from the University of California, this team spent two weeks devising a multi-pronged strategy to rid Rwandan coffee of the potato taste defect. The consortium grew in the wake of this meeting and now works on multiple fronts to solve the potato taste mystery.

Researchers from Rogers Family Company grow antestia bugs and analyze coffee cherries for damage in Rwanda. Teams at Seattle University and University of Washington, Bothell analyze coffee beans for differences in chemical composition to determine the cause of potato taste. CIRAD, in partnership with the Pasteur Institute in France, works to determine potato taste's biological footprint. Through LINK, one Rwandan entomologist's passion has grown into a global effort spanning five continents, with a solid network of researchers committed to eliminating the potato taste defect and protecting the livelihoods of Rwanda's farmers.

Expected Outputs and Outcomes

Expected Outputs & Outcomes

Clarifying the Challenge Ecosystem

One of the most important outputs of LINK is the creation of a **Collaborative Innovation Challenge Ecosystem**, a decision-making tool used to describe the individuals and resources needed to solve a challenge. GKI develops this tool by overlaying research on the "challenge genome" with insight derived from challenge and network maps created through direct engagement with Challengers and other stakeholders. As the **Essential Challenge Map** (featured in Fig. 4) shows, analysis reveals multiple core components of the initial LINK challenge on which work is required to achieve a sustainable solution. In the example given, Entrepreneurship, Human Centered Design, Knowledge Sharing, and Diagnostics constitute the most essential themes for solution generation. These core sub-challenges direct efforts to identify available and needed resources per the THICK methodology, as well as optimal partners to provide those resources not yet accessible to the LINK Challengers. The subsequent Challenge Ecosystem,

Fig.4: In an Essential Challenge Map challenges break into smaller subchallenges.

illustrated in Fig. 5, allows us to make strategic decisions on highest-potential solution pathways to follow, optimal partners to engage, and critical resource needs to prioritize. This Challenge Ecosystem constitutes a central input into the Collaborative Innovation Strategy GKI and its partners devise to guide solution generation, implementation, and evaluation.
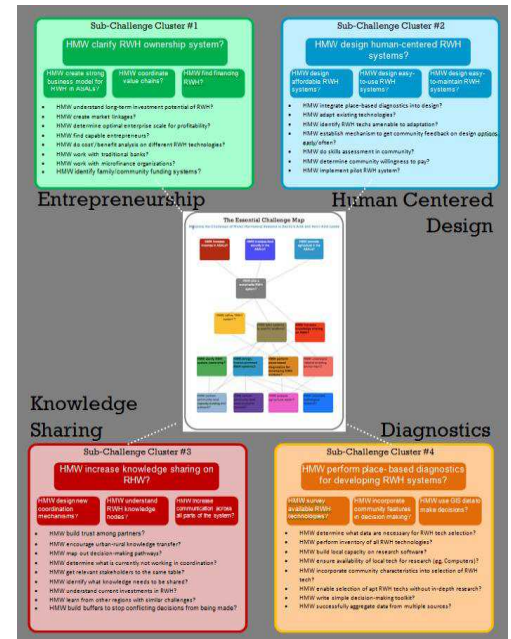
Solving Challenges Through Networks: The Challenge Ecosystem

Technology

Human

Institutional

Collaboration & Communication
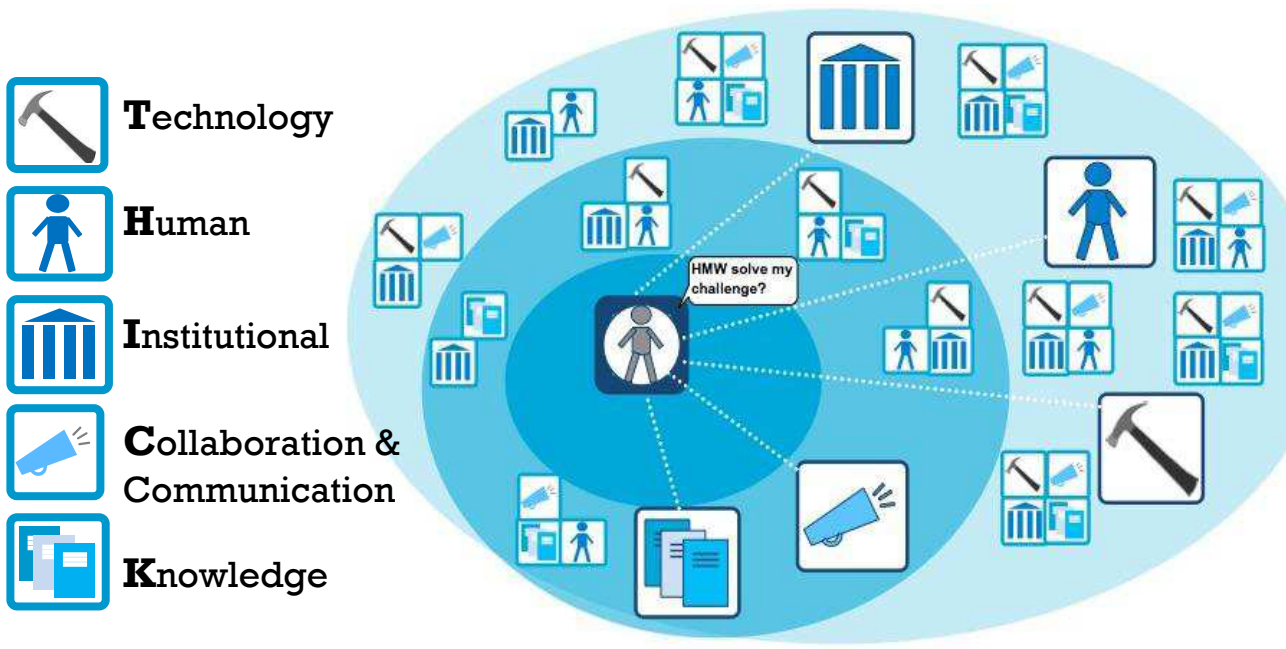
Knowledge

Figure 5: Example Challenge Ecosystem. In a fully realized version, each icon is associated with a specific THICK resource necessary to solve the identified sub-challenge

Methodologies and Corresponding Results

The Global Knowledge Initiative uses a number of tested methodologies in each LINK phase, ensuring LINK projects follow a systematic, scientific approach. The table below offers an overview of methods used, and examples of results produced, as demonstrated by past experiences. Taken together, these provide LINK's research-driven theoretical foundation.

Phase	Methods	Results
Activate	• Collaborative Innovation Toolkit • Training of Trainers	• Expose professionals to new tools for collaborative innovation to which they were otherwise unaware • Offer trainees a replicable process for solution generation • Provide a participatory, user-centered training experience designed to build stakeholder buy-in and energy
Locate	• THICK methodology • 3-Level LINK analysis	• Determine baseline resources available and needed for solution generation • Generate political buy-in to networks' activities through distribution of multi-use LINK analysis insights
Enable	• Innovation Systems Leadership Training • Network design	• Boost capacity for innovation systems leadership with best-in-class, internationally vetted curriculum (e.g., Participants in 2012 Tanzania training doubled pre and post-test scores) • Strategically connect developing country researchers with international partners poised to address a particular need
Connect	• Collaboration Colloquium • Network optimization	• Provide a forum to generate numerous high-value network connections in a condensed time-frame • Refine network connections per emerging needs and opportunities; leverage other networks for connections

Expected Outcomes of LINK

A fundamental goal of LINK is to promote collaborative innovation as a means of economic and social development. Long-term outcomes of LINK include:

Outcome 1: Organize innovation system components to optimize impact. GKI's tools and approaches for network design and optimization support innovation system alignment around specific priorities and challenges. We help potential partners cross sectoral, disciplinary, and geographic divides to identify shared priorities and articulate a common vision for action.

Outcome 2: Clarify challenge context and knowledge partnership landscape. Too often, development programs are designed and implemented without taking into account the breadth of factors impacting success. To avoid ill-designed partnerships and investments, GKI works with LINK Teams to clarify the context—business, legal, economic—of their challenge.

Outcome 3: Build individuals' capacity for collaborative innovation and problem solving. Our focus on capacity building ensures LINK partners not only have a clear path toward a solution, but also the necessary skills to effectively follow that path.

Outcome 4: Spur new networks aimed at solving specific challenges. GKI creates purpose-driven networks formulated to foster real solutions to specific development challenges.

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Taking LINK to Scale through Partnership

Developing Future LINK Programs: Taking LINK to Scale

The LINK Program spurs purpose-driven networks around the world aimed at solving specific development challenges. As noted, LINK is live in Rwanda, Afghanistan/Pakistan with the US, and Kenya. Our larger vision, though, involves taking LINK to scale quickly. We expect to move from implementing **3 LINK programs in 2013, to 7 LINK programs in 2014, to 20 simultaneous LINK programs across Africa and the word by 2016.** We cannot transform networks at this scale in isolation of other organizations and ongoing investments: we will tackle them through partnership.

Scaling LINK in Africa:

🔵 5 LINKs in 3 countries

🟠 20 LINKS throughout Africa

Fig. 6 Scaling LINK in Africa. Image: Discomer.com

Scaling Through Partnership

Bringing this vision to fruition requires partnership with the private sector, as well as local researchers, governments, donor organizations. Many pathways lead to achieving a scaled LINK program. For example, GKI can partner with a firm to sponsor a single LINK pilot in a new geography or it can develop regional, cross-sectoral LINK programs targeting challenges at dozens of research universities, and financed by a global consortium of donors. Based on your organization's needs, and the challenges you seek to solve, we can work with you to design LINK programs of varying shapes and sizes. When determining these details, important considerations include:

a) Thematic/Geographical focus: Is there a particular challenge domain on which you would like to focus the LINK program (e.g., climate change, food security)? Is there a specific geography on which the LINK program should focus?
b) Participation base: Are there specific constituencies you would like to engage through LINK (e.g., small business owners, students, women in science, community leaders)?
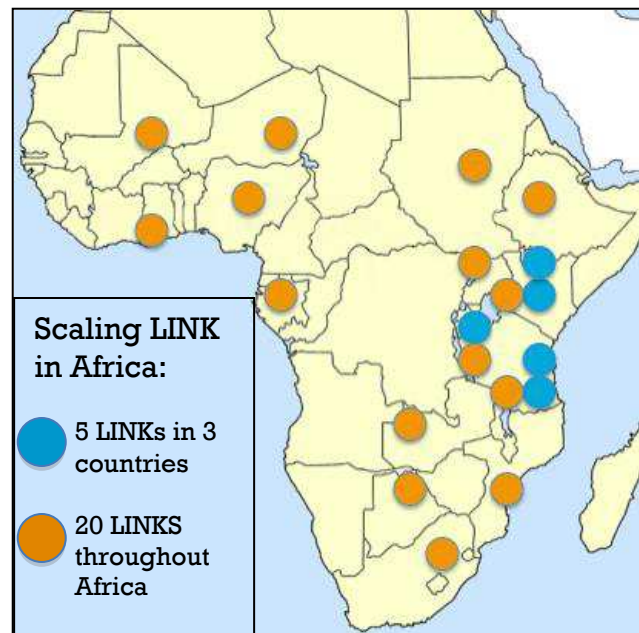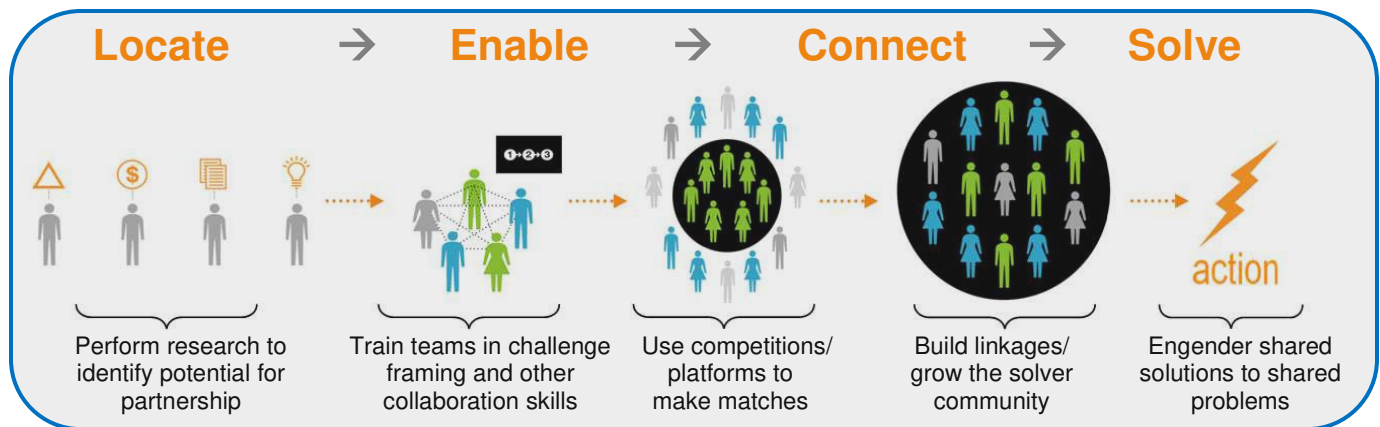
Background on GKI

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 identified the need for a "clearinghouse for resources & information to help build knowledge partnerships that can tackle development challenges." Chairman Sam Pitroda and Advisory Board Co-Chair Nina Fedoroff, with Chief Operating Officer Sara Farley, established GKI as a response to this call.

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— required for collaborative problem solving; **Enable** partners to collaborate effectively through trainings and competitions; and **Connect** seekers together with the global network of problem solvers to bring solutions to scale.

Locate →	Enable →	Connect →		Solve
Perform research to identify potential for partnership	Train teams in challenge framing and other collaboration skills	Use competitions/ platforms to make matches	Build linkages/ grow the solver community	Engender shared solutions to shared problems

Our Approach

We work with a continuum of partners. GKI takes an innovation systems approach. We engage a diverse array of actors—universities, private 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 equips them with an understanding of the context, community, needs, and opportunities for collaborative activity.

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

We cultivate talent. GKI offers a direct connection between problem solving and capacity building. In developing countries, efforts to cultivate talent and enable lasting knowledge partnerships are vital for the emergence of the next generation of engineers, technicians, scientists, managers, and innovators.

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