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APPLICATION OF COMPREHENSIVE ISSUE ANALYSIS TO INFORM DEVELOPMENT RESEARCH IN EAST AFRICA, PART 2: FOOD SECURITY (FS); WATER, SANITATION AND HYGIENE (WASH)

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Application of Comprehensive Issue Analysis to Inform Development Research in East Africa, Part 2: Food Security (FS); Water, Sanitation and Hygiene (WaSH)

Authors

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Description of this Document

Development researchers generally want to identify, examine, and improve the most important elements of the system in which they work (e.g. maternal/child healthcare) that are not yet adequately addressed. Within any given system, however, it is quite common to observe multiple unmet conditions that limit problem resolution such that working on one (or even a few) in order to "make progress" is rarely sufficient to overcome a systemic issue. Additionally, by the time development practitioners are able to address other conditions, the state of those already dealt with may have changed. The key is to pursue solutions that address the main unmet conditions simultaneously, as a system, by thinking ahead about the connection between potential solution paths and outcomes that are most likely to lead to on-the-ground impact.

With this in mind, researchers at Purdue University have developed a method (initially referred to as *Comprehensive Issue Analysis*), rooted in innovation science, to assist in the identification of the most important and interrelated suite of factors that define a specific grand challenge problem. LASER PULSE employs this approach to frame and analyze the scope of issues that are related to various region-specific development priorities. For each priority area, a view of the "conditions for success" that are typically required to address the specific category that poses a challenge is developed. Gathered from an extensive literature review and a deep mining of internet resources, these conditions build upon patterns understood in innovation science. With input from advisors knowledgeable on the current state of conditions in the region of focus, as well as perspectives gained from stakeholders engaged in LASER PULSE's R4D workshop sessions, these generalized conditions for success are shortlisted to specifically call attention to those that are required in the specific context and not adequately addressed. The results of this input gathering process then help frame development research themes and focal areas that form the basis of a Request for Applications (RFA) for funding of LASER research grants that the USAID-funded LASER PULSE consortium will subsequently award. RFAs will be generated for selected development sectors in various countries of interest to USAID; the first RFA will be for East Africa.

Note that this document represents the first iteration of this innovation science method; refinements to the process are ongoing and have already resulted in certain revisions. For example, the overall name of the

approach is now referred to as "Comprehensive Success Factor Analysis" to more clearly convey its intent. The tangible artifacts of the process itself have also undergone significant revision, such that the tools for application included in this document have been superseded by newer versions (e.g., success factor trees → success factor checklists; system template → system synthesis template). As such, this document represents – *and thus should be viewed as* – an early stage in the evolution of an overall process, and its contents should therefore be properly considered as archived. Future documents in the present technical report series entitled *LASER PULSE R4D Innovation Science Frameworks and Tools* will be more accessible and contain usable tools for those interested in applying them.

Content Type Definitions

Guide for Facilitators

A document that provides an overview of the theory that supports specific Innovation Science methods used for a particular analysis, as well as step by step instructions to facilitate a related working session, inclusive of activity descriptions, activity timing, a listing of required supplies and materials to run the session, input capture templates, and responses to frequently asked questions (FAQs).

Success Factor Tree

An extensive outline of the key factors that are likely needed to achieve commonly desirable outcomes when addressing a specific grand challenge problem.

Stakeholder Map

A visual representation of the stakeholder categories/roles that are likely to play a vital role in addressing a specific grand challenge problem.

Template

A custom-designed printable framework intended to encourage users to consider specific questions and record related information when performing work in support of specific Innovation Science analyses.

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Disclaimer

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FACILITATOR'S GUIDE*

FOOD SECURITY - COMPREHENSIVE ISSUE ANALYSIS

INTRODUCTION

The sectors that will be explored at the Research for Development (R4D) Conference in Uganda – food security, basic education, water, sanitation, and hygiene (WaSH), and maternal and child health (MC health) – involve what are frequently termed "grand challenges" due to their sheer complexity and implications on the lives of millions. These challenges, and others of equal importance and scale, are not new. They have been the focus of innumerable investments of funds and effort by regional and foreign governments, non-governmental organizations, faith-based organizations, and countless implementers and volunteers for decades. And while significant progress has been made, many aspects of these challenges remain very real obstacles to economic and social advancement in East Africa.

Our goal at the R4D is to identify, as precisely as possible, which aspects of these sectors, that if addressed through focused research[1] investment and related translation into practice, could be advanced to yield tangible benefit at scale for affected populations. At the core of this pursuit is the need to grapple with the scope and highly interconnected nature of the various aspects of these problems. Historically, this complexity has been handled in different ways. Some have pursued qualitative approaches that typically rely on gathering the opinions of a select set of experts (e.g., employing convening activities or a Delphi based survey)[4], but this approach often results in bias due to the inclusion of only a limited number of inputs, and may not provide the comprehensive view required to appropriately frame these problems. To address this concern, others have developed computer models of these problems, typically anchored in a value-chain or root-cause methodology, using techniques such as systems-dynamics or agent-based modeling [1-3], but these efforts tend to oversimplify the problem in an effort to maintain computational efficiency. Alternatively, some organizations simply acknowledge the inherent complexity and "do what they can" to affect change on elements of the system. While noble, and certainly impactful to small portions of a population, these efforts typically suffer scale-up obstacles that make expansion of impact difficult. Across these approaches, many resulting efforts to address major challenges fail to reach fruition or achieve their impact goals due to unidentified gaps in the research-to-practice translation system at scale. With these perspectives in mind, at the upcoming R4D, we will be pursuing a hybrid approach – a method termed Comprehensive Issue Analysis (CIA) – that brings together a perspective on the comprehensive success factors that are typically required to address challenges in a particular sector at scale with a wide range of informed opinions to identify the current

[1] Research encompasses any activity involving systematic study and/or the development of knowledge. Representative activities include, but are not limited to development of new technologies, data collection and analysis, case studies, literature reviews, objective analyses of development or implementation efforts.

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state of the system and remaining gaps that must be addressed to achieve desirable outcomes. This Facilitator's Guide provides an overview of the methodology, objectives, and activities that will be pursued in the Comprehensive Issue Analysis workshop.

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COMPREHENSIVE ISSUE ANALYSIS

Overview

CIA brings together a holistic view of the success factors underlying the problems we will be exploring, with perspectives on prioritization driven by an array of individuals with extensive and diverse experiences in international development, including you!

CIA has been developed over a 7-year period through work at Purdue University employing principles of innovation science to address a range of complex challenges, such as ensuring availability and access to medication for those suffering from multi-drug resistant tuberculosis, providing reliable access to potable water for rural villages in a Caribbean nation, and systematically tackling poverty and opportunity access problems among disenfranchised populations in urban areas. These efforts highlighted a multi-faceted pattern that is present in functioning systems that achieve desirable outcomes to complex societal challenges. Many aspects of the pattern will be intuitive to those who have experience in grand challenge domains, but the many success factors that must be in place to realize tangible impact in most situations are rarely considered together.

In its most fundamental form, CIA frames grand challenges at a systems level, and emphasizes that solutions are a function of context, and require commitment, awareness, motivation, leadership, resourcing, knowledge and/or technology, as well as means to overcome barriers in the short-term and ensure sustainability in the long-term.[5, 6] This view is founded on several fundamental principles of innovation science. At a foundational level, the ability to make sustainable progress at scale on any issue is predicated on the existence of a secure and stable context that fosters constructive debate and pursuit of solutions. Achieving this, and making strides on solution development, requires engagement of supportive and influential leadership. Even with leadership involvement, ultimately, there is no impact without adoption of solutions by intended beneficiaries. And so, the efforts of leaders must be directed toward issues where there is awareness and acknowledgment of need, and motivation of involved stakeholders to make progress. With these conditions for success in place, solution development efforts can progress. However, typically there is a need for enabling methods or start-up resources to launch a new idea. Once functioning, additional, and often different resources, are required to make the system sustainable and resilient on technical, operational, economic, environmental, and cultural fronts. This will require effective translation or implementation, which is only possible if potential beneficiaries are aware of the solution, can access it, and it can fit into their lives. Finally, to achieve impact at scale, the solution must be tailorable to context across individual, household, community, regional, and national levels.[7]

Building on these basic premises, comprehensive issue analyses on any given topic are developed by performing an extensive literature review and data mining activity spanning journal articles from the development field, news articles, reports and other documents, guided by the above innovation patterns

and related terminology and logic. The result is an extensive outline of the key factors that are likely needed to achieve commonly desirable outcomes when addressing a specific grand challenge problem. The output of the analysis is organized in a logic format that incorporates a hierarchy, conveying issue relatedness and/or dependence in categories. We thus refer to the output as a "success factor tree". Importantly, the success factors highlighted in this type of analysis represent a reference state and are, to the extent possible, context independent. They are thus not prescriptive. Instead they serve as thought starters for constructive dialogue on the potential priorities in a given region – here, East Africa.

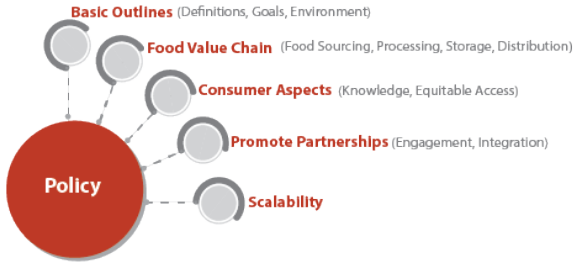
Navigating the Tree

The "success factor trees" representing the comprehensive issue analyses that will be employed in the R4D workshop have been structured so that information is categorized into four major groupings, and color-coded accordingly:

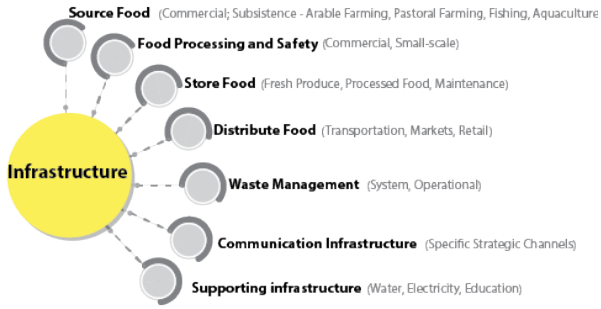
1. **Security/Safety**, **Policy** and **Government** represent the necessary foundational components of the system that govern it and allow it to function. {red to orange hues}
2. **Infrastructure**, **Equipment/Supplies**, **Workforce/Talent**, **Capital/Finances** and **Practices/Mechanisms** are elemental components associated with the value chain that are used to create and make as solution available and accessible. {green to yellow hues}
3. **Awareness**, **Motivation**, **Enabling Resources**, **Adoption/Habit Conversion**, and **Outcome/Evaluation** are components associated with human behavior and solution adoption. {light to dark blue hues}
4. **Sustainability** and **Resilience** dimensions support a constant feedback loop that maintains the system, factoring in long-term growth and the potential to tolerate change or shock. {purple to violet hues}

Each section of the "tree" is accompanied by a small bubble diagram that allows participants to obtain a brief overview of the section. The bubble diagram provides key ideas (in bold colored text) from each major branch within the section of the tree in its order of occurrence from the start to the end of the section. Along with the key ideas are topics and phrases (within brackets in grey text) that are covered within each branch of the tree. An illustration of the sections along with their respective bubble diagrams from the "Food Security" tree is provided in Figure 1 below.

Necessary foundational components of the system that govern it and allow it to function.



Root elemental components associated with operations that are used to create availability/access to a specific resource.



Root elemental components associated with operations that are used to create availability/access to a specific resource.

Components associated with the human behavioral aspects of the system.

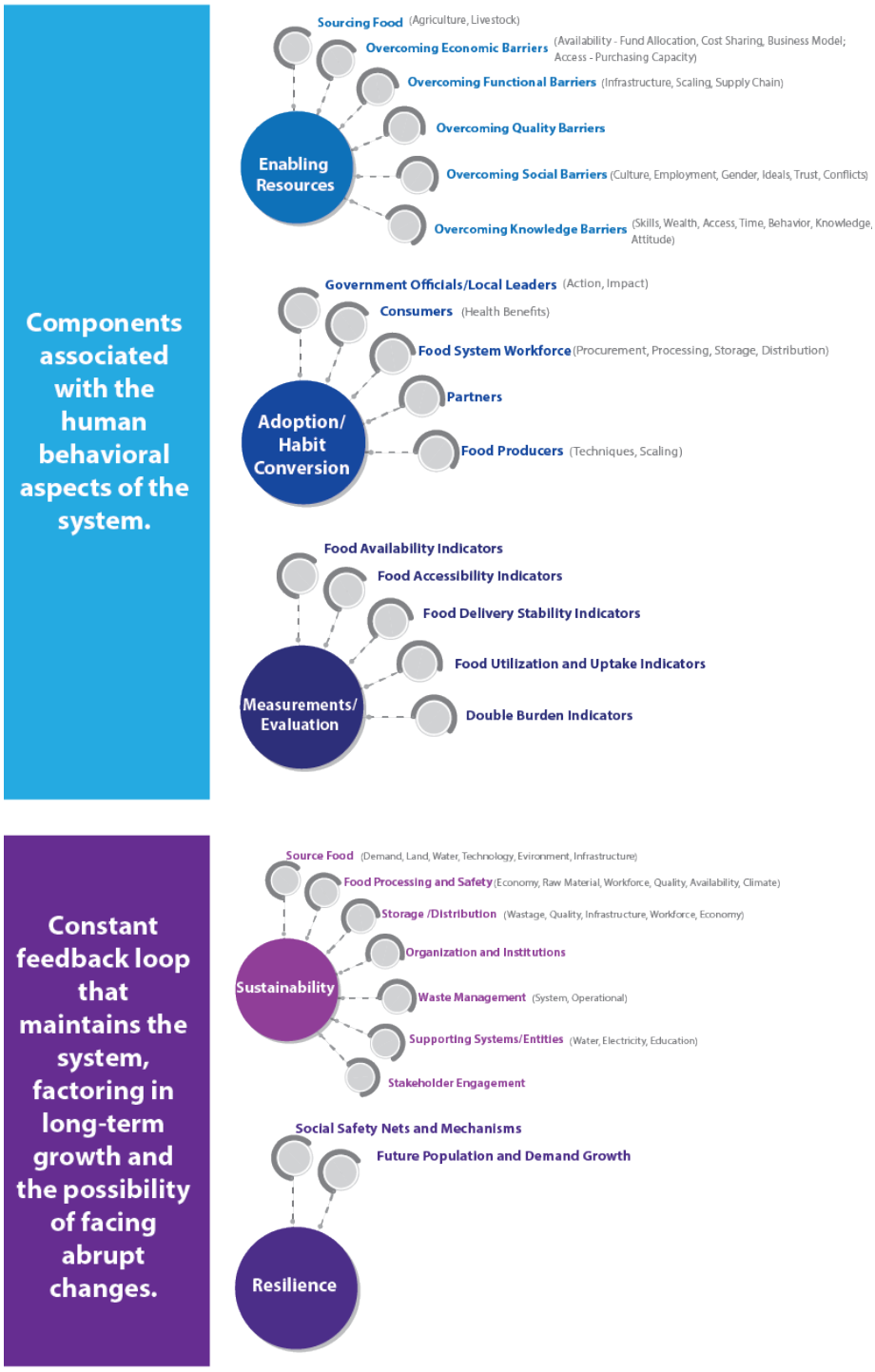


Figure 1. Illustration of main sections and sub-branches of the Food Security success factor tree.

PREPARING FOR THE CIA WORKSHOP – FACILITATOR

Comprehensive Issue Analysis Workshop Activity

Comprehensive issue analysis will be a significant focus of the third day of the R4D conference (May 8th). Conference participants will be provided with a pre-read outlining the fundamental aspects of CIA, as well as an electronic copy, in list-form, of the success factors identified for their sector – essentially this is a success factor tree in list form. As part of a pre-work activity, participants will also have been asked to carefully review the tree, and come prepared to the CIA session with a short list of success factors that they believe meet the following three criteria for the geographic region of interest (here East Africa):

1. The success factor is **significant** to overall efforts to realize priority-specific outcomes
2. The success factor is **not currently realized** in the existing system in the region of interest today
3. There is great likelihood that **research** on that success factor **can help realize a desired state**

Once at the conference, participants in each sector CIA breakout session will be seated at tables in teams of 5 to 6. The individuals at each table will represent diverse backgrounds and perspectives, and will likely have different views of the priorities that should be addressed to make progress in their sector.

With the above as context, facilitation guidance for the CIA workshop session is as follows:

Logistics

Location
The plenary session will be held in the Royal Palm Room at the Speke Resort
The breakout rooms for the Issue Analysis Activity include the Royal Palm Room (which will be split into two sections), as well as the Acacia and Ebony Rooms.

Timing
May 8th, 09:40 – 13:00 (Session timing shaded on overall agenda below)

08:30 – 09:30	Plenary: Comprehensive Issue Analysis
09:40 – 13:00	**Issue Analysis Breakout Sessions (4 concurrent 3-hour sessions, by sector)**
	[Tea Break at 11:00 am for 15 minutes]
13:00– 14:00	Lunch
14:00 – 16:00	RFA Design Input Session

Objective

The objective of this workshop is for participants in each team to

1. Identify and collectively prioritize up to 3 success factors per team that they believe could advance progress on the session sector if supported through research
2. Work through and complete systems templates (figure 3) for each of the topics they prioritize

Facilitator's Pre-workshop Preparation

Your role as the facilitator is to guide participants through the following activity and support productive discussion among team members. We hope to encourage participants to think about the path of research from idea to implementation, the larger context of each priority they may consider, and the stakeholders involved in developing effective solutions. To prepare for your role, please –

1. Read this guide completely
2. Go over the attached success factor tree and be familiar with its content and organization
3. Participate in training provided for facilitators
4. Ensure that all the items required at your session, as provided in the checklist in this guide, are available before you start your session

Team Formation

The participants will be pre-grouped into teams of 5 to 6 people, consisting of members from distinct disciplines and will need to be directed to their respective tables. We anticipate that each breakout session will have approximately 30 participants.

Session Materials

Each breakout room should have the following materials and supplies:

- ☐ Success factor tree related to session sector (1 per table) [see Figure 2 for illustration]
- ☐ Stakeholder map related to session sector (1 per table) [see Figure 3 for illustration]
- ☐ Priority capture card (3 per table) [see Figure 4 for illustration]
- ☐ System template (at least 3 per table) [see Figure 5 for illustration]
- ☐ Flip charts (1 per table)
- ☐ Flip chart markers
- ☐ Pens/pencils
- ☐ Highlighters
- ☐ Sticky notes
- ☐ Pins or tape (depending upon room wall materials)

Room Preparation

The room should be set up with individual tables arranged to accommodate 5 to 6 people. Each table should be near a wall mounted poster displaying the tree of success factors, and the stakeholder map. A flip chart should also be arranged near each table. Each table should then be provided with priority capture cards, and system templates as noted above, as well as markers, pens/pencils, sticky notes, and pins or tape.

Facilitating the CIA Working Session

The working session should start with a brief introduction period and then progress in two main parts. Attempt to adhere to recommended activity timing as much as possible.

Activity Introduction *(15 minutes)*

1. **Introduction** – You should initiate the session by gaining the attention of attendees, introducing yourself, and providing a brief overview of your background that supports your involvement in the session.
2. **Instructions -** You will be giving participants at your session instructions on what will take place during the session and introducing the concepts and logic presented in this document. This presentation will be provided to you prior to the session for convenience and consistency.
3. **Discussion starter** – To initiate discussion among team members, we encourage you to ask participants to introduce themselves to each other. Once the members of each team know each other, the workshop activity can commence. The workshop is divided into two main parts and a description of each is provided in detail below.

Activity Details: Part 1: Identifying priority success factors *(65 minutes)*

In the first part of the activity, participants should (re)familiarize themselves with the success factor tree and work to identify the most pressing success factors that should be addressed through research to achieve desirable outcomes in the session sector.

1.1 Success factor identification (Individual activity) (15 min) – To initiate this activity, participants will navigate the tree (Figure 2) and identify success factors they individually believe to be priorities. Remind participants to make use of their pre-work, as they should have already identified at least some priorities prior to arrival at the session. If they did not perform the pre-work, they can of course initiate this activity at this time.

As noted above, a priority should be a success factor that is significant to making progress, is not currently being addressed to a satisfactory level, and could likely benefit from research. Participants are also welcome to identify success factors that are not on the tree that they believe need to be addressed in order to achieve holistic solutions in the sector. The tree is intended to serve as inspiration but is not a definitive list of options.

When facilitating this activity, it is suggested that you encourage individuals to develop an initial list of priorities on their own, BEFORE interacting with their team. Each participant should be encouraged to write their priorities down on sticky notes – one priority per note - and hold onto to them to subsequently share with their team. This will help to avoid premature convergence, or the dominance of any single point of view.

Note that each success factor on the tree has a unique number composed of its category and line number (shown in the color bar on the left side of each section of the tree). These numbers can be used in lieu of writing out full statements to save time.

1.2 ***Success factor prioritization*** (50 min) - Once individuals have recorded their thoughts, they can then join their team to begin discussions to identify which success factors are of highest priority and engage in ranking them. We have found it helpful to allow one participant to talk through their priorities at a time, placing their respective sticky notes on a flip chart. Then as each person shares their perspective, the sticky notes can be teamed or separated on the flip chart to show overlap or differences of opinion. When ranking priorities, participants should be encouraged to consider **root-cause, dependency between priorities, and any natural hierarchies that may underlie the relationships between the priorities proposed by team members**. Each team should be encouraged to select up to three collective priorities and record each and its rank on a separate priority card. [A rank of #1 indicates highest priority].

NOTE: At the end of Part 1 of the activities, participants will take a **Tea Break for 15 minutes**

Activity Details: Part 2: Achieving a system understanding *(105 minutes)*

In the second part of the activity, participants should work to convey a system level understanding of the success factors that must be realized to ensure that tangible impact can be achieved in their priority areas. Each prioritized success factor should be examined individually (unless it is found that two or more are closely dependent). **Importantly, teams should complete the following sub-activities (#1 - #5) for <u>each</u> of their top three priorities (up to three) in the 105-minute allotted timeframe.**

2.1 ***Priority success factor placement in system template*** – Working with one priority success factor at a time, the teams should identify the system category – e.g., policy, infrastructure, finance – in which their priority would be best categorized, and then write in their priority success factor on the system template provided. The priority should be highlighted by marking a star next to it.

2.2 ***Priority dependency determination*** – With the teams' priority success factor placed in the system template the teams should discuss the other elements of the system that must exist to ensure that effort dedicated to their priority can actually be translated to impact. The teams can review the tree to find other success factors that are closely connected to their priority and/or

define those observed through their own experiences, and fill in the "System Linkages" column provided in the template along with a rationale for choosing that item in the "Rationale" column. More than one factor can be included in each category, if desired. Choices should be guided by the success factor categories captured on the template.

Note: The success factor tree provides a basis for thinking about surrounding factors connected to participants' priorities but it is not exhaustive. Teams that would like to add factors that are not on the tree are welcome to do so.

Note: Teams may elect to divide the work of completing the system template, for example by breaking into sub-groups of 2 or 3 participants to accelerate their work.

2.3 Gap Identification – Once all system linkages are recorded, teams should work to indicate where there are gaps in the system that should be addressed to achieve desirable outcomes on the priority under discussion. Considering each factor in the system, teams should collaborate to specifically identify those success factors that are in-place and functioning today, and which require attention through research or development. Working row-by-row in the template, teams should place a "Yes" in the last column of the System Template, labeled "Gap", to indicate that a factor is addressed and operational or a "No" to indicate that the factor is not addressed satisfactorily today. Those success factors (rows) labeled with a "No" are to be considered critical focal points for RFAs later in the process.

2.4 Stakeholder identification – Having identified critical caps in the system, teams should now identify, and list out which stakeholders are likely to play a vital role in addressing those gaps – i.e., the success factor priorities and prerequisite or dependent factors that were categorized as not being addressed satisfactorily. The stakeholders in the broader system fulfill unique roles associated with your sector. Each of these roles, to the extent possible, has been depicted on a visual that we call a stakeholder map (Figure 4). Using the provided stakeholder map as a stimulus, choose relevant stakeholders, and list them in the "Stakeholders to Involve" column on their system template. If teams see a need to include a stakeholder that does not appear on the stakeholder map, they should feel free to do so.

2.5 Synthesis of Priority – Once the system underlying a team's priority is fully described, teams should reflect upon the overall challenge and its connections to other aspects of the system, and summarize the priority in a single, brief statement. They should place this statement in the box labeled "Synthesis of Priority" at the bottom of the System Template. In addition, define the scope of the priority by checking a box for the individual, household, community, region, or national level indicator in the section of the System Template labeled "Scope."

End Products

By the end of the session, each team should complete up to three system templates – one for each of the topics prioritized by the table. Templates should be collected by the facilitator and delivered to the Purdue team for further analysis and review.

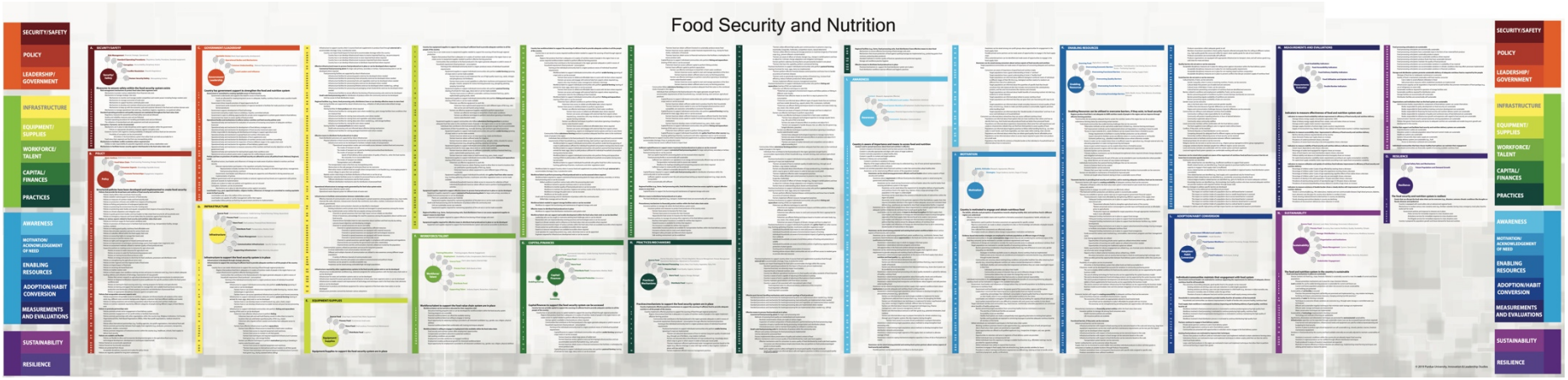


Figure 2. Food Security Success Factor Tree

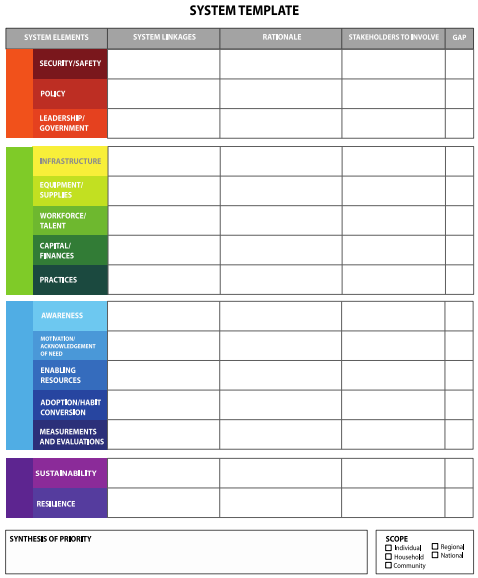


Figure 3. System Template

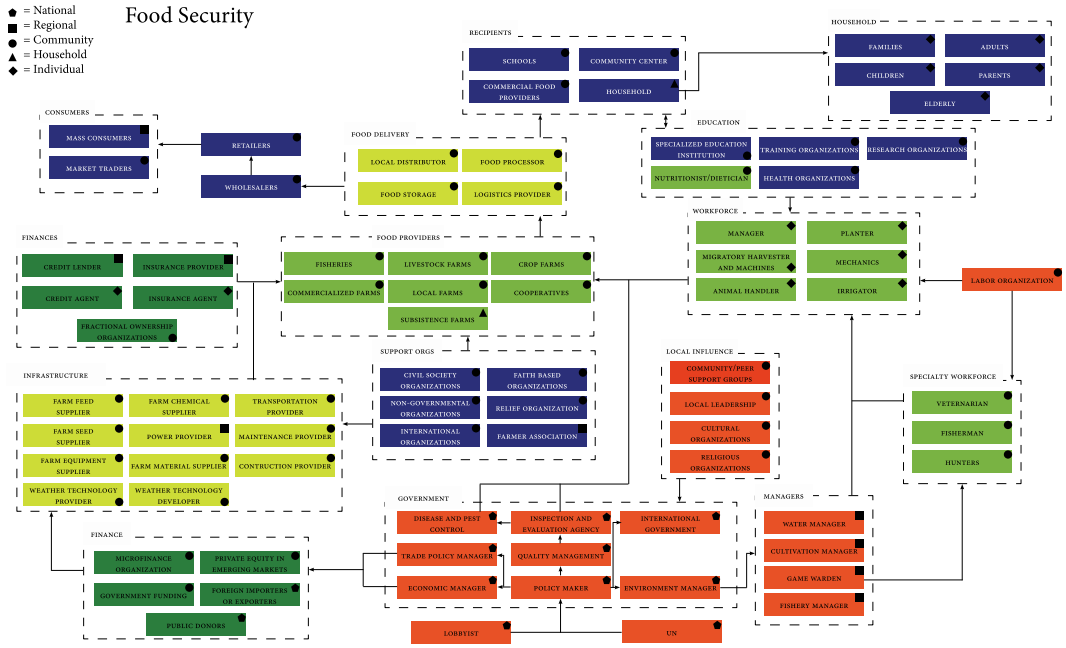


Figure 4. Food Security Stakeholder Map

Tips for Facilitators:

- Encourage participants to take ownership of the work products and activity deliverables. The facilitator should refrain from being a scribe.
- Encourage participants to use the templates to guide their work
- Encourage participants to think holistically, beyond their specific expertise to its implications
- Encourage recording of "leaves" from the "tree" more than simply "branches" – i.e., capture details
- Discourage exploration of solutions

Contacts for more information:

During the session three members of the Purdue Innovation Studies Program will be on-site to help in guiding the groups and/or answer questions: Prof. Joe Sinfield, Romika Roshan Kotian, and Maggie Busse.

In the interim, if you have any questions related to the CIA process or facilitation of the session feel free to contact the Innovation Science team at **innovation@purdue.edu**

REFERENCES

1. Coronato, A. Florio, V. D., Bakhouya, M. and Serugendo, G. D. M. (2012). Formal Modeling of Socio-technical Collective Adaptive Systems. IEEE Sixth International Conference on Self-Adaptive and Self-Organizing Systems Workshops. Lyon. pp. 187-192. doi: 10.1109/SASOW.2012.40
2. Norman, D., & Stappers, P. J. (2016). DesignX: Design and complex sociotechnical systems. She Ji: The Journal of Design, Economics, and Innovation, 1(2). http://dx.doi.org/10.1016/j.sheji.2016.01.002
3. Walters, J. P., Javernick-Will, A. N. (2015). "Long-Term Functionality of Rural Water Services in Developing Countries: A System Dynamics Approach to Understanding the Dynamic Interaction of Factors". Environmental Science and Technology. 49, pp. 5035−5043. doi: 10.1021/es505975h.
4. Goodman, C. M. (1987). The Delphi Technique a Critique. Journal of Advanced Nursing. 12, 729-734.
5. Sinfield, J.V., and Solis, F., National Academy of Engineering, **The Bridge**, "Thinking Big to Address Major Challenges: Design and Problem-Solving Patterns for High-Impact Innovation," 11-18, Summer 2016.
6. Solis, F. and Sinfield, J.V., "Designing for Big X: Characterizing Design for Major Challenges," **International Journal of Engineering Education**, 34, 2(B), 1-22, 2018.
7. Joseph V. Sinfield, Ananya B. Sheth, Romika Roshan Kotian, "Framing the Intractable: Comprehensive Success Factor Analysis for Grand Challenges," Purdue Innovation and Leadership Studies, working paper, 2019.

GLOSSARY

Priority Card: A rectangular piece of paper used to record one priority success factor resulting from the deliberations of a team.

System Template: A large-format printed document used to record the success factor priorities and related dependencies that a team believes warrant research-based effort

Success Factor: Any of literally hundreds of resources, relationships, roles, or actions that likely must be in place to enable a functioning system capable of achieving desirable outcomes related to a sector

Sector: An area of focus that has been identified by R4D event organizers in collaboration with USAID and regional representatives as a country development strategy imperative

FREQUENTLY ASKED QUESTIONS

General Facilitation Questions

1. **What must I do as a Facilitator?**

   Ans. Facilitation is the process of enabling groups of people to collaborate in a cooperative manner to help them achieve their goal. You should move around the room and interact with participants to make sure all the groups are collaboratively progressing on the assigned task according to the provided timeline. Additionally, you will help any groups that are uncertain about how to execute certain steps of the activities.

   Below are some tips to help you with this process.

   Dos:

   - Do come prepared for the session by completing all required pre-work.
   - Do encourage participants to think holistically, beyond their specific expertise to its implications.
   - Do encourage participants to take turns voicing their opinions and comments along with listening to other participants' thoughts and views.
   - Do encourage participants to use the provided templates to guide their work.
   - Do allow participants to record sub-branches and leaves beyond the branches in the provided success factor tree.

   Don'ts:

   - Don't participate in or contribute to a group's brainstorming process for the activity.
   - Don't get side-tracked into long conversations with individuals or groups.
   - Don't explore solutions to problems. Participants need to focus on piecing together all the parts of the system that are required to overcome their priority problem.

2. **How should I (facilitator) prepare myself for the CIA session?**

   Ans. Read this guide in its entirety and complete all tasks listed in the 'Facilitator's Pre-workshop Preparation' section of the Facilitator's Guide. Contact innovation@purdue.edu with questions you have about the facilitation before the session.

3. **What should I (facilitator) do if there are participants who are not actively involved in discussion?**

   Ans. These participants may be identified as the ones sitting quietly, on their phones or working alone. Ease these individuals into the process. Give them an opportunity to share their thoughts and ideas with their group by asking them what they think.

4. **How do I (facilitator) help a table that is finding it difficult to follow the process?**
   Ans. Start by asking the participants at the table to describe the step that they find difficult. Next ask them to describe what they think a solution might be. If what they describe aligns with the process they are required to follow, encourage them to implement their ideas. If not, guide them to their pre-read documents and explain what they need to do.

5. **What should I (facilitator) do if a table finishes early?**
   Ans. Request that the table summarize their work to you so you can assess if they have performed the required tasks as per instructions.
   - If not, request that they iterate on the parts that they can improve.
   - If they are indeed done with required deliverables, direct the group to the RFA process in their pre-read documents and request that they prepare for it.

6. **How should I (facilitator) manage conflict of opinion? / How should I (facilitator) help a group that is finding difficulty in reaching consensus?**
   Ans. Discussions and debates on differences of opinion are an integral part of this session. Participants are required to reason with each other to complete the activity. If the debates go beyond appropriate limits, contact one of the managing facilitators (from the Purdue team) so that they can address the situation.

Material Validation Questions

1. **How were the sources for the material in the success factor trees validated? / Where did these perspectives come from?**
   Ans. The trees were made by gathering data from a vast variety of sources including documents, reports, news articles, research papers and the opinions and views of a number of relevant stakeholders including experts from the field as well as those from the East African region.

2. **How is the material provided contextual to East Africa?**
   Ans. The material is a general representation of an ideal system where components need to exist for the system to work. It is up to the participants to interpret it and apply it to their context.

3. **How is the prioritization of** success factor**s done?**
   Ans. The prioritization and interdependencies of success factors are to be decided upon by the groups of participants for their specific success factors.

Success factor tree setup, interpretation and navigation questions

1. **How do I (facilitator) guide participants to find information in the success factor tree?**
   Ans. See section on "Navigating the Tree" provided in your Facilitator's Guide.

2. **How are** success factor**s categorized? / Why is a** success factor **in a specific category and not somewhere else?**
   Ans. Although the success factor trees have been organized to capture as many parts of a complex socio-technical system as possible in a mutually exclusive manner, there are inevitable overlaps and this implies that certain topics may fall within multiple sections. In contrast, the context in which a success factor was discovered during data mining activities may also result in a topic being placed in a category that is different than what a participant might initially consider.

3. **What if participants are unable to find a topic within the success factor tree?**
   Ans. Participants can use the list format success factor tree provided in their pre-read documents or the bubble diagrams on the poster to help get a sense of topics covered within each section of the trees. If a participant cannot find a specific topic, consider synonyms for keywords and see if those are present in the tree. If the topic still cannot be located in the tree, feel free for participants to add it. The tree is inevitably not completely exhaustive.

4. **How should participants interpret the language within the success factor trees?**
   Ans. The tree has been constructed with generalized terms to allow participants from various fields to understand and interpret wording according to their backgrounds. They should collaborate to find a common understanding. Discipline specific words have been avoided in an attempt to be inclusive.

System Template Questions

1. **What should be written in the System Template?**
   Ans. The section on Activity Details, Part 2 of your Facilitator's Guide provides detailed information on completing the system template.

2. **What is the level/scope that a team should focus on when presenting a priority?**
   Ans. The group can decide the appropriate level at which to address their priority and make note of this in their system template. Options may include individual, household, community, region, and nation.

3. **Can participants brainstorm/ use a different method to fill the System Template or are they required to utilize the provided success factor trees to complete it?**
   Ans. Participants should be encouraged to utilize the trees directly, but may also employ them as a guide or basis for brainstorming to fill the system templates. The procedure and template for the activity is designed to allow participants to understand the full system-level translation process.

4. **Can an expert focus only on their own area of expertise?**
   Ans. This workshop aims to obtain a collective view of the presented challenge from multiple angles brought by the experts in the room. These contributions are valuable and can be documented in whatever way the participants feel most comfortable. Regardless of the approach, it is important that all components of the template be completed.

5. **What should participants do if during the exercise they realize that the** success factor **they prioritized is not the most critical?**
   Ans. If the perceived critical success factor is related to the success factor thought previously to be a priority, the team simply needs to mark the new-found success factor as a priority on their system template. If not, they may fill out a separate template.

6. **Where can participants document new ideas not present in the success factor tree? / Why isn't "x" on the success factor tree?**
   Ans. The trees are inevitably not exhaustive, they are meant to provide a more holistic view of the breadth and depth of the problem. They can be expanded beyond the branches provided. New ideas that are deemed to be priorities and cannot be found on the tree should be documented in their appropriate section of the system template.

7. **Can people send in more thoughts on priorities after the working session?**
   Ans. Additions to the success factor tree are always welcome. However, participants should recognize that only priorities developed at the session will have timely influence on the request for applications (RFAs) that will result from the workshop, so providing inputs during this session is ideal.

General Session Related Queries

1. **What expectations should facilitators and participants have for the session?**
   Ans. The CIA session will be an active working session which involves collaboration between people from various backgrounds and disciplines.

2. **How will session outputs be used?**
   Ans. Completed System Templates will be used as guides to inform the Request for Applications (RFA) session that will take place after the CIA session, and to help formulate formal RFAs following the R4D event.

3. **What if a group is running out of time?**
   Ans. Monitor the teams to make sure they follow the provided timeline to prevent this from taking place. If at 30 minutes to the end of the session, you find groups that have not made

sufficient progress, request the groups to note down their top three priorities and fill out their respective System Template to the best of their ability in the time available.

4. **Will participants remain in the same groups throughout the CIA session?**
   Ans. Yes.

5. **On what basis are the groups formed?**
   Ans. Teams are pre-assigned to participants to ensure that perspectives from different disciplines are present at each table.

6. **What if participants would like to consult local stakeholders to obtain input from them?**
   Ans. Encourage them to do so if someone with relevant background is present at the session.

7. **What materials will be provided to participants?**
   Ans. All materials listed in the attached checklist will be provided.

8. **How will funds be allocated toward priorities after the session?**
   Ans. Funds will be allocated through rigorous review of applications to the Request For Application (RFA) process that is being deployed by the LASER PULSE consortium.

9. **Can participants leave the room and work elsewhere?**
   Ans. No. The working session is designed to be a collaborative and interactive session that requires in-person engagement.

Food Security
Success Factor Tree

A. Security/Safety

Measures to ensure safety within the food value chain exists

1. Risk management mechanisms to protect food value chain segments exist
2. Mechanisms to protect various stakeholders from financial risks exist
3. Mechanisms to manage strategic risks exist
4. Mechanisms to monitor and manage market competition and market power including foreign markets exist
5. Mechanisms to manage economies of scale exist
6. Mechanisms to support business continuity plans exist
7. Mechanisms to develop and maintain infrastructure and critical systems exist
8. Mechanisms to keep up with the economic cycle and customer demand in the food and nutrition domain exist
9. Mechanisms to manage operational risks exist (e.g. cleanliness, hygiene, regulations, occupational safety)
10. Standard operating procedures and quality measures are maintained throughout the food value chain
11. Regulatory measures for quarantine and food safety exist and are followed
12. Quality and reliability measures exist and are followed
13. Standard operating procedures for handling perishables exist and are followed
14. The utilization of standardized and safe equipment and tools are promoted
15. Corruption, if present, can be circumvented
16. Mechanisms are in place to take disciplinary action against corruption within the government
17. Policies on appropriate disciplinary measures against corruption exist
18. Economic barriers with regard to creating availability of adequate nutritious food can be overcome
19. Possibility of corruption can be circumvented
20. All entities in the food delivery system that utilize funds are held accountable for it
21. Food value chain segments are free from any monopolizing entity

22 Mechanisms to facilitate conflict resolution where required exist
23 Entities to take responsibility for peaceful negotiation among various stakeholders exist
24 Mechanisms to facilitate human security against risks/ hazards in the food value chain exist

B. Policy

***Structured policies have been developed and implemented to create food security**

1 Policies that provide the broad basis and outlines of food security and nutrition exist
2 Policies clearly define what constitutes food security
3 Policies establish national goals for provision of food security
4 Policies on measures of nutrition intake and food security exist
5 Policies on protection of forests and wildlife from impacts of hunting exist
6 Policies on fishing and protection of endangered species exist
7 Policies on protecting the environment from/for hunting exist
8 Policies on protecting water bodies and aquatic ecosystems from impacts of excessive fishing exist
9 Policies on climate adaptation and mitigation exist
10 Policies to guide government bodies and local leaders to help create food security for all households exist
11 Policies on emergency measures and Social Safety Nets for protection against food crises exist
12 Policies on various aspects related to food security and nutrition value chain exist
13 Policies on minimum wages for food system workforce exist
14 Policies on provision of infrastructure to facilitate food security exist (e.g. transportation facility, storage facilities, markets)
15 Policies on making good quality, nutritious food affordable exist
16 Policies that articulate expiration periods for various foods exist
17 Policies on subsidies offered within the food supply chain exist

Food Security
Success Factor Tree

18 Policies on ownership/ rights to manage farm lands exist
19 Policies on access to land for women exist
20 Policies on rights and management of shared communal lands exist
21 Policies on improvement of techniques and technology used in food supply chain (segments) exist
22 Policies on assessment methods utilized to maintain quality of food produced exist
23 Supportive policies on creating access to resources for agriculture exist
24 Policies on access to water resources for agriculture exist
25 Policies on access to water for food processing purposes exist
26 Policies on training farmers/ food producers exist
27 Policies on energy and access to electricity for food producers, processors and distributors exist
28 Policies on strengthening the agricultural sector exist
29 Policies on inter-regional and intra-regional trade of food exists
30 Policies on import/export of food exist
31 Policies on receiving aid-based food exist
32 Policies on market creation exist
33 Policies on food supply chain workforce training services and access to extension exist (e.g. how to obtain adequate funding, delivery and utilization c tehnology, improvement of crop growth)
34 Policies that connect research on agricultural development and training services/access to extension exist
35 Policies on degrees/certifications required to prove qualification for specific positions within the food system workforce exist
36 Policies on training for food sourcing exists (e.g. training programs for farmers and agriculturists)
37 Policies on training and support for local talent to manage their own scalable food businesses exist (e.g. production and distribution of fre produce, production and distribution of processed food)
38 Policies on appropriate disciplinary measures against corruption exist
39 Policies that encapsulate consumer aspects exist
40 Policies on provision of equitable access to nutritious, adequate and diverse food for all residents of the nation exists (e.g. different socio-economic backgrounds, religions, customers that have different abilities and needs)
41 Policies on raising awareness and sensitizing population about food security and nutrition intake exist
42 Policies on nutrition standards required by different categories of people during different stages of their lifetime exist
43 Policies to promote partnerships exist
44 Policies promote private sector engagement in food delivery system
45 Policies promote engagement of non-profit entities to facilitate food security
46 Policies promote partnerships with other organizations within the country (e.g. Religious institutions, Civil Society Organizations(CSOs), Faith Based Organizations (FBOs), Other Non-profit organizations, medical schools for nutrionists)

47 Policies allow international partnerships (e.g. Funding agencies, non-profit organizations, international food-aid)
48 Policies promote partnerships between food supply chain segments (e.g. producers, processors, transporters, wholesalers, retailers, consumers)
49 Policies promote integration of institutions/sectors within the country (e.g. healthcare, schools, food supply) to deliver food security
50 Policies are scalable and flexible
51 Policies are flexible to allow and incorporate development/progress in the agriculture/food sector (e.g. technological development, development in techniques implemented)
52 Policies framed are economically operational
53 Policies framed are functionally operational
54 Policies are protected from misuse
55 Acceptable disciplinary measures are in place for policy misuse
56 Policies are regularly updated for long-term sustenance

C. Leadership/Government

Country has government support to strengthen the food and nutrition system

1 *Government is committed to creating equitable access to food security
2 Government understands and supports the need for access to food security
3 Funds are allocated for creating long-term access to adequate, healthy, nutritious food to create a positive health impact in the country
4 Government drives towards provision of equal opportunity for all
5 Government works towards harmonization of regional standards to facilitate fair trade practicies of regional farmers/producers
6 Government supports development of food technology
7 Government and policy makers have an ambitious, hopeful, committed attitude
8 Government is open to ultilizing opportunities for private sector engagement to achieve goals related to food delivery

Food Security
Success Factor Tree

9 Government has means to assess quality of food provided
10 Operational bodies and mechanisms to enforce various nutrition and food security policies exist
11 Operational body and mechanism for evaluation of outcomes of increasing consumption of adequate nutritious food exist
12 Operational body and mechanism for development of food delivery strategies exist
13 Operational body and mechanism for development of food security investment plans exist
14 Entities responsible for developing and distributing technology to support agriculture exist
15 Operational body and mechanism to spread food and nutrition information exist
16 Operational body and mechanism for distribution of food supplements exist
17 Operational body and mechanism for distribution of nutrition services exist (nutrition counselling)
18 Operational body and mechanism for inspection of food at different stages in the supply chain exist
19 Operational body and mechanism for regulation of food delivery systems exist
20 Operational body and mechanism to measure outcomes of the nutrition and food security objectives set by the government exist
21 Operational body and mechanism for training food supply chain workforce exist
22 Operational and just judicial system exists to apply laws for conflict/ dispute resolution
23 Policies and laws on provision of nutrition and food security are adhered to across all political levels (National, Regional, Local)
24 All political sectors, local leaders and influencers of change are made aware of policies related to nutrition and food security
25 Relevant representation participates in the regulation and policy framing process
26 Representation includes members from the food sector (e.g. experts in the field of agriculture, management, food processing industry, nutrition)
27 Government, local leaders and influencers of change are supportive and influential in driving awareness and implementation of policies
28 Different government and non-government bodies at national, regional and local levels are in agreement with policies and work towards its implementation
29 Checks are in place to make sure policies and regulations are not misused
30 Corruption, if present, can be circumvented
31 Mechanisms are in place to take disciplinary action against corruption
32 Local leaders (e.g. govt. appointed leaders, religious bodies, influencers of change) are committed to creating equitable access to food security
33 Local leaders care about the welfare of the community
34 Local leaders are capable of conflict management within their regions
35 Local leaders follow policies set forth by the government and drive its implementation

D. Infrastructure

Infrastructure to support the food security system is in place

1 Infrastructure is developed through strategic planning

2 Infrastructure to support the sourcing of sufficient food to provide adequate nutrition to all the people of the country exists

3 Country has or can create infrastructure to support the sourcing of food through regional production

4 Regions that produce food that is adequate or in surplus of nutrition needs of people in the region have or can create infrastructure to perform effective farming practices

5 Communities that contribute to the food produced in the region generate adequate or yield in excess of household requirement (food produced - consumption)

6 Farming at the individual/ community level in a region produces excess of individual household requirements

7 Infrastructure to support individuals/ communities who perform arable farming (growing of crops) exist or can be developed

8 Farmers have or can access infrastructure required for arable farming (e.g. tractors, latest technologies in agriculture)

9 Farmers have or can access operational infrastructure to perform post-harvest processing and handling

10 Infrastructure to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) exist or can be developed

11 Farmers have or can develop means to hold livestock (e.g. pens, sheds, coops)

12 Farmers have or can develop infrastructure to enable harvest and post-harvest processing and handling procedures

13 Infrastructure to support individuals/ communities who perform fishing and aquaculture (rearing of fish) exist or can be developed
14 Fishermen have effective infrastructure to perform fishing
15 Fishermen have safe and well-built floating vessels to allow them to travel to locations that can yield better quantity/quality of fish (e.g. boats)
16 Fishermen who migrate to/from coastal communities have adequate access to fisheries
17 Farmers have effective infrastructure to perform aquaculture
18 Farmers have effective infrastructure to breed fish in fresh water conditions
19 Farmers have access to required equipment and machinery
20 Farmers have access to markets to sell their goods
21 Farmers have techniques and required equipment/infrastructure to process food grown (e.g. cold storage facility)
22 Farmers use effective techniques to perform mariculture (growing or breeding in marine water/ brackish water)
23 Farmers have access to required equipment and machinery
24 *Farmers have access to international and local markets to sell their goods
25 *Farmers have techniques and required equipment/infrastructure to process food grown (e.g. drying seaweed before selling)

26 Infrastructure to support Country when it sources food and supplements to produce food through **external aid to accommodate shortage**, if any, in production exists
27 Country can import food/ request for food-aid to accommodate shortage within the country
28 Country has or can develop infrastructural means to receive imported food (e.g. sea ports/ airports)
29 Country has or can develop infrastructure to store imported food where required
30 Country has or can develop infrastructure to process imported food where required
31 Country has or can develop infrastructure to distribute imported food where required

32 Effective infrastructural means to **process food** produced are in place or can be developed where required
33 Commerical food processing plants for large scale primary, secondary or tertiary food processing exist or can be developed where required
34 *Food processing facilities are supported by robust infrastructure
35 Infrastructure facilities for processing grains exist/ can be developed where needed

36 Infrastructure facilities for processing meat and poultry exist/ can be developed where needed
37 Infrastructure facilities for processing fruits and vegetables exist/ can be developed where needed
38 Infrastructure facilities for processing dairy exist/ can be developed where needed
39 Infrastructure facilities for processing fisheries exist/ can be developed where needed (e.g. salting)
40 Infrastructure facilities for processing and packaging certain foods/drinks exist/ can be developed where needed
41 Infrastructure facilities to ensure effective functioning of food processing units exist/ can be developed
42 Small-scale food processing units for distribution of produce within the community exist/ can be developed
43 Unit has access to food distribution means

44 *Regional facilities (e.g. farms, food processing units, food distributors) have or can develop effective means to **store food**
45 *Food storing facilities are supported by robust infrastructure (e.g. utilization of safe private/ underutilized storage facilities)
46 *Storing facilities for farm produce exist where required
47 Infrastructure facilities for storing grains exist where needed (e.g. grain storage facilities have conditions that are moisture free)
48 Infrastructure facilities for storing meat and poultry exist where needed
49 Infrastructure facilities for storing fruits and vegetables exist where needed
50 Infrastructure facilities for storing dairy exist where needed (e.g. cold storage facilities)
51 Infrastructure facilities for storing fish exist where needed
52 *Storing facilities for processed food exist where required
53 Small-scale processing units are informed about effective storing mechanisms
54 Infrastructure facilities for storing packaged food/drink exist where needed

55 *Effective means to **distribute food** produced are in place or can be developed
56 *Food distribution processes are supported by robust infrastructure
57 Physical obstacles to food security imposed by local terrain can be overcome by creating access
58 Infrastructure exists/ can be developed to facilitate multiple modes of transportation
59 *Operational transportation modes exist and enable access between markets/ food and consumers
60 The modes of transport are safe
61 The modes of transport are trusted by families/communities/ food distributors
62 The modes of transport are efficient
63 Speed of food delivery allows preservation of quality of food (i.e. when the food reaches the consumer, it is in consumable form)
64 The modes of transport are reliable

65 Transportation cost is affordable
66 The transportation route is free from any monopolizing entity
67 Obstructions to the safe passage of commutors/ food can be overcome
68 Alternative means to deliver food are sought where transportation is not feasible (e.g. encouraging people in remote villages to grow their own produce)
69 Markets and/or retail shops to facilitate distribution of food exist or can be set up
70 *Distribution networks facilitate access to markets for processed food as well as fresh produce
71 *Efficient distribution mechanisms exist for fresh produce
72 *Efficient distribution mechanisms exist for distribution of processed food

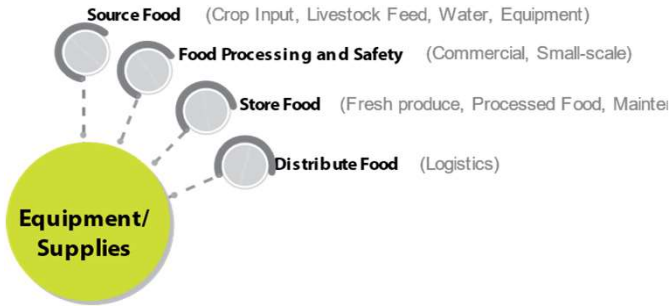
73 Operational infrastructure to manage waste generated by the food value system exists
74 Operational waste collection system exists
75 Operational waste disposal system for different kinds of waste exist

76 Infrastructure to **facilitate communication** between stakeholders exists
77 Effective channels of communication exist or can be developed to spread awareness among populations (e.g. mass media channels like radio, television, interpersonal channels like nutritionist, local sellers, markets, institutional channels like schools, government)
78 Acceptable and robust communication channels are identified or developed
79 Existing institutions and/or private sector channels are leveraged to spread awareness among the masses (e.g. trusted private-sector entities that are popular among communities)
80 Channels to spread awareness that have high impact and are reliable are identified
81 Drivers of awareness acknowledge the need for awareness among the population about nutrition and food security
82 Channel drivers formalize intent to raise awareness about nutrition and food security by setting outcome based objectives and developing strategies
83 Channels to spread awareness are secure and stable
84 Channels to spread awareness are supported by sufficient resources
85 Channels to spread awareness are equipped with material resources
86 Channels to spread awareness are equipped with technological resources
87 Channels to spread awareness are equipped with human resources
88 Channels to spread awareness are financially secure
89 Channels to spread awareness operate legally in compliance with existing laws and regulations
90 Channel drivers are trusted by the government and other stakeholders

Food Security
Success Factor Tree

91 Channel drivers and the communication channels utilized are trusted by the population
92 *Communication systems utilized are persistent and secure for long-term purposes
93 Involved stakeholders trust communication channels used
94 Different and multiple channels of communication are utilized to raise awareness among different target populations
95 A variety of effective channels of communication exist
96 Communication channels and systems are resilient to environmental and political change
97 Awareness can be spread in a socially acceptable way
98 Awareness can be raised among vulnerable/high risk target populations
99
100 Infrastructure required by **other supplementary systems to the food security system** exist or can be developed
101 Infrastructure to educate/train workforce (e.g. extension programs) for various positions with the food value chain exist or can be developed
102 Infrastructure for water and sanitation systems exist or can be developed
103 Infrastructure required for power generation and distribution to food value chain segments exists or can be developed
104 Infrastructure to enable research and improvement of technology and techniques used in the food value chain elements exists or can be developed
105 Infrastructure to produce and distribute equipment for various segments of the food value chain exists or can be developed
106 Infrastructure promotes connectivity between various subsystems

E. Equipment/ Supplies



Equipment/ Supplies to support effective delivery of food security through an operational food value-chain is in place

1 Country has equipment/ supplies to support the **sourcing of sufficient food** to provide adequate nutrition to all the people of the country

2 Country has or can create access to equipment/ supplies needed to support the sourcing of food through regional production

3 Regions that produce food that is adequate or in surplus of nutrition needs of people in the region have or can create access to equipment/ supplies needed to perform effective farming practices

4 Communities that contribute to the food produced in the region generate adequate or yield in excess of household requirement (food produced - consumption)

5 Farming at the individual/ community level in a region produces excess of individual household requirements

6 Equipment/ supplies to support individuals/ communities who perform arable farming (growing of crops) exist or can be made available

7 Farmers have access to and implement the use of high quality inputs (e.g. seeds, nitrogen and phosphorous rich fertilizers)

8 Farmers have access to and capability to utilize farm machinery and equipment (tractors, ploughs, mowers, sprayers) for various farming processes (e.g. ploughing, planting, spraying, harvesting)

9 Equipment/ supplies to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) exist or can be made available

10 *Farmers have access to sufficient sustainable, nutritious livestock feed (e.g. grains, replenishable grazing lands, water)

11 Equipment/ supplies to support individuals/ communities who perform fishing and aquaculture (rearing of fish) exist or can be made available

12 Fishermen use effective equipment to catch fish

Food Security
Success Factor Tree

13 Fishermen have sophisticated equipment to catch different types of fish (e.g. nets that can be cast and hauled using motors)

14 Farmers use effective equipment/ supplies required to perform aquaculture

15 Farmers use effective techniques to breed fish in fresh water conditions

16 Farmers use effective techniques to perform mariculture (growing or breeding in marine water/ brackish water)

17 Equipment/ supplies to support communities who follow **subsistence farming practice**s to produce adequate food that caters to the nutritional needs of people in the region exists or can be made available

18 Individuals that contribute to the food produced in the region generate enough food to accommodate requirements of their households (e.g. nomadic farming, slash and burn agricultural practices)

19 Equipment/ supplies to support individuals/ communities who perform arable farming (growing of crops) exists or can be made available

20 *Farmers have/ can obtain access to crop inputs (e.g. seeds and fertilizers)

21 Farmers have/ can obtain sufficient water for irrigation

22 *Farmers have/ can obtain access to equipment (e.g. ploughs, sickles, shovels) for various farming processes (e.g. ploughing, planting, spraying, harvesting)

23 Equipment/ supplies to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) exists or can be made available

24 *Farmers have/ can obtain access to sufficient sustainable, nutritious livestock feed (e.g. grains, replenishable grazing lands, water)

25 Farmers have/ can create means to hold livestock (e.g. pens, sheds, coops)

26 Equipment/ supplies to support individuals/ communities who perform fishing and aquaculture (rearing of fish) exists or can be made available

27 Fishermen use effective equipment to catch fish

28 Fishermen have/ can obtain floating vessels to allow them to travel to locations that can yield better quantity/quality of fish (e.g. boats)

29 Fishermen have/ can obtain equipment to catch different types of fish (e.g. nets,hooks)

30 Equipment/ supplies to support individuals/ households who gather food from other sources (e.g. hunting; gathering of berriers, mushrooms and other vegetation) exists or can be made available

31 Individuals/ households have/ can obtain access to resources for collection of food

32 Individuals/ households have/ can obtain efficient tools to perform hunting/gathering activities

33 Equipment/ supplies required to support effective means to **process food** produced are in place or can be developed
34 Equipment/ supplies required to support commerical food processing plants for large scale primary, secondary or tertiary food processing exist or can be developed
35 Plants can sustainably source raw materials
36 Equipment/ supplies required for maintaining operations of the plant are or can be made accessible
37 Small-scale food processing units for distribution of produce within the community exist
38 Unit can sustainably source raw materials
39 Equipment/ supplies required for maintaining operations of the unit are or can be made accessible

40 Regional facilities (e.g. farms, food processing units, food distributors) have or can access equipment/ supplies to support means to **store food**
41 Equipment and supplies required to support effective functioning of food storage units exist

42 Equipment/ supplies required for effective means to **distribute food** produced are in place or can be developed
43 Equipment and supplies required to support the food distribution system exist and are accessible to distributors

F. Workforce/ talent

Workforce/ talent to support effective delivery of food security through an operational food value-chain is in place
1 Workforce/ talent can be **trained or educated** for their respective roles

Food Security
Success Factor Tree

2 Education/ training programs exist or can be developed for workforce/ talent within the food security system
3 Training programs are accessible
4 Potential workforce/ talent can afford the available training
5 Potential workforce/ talent are willing to engage in training
6 Equal opportunity for obtaining training is provided to all interested candidates (e.g. gender, race, religion, physical abilities)
7 Potential workforce/ talent feel comfortable with training techniques adopted

8 Workforce/ talent is **willing to engage in employment**/roles available within the food value chain
9 Food security and nutrition system offers employment opportunities
10 Compensation provided is attractive to potential workforce
11 Safe working conditions are provided
12 Employment provides satisfaction to engaged workforce
13 Employment enables professional growth for interested workforce/ talent
14 Equal opportunity for employment is provided to all interested candidates (e.g. gender, race, religion, physical abilities)

15 Country has workforce/talent to support the **sourcing of sufficient food** to provide adequate nutrition to all the people of the country
16 Country has or can recruit or access required workforce/talent needed to support the sourcing of food through regional production
17 Regions that produce food that is adequate or in surplus of nutrition needs of people in the region have or can access required workforce/talent needed to perform effective farming practices
18 Communities that contribute to the food produced in the region generate adequate or yield in excess of household requirement (food produced - consumption)
19 Farming at the individual/ community level in a region produces excess of individual household requirements
20 Workforce/ talent to support individuals/ communities who perform arable farming (growing of crops) exist or can be accessed
21 Farmers have access to skilled and affordable labor to assist with the farm where required
22 Farmers can access and engage with external help from experts where required (e.g. experts who may introduce water management methods in farming)
23 Workforce/ talent to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) exist or can be accessed
24 Farmers have access to skilled and affordable labor to assist with the farm where required

Food Security
Success Factor Tree

25 Farmers can access and engage with external help from experts where required (e.g. veterinarian (vets) for the wellbeing of their livestock)

26 Workforce/ talent to support individuals/ communities who perform fishing and aquaculture (rearing of fish) exist or can be accessed

27 Fishermen have sufficient workforce to perform fishing activities

28 Fishermen have access to skilled and affordable labor where required

29 Farmers have access to workforce/ talent to perform aquaculture

30 Farmers use effective techniques to breed fish in fresh water conditions

31 Farmers have access to skilled and affordable labor where required

32 Farmers can access and engage with external help from experts where required (e.g. researchers who may introduce new technologies to improve aquatic farming methods)

33 Farmers use effective techniques to perform mariculture (growing or breeding in marine water/ brackish water)

34 Farmers have access to skilled and affordable labor where required

35 Farmers can access and engage with external help from experts where required (e.g. experts on endangered marine species and how to save them)

36 Communities follow subsistence farming practices to produce adequate food that caters to the nutritional needs of people in the region

37 Individuals that contribute to the food produced in the region generate enough food to accommodate requirements of their households (e.g. nomadic farming, slash and burn agricultural practices)

38 Workforce/ talent to support individuals/ communities who perform arable farming (growing of crops) to yield produce sufficient for individual household consumption during every harves exist

39 Workforce/ talent to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) to yield produce sufficient for individual household consumption during every harvest exists

40 Workforce/ talent to support individuals/ communities who perform fishing and aquaculture (rearing of fish) to yield produce sufficient for individual household consumption during every harvest exists

Food Security
Success Factor Tree

41 Workforce/ talent to support individuals/ households who gather food from other sources (e.g. hunting; gathering of berriers, mushrooms and other vegetation) exists

42 Workforce/ talent to support Country when it sources food and supplements to produce food through **external aid** to accommodate shortage, if any, in production exists

43 Workforce/ talent to perform **processing of food** produced exist or can be accessed where required
44 Workforce/ talent required to support commerical food processing plants for large scale primary, secondary or tertiary food processing exist or can be accessed
45 Skilled workforce to perform various tasks within the processing plant exist
46 Workforce trained to operate machinery exist or can be recruited
47 Workforce to monitor quality of food produced exist or can be recruited
48 Workforce to maintain the operation, hygiene and sanitary needs of the facility exist or can be recruited
49 Workforce to manage the plant exist or can be recruited
50 Workforce can be locally sourced
51 Small-scale food processing units for distribution of produce within the community exist
52 Skilled labor manage and run the unit

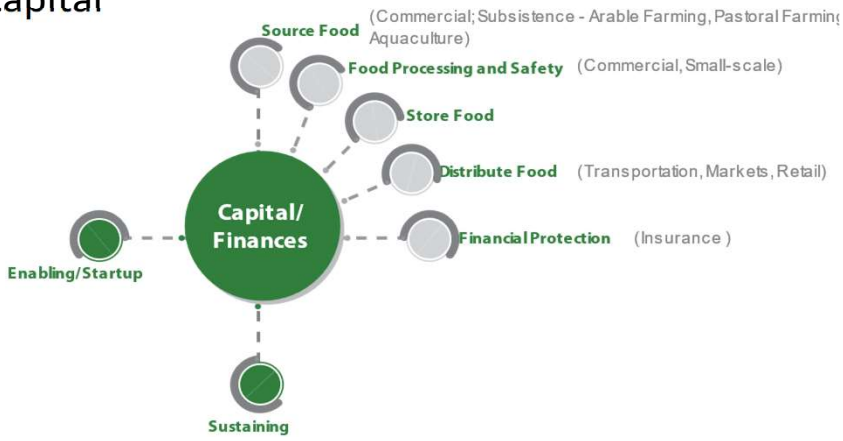
53 Workforce/ talent needed to support **storage facilities** exist or can be recruited
54 Workforce to support the functioning and maintenance of regional storage units exist

55 Effective means to **distribute food** produced are in place
56 Workforce to support food distribution mechanisms and systems exist

57 Workforce/ talent who can support and enable development within the food value chain exist or can be identified and engaged when needed
58 Leadership who can be sought to overcome existing local challenges exist or can be elected
59 Researchers who can improve/ develop existing practices and technologies exist or can be sourced
60 Experts on climate variation and its influence on the food value chain are accessible where required
61 Experts on environmental impact of various activites within the food value chain are available/accessible where required
62 Private sector/ non-profit entities are available/ accessible where required
63 Experts on resource management are available/ accessible where required
64 Local operators for supporting systems (e.g. water, electricity) exist or can be appointed
65 Engineers required for infrastructure development exist or can be sourced

Food Security
Success Factor Tree

G. Capital



Capital/ finances to start/ support segments that facilitate effective delivery of food security through an operational food value-chain can be accessed

1. Country has/ can provide capital to support the **sourcing of sufficient food** to provide adequate nutrition to all the people of the country
2. Country has or can provide access to capital needed to support the sourcing of food through regional production
3. Regions that produce food that is adequate or in surplus of nutrition needs of people in the region have or can create access to capital needed to perform effective farming practices
4. Startup capital is available to food producers where required
5. Communities that contribute to the food produced in the region generate adequate or yield in excess of household requirement (food produced - consumption)
6. Farming at the individual/ community level in a region produces excess of individual household requirements
7. Capital/ finances to support individuals/ communities who perform arable farming (growing of crops) exists or can be accessed
8. Farmers have/ can obtain large pieces of arable land
9. Farmers have/ can access capital to carry out farming/ agricultural practices and can accommodate economic fluctuations (e.g. cash access)
10. Farmers have/ can obtain access to financial mechanisms that facilitate a marketplace for excess produce sales
11. Capital/ finances to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) exists or can be accessed

Food Security
Success Factor Tree

12 *Farmers have/ can obtain sufficient livestock to sustainably produce excess food
13 Farmers have/ can access capital to sustain livestock requirements (e.g. money for food, shelter, medication of livestock)
14 *Farmers have/ can obtain access to financial mechanisms that facilitate a marketplace for excess produce sales
15 Capital/ finances to support individuals/ communities who perform fishing and aquaculture (rearing of fish) exist or can be accessed
16 Fishermen have/ can access sufficient capital to perform fishing activities
17 Farmers have sufficient capital to perform aquaculture
18 Farmers use effective techniques to breed fish in fresh water conditions
19 Farmers have/ can access capital to start and manage operations of the farm
20 Farmers have/ can obtain sufficient area to carry out farming practices
21 Farmers use effective techniques to perform mariculture (growing or breeding in marine water/ brackish water)
22 Farmers have/ can access capital to start and manage operations of the farm
23 Farmers have/ can obtain sufficient area to carry out farming practices
24 Communities follow subsistence farming practices to produce adequate food that caters to the nutritional needs of people in the region
25 Individuals that contribute to the food produced in the region generate enough food to accommodate requirements of their households (e.g. nomadic farming, slash and burn agricultural practices)
26 Capital/ finances to support individuals/ communities who perform arable farming (growing of crops) exists or can be accessed
27 Farmers have/ can obtain sufficient arable land to produce food for their households
28 *Farmers have/ can access capital to carry out farming/ agricultural practices and, if susceptible, can overcome vulnerability to economic fluctuations
29 Capital/ finances to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) exist or can be accessed
30 *Farmers have/ can obtain sufficient livestock to produce sufficient food for their family

31 Farmers have/ can access capital to sustain livestock requirements (e.g. food, shelter, medication)
32 Farmers have/ can develop means to hold livestock (e.g. pens, sheds, coops)
33 Capital/ finances to support individuals/ communities who perform fishing and aquaculture (rearing of fish) exist or can be accessed
34 Fishermen have sufficient capital to perform fishing activities
35 Capital/ finances to support individuals/ households who gather food from other sources (e.g. hunting; gathering of berriers, mushrooms and other vegetation) exist or can be accessed

36 Capital/ finances to support Country when it sources food and supplements to produce food through external aid to accommodate shortage, if any, in production exists
37 Country has/ can source sufficent funds to import food

38 Sufficient capital/ finances to support means to **process food** produced are in place or can be accessed
39 Capital/ finances required to support commerical food processing plants for large scale primary, secondary or tertiary food processing exist or can be sourced
40 Start-up capital required for processing plants can be accessed where required
41 Food processing facility is economically self-sustainable
42 Sufficient raw material to run operations in an energy and economically efficient way can be sourced
43 Transportation mechanisms exist to source raw material
44 Workforce for loading/ unloading and transporting purposes exist where required
45 Sufficient output to create profits can be produced
46 There is sufficient sustainable demand for the processed food
47

Capital/ finances required to support small-scale food processing units for distribution of produce within the community exist or can be accessed
48 Sufficient capital is sourced to start the unit and purchase/setting up required equipment (e.g. large utensils, furnace/kiln)
49 Unit is economically self-sufficient

50 Regional facilities (e.g. farms, food processing units, food distributors) have/ can access capital to support effective means to **store food**
51 Capital/ finances to support the functioning and maintenance of regional storage units exist

52 Effective means to **distribute food** produced are in place
53 The food distribution segments (e.g. transport, market/ retail store) are economically self-sustainable

54 **Precautionary mechanisms to financially protect entities within the food value chain exists**
55 Insurance policies to manage risk within the food delivery system exists
56 Insurance policies and measures to protect food producers of the country exists
57 Farmers have access to insurance for their crops
58 *Farmers have access to insurance for their livestock
59 Aquaculturists have access to insurance for their livestock
60 Insurance policies to manage risk among other segments of the food delivery system exists
61 Business interruption insurance is available for entities that require it
62 Hazard insurance is available for entities that require it
63 Fire insurance is available for entities that require it
64 Automobile insurance policies are available for transportation facilities within the food delivery system
65 Insurance schemes exist to cover work related injuries
66 Biological safety principles are followed where required
67 Safe working environment can be established

H. Practices/ Mechanisms

Practices/ mechanisms to support effective delivery of food security through an operational food value-chain is in place

1 Country implements effective practices/mechanisms to support the **sourcing of sufficient food** to provide adequate nutrition to all the people of the country
2 Country implements effective practices to support the sourcing of food through regional production
3 Regions that produce food that is adequate or in surplus of nutrition needs of people in the region implement effective farming practices

Food Security
Success Factor Tree

4 Communities that contribute to the food produced in the region generate adequate or yield in excess of household requirement (food produced - consumption) through effective mechanisms/ practices

5 *Farming at the individual/ community level in a region produces excess of individual household requirements

6 Practices/ mechanisms to support individuals/ communities who perform arable farming (growing of crops) are implemented

7 Farmers are educated about/aware of how to maintain long-term quality of arable land (e.g. through use of fertilizers, crop rotation methods)

8 Farmers are educated about diversification of crops produced (e.g. knowledge about which crops to grow in which season in order to have year-round yield)

9 Farmers implement efficient/sophisticated water management practices based on the region (e.g. effective drainage in areas with high rainfall or drip irrigation methods in places with low rainfall)

10 Farmers implement efficient resource management practices

11 Farmers utilize efficient/high quality pest control practices to preserve crops (e.g. insecticides, fungicides, herbicides, competitive insects, natural deterrents)

12 Farmers utilize effective drying and storage practices to maximize longevity of harvested crops (e.g., prevent aflatoxin contamination)

13 Farmers are aware of effects of climate changes (e.g. change in rainfall pattern) and how to adjust for it (climate change adaptation and mitigation techniques)

14 Farmers perform sedentary farming (farms are permanently located in one place)

15 Farmers that have the capability, perform commercial farming

16 Practices/ mechanisms to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) are implemented

17 Farmers perform effective livestock disease control practices and know how to handle occurrence of common diseases

18 Farmers work on genetically improving varieties of livestock (e.g. increase food efficiency, reduce methane production) where possible

19 Farmers implement efficient resource management practices

20 Practices/ mechanisms to support individuals/ communities who perform fishing and aquaculture (rearing of fish) are implemented

21 Fishermen use effective techniques to catch fish

22 Fishermen are cognizant of environment impacts and follow policies on fishing in different water bodies
23 Fishermen have effective means to store fish in a way to preserve it for consumption
24 Fishermen are informed about different types of aquatic foods that are nutritious and have market demand (e.g. aqautic plants, fish, crustaceans,
25 Fishermen use efficient fishing techniques based on location and water body (e.g. sea, ocean, river, stream, pond)
26 Fishermen are aware of impacts of climatic changes and how to adapt to it
27 Farmers use effective techniques to perform aquaculture
28 Farmers use effective techniques to breed fish in fresh water conditions
29 Farmers have adequate technological expertise to manage aquatic farms (e.g. life cycle of fish to be bred)
30 Farmers are aware of seasonal effects on produce and adjust for it
31 Farmers are equipped to handle diseases that can affect the fish grown (e.g. fungal infections, parasites)
32 Farmers use effective techniques to perform mariculture (growing or breeding in marine water/ brackish water)
33 Farmers have adequate technological expertise to manage marine farms
34 Farmers are aware of tidal and seasonal effects on produce and adjust for it
35 Farm locations are appropriate
36 Farmers are aware of market demands and competition and are able to adjust according to it
37 Communities follow subsistence farming practices to produce adequate food that caters to the nutritional needs of people in the region
38 Individuals that contribute to the food produced in the region generate enough food to accommodate requirements of their households (e.g. nomadic farming, slash and burn agricultural practices)
39 Practices/ mechanisms to support individuals/ communities who perform arable farming (growing of crops) are implemented
40 *Farmers are aware of how to maintain quality of arable land (e.g. through use of fertilizers, crop rotation methods)

41 Farmers are educated about diversification of crops produced (e.g. knowledge about which crops to grow in which season in order to have year-round yield)
42 *Farmers implement effective water management practices
43 *Farmers utilize efficient pest control practices to preserve crops (e.g. insecticides, fungicides, herbicides)
44 *Farmers are aware of effects of climate changes (e.g. change in rainfall pattern) and how to adjust for it (climate change adaptation and mitigation techniques)
45 Farmers have an understanding about shared communal lands
46 Practices/ mechanisms to support individuals/ communities who perform pastoral farming (rearing of animals for meat, eggs, dairy) are implemented
47 Farmers perform effective livestock disease control practices and know how to handle occurrence of common diseases
48 Farmers implement efficient resource management practices
49 Practices/ mechanisms to support individuals/ communities who perform fishing and aquaculture (rearing of fish) are implemented
50 Fishermen use effective techniques to catch fish
51 *Fishermen are cognizant of environment impacts and follow policies on fishing in different water bodies
52 *Fishermen have effective means to catch and consume fish that is appropriate for consumption
53 *Fishermen use efficient fishing techniques based on location and water body (e.g. sea, ocean, river, stream, pond)
54 *Fishermen are aware of impacts of climatic changes and how to adapt to it
55 Practices/ mechanisms to support individuals/ households who gather food from other sources (e.g. hunting; gathering of berriers, mushrooms and other vegetation) exists
56 Individuals/households have means to store and preserve collected food
57 *Individuals/ households are aware of environmental impacts of hunting
58 *Individuals/ households are aware of environmental impacts of gathering vegetative food from wildlands
59 *Individuals/ households are aware of and follow policies of hunting and protection of wildlife
60 *Individuals/ households are aware of and follow policies of gathering vegetative food and protection of plant species

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61 *Hunting policies facilitiate preservation of resources
62 *Hunting policies ensure reliant communities are not cut-off from access to needed game or provide alternate resources

63 Practices/ mechanisms to support Country when it sources food and supplements to produce food through **external aid** to accommodate shortage, if any, in production exists
64 Country can import food/ request for food-aid to accommodate shortage within the country
65 Standard operating procedures for the import of food exist and are implemented
66 Imported food does not adversely impact local markets
67 Imported food is of desired nutrition value
68 Country has effective operational mechanisms to check quality and safety standards of food imported
69 Country is aware of and is capable of adjusting to fluctuations in pricing
70 Country is aware of and is capable of adjusting to fluctuations in food availability
71 Country maintains good relations with food donor countries
72 Country is aware of risk associated with international trade in food
73 Food imported caters to cultural and dietary preferences of the consumers
74 Food imported is affordable
75 Food imported is accessible

76 *Effective **post-harvest processing and handling** mechanisms exist to prevent spoilage of food produced
77 Standard procedures and mechanisms for treating/processing grains are implemented where needed (e.g. post-harvest processing and handling)
78 Standard procedures and mechanisms for treating/processing meat and poultry are implemented where needed
79 Standard procedures and mechanisms for treating/processing fruits and vegetables are implemented where needed
80 Standard procedures and mechanisms for treating/processing dairy are implemented where needed
81 Standard procedures and mechanisms for treating/processing fish are implemented where needed (e.g. salting)

82 Effective means to **process food** produced are in place
83 Commerical food processing plants for large scale processing exist
84 *Methods of assessing food quality are standardized and implemented
85 *Bacterial contamination checks are made at various stages
86 *Inspection of nutrient composition of foods produced is performed during the food processing stage
87 *Inspection of expiry is performed during processing, transportation and distribution phases
88 *Chemicals/ processes used to maintain food quality are utilized in a sanitary way

Food Security
Success Factor Tree

89 Small-scale food processing units for distribution of produce within the community exist
90 *Efficient and sanitary techniques for food processing are implemented
91 Unit has demand for processed food
92 *Process implemented allows preservation of quality and nutrient content of food
93 *Effective mechanisms exist to ensure quality of food distributed by small-scale food suppliers
94 *Effective mechanisms exist for consumers to assess quality of food distributed by small-scale food suppliers
95 *Consumers are informed about simple tests/checks they can perform on fresh produce/ packaged goods to ensure quality
96 *Small-scale suppliers practice safety and hygiene to ensure good quality of goods produced
97 *Small-scale suppliers are informed about safe and hygienic practices to follow to ensure good quality of goods produced

98 Regional facilities (e.g. farms, food processing units, food distributors) have effective means to **store food**
99 *Mechanisms to ensure effective functioning of food storage units exist
100 *Mechanisms that ensure protection of food against spoiling/ wastage are implemented (e.g. protecting grains from moisture, protecting dairy products)
101 *Standard methods to monitor quality of food are operational and performed regularly
102 Storage unit workforce practice hygiene

103 Effective means to **distribute food** produced are in place
104 Practices/ mechanisms to support the food distribution system are in place
105 Food distribution workforce exercise efficient and hygienic practices

Food Security
Success Factor Tree

I. Awareness

***Country is aware of the availability of and means to access sufficient and nutritious food**

1. Content used to spread awareness about food and nutrition is effective
    2. Content is based on formative research and has been proven to be effective
    3. Content is culturally appropriate and aligns with values of target audience
    4. Content motivates population to adopt healthy diets
    5. Content is specific to context and target audience
    6. Variations in literacy are surmountable
        7. Content is sensitive to variations in literacy
        8. Majority of the target audience finds content easy to understand (e.g. Use of more pictoral representations, avoidance of difficult words or phrases)
    9. Content can sensitize population about food and nutrition in order that communities adopt healthy diets
        10. Awareness can be raised among different sectors of the population involved
            11. Awareness can be raised among **government officials and local leaders** about various aspects of food security and nutrition
                12. Awareness about requirement of efficient food production/delivery system is raised among the government and local leaders
                    13. Awareness can be raised among Government and local leaders about the need for better food sourcing and delivery system in the region
                        14. Awareness can be raised about the requirement to strengthen delivery of good quality and nutritious food in the region (e.g. statistics show a large percentage of the population
                        15. Awareness can be raised about the existence of double burden of malnutrition within the region of control

16 Awareness can be raised on the particular segment of the food delivery supply chain that requires immediate attention in the region to allow adequate, secure and consistent food delivery (e.g. warehouses are required to store food, transportation facility is required)

17 Awareness can be raised where people know about requirements to maintain good health through adequate nutrition intake but do not know how to avail good quality food

18 Local leaders can be made aware of means to develop/ strengthen the food supply chain

19 Local leaders and influencers of change are informed about means to setup/strengthen segments of the food supply chain that are found to be weak or non-existent

20 Local leaders and influencers of change are informed about existing food and nutrition policies that they need to ensure for adequate delivery of nutritious food

21 Local leaders and influencers of change are informed about how to aid in overcoming double burden of malnutrition in the region

22 Awareness can be raised among **potential and existing food system workforce/talent** about various aspects of food security and nutrition

23 Awareness can be raised among potential food system workforce (e.g. nutritionists, farmers, food processors, food distributors) about opportunities in the food and nutrition domain, and required qualifications/ certifications.

24 Awareness is raised about ways in which to engage in the food system

25 Awareness is raised about extension programs and services

26 Job opportunities in the food and nutrition domain are appealing

27 Awareness can be raised among existing food and nutrition supply chain segments about requirement to provide adequate and nutritious food to all households

28 Awareness is raised among target populations at the source of the food supply chain about nutrition and food quality (e.g. agriculturists)

29 Farmers are informed about demand to be met

30 Farmers are informed about practices that yield nutritious food (e.g. ways to maintain health of livestock)

31 Farmers are informed about practices that help avoid losses (e.g. losses due to pests can be avoided by use of pesticides)

32 Awareness is raised among food processing units about quality standards to uphold for delivery of healthy, nutritious food

33 Awareness is raised among target populations about food quality checks and certification requirements (e.g. requirements that processed food must meet, expiry date)

34 Awareness is raised among food transporters and distributors about hygienic and safe practices while handling food

35 Awareness can be raised among food and nutrition supply chain segment **workforce/talent** about mechanisms to provide adequate and nutritious food to all households

36 Awareness is raised among target populations about methods to develop/ strengthen food procurement processes (e.g. agriculturists)

37 Farmers are informed about new technologies available to implement for better crop/livestock yield and how to access them (e.g. tractors for ploughing the fields)

38 Farmers are informed about new techniques to implement for better crop/livestock yield (e.g. better sowing or irrigation methods, different diets for livestock)

39 Farmers are informed about resource management techniques (e.g. finance management, water resource management, land use)

40 Farmers are informed about avenues to sell their goods (e.g. potential wholesalers, local markets)

41 Farmers are informed about ways to prepare themselves for climate variations (e.g. through use of irrigation systems like drip irrigation during droughts)

42 Farmers have access to accurate climate predications to prepare themselves

43 Awareness is raised among target populations about methods to setup/strengthen food processing units

44 Awareness is raised among target populations about methods to develop/strengthen food distribution networks and processes

45 Awareness is raised among target segments of the supply chain on methods to alleviate wastage of food

46 Awareness is raised on coping mechanisms/ adaptive capacities in times of risk or fluctuations in supply

47 Awareness can be raised among **potential and existing food system partners** about various aspects of food security and nutrition

48 Possible partners can be approached to contribute to the food system

49 Awareness can be raised among non-profit groups about opportunities for engagement in the food supply chain
50 Possible private sector partners can be made aware of opportunities to engage in the food supply chain
51 Other potential partners can be identified and made aware of opportunities to engage in the food supply chain

52 Awareness can be raised among **consumers** about various aspects of food security and nutrition
53 Target populations/ communities are made aware of importance of consuming adequate and nutritious food
54 Consumers are aware of importance of good food and nutrition intake
55 Target populations have a good understanding of what is "nutrition"
56 Target populations have a good understanding of what is "healthy food"
57 Target populations are informed about different biological nutritional needs of individuals at different stages of their life time (e.g. biological nutrition needs of a newborn are different from that of an adolescent)
58 Target populations are informed about the quantities of specific food that should constitute their diet (balanced diet that includes macronutrients like carbohydrates,
59 Target populations are informed about health benefits of consuming nutrient rich diet (e.g. resilience to certain diseases)
60 Target populations are informed about where to access nutritious food
61 Target populations are informed that they can grow their own food along with ways to do so
62 Target populations are informed about simple everyday measures to ensure quality of food they consume (e.g. checks to make sure fresh produce is consumable, hygienic
63 Target populations are informed about the "double burden of malnutrition" and how it can occur and individual or at household level

64 Consumers are informed about where/how they can access sufficient nutritious food
65 Populations are informed about food options that are more nutritious than others and how to identify them (e.g. fresh foods/ naturally produced foods are better than processed foods)
66 Populations are informed about experience characteristics (that come from self-experiences) and credence characteristics (details they can find from third parties) to assess quality of food

67 Populations are informed about hygienic practices to follow while handling food (e.g. use clean water to wash hands, wash fruits/vegetables, use clean water while cooking, clean utensils)
68 Populations are informed about where they can obtain good quality food at affordable prices
69 Populations can be informed about where to access inputs required to grow their own produce on a small scale
70 Populations that identify the existence of double burden at the individual or household level are informed about how to overcome it

J. Motivation

***Country is motivated to engage in and support available food system**

1 The beliefs, attitudes and perceptions of populations towards adopting healthy diets and nutritious food in different regions are understood
2 Effective channels and reliable means exist to perform a formative assessment of populations' beliefs, attitudes and perceptions
3 Mechanisms used to perform formative assessment are appropriate for specific context
4 Rigorous assessments are made to obtain comprehensive data on the knowledge and attitudes of people towards adequate, healthy food
5 Data collected from assessments are effectively analyzed
6 The analysis results are utilized to drive change in populations' motivation and behavior

7 Evidence-based intervention strategies are employed to motivate populations at different stages of change
8 Individuals/ communities in the pre-contemplation stage (where they are not considering the nutritional impact of the food they consume) can be motivated to consider nutritional requirements and impact
9 Influencers of change are motivated to consider the need to provide access to adequate and diverse nutritious food

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10 Target populations are motivated to consider benefits of consuming nutritious diets
11 Barriers preventing consideration of purchasing healthy foods (e.g. lack of finances to cover costs, gender inequality) are identified
12 Strategies to facilitate equitable access to adequate, diverse nutritious food are implemented
13 Viable private sector channels are considered and employed to overcome barriers (e.g. advertisements through trusted channels)
14 Communities are conscious about existing living conditions and possible healthier lives after obtaining food security (e.g. consuming adequate nutrition can reduce stunted development in children)
15 Individuals, families and communities feel empowered and believe they can create meaningful impact in their lives
16 Individuals and families care about their health
17 Communities are aware of channels they can use to influence change in their lives
18 Communities believe they can create the change they want to see
19 Communities are aware that food security is a shared national responsibility

20 Individuals/ communities in the **contemplation stage** (contemplating the benefits of consuming/delivering adequate nutritious food) can be motivated to engage in the available food system
21 Government, local leaders and influencers of change believe they can benefit population by facilitating awareness and access to nutritious food
22 Government and local leaders care for the greater good of the communities, regions and the nation
23 Leadership is convinced that improving access to good quality food can improve economy
24 Leadership acknowledges that individual's consumption of good quality food has a long-term impact on their health, which in turn produces able-bodied workforce for the nation
25 Local leaders are inclined to strengthen household food security by building the capacity of local talent and local markets (external food aid is very difficult to compete with and causes local markets to shut down)
26 Target individuals, families and communities (e.g. food insecure, nutritionally vulnerable populations) are convinced about benefits of healthy eating habits
27 Barriers preventing target populations from consuming healthy food are minimized or overcome
28 The priorities of individuals/families are assessed
29 Accessibility issues are identified
30 Healthy food options are made a comparitively more appealing alternative to existing food options
31 Families and households are exposed to convincing messages to prioritize adequate nutritious food for all members of the family

32 Skilled individuals are motivated to participate in the food value-chain system
33 Working conditions promote interest in job opportunities (e.g. appropriate hours of work and good pay)
34 Jobs in food value-chain system are perceived as respectable
35 Equal opportunities are offered to all qualified applicants (e.g. irrespective of religion, cast, race, gender, abilities)
36 Opportunities to volunteer and serve in segments of food delivery system are provided
37 Skilled individuals have an entrepreneurial trait
38 Skilled individuals have the capacity to manage a scalable food business (e.g. affordable trainings may be provided for capacity building)
39 Skilled individuals have ability to expand their business
40 Incentives to engage in food supply chain are attractive (e.g. banks provide subsidies for loans)
41 Procedure to obtain trainings/certifications required are not difficult (e.g. training on how to handle certain machinery/ equipment, quality certifications)

K. Enabling Resources

Enabling Resources can be utilized to overcome barriers, if they exist, to delivery of adequate nutritious food to all households

1 Regions produce food that is not adequate to fulfill nutrition needs of people in the region and can improve through effective farming practices
2 *Communities do not produce adequate food to sustain the nutrition needs of the region but can do so (attain susbsistence farming status) by overcoming certain barriers
3 *Individuals/communities face arable farming challenges that can be overcome
4 *Alternative methods can be used where arable land is limited (e.g. intensive farming techniques)
5 *Soil improvement methods can be implemented where soil degradation is resulting in lower/ no yield
6 *Access to input materials (E.g. seeds, fertilizers) can be created where there is limited/ no access
7 *Energy requirements to facilitate in-country fertlizer production can be achieved

8 *Import channels for fertilizer access are effective where in-country production is not feasible
9 *Economic policies (e.g., subsidies) enable fertilizer access where otherwise unviable
10 *Access to water can be created where there is insufficient water for agriculture (e.g. through external aid or by educating population on water storing/conserving techniques)
11 *Access to pest control measures can be created where there is limited/no access
12 *Labor can be sourced in regions with low labor and high employment opportunities
13 *Economic barriers can be overcome
14 *Climate resilience mechanisms can be developed/strengthened where required (climate change adaptation and mitigation techniques)
15 *Practices of crop production for part of the year can be extended to year-round production where possible (e.g. where farmers are not aware of crop rotation techniques)
16 Individuals/communities face pastoral faming challenges that can be overcome
17 *Access to livestock feed can be created
18 *Economic barriers can be overcome
19 *Diseases that cause high mortality among livestock/ render their produce inconsumable can be overcome
20 *Farmers are educated on maintenance of livestock for improved yield
21 *Farmers are taught about livestock rearing to have a sustainable source of food

22 ***Economic barriers** in providing food security and nutrition, and in receiving adequate nutritious food can be overcome
23 *Economic barriers with regard to creating availability of adequate nutritious food can be overcome
24 *Allocation of finances within the food value chain system is done based on past results from performances of various sub-sectors
25 *Opportunities to engage non-profit resources are effectively utilized
26 *The food and nutrition production and delivery system is economically scaleable
27 *Sources are available to sponsor system start-up or to gain/augment government financial support
28 *Food produced is made more affordable by strengthening different segments of the supply chain
29 *Adequate funding mechanisms are in place to support food procurement (e.g. agriculture, international aid)
30 *Government allocates funds to strengthen agricultural sector of the country
31 *Market and private sector is encouraged to provide input and financial services at affordable prices to agriculturists
32 *Production inputs are subsidized for target populations through appropriate mechanisms to make it more affordable
33 *Adequate funding mechanisms are in place to support food storage
34 *Adequate funding mechanisms are in place to support food transportation facilities

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35 *Adequate funding mechanisms are in place to support food distribution facilities (e.g. market development)
36 *Adequate funding mechanisms are in place to support advertisements/ knowledge sharing strategies to facilitate consumption of adequate nutritious food
37 *Adequate funding mechanisms are in place to support food emergencies
38 Funds account for various costs involved (e.g. commodities, interventions, programs and their management costs)
39 Cost sharing opportunities are utilized
40 Opportunities of sourcing private sector capital are utilized where/when needed
41 *Opportunities of sourcing non-profit capital are utilized where/when needed
42 Opportunities of sourcing non-traditional capital are utilized
43 Viable opportunities for industry engagement are utilized (e.g. use of private sector distribution networks, use of private sector storage facilities)
44 Opportunities to obtain external monetary aid are utilized (e.g. USAID)
45 Monetary transaction costs at country level are kept in check (to avoid paying high exchange rates)
46 Other possible partnership opportunities between food delivery system and entities within the country are tapped
47 Possibility of corruption can be circumvented
48 All entities in the food delivery system that utilize funds are held accountable for it
49 *A business model can be developed that accounts for variations in community purchasing power
50 The cost to employ skilled workforce for food security systems and services can be supported by the system business model
51 The cost of utilizing technology for food security can be supported by the system businesss model
52 The cost to develop/ implement food technology products can be supported by the system business model
53 The cost to produce/implement development and distribution of food technology products (e.g. vitamin tablets or food supplements) for food security can be supported by the business model
54 The cost to construct and maintain infrastructure for food delivery can be supported by the business model
55 Business model accommodates inter and intra domain integration of services to avoid duplication and wastage

56 *Economic barriers with regard to creating accessibility to adequate nutritious food can be overcome
57 Costs of nurtitious food are controlled to local economic capacity
58 The economics of the system are appropriately tailored to local income levels
59 Cost of food can be subsidized to make it affordable for people with low incomes
60 The economy can be strengthened by providing better job opportunities with better pay

61 Precautionary mechanisms to financially protect entities within the food value chain exists
62 Insurance policies to manage risk among food consumers exits

63 Health insurance policies are available
64 Life insurance policies are available

65 **Functional barriers,** if they exist, can be overcome
66 Infrastructural barriers can be overcome
67 Infrastructural barriers with respect to food sourcing can be overcome based on the scale and venue (e.g. large farm equipment requirements can be met, small-scale farm maintenance requirements can be met, port for import/ export can be developed where required)
68 Infrastructural barriers with respect to food processing can be overcome based on the scale
69 Infrastructural barriers with respect to food storage can be overcome based on the scale
70 Infrastructural barriers with respect to food distribution can be overcome based on the scale
71 Transportation system barriers can be overcome
72 System scaling barriers can be overcome where they exist
73 *Supply chain can be shortened to avoid middle-men and allow individual producers to direct sell their goods to consumers or markets at suitable locations through Producer Associations
74 Producer associations have a strong governing structure with specific tasks assigned to specific roles
75 Producer associations have sufficient workforce
76 Producer associations collect adequate goods to sell
77 Members of producer associations check quality of goods collected and grade them for selling at different markets (e.g. high quality goods like cocoa and coffee for export, lower quality goods for sale at local markets)
78 Producer associations are economically self-sufficient
79 Producer organizations are equipped with appropriate infrastructure to transport, store, and sell various goods (e.g. cold chain for meat and dairy)

80 **Quality barriers** do not exist or can be overcome
81 Acceptable disciplinary measures are in place for taking action against misconduct within the food delivery system
82 Acceptable disciplinary measures are in place for not meeting quality requirements
83 Acceptable disciplinary measures are in place for not meeting stated nutrition composition
84 Acceptable disciplinary measures are in place to prevent conflicts that disrupt consistent supply of nutritious food

85 **Social barriers** do not exist or can be overcome
86 Cultural barriers, if exist, can be overcome
87 Gender inequality, when it comes to receiving nutrition, if exists, can be overcome

88 Cultural ideals that prevent use of arable land are overcome
89 Cultural issues (child labor), if exist, can be overcome
90 Cultural barriers preventing consumption of nutritious food are identified and overcome
91 Barriers related to workforce and employment availability, if exist, can be overcome
92 *Barriers preventing growth of workforce (e.g farm owners/startups, farmhands) are overcome
93 Barriers preventing regular availability of workforce are overcome
94 Barriers preventing regular availability of jobs are overcome
95 Gender issues can be overcome
96 *Jobs in the food value-chain system promote gender equality
97 Conflicts that arise because of gender differences can be overcome
98 Stigma and communication challenges because of gender differences can be overcome
99 Communities are willing to avail adequate nutritious food available
100 Community is willing to take responsibility for its well being
101 Community will reliquish present impeding behaviors in favor of desired behaviors
102 Community is optimistic about its future
103 Community values community wellfare
104 Local community members will be comfortable with the food delivery system
105 The food supplier(s) is/are willing to cater to regional needs without biases
106 Conflicts, if they exist, can be resolved
107 Territorial disputes on food distribution can be overcome
108 Competing demands for adequate food for different regions can be negotiated
109 Ownership conflicts influencing access to food security can be resolved
110 Infrastructure exists to facilitate communication between different stakeholders
111 Social group biases do not exist or can be overcome
112 Religious barriers do not exist or can be overcome (e.g. religious group segregations/ ethnic group segregations)
113 Language variations/barriers between people from different regions can be overcome
114 Local community members are comfortable with the market system and food supplier(s)
115 *Local and regional food system operators are comfortable working with each other

116 Awareness can be raised where people are aware of the requirment of nutritious food and how to access it but do not know how to overcome specific barriers
117 Existing barriers are identified
118 Skills related barriers are identifed (e.g. Insufficient workforce to support food system)

119 Wealth related barriers are identified (e.g. Financial capacity to purchase healthy food is insufficient, financial capacity to engage in food supply chain is insufficient)
120 Access related barriers are identified (e.g. Fertile land is not available in regional location, food distribution system unavailable)
121 Time related barriers are identified (e.g. food supply unit is operational only for limited hours)
122 Behavior/ Habit related barriers are identified (e.g. consistently consuming unhealthy food)
123 *Culture/religion/ tradition related barriers are identified (e.g. girls of a family do not receive adequate nutrition)
124 *Knowledge barriers are identified (e.g. the knowledge that healthy mothers who have received adequate nutrition can provide newborns with required nutrition through breast milk)
125 Effective strategies to address specific barriers are developed
126 *The barriers to be addressed are identified and prioritized
127 The impact on nutrition intake of a population due to a skill based barrier is assessed
128 The impact on nutrition intake of a population due to a wealth based barrier is assessed
129 The impact on nutrition intake of a population due to access based barrier is assessed
130 The impact on nutrition intake of a population due to a time based barrier is assessed
131 The impact on nutrition intake of a population due to a behavior based barrier is assessed
132 The impact on nutrition intake of a population due to a cultural barrier is assessed
133 *Strategies to address specific high priority and high impact barriers are implemented based on prioritization

L. Adoption/ Habit conversion

Individuals/ communities maintain their engagement with the food system

1 Government and local leaders are motivated to continue supporting the requirements for delivery of adequate, diverse nutritious food for all households
2 The outcomes of providing adequate, good quality food to the people can be measured
3 Existing solutions are driving a year over year reduction in underweight population

4 Existing solutions are driving a year over year improvement in child health (e.g. decrease in infant mortality rate, decrease in mortality rates of children under the age of five)
5 Provision of access to adequate food and nutrition promotes health equity among communities
6 Households in communities are motivated to provide healthy food for all members of the household
7 Households and communities can observe improvements in health of families who consume healthy, nutritious food
8 Food supply chain workforce is motivated to continue improving and facilitating delivery of good quality, nutritious food for all
9 Workforce involved in food procurement process is motivated to continue producing/procuring high quality food
10 Workforce involved in food processing is motivated to continue producing high quality, nutritious food
11 Workforce involved in food transportation/ storing process is motivated to continue maintaining the high quality of produced food
12 Workforce involved in food distribution process is motivated to continue distributing high quality food
13 Partners continue to engage in food delivery system
14 Private sector partners continue to aid in food delivery system
15 Non-profit organizations continue to aid in food delivery system
16 Communities are presented with opportunities to volunteer and/or engage in the food delivery system
17 Existing food producers are motivated to improve their techniques
18 Farmers that produce insufficent yield are motivated to learn and implement methods to attain subsistence farming status
19 Subsistence farmers are motivated to learn and implement techniques to obtain surplus yield that can then be sold to meet local foods deficits
20 Large-scale food producers in the region are motivated to learn and implement techniques that allow them to perform commercial farming or export their goods

M. Measurements and Evaluation

Food Security
Success Factor Tree

	***Indicators to measure effectiveness of delivery of food and nutrition system exist**
1	Indicators to measure food availability indicate improvement in efficiency of food security and nutrition delivery
2	Average dietary energy supply consumption approaches 100%
3	Share of dietary energy supply derived from cereals, roots and tubers shows an increase
4	Average protein supply meets country's requirements
5	Average supply of protein of animal origin meets country's requirements
6	Supply of micronutrient (e.g. Vitamin A,B,C,D, Iron, Iodine) rich food meets country's nutrition requirements
7	Indicators to measure accessibility show improvement in efficiency of food security and nutrition delivery
8	Rail line density achieves required density set by country
9	Gross Domestic Product per Capita shows an increase
10	Prevalence of undernourishment shows a decrease
11	Prevalence of severe food insecurity in the total population shows a decrease
12	Indicators to measure stability food security and nutrition delivery indicates improvement in efficiency
13	Cereal import dependency ratio shows a decrease
14	Percentage of arable land equipped for irrigation shows an increase
15	Value of food imports over total merchandise exports shows a decrease
16	Political stability and absence of violence/terrorism/monopoly shows an increase
17	Per capita food production variability meets requirements according to per capita consumption variability
18	Per capita food supply variability meets requirements according to per capita food consumption variability
19	Indicators to measure utilization and uptake of nutritious food indicates improvement in efficiency of food security and nutrition delivery
20	Percentage of children under 5 years of age affected by wasting shows a decrease
21	Percentage of children under 5 years of age who experience stunting shows a decrease
22	Percentage of children udner 5 years of age experiencing cognifive effects of low iodine shows a decrease
23	Percentage of children under 5 years of age who are overweight shows a decrease
24	Prevalence of obesity in the adult population (18 years and older) shows a decrease
25	Prevalence of anemia among women of reproductive age (15-49 years) shows a decrease
26	Prevalence of exclusive breastfeeding among infants 0-5 months of age shows an increase
27	Indicators to measure existence of double burden shows a steady decline with improvement of food security and nutrition delivery
28	Trends in communicable (e.g. HIV, tuberculosis, malaria) and non-communicable diseases (high blood pressure, diabetes, heart ailments) over the years for country show decline in number of cases
29	Trends showing malnourishment/ undernutrition in country are declining
30	Trends showing overnutrition/ obesity in country are declining
31	Prevalence of micronutrient deficiences show reduction in trends

N. Sustainability

The food security and nutrition system in the country is sustainable

1 *Food sourcing mechanisms in place are sustainable
2 Diverse nutrient rich food (e.g. crops, livestock, fisheries) is sustainably sourced to meet the needs of current and future populations
3 Disease prevention mechanisms are in place for crops, livestock, fisheries
4 Land available for use for arable farming purposes is sustainable for current and future use
5 Current and future population projections are taken into account to ensure sustainability
6 Land holdings are protected
7 Sustainability of soil fertility is ensured
8 Practices that promote long-term soil fertility are promoted and implemented (e.g. crop rotation techniques, fertilizing techniques, precautionary measures, changing existing harmful practices)
9 Sustainability of water for farming is ensured
10 Techniques to overcome climate variations are overcome (e.g. through water storage or controlled water use techniques)
11 Efficient and sustainable irrigation techniques that minimize water wastage are implemented
12 Efficient water storage techniques are implemented
13 Water conservation techniques are implemented
14 Sustainability of technology implemented in farming is ensured
15 Technology and methods of farming are updateable
16 Agroforestry, aforestation and reforestation techniques are promoted for environmental sustainability
17 Infrastructure capacities can be expanded through sustainable means (use can be increased/improved where required)

18 Crop harvest and seed projections, infrastructural needs and equipment are used for evidence based planning and budgeting for food security
19 Systems in place to produce agricultural equipment are self-sustainable (e.g. shovels, planters, tractors, livestock maintenance equipment)
20 Variations in food produced by the country and food available externally are annually adjusted to maintain sustainability of food
21 Variations in economic conditions within the country do not advesely impact food sourcing
22 Variations in regional produce can be nullified through efficient distribution techniques
23 Foods produced in excess of country's requirement are exported
24 Methods to improve efficiency in food production are utilized (e.g. implementing mixed farming techniques and utilizing animal waste as manure for plants)

25 *Food processing units/plants are sustainable
26 Food processing units/plants are economically sustainable
27 Food processing units/plants have sustainable input in the form of raw material/ fresh produce
28 Food processing units/plants sustainably produce outputs
29 Food processing units/plants have sustainable workforce where required
30 Food processing units/plants produce foods that have sustainable demand
31 Food processing units/plants maintain the quality of food produced
32 Food processing units/plants can accommodate variations in availability of raw material
33 Food processing units/plants can accommodate variations in climatic conditions that may affect processes implemented
34 Food processing units/plants can accommodate variations in financial conditions

35 *Storage and distribution systems promote sustainable delivery of adequate nutritious food as required by the people
36 Wastage of food due to inadequate maintenance is overcome
37 Quality of food is maintained sustainably untill food reaches consumer
38 Care is taken to avoid aflatoxin infestation in food
39 Safe preservative measures within established standards are implemented
40 Infrastructure capacity can be expanded or improved to include facilities that promote minimization of food spoilage (e.g. use of refrigerators to store milk)
41 Sustainable workforce required for operation of storage facilities exist
42 Sustainable workforce required for distribution exists
43 Storage facilities are economically self-sustainable
44 Distribution facilities are economically self-sustainable

Food Security
Success Factor Tree

45 *Organizations and institutions that run the food system are sustainable
46 Administrative bodies responsible for components of food delivery system can sustain themselves
47 Bodies responsible for policy development on food security are sustainable
48 Bodies responsible for food workforce training curriculum development are sustainable
49 Bodies responsible for financing the food security and nutrition delivery system are sustainable
50 Bodies responsible for evaluation of quality and nutritional value of food delivered are sustainable
51 Bodies responsible for infrastructure growth and expansion with regard to food security are sustainable
52 Communication channels used to spread awareness among populations are sustainable
53
Policies that govern food security and access to adequate nutrition are sustainable and enable long term growth and development in the country

54 *Entities that support and facilitate food security and nutrition delivery systems are sustainable
55 Food distribution outlets are sustainable
56 Education system to educate population about food and nutrient intake are sustainable
57 Healthcare systems are sustainable
58 Systems that provide clean water supply are sustainable
59 Energy delivery systems are sustainable (e.g., fuel)
60 Access to electricity is achieved and sustainable

61 Individuals/ communities that have chosen healthy food options can be encouraged to maintain their engagement
62 Government and local leaders are motivated to continue supporting the requirements for delivery of adequate, diverse nutritious food for all households
63 The outcomes of providing adequate, good quality food to the people can be measured
64 Existing solutions are driving a year over year reduction in underweight population
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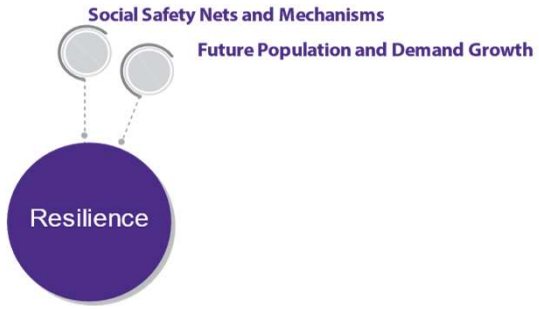
O. Resilience



The food security and nutrition system is resilient

1 ***Events that can disrupt the food value chain can be overcome (e.g. disasters; extreme climatic conditions like droughts or floods; diseases and epidemics)**
2 Country is equipped with social safety nets at national and regional levels
3 Mechanisms to combat various crisis scenarios exist (e.g. fertilizer subsidies during crises; emergency stock piles; food for work/cash for work)
4 Government policies and response to stressors are in place
5 Police services for immediate response to crises situations exists
6 Ambulance services for immediate response to crises situations exists
7 Fire Brigade services for immediate response to crises situations exists
8 Country is prepared for population growth and future demand for food and nutrition

Food Security

= National
= Regional
= Community
= Household
= Individual

RECIPIENTS
- SCHOOLS
- COMMUNITY CENTER
- COMMERCIAL FOOD PROVIDERS
- HOUSEHOLD

HOUSEHOLD
- FAMILIES
- ADULTS
- CHILDREN
- PARENTS
- ELDERLY

CONSUMERS
- MASS CONSUMERS
- MARKET TRADERS

RETAILERS

WHOLESALERS

FOOD DELIVERY
- LOCAL DISTRIBUTOR
- FOOD PROCESSOR
- FOOD STORAGE
- LOGISTICS PROVIDER

EDUCATION
- SPECIALIZED EDUCATION INSTITUTION
- TRAINING ORGANIZATIONS
- RESEARCH ORGANIZATIONS
- NUTRITIONIST/DIETICIAN
- HEALTH ORGANIZATIONS

WORKFORCE
- MANAGER
- PLANTER
- MIGRATORY HARVESTER AND MACHINES
- MECHANICS
- ANIMAL HANDLER
- IRRIGATOR

LABOR ORGANIZATION

FINANCES
- CREDIT LENDER
- INSURANCE PROVIDER
- CREDIT AGENT
- INSURANCE AGENT
- FRACTIONAL OWNERSHIP ORGANIZATIONS

FOOD PROVIDERS
- FISHERIES
- LIVESTOCK FARMS
- CROP FARMS
- COMMERCIALIZED FARMS
- LOCAL FARMS
- COOPERATIVES
- SUBSISTENCE FARMS

SUPPORT ORGS
- CIVIL SOCIETY ORGANIZATIONS
- FAITH BASED ORGANIZATIONS
- NON-GOVERNMENTAL ORGANIZATIONS
- RELIEF ORGANIZATION
- INTERNATIONAL ORGANIZATIONS
- FARMER ASSOCIATION

LOCAL INFLUENCE
- COMMUNITY/PEER SUPPORT GROUPS
- LOCAL LEADERSHIP
- CULTURAL ORGANIZATIONS
- RELIGIOUS ORGANIZATIONS

SPECIALTY WORKFORCE
- VETERNARIAN
- FISHERMAN
- HUNTERS

INFRASTRUCTURE
- FARM FEED SUPPLIER
- FARM CHEMICAL SUPPLIER
- TRANSPORTATION PROVIDER
- FARM SEED SUPPLIER
- POWER PROVIDER
- MAINTENANCE PROVIDER
- FARM EQUIPMENT SUPPLIER
- FARM MATERIAL SUPPLIER
- CONTRUCTION PROVIDER
- WEATHER TECHNOLOGY PROVIDER
- WEATHER TECHNOLOGY DEVELOPER

GOVERNMENT
- DISEASE AND PEST CONTROL
- INSPECTION AND EVALUATION AGENCY
- INTERNATIONAL GOVERNMENT
- TRADE POLICY MANAGER
- QUALITY MANAGEMENT
- ECONOMIC MANAGER
- POLICY MAKER
- ENVIRONMENT MANAGER
- LOBBYIST
- UN

MANAGERS
- WATER MANAGER
- CULTIVATION MANAGER
- GAME WARDEN
- FISHERY MANAGER

FINANCE
- MICROFINANCE ORGANIZATION
- PRIVATE EQUITY IN EMERGING MARKETS
- GOVERNMENT FUNDING
- FOREIGN IMPORTERS OR EXPORTERS
- PUBLIC DONORS

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FACILITATOR'S GUIDE*

WaSH - COMPREHENSIVE ISSUE ANALYSIS

INTRODUCTION

The sectors that will be explored at the Research for Development (R4D) Conference in Uganda – food security, basic education, water, sanitation, and hygiene (WaSH), and maternal and child health (MC health) – involve what are frequently termed "grand challenges" due to their sheer complexity and implications on the lives of millions. These challenges, and others of equal importance and scale, are not new. They have been the focus of innumerable investments of funds and effort by regional and foreign governments, non-governmental organizations, faith-based organizations, and countless implementers and volunteers for decades. And while significant progress has been made, many aspects of these challenges remain very real obstacles to economic and social advancement in East Africa.

Our goal at the R4D is to identify, as precisely as possible, which aspects of these sectors, that if addressed through focused research[1] investment and related translation into practice, could be advanced to yield tangible benefit at scale for affected populations. At the core of this pursuit is the need to grapple with the scope and highly interconnected nature of the various aspects of these problems. Historically, this complexity has been handled in different ways. Some have pursued qualitative approaches that typically rely on gathering the opinions of a select set of experts (e.g., employing convening activities or a Delphi based survey)[4], but this approach often results in bias due to the inclusion of only a limited number of inputs, and may not provide the comprehensive view required to appropriately frame these problems. To address this concern, others have developed computer models of these problems, typically anchored in a value-chain or root-cause methodology, using techniques such as systems-dynamics or agent-based modeling [1-3], but these efforts tend to oversimplify the problem in an effort to maintain computational efficiency. Alternatively, some organizations simply acknowledge the inherent complexity and "do what they can" to affect change on elements of the system. While noble, and certainly impactful to small portions of a population, these efforts typically suffer scale-up obstacles that make expansion of impact difficult. Across these approaches, many resulting efforts to address major challenges fail to reach fruition or achieve their impact goals due to unidentified gaps in the research-to-practice translation system at scale. With these perspectives in mind, at the upcoming R4D, we will be pursuing a hybrid approach – a method termed Comprehensive Issue Analysis (CIA) – that brings together a perspective on the comprehensive success factors that are typically required to address challenges in a particular sector at scale with a wide range of informed opinions to identify the current state of the system and remaining gaps that must be addressed to achieve desirable outcomes. This

[1] Research encompasses any activity involving systematic study and/or the development of knowledge. Representative activities include, but are not limited to development of new technologies, data collection and analysis, case studies, literature reviews, objective analyses of development or implementation efforts.

*Authored by Joseph V. Sinfield, Romika R. Kotian, Margaret M. Busse Purdue University, Innovation and Leadership Studies Program

Facilitator's Guide provides an overview of the methodology, objectives, and activities that will be pursued in the Comprehensive Issue Analysis workshop.

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COMPREHENSIVE ISSUE ANALYSIS

Overview

CIA brings together a holistic view of the success factors underlying the problems we will be exploring, with perspectives on prioritization driven by an array of individuals with extensive and diverse experiences in international development, including you!

CIA has been developed over a 7-year period through work at Purdue University employing principles of innovation science to address a range of complex challenges, such as ensuring availability and access to medication for those suffering from multi-drug resistant tuberculosis, providing reliable access to potable water for rural villages in a Caribbean nation, and systematically tackling poverty and opportunity access problems among disenfranchised populations in urban areas. These efforts highlighted a multi-faceted pattern that is present in functioning systems that achieve desirable outcomes to complex societal challenges. Many aspects of the pattern will be intuitive to those who have experience in grand challenge domains, but the many success factors that must be in place to realize tangible impact in most situations are rarely considered together.

In its most fundamental form, CIA frames grand challenges at a systems level, and emphasizes that solutions are a function of context, and require commitment, awareness, motivation, leadership, resourcing, knowledge and/or technology, as well as means to overcome barriers in the short-term and ensure sustainability in the long-term.[5, 6] This view is founded on several fundamental principles of innovation science. At a foundational level, the ability to make sustainable progress at scale on any issue is predicated on the existence of a secure and stable context that fosters constructive debate and pursuit of solutions. Achieving this, and making strides on solution development, requires engagement of supportive and influential leadership. Even with leadership involvement, ultimately, there is no impact without adoption of solutions by intended beneficiaries. And so, the efforts of leaders must be directed toward issues where there is awareness and acknowledgment of need, and motivation of involved stakeholders to make progress. With these conditions for success in place, solution development efforts can progress. However, typically there is a need for enabling methods or start-up resources to launch a new idea. Once functioning, additional, and often different resources, are required to make the system sustainable and resilient on technical, operational, economic, environmental, and cultural fronts. This will require effective translation or implementation, which is only possible if potential beneficiaries are aware of the solution, can access it, and it can fit into their lives. Finally, to achieve impact at scale, the solution must be tailorable to context across individual, household, community, regional, and national levels.[7]

Building on these basic premises, comprehensive issue analyses on any given topic are developed by performing an extensive literature review and data mining activity spanning journal articles from the development field, news articles, reports and other documents, guided by the above innovation patterns

and related terminology and logic. The result is an extensive outline of the key factors that are likely needed to achieve commonly desirable outcomes when addressing a specific grand challenge problem. The output of the analysis is organized in a logic format that incorporates a hierarchy, conveying issue relatedness and/or dependence in categories. We thus refer to the output as a "success factor tree". Importantly, the success factors highlighted in this type of analysis represent a reference state and are, to the extent possible, context independent. They are thus not prescriptive. Instead they serve as thought starters for constructive dialogue on the potential priorities in a given region – here, East Africa.

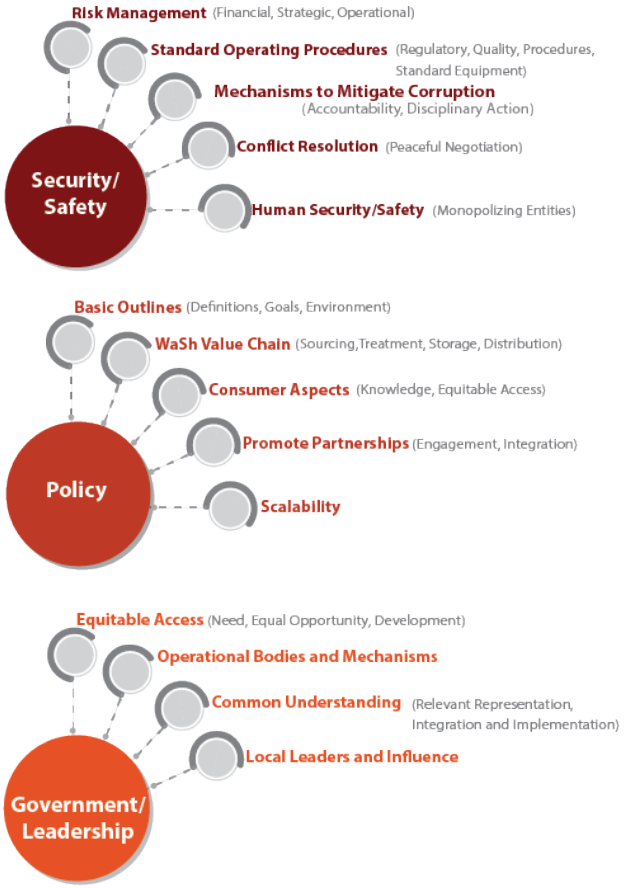
Navigating the Tree

The "success factor trees" representing the comprehensive issue analyses that will be employed in the R4D workshop have been structured so that information is categorized into four major groupings, and color-coded accordingly:

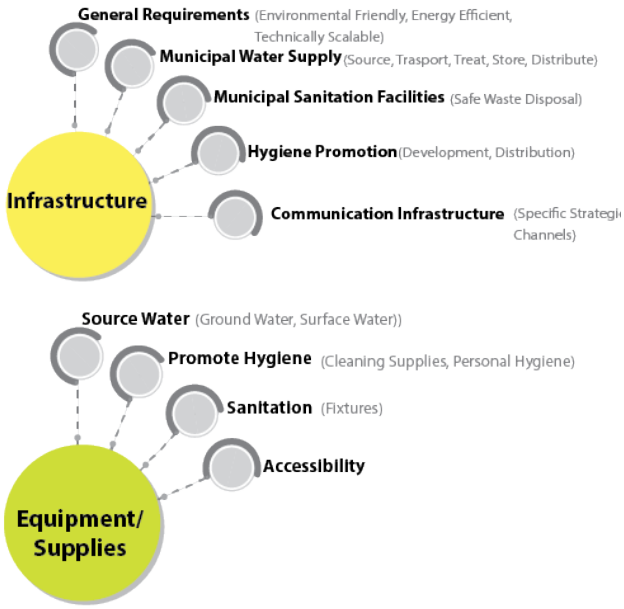
1. **Security/Safety**, **Policy** and **Government** represent the necessary foundational components of the system that govern it and allow it to function. {red to orange hues}
2. **Infrastructure**, **Equipment/Supplies**, **Workforce/Talent**, **Capital/Finances** and **Practices/Mechanisms** are elemental components associated with the value chain that are used to create and make as solution available and accessible. {green to yellow hues}
3. **Awareness**, **Motivation**, **Enabling Resources**, **Adoption/Habit Conversion**, and **Outcome/Evaluation** are components associated with human behavior and solution adoption. {light to dark blue hues}
4. **Sustainability** and **Resilience** dimensions support a constant feedback loop that maintains the system, factoring in long-term growth and the potential to tolerate change or shock. {purple to violet hues}

Each section of the "tree" is accompanied by a small bubble diagram that allows participants to obtain a brief overview of the section. The bubble diagram provides key ideas (in bold colored text) from each major branch within the section of the tree in its order of occurrence from the start to the end of the section. Along with the key ideas are topics and phrases (within brackets in grey text) that are covered within each branch of the tree. An illustration of the sections along with their respective bubble diagrams from the "WaSH" tree is provided in Figure 1 below.

Necessary foundational components of the system that govern it and allow it to function.



Root elemental components associated with operations that are used to create availability/access to a specific resource.



Root elemental components associated with operations that are used to create availability/access to a specific resource.

Components associated with the human behavioral aspects of the system.

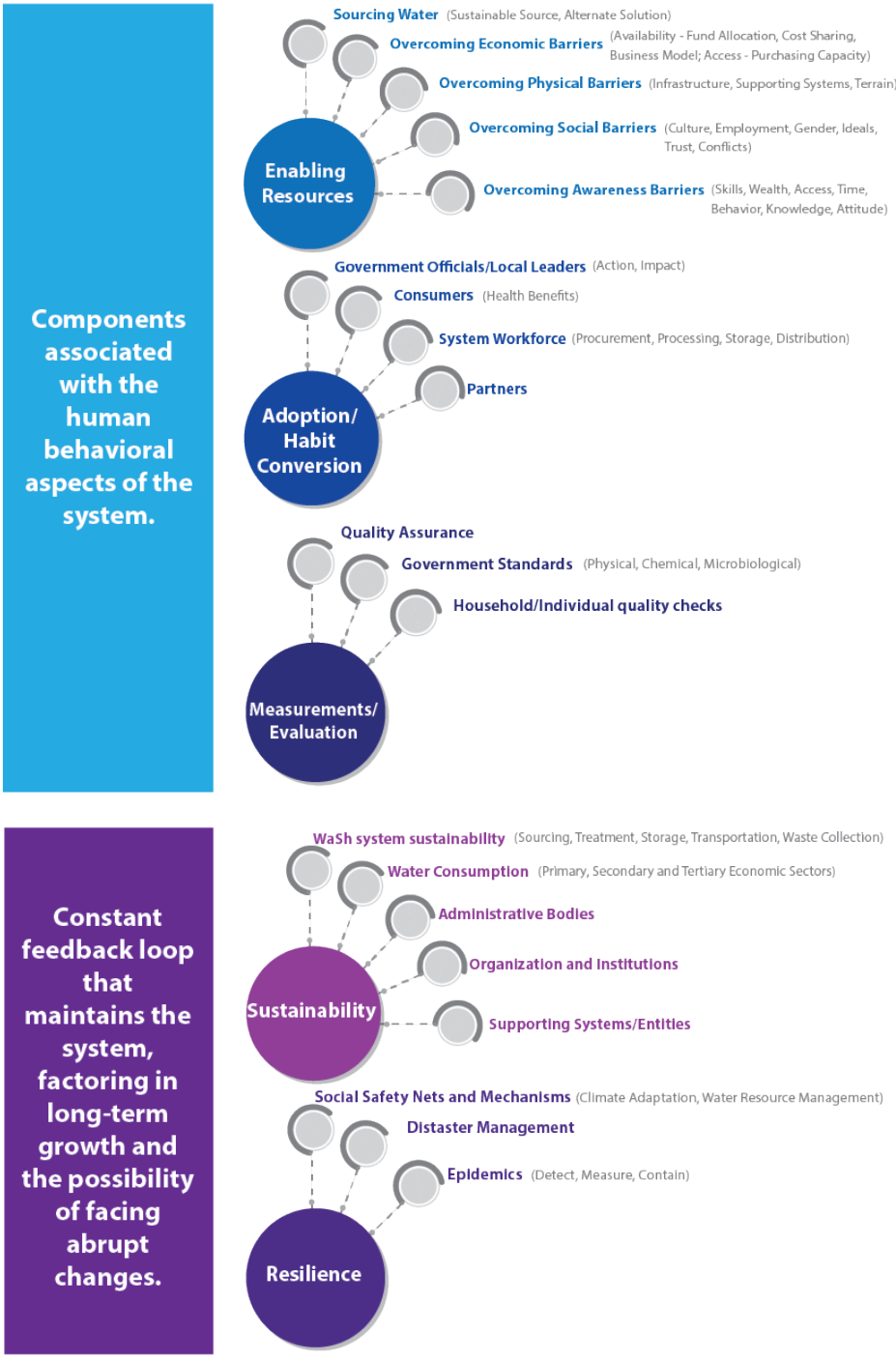


Figure 1. Illustration of main sections and sub-branches of the WaSH success factor tree.

PREPARING FOR THE CIA WORKSHOP – FACILITATOR

Comprehensive Issue Analysis Workshop Activity

Comprehensive issue analysis will be a significant focus of the third day of the R4D conference (May 8th). Conference participants will be provided with a pre-read outlining the fundamental aspects of CIA, as well as an electronic copy, in list-form, of the success factors identified for their sector – essentially this is a success factor tree in list form. As part of a pre-work activity, participants will also have been asked to carefully review the tree, and come prepared to the CIA session with a short list of success factors that they believe meet the following three criteria for the geographic region of interest (here East Africa):

1. The success factor is **significant** to overall efforts to realize priority-specific outcomes
2. The success factor is **not currently realized** in the existing system in the region of interest today
3. There is great likelihood that **research** on that success factor **can help realize a desired state**

Once at the conference, participants in each sector CIA breakout session will be seated at tables in teams of 5 to 6. The individuals at each table will represent diverse backgrounds and perspectives, and will likely have different views of the priorities that should be addressed to make progress in their sector.

With the above as context, facilitation guidance for the CIA workshop session is as follows:

Logistics

Location
The plenary session will be held in the Royal Palm Room at the Speke Resort
The breakout rooms for the Issue Analysis Activity include the Royal Palm Room (which will be split into two sections), as well as the Acacia and Ebony Rooms.

Timing
May 8th, 09:40 – 13:00 (Session timing shaded on overall agenda below)

08:30 – 09:30	Plenary: Comprehensive Issue Analysis
09:40 – 13:00	**Issue Analysis Breakout Sessions (4 concurrent 3-hour sessions, by sector)**
	[Tea Break at 11:00 am for 15 minutes]
13:00– 14:00	Lunch
14:00 – 16:00	RFA Design Input Session

Objective

The objective of this workshop is for participants in each team to

1. Identify and collectively prioritize up to 3 success factors per team that they believe could advance progress on the session sector if supported through research
2. Work through and complete systems templates (figure 3) for each of the topics they prioritize

Facilitator's Pre-workshop Preparation

Your role as the facilitator is to guide participants through the following activity and support productive discussion among team members. We hope to encourage participants to think about the path of research from idea to implementation, the larger context of each priority they may consider, and the stakeholders involved in developing effective solutions. To prepare for your role, please –

1. Read this guide completely
2. Go over the attached success factor tree and be familiar with its content and organization
3. Participate in training provided for facilitators
4. Ensure that all the items required at your session, as provided in the checklist in this guide, are available before you start your session

Team Formation

The participants will be pre-grouped into teams of 5 to 6 people, consisting of members from distinct disciplines and will need to be directed to their respective tables. We anticipate that each breakout session will have approximately 30 participants.

Session Materials

Each breakout room should have the following materials and supplies:

- ☐ Success factor tree related to session sector (1 per table) [see Figure 2 for illustration]
- ☐ Stakeholder map related to session sector (1 per table) [see Figure 3 for illustration]
- ☐ Priority capture card (3 per table) [see Figure 4 for illustration]
- ☐ System template (at least 3 per table) [see Figure 5 for illustration]
- ☐ Flip charts (1 per table)
- ☐ Flip chart markers
- ☐ Pens/pencils
- ☐ Highlighters
- ☐ Sticky notes
- ☐ Pins or tape (depending upon room wall materials)

Room Preparation

The room should be set up with individual tables arranged to accommodate 5 to 6 people. Each table should be near a wall mounted poster displaying the tree of success factors, and the stakeholder map. A flip chart should also be arranged near each table. Each table should then be provided with priority capture cards, and system templates as noted above, as well as markers, pens/pencils, sticky notes, and pins or tape.

Facilitating the CIA Working Session

The working session should start with a brief introduction period and then progress in two main parts. Attempt to adhere to recommended activity timing as much as possible.

Activity Introduction *(15 minutes)*

1. **Introduction** – You should initiate the session by gaining the attention of attendees, introducing yourself, and providing a brief overview of your background that supports your involvement in the session.
2. **Instructions -** You will be giving participants at your session instructions on what will take place during the session and introducing the concepts and logic presented in this document. This presentation will be provided to you prior to the session for convenience and consistency.
3. **Discussion starter** – To initiate discussion among team members, we encourage you to ask participants to introduce themselves to each other. Once the members of each team know each other, the workshop activity can commence. The workshop is divided into two main parts and a description of each is provided in detail below.

Activity Details: Part 1: Identifying priority success factors *(65 minutes)*

In the first part of the activity, participants should (re)familiarize themselves with the success factor tree and work to identify the most pressing success factors that should be addressed through research to achieve desirable outcomes in the session sector.

1.1 Success factor identification (Individual activity) (15 min) – To initiate this activity, participants will navigate the tree (Figure 2) and identify success factors they individually believe to be priorities. Remind participants to make use of their pre-work, as they should have already identified at least some priorities prior to arrival at the session. If they did not perform the pre-work, they can of course initiate this activity at this time.

As noted above, a priority should be a success factor that is significant to making progress, is not currently being addressed to a satisfactory level, and could likely benefit from research. Participants are also welcome to identify success factors that are not on the tree that they believe need to be addressed in order to achieve holistic solutions in the sector. The tree is intended to serve as inspiration but is not a definitive list of options.

When facilitating this activity, it is suggested that you encourage individuals to develop an initial list of priorities on their own, BEFORE interacting with their team. Each participant should be encouraged to write their priorities down on sticky notes – one priority per note - and hold onto to them to subsequently share with their team. This will help to avoid premature convergence, or the dominance of any single point of view.

Note that each success factor on the tree has a unique number composed of its category and line number (shown in the color bar on the left side of each section of the tree). These numbers can be used in lieu of writing out full statements to save time.

1.2 ***Success factor prioritization*** (50 min) - Once individuals have recorded their thoughts, they can then join their team to begin discussions to identify which success factors are of highest priority and engage in ranking them. We have found it helpful to allow one participant to talk through their priorities at a time, placing their respective sticky notes on a flip chart. Then as each person shares their perspective, the sticky notes can be teamed or separated on the flip chart to show overlap or differences of opinion. When ranking priorities, participants should be encouraged to consider **root-cause, dependency between priorities, and any natural hierarchies that may underlie the relationships between the priorities proposed by team members**. Each team should be encouraged to select up to three collective priorities and record each and its rank on a separate priority card. [A rank of #1 indicates highest priority].

NOTE: At the end of Part 1 of the activities, participants will take a **Tea Break for 15 minutes**

Activity Details: Part 2: Achieving a system understanding (105 minutes)

In the second part of the activity, participants should work to convey a system level understanding of the success factors that must be realized to ensure that tangible impact can be achieved in their priority areas. Each prioritized success factor should be examined individually (unless it is found that two or more are closely dependent). **Importantly, teams should complete the following sub-activities (#1 - #5) for <u>each</u> of their top three priorities (up to three) in the 105-minute allotted timeframe.**

2.1 ***Priority success factor placement in system template*** – Working with one priority success factor at a time, the teams should identify the system category – e.g., policy, infrastructure, finance – in which their priority would be best categorized, and then write in their priority success factor on the system template provided. The priority should be highlighted by marking a star next to it.

2.2 ***Priority dependency determination*** – With the teams' priority success factor placed in the system template the teams should discuss the other elements of the system that must exist to ensure that effort dedicated to their priority can actually be translated to impact. The teams can

review the tree to find other success factors that are closely connected to their priority and/or define those observed through their own experiences, and fill in the "System Linkages" column provided in the template along with a rationale for choosing that item in the "Rationale" column. More than one factor can be included in each category, if desired. Choices should be guided by the success factor categories captured on the template.

Note: The success factor tree provides a basis for thinking about surrounding factors connected to participants' priorities but it is not exhaustive. Teams that would like to add factors that are not on the tree are welcome to do so.

Note: Teams may elect to divide the work of completing the system template, for example by breaking into sub-groups of 2 or 3 participants to accelerate their work.

2.3 ***Gap Identification*** – Once all system linkages are recorded, teams should work to indicate where there are gaps in the system that should be addressed to achieve desirable outcomes on the priority under discussion. Considering each factor in the system, teams should collaborate to specifically identify those success factors that are in-place and functioning today, and which require attention through research or development. Working row-by-row in the template, teams should place a "Yes" in the last column of the System Template, labeled "Gap", to indicate that a factor is addressed and operational or a "No" to indicate that the factor is not addressed satisfactorily today. Those success factors (rows) labeled with a "No" are to be considered critical focal points for RFAs later in the process.

2.4 ***Stakeholder identification*** – Having identified critical caps in the system, teams should now identify, and list out which stakeholders are likely to play a vital role in addressing those gaps – i.e., the success factor priorities and prerequisite or dependent factors that were categorized as not being addressed satisfactorily. The stakeholders in the broader system fulfill unique roles associated with your sector. Each of these roles, to the extent possible, has been depicted on a visual that we call a stakeholder map (Figure 4). Using the provided stakeholder map as a stimulus, choose relevant stakeholders, and list them in the "Stakeholders to Involve" column on their system template. If teams see a need to include a stakeholder that does not appear on the stakeholder map, they should feel free to do so.

2.5 ***Synthesis of Priority*** – Once the system underlying a team's priority is fully described, teams should reflect upon the overall challenge and its connections to other aspects of the system, and summarize the priority in a single, brief statement. They should place this statement in the box labeled "Synthesis of Priority" at the bottom of the System Template. In addition, define the scope of the priority by checking a box for the individual, household, community, region, or national level indicator in the section of the System Template labeled "Scope."

End Products

By the end of the session, each team should complete up to three system templates – one for each of the topics prioritized by the table. Templates should be collected by the facilitator and delivered to the Purdue team for further analysis and review.

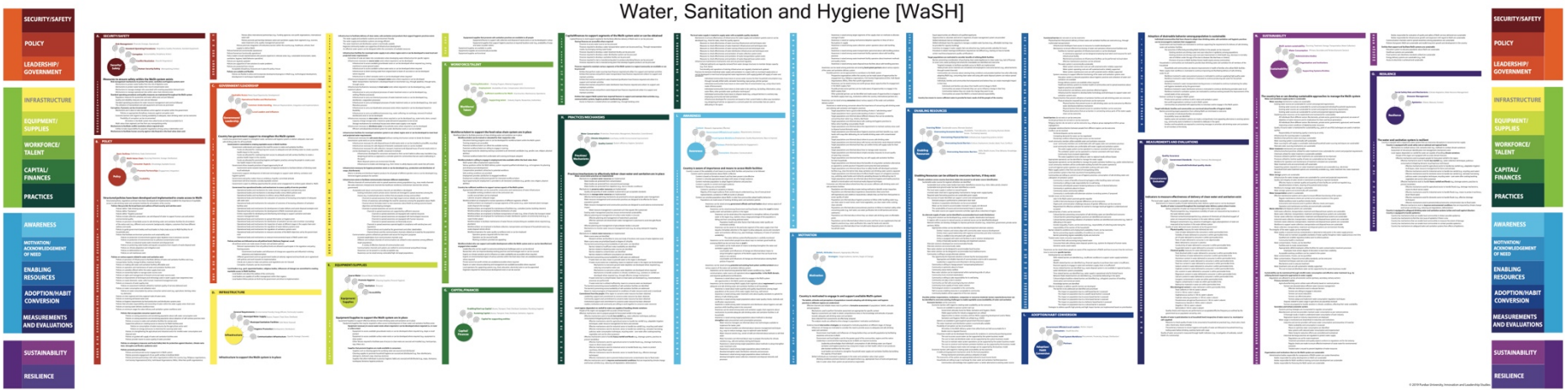


Figure 2. WaSH Success Factor Tree

Figure 3. System Template

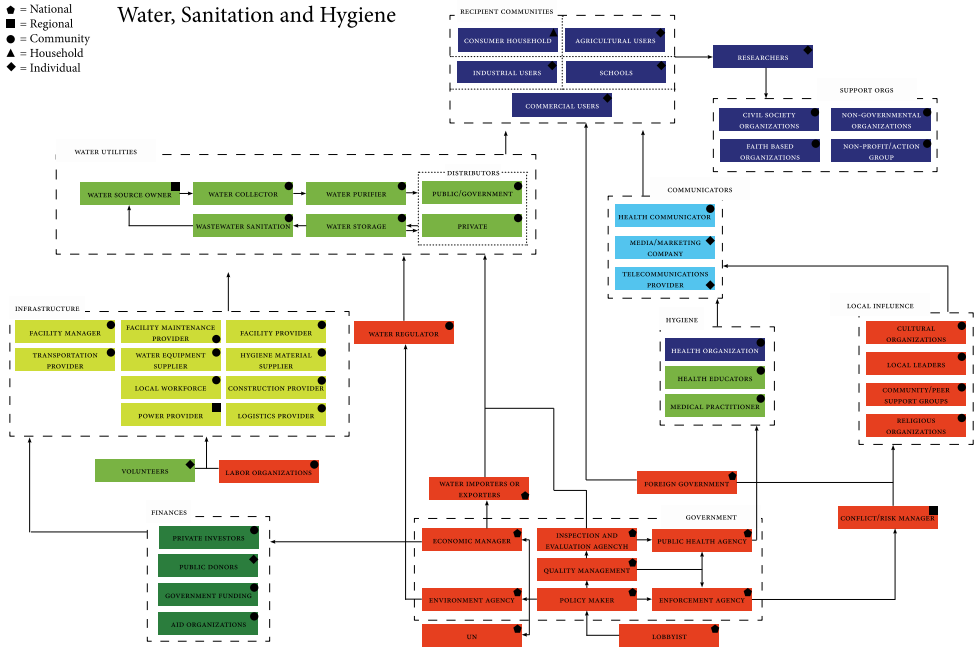


Figure 4. WaSH Stakeholder Map

Tips for Facilitators:

- Encourage participants to take ownership of the work products and activity deliverables. The facilitator should refrain from being a scribe.
- Encourage participants to use the templates to guide their work
- Encourage participants to think holistically, beyond their specific expertise to its implications
- Encourage recording of "leaves" from the "tree" more than simply "branches" – i.e., capture details
- Discourage exploration of solutions

Contacts for more information:

During the session three members of the Purdue Innovation Studies Program will be on-site to help in guiding the groups and/or answer questions: Prof. Joe Sinfield, Romika Roshan Kotian, and Maggie Busse.

In the interim, if you have any questions related to the CIA process or facilitation of the session feel free to contact the Innovation Science team at **innovation@purdue.edu**

REFERENCES

1. Coronato, A. Florio, V. D., Bakhouya, M. and Serugendo, G. D. M. (2012). Formal Modeling of Socio-technical Collective Adaptive Systems. IEEE Sixth International Conference on Self-Adaptive and Self-Organizing Systems Workshops. Lyon. pp. 187-192. doi: 10.1109/SASOW.2012.40
2. Norman, D., & Stappers, P. J. (2016). DesignX: Design and complex sociotechnical systems. She Ji: The Journal of Design, Economics, and Innovation, 1(2). http://dx.doi.org/10.1016/j.sheji.2016.01.002
3. Walters, J. P., Javernick-Will, A. N. (2015). "Long-Term Functionality of Rural Water Services in Developing Countries: A System Dynamics Approach to Understanding the Dynamic Interaction of Factors". Environmental Science and Technology. 49, pp. 5035−5043. doi: 10.1021/es505975h.
4. Goodman, C. M. (1987). The Delphi Technique a Critique. Journal of Advanced Nursing. 12, 729-734.
5. Sinfield, J.V., and Solis, F., National Academy of Engineering, **The Bridge**, "Thinking Big to Address Major Challenges: Design and Problem-Solving Patterns for High-Impact Innovation," 11-18, Summer 2016.
6. Solis, F. and Sinfield, J.V., "Designing for Big X: Characterizing Design for Major Challenges," **International Journal of Engineering Education**, 34, 2(B), 1-22, 2018.
7. Joseph V. Sinfield, Ananya B. Sheth, Romika Roshan Kotian, "Framing the Intractable: Comprehensive Success Factor Analysis for Grand Challenges," Purdue Innovation and Leadership Studies, working paper, 2019.

GLOSSARY

Priority Card: A rectangular piece of paper used to record one priority success factor resulting from the deliberations of a team.

System Template: A large-format printed document used to record the success factor priorities and related dependencies that a team believes warrant research-based effort

Success Factor: Any of literally hundreds of resources, relationships, roles, or actions that likely must be in place to enable a functioning system capable of achieving desirable outcomes related to a sector

Sector: An area of focus that has been identified by R4D event organizers in collaboration with USAID and regional representatives as a country development strategy imperative

FREQUENTLY ASKED QUESTIONS

General Facilitation Questions

1. **What must I do as a Facilitator?**

   Ans. Facilitation is the process of enabling groups of people to collaborate in a cooperative manner to help them achieve their goal. You should move around the room and interact with participants to make sure all the groups are collaboratively progressing on the assigned task according to the provided timeline. Additionally, you will help any groups that are uncertain about how to execute certain steps of the activities.

   Below are some tips to help you with this process.

   Dos:

   - Do come prepared for the session by completing all required pre-work.
   - Do encourage participants to think holistically, beyond their specific expertise to its implications.
   - Do encourage participants to take turns voicing their opinions and comments along with listening to other participants' thoughts and views.
   - Do encourage participants to use the provided templates to guide their work.
   - Do allow participants to record sub-branches and leaves beyond the branches in the provided success factor tree.

   Don'ts:

   - Don't participate in or contribute to a group's brainstorming process for the activity.
   - Don't get side-tracked into long conversations with individuals or groups.
   - Don't explore solutions to problems. Participants need to focus on piecing together all the parts of the system that are required to overcome their priority problem.

2. **How should I (facilitator) prepare myself for the CIA session?**

   Ans. Read this guide in its entirety and complete all tasks listed in the 'Facilitator's Pre-workshop Preparation' section of the Facilitator's Guide. Contact innovation@purdue.edu with questions you have about the facilitation before the session.

3. **What should I (facilitator) do if there are participants who are not actively involved in discussion?**

   Ans. These participants may be identified as the ones sitting quietly, on their phones or working alone. Ease these individuals into the process. Give them an opportunity to share their thoughts and ideas with their group by asking them what they think.

4. **How do I (facilitator) help a table that is finding it difficult to follow the process?**
   Ans. Start by asking the participants at the table to describe the step that they find difficult. Next ask them to describe what they think a solution might be. If what they describe aligns with the process they are required to follow, encourage them to implement their ideas. If not, guide them to their pre-read documents and explain what they need to do.

5. **What should I (facilitator) do if a table finishes early?**
   Ans. Request that the table summarize their work to you so you can assess if they have performed the required tasks as per instructions.
   - If not, request that they iterate on the parts that they can improve.
   - If they are indeed done with required deliverables, direct the group to the RFA process in their pre-read documents and request that they prepare for it.

6. **How should I (facilitator) manage conflict of opinion? / How should I (facilitator) help a group that is finding difficulty in reaching consensus?**
   Ans. Discussions and debates on differences of opinion are an integral part of this session. Participants are required to reason with each other to complete the activity. If the debates go beyond appropriate limits, contact one of the managing facilitators (from the Purdue team) so that they can address the situation.

Material Validation Questions

1. **How were the sources for the material in the success factor trees validated? / Where did these perspectives come from?**
   Ans. The trees were made by gathering data from a vast variety of sources including documents, reports, news articles, research papers and the opinions and views of a number of relevant stakeholders including experts from the field as well as those from the East African region.

2. **How is the material provided contextual to East Africa?**
   Ans. The material is a general representation of an ideal system where components need to exist for the system to work. It is up to the participants to interpret it and apply it to their context.

3. **How is the prioritization of** success factor**s done?**
   Ans. The prioritization and interdependencies of success factors are to be decided upon by the groups of participants for their specific success factors.

Success factor tree setup, interpretation and navigation questions

1. **How do I (facilitator) guide participants to find information in the success factor tree?**
   Ans. See section on "Navigating the Tree" provided in your Facilitator's Guide.

2. **How are** success factor**s categorized? / Why is a** success factor **in a specific category and not somewhere else?**
   Ans. Although the success factor trees have been organized to capture as many parts of a complex socio-technical system as possible in a mutually exclusive manner, there are inevitable overlaps and this implies that certain topics may fall within multiple sections. In contrast, the context in which a success factor was discovered during data mining activities may also result in a topic being placed in a category that is different than what a participant might initially consider.

3. **What if participants are unable to find a topic within the success factor tree?**
   Ans. Participants can use the list format success factor tree provided in their pre-read documents or the bubble diagrams on the poster to help get a sense of topics covered within each section of the trees. If a participant cannot find a specific topic, consider synonyms for keywords and see if those are present in the tree. If the topic still cannot be located in the tree, feel free for participants to add it. The tree is inevitably not completely exhaustive.

4. **How should participants interpret the language within the success factor trees?**
   Ans. The tree has been constructed with generalized terms to allow participants from various fields to understand and interpret wording according to their backgrounds. They should collaborate to find a common understanding. Discipline specific words have been avoided in an attempt to be inclusive.

System Template Questions

1. **What should be written in the System Template?**
   Ans. The section on Activity Details, Part 2 of your Facilitator's Guide provides detailed information on completing the system template.

2. **What is the level/scope that a team should focus on when presenting a priority?**
   Ans. The group can decide the appropriate level at which to address their priority and make note of this in their system template. Options may include individual, household, community, region, and nation.

3. **Can participants brainstorm/ use a different method to fill the System Template or are they required to utilize the provided success factor trees to complete it?**
   Ans. Participants should be encouraged to utilize the trees directly, but may also employ them as a guide or basis for brainstorming to fill the system templates. The procedure and template for the activity is designed to allow participants to understand the full system-level translation process.

4. **Can an expert focus only on their own area of expertise?**
   Ans. This workshop aims to obtain a collective view of the presented challenge from multiple angles brought by the experts in the room. These contributions are valuable and can be documented in whatever way the participants feel most comfortable. Regardless of the approach, it is important that all components of the template be completed.

5. **What should participants do if during the exercise they realize that the** success factor **they prioritized is not the most critical?**
   Ans. If the perceived critical success factor is related to the success factor thought previously to be a priority, the team simply needs to mark the new-found success factor as a priority on their system template. If not, they may fill out a separate template.

6. **Where can participants document new ideas not present in the success factor tree? / Why isn't "x" on the success factor tree?**
   Ans. The trees are inevitably not exhaustive, they are meant to provide a more holistic view of the breadth and depth of the problem. They can be expanded beyond the branches provided. New ideas that are deemed to be priorities and cannot be found on the tree should be documented in their appropriate section of the system template.

7. **Can people send in more thoughts on priorities after the working session?**
   Ans. Additions to the success factor tree are always welcome. However, participants should recognize that only priorities developed at the session will have timely influence on the request for applications (RFAs) that will result from the workshop, so providing inputs during this session is ideal.

General Session Related Queries

1. **What expectations should facilitators and participants have for the session?**
   Ans. The CIA session will be an active working session which involves collaboration between people from various backgrounds and disciplines.

2. **How will session outputs be used?**
   Ans. Completed System Templates will be used as guides to inform the Request for Applications (RFA) session that will take place after the CIA session, and to help formulate formal RFAs following the R4D event.

3. **What if a group is running out of time?**
   Ans. Monitor the teams to make sure they follow the provided timeline to prevent this from taking place. If at 30 minutes to the end of the session, you find groups that have not made sufficient progress, request the groups to note down their top three priorities and fill out their respective System Template to the best of their ability in the time available.

4. **Will participants remain in the same groups throughout the CIA session?**
   Ans. Yes.

5. **On what basis are the groups formed?**
   Ans. Teams are pre-assigned to participants to ensure that perspectives from different disciplines are present at each table.

6. **What if participants would like to consult local stakeholders to obtain input from them?**
   Ans. Encourage them to do so if someone with relevant background is present at the session.

7. **What materials will be provided to participants?**
   Ans. All materials listed in the attached checklist will be provided.

8. **How will funds be allocated toward priorities after the session?**
   Ans. Funds will be allocated through rigorous review of applications to the Request For Application (RFA) process that is being deployed by the LASER PULSE consortium.

9. **Can participants leave the room and work elsewhere?**
   Ans. No. The working session is designed to be a collaborative and interactive session that requires in-person engagement.

Water, Sanitation and Hygiene [WaSH]
Success Factor Tree

A. Security/ Safety

Measures to ensure safety within the WASH system exists

1. Risk management mechanisms to protect the water, sanitation and hygiene systems exist
2. Mechanisms to protect water bodies from the risk of depletion exist
3. Mechanisms to protect water bodies from risk of contamination exist
4. Mechanisms to manage strategic risks associated with meeting population demand exist
5. Mechanisms to manage operational risks within value chain elements exist
6. Standard operating procedures and quality measures are maintained throughout the WASH system
7. Regulatory measures for quarantine and water safety exist and are followed
8. Quality and reliability measures exist and are followed
9. Standard operating procedures for water resource management exist and are followed
10. The utilization of standardized and safe equipment and tools are promoted
11. Corruption, if present, can be circumvented
12. Mechanisms are in place to take disciplinary action against corruption within the government
13. Policies on appropriate disciplinary measures against corruption exist
14. Economic barriers with regard to creating availability of adequate, clean drinking water can be overcome
15. Possibility of corruption can be circumvented
16. All entities in the WASH system that utilize funds are held accountable for it
17. Mechanisms to facilitate conflict resolution where required exist
18. Entities to take responsibility for peaceful negotiation among various stakeholders exist
19. Mechanisms to facilitate human security against risks/ hazards in the food value chain exist
20. Food value chain segments are free from any monopolizing entity

B. Policy

The governing bodies of the country have established the importance of equitable access to safe drinking water and sanitation facilities for all residents through structured policies

1 Structured policies, regulations and laws have been developed and implemented for delivery of WASH facilities
2 Policies that provide the broad basis and outlines of food security and nutrition exist
3 Policies define "Safe drinking water"
4 Policies define "Sanitation"
5 Policies define "Hygienic practices"
6
Policies include collection, preparation, use and disposal of water to support human uses and protect environmental quality
7 Policies on provision of equitable access to safe drinking water and sanitation facilities for all residents of the nation exist (e.g. different socio-economic backgrounds, religions, customers that have different abilities and needs)
8 Policies to guide government bodies and local leaders to help create access to WASH facilities for all households exist
9 Policies that facilitate environment protection and sustainability exist
10 Policies on protection of environment against water depletion due to excessive use exist
11 Policies on protection of environment due to pollution/ contamination exist
12 Policies on industrial waste water treatment and disposal exist
13 Policies on protecting water bodies and aquatic ecosystems from impacts of waste disposal exist
14 Policies on climate adaptation and mitigation exist
15 Policies on deforestation exist
16 Policies on soil maintenace exist
17 Policies on various aspects related to water and sanitation exist

Water, Sanitation and Hygiene [WaSH]
Success Factor Tree

18 Policies on provision of infrastructure to facilitate delivery of water and sanitation facilities exist (e.g. transportation facility, storage facilities, treatment facility)
19 Policies on making safe water and sanitation facilities affordable exist
20 Policies on operation and maintenance of water and sanitation facilities exist
21 Policies on subsidies offered within the water supply chain exist
22 Policies on ownership/ rights to manage water sources exist
23 Policies on rights and management of shared communal water sources exist
24 Policies on improvement of techniques and technology used in water supply chain (segments) exist
25 Policies on waste (domestic, water, solid, human) treatment/ management exist
26 Policies on measures of water quality exist
27 Policies on assessment methods utilized to maintain quality of services delivered exist
28 Policies on water consumption and utilization exist
29 Policies on water consumption by various consumer sectors exist (e.g. agriculture, farming, industry, domestic)
30 Policies on inter-regional and intra-regional trade of water exists
31 Policies on receiving aid-based water exist
32 Policies on hygiene requirements by food production and distribution systems exist
33 Policies that articulate responsibility and ownership of water within the water supply value-chain exist
34 Policies on training water delivery workforce exist
35 Policies on minimum wages for water delivery and sanitation system workforce exist

36 Policies that encapsulate consumer aspects exist
37 Policies on raising awareness and sensitizing population about safe water consumption exist
38 Policies on raising awareness and sensitizing population about adoption of safe sanitary practices exist
39 Policies on access to water and sanitation facilities for women exist
40 Supportive policies on creating access to resources for WASH facilities exist
41 Policies on consumption of water resources by the agriculture sector exist
42 Policies on energy and access to electricity for sourcing water exist
43 Policies on strengthening the agricultural and industrial sector for mindful water consumption and disposal exist
44 Policies on guided self-supply of water and sanitation facilities exist
45 Policies provide means to assess quality of water provided
46 Policies on emergency measures and Social Safety Nets for protection against disasters, climate variations (droughts and floods), epidemics exist
47 Policies promote partnerships

48 Policies promote private sector engagement in WASH system
49 Policies promote engagement of non-profit entities to facilitate WASH
50 Policies promote partnerships with other organizations within the country (e.g. Religious organizations, Civil Society Organizations(CSOs), Faith Based Organizations (FBOs), Other Non-profit organizations)
51 Policies allow international partnerships (e.g. Funding agencies, non-profit organizations, international water-aid)
52 Policies promote partnerships between water and sanitation supply chain segments (e.g. sourcers, water treatment units, quality management personnel)
53 Policies promote integration of institutions/sectors within the country (e.g. healthcare, schools, food supply) to deliver WASH
54 Policies framed are economically operational
55 Policies framed are functionally operational
56 Policy makers include representatives who possess expertise in relevant areas (e.g. sustainable environment, water, sanitation, hygiene, habit/ behavior specialists)
57 Policies are regularly updated
58 Policies are supportive of new solutions to water problems
59 Policies are protected from misuse
60 Acceptable disciplinary measures are in place for policy misuse
61 Policies are scalable and flexible
62 Policies are flexible to allow and incorporate development/progress in WASH (e.g. technological development, development in techniques implemented)

C. Government

1 **Country has government support to strengthen water, sanitation and hygiene systems to deliver adequate, clean and safe drinking water for all households**
2 Government is committed to creating equitable access to WASH facilities
3 Government understands and supports the need for access to water and sanitation facilities
4 Funds are allocated for creating long-term access to adequate and safe drinking water to create a positive health impact in the country
5 Funds are allocated for creating long-term access to adequate and safe sanitary facilities to create a positive health impact in the country
6 Funds are allocated for promoting hygiene and hygienic practices among the people to create a positive health impact in the country
7 Government drives towards provision of equal opportunity for all
8 Government works towards harmonization of regional standards to facilitate delivery of drinking water to all individuals
9 Government supports development of alternate technologies to support water delivery, sanitation and hygiene systems
10 Government and policy makers have an ambitious, hopeful, committed attitude
11 Government will drive towards a socially equitable solution
12 Government is open to ultilizing opportunities for private sector engagement to achieve goals related to WASH
13 Government has operational bodies and mechanisms to assess quality of service provided
14 Operational bodies and mechanisms for water resource management and planning exist
15 Operational bodies and mechanisms to develop/ modify various WASH policies exist
16 Operational bodies and mechanisms to enforce various WASH policies exist
17 Operational body and mechanisms for evaluation of outcomes of increasing consumption of adequate safe water exist

18 Operational body and mechanisms for evaluation of outcomes of increasing utilization of sanitation facilities exist
19 Operational body and mechanisms for development of water delivery and waste disposal strategies exist
20 Operational body and mechanisms for development of WASH investment plans exist
21 Entities responsible for developing and distributing technology to support sanitation and water resource management exist
22 Operational body and mechanisms to spread information on hygiene exist
23 Operational body and mechanisms for distribution of sanitation services exist (nutrition counselling)
24 Operational body and mechanisms for inspection of water at different stages in the supply chain exist
25 Operational body and mechanisms for regulation of water delivery systems exist
26 Operational body and mechanisms for regulation of sanitation systems exist
27 Operational body and mechanisms to measure outcomes of the WASH objectives set by the government exist
28 Operational body and mechanisms to measure environmental impact of WASH system exist
29 Policies and laws are followed across all **political levels** (National, Regional, Local)
30 All political sectors are made aware of water and sanitation policies
31 Relevant representation from all political levels are allowed to participate in the regulation and policy framing process
32 Government, local leaders and influencers of change are supportive and influential in driving awareness and implementation
33 Different government and non-government bodies at national, regional and local levels are in agreement with policies and work towards its implementation
34 Checks are in place to make sure policies and regulations are not misused
35 Corruption, if present, can be circumvented
36 Local leaders (e.g. govt. appointed leaders, religious bodies, influencers of change) are committed to creating equitable access to WASH facilities
37 Local leaders care about the welfare of the community
38 Local leaders are capable of conflict management within their regions
39 Local leaders follow policies set forth by the government and drive its implementation

D. Infrastructure

1 Infrastructure to facilitate delivery of clean water, safe sanitation and products that support hygienic practices exists
2 The water supply and sanitation systems are environment friendly
3 The water supply and sanitation systems are energy efficient
4 The water treatment and distribution system is technically scaleable
5 Regional community leaders are supportive of infrastructure development
6 An effective water system can be designed within the constraints of available resources
7

Infrastructure facilities for **municipal water supply** in a(n urban) region exist or can be developed to meet local and projected water requirements
8 Economies of scale are taken into consideration when developing water infrastructure for specific regions
9 Infrastructure necessary to source water exists where required or can be developed
10 Infrastructure to access available groundwater exists or can be developed where required (e.g. boring machines to access ground water)
11 Infrastructure to access available surface water exists or can be developed where required
12 Infrastructure to divert existing water from original basin to basin of use exists or can be developed where required
13 Infrastructure to collect rainwater exists or can be developed where required
14 Infrastructure/ equipment necessary to transport water exists where required or can be developed
15

Water transportation mechanism is developed based on local terrain (e.g. through pipelines, through tanks, through trains)
16 Infrastructure/ mechanisms necessary to treat water exists where required or can be developed (e.g. water treatment plants)
17 Infrastructure to carry out physical processes of water treatment exists or can be developed (e.g. settling, filtration processes)

18 Infrastructure to carry out chemical processes of water treatment exists or can be developed (e.g. disinfection, coagulation processes)
19 Infrastructure to carry out biological processes of water treatment exists or can be developed (e.g. slow sand filteration process)
20 Infrastructure to carry out desalination processes exists where required or can be developed based on feasibility
21 Infrastructure to carry out additional processes (e.g. water softening, ion exchange, removal of residual disinfectant) exist or can be developed
22 Infrastructure necessary to store water exists where required or can be developed (e.g. water tanks, dams, sumps)
23 Capacity of large storage tanks is based on peak demand of population to be served
24 Storage mechanisms for invdividual houses exist where water supply is not regular
25 Infrastructure necessary to distribute water to households exists where required or can be developed
26 Efficient centralized/ decentralized system for water distribution exists or can be installed

27 Infrastructure facilities for municipal **sanitation system** in a(n urban) region exist or can be developed to meet local and projected water requirements
28 Infrastructure necessary for safe waste disposal (without coming into human contact to break the *disease transmission cycle*) exists or can be installed
29 Infrastructure necessary for safe disposal/ reuse of solid waste exists or can be installed (e.g landfills, recycling)
30 Infrastructure necessary for safe disposal of domestic wastewater exists or can be installed
31 Infrastructure necessary for safe collection, transport, treatment and disposal/ reuse of human waste exists or can be developed (e.g. fertilizer, landfill, conversion to biofuel)
32 Infrastructure developed for consumers are based on their current habits to allow easy translation (e.g. designing pit latrines as opposed to a comode system for communities that are used to defecating in the open)
33 Waste disposal systems are environment friendly
34 Infrastruture to enable acid drainage (e.g. from mines) to safely dispose acidic waste (low pH) exists

35 Infrastructure necessary for **hygiene promotion** exists or can be developed (e.g. production and distribution of soaps, disinfectants)
36 Means to develop and distribute hygiene products for all people of different genders exist or can be developed (e.g. feminine hygiene products for women)

37 Infrastructure exists to **facilitate communication** between different stakeholders
38 Effective channels of communication exist to spread awareness among populations (e.g. mass media channels like radio, television; interpersonal channels like healthcare workforce; institutional channels like schools, government)

39 Acceptable and robust communication channels are identified or developed
40 Existing institutions and/or private sector channels are leveraged to spread awareness among the masses (e.g. trusted private-sector entities that are popular among communities)
41 Channels to spread awareness that have high impact and are reliable can be identified
42 Drivers of awareness acknowledge the need for awareness among the population about WASH
43 Channel drivers formalize intent to raise awareness about WASH by setting outcome based objectives and developing strategies
44 Channels to spread awareness are secure and stable
45 Channels to spread awareness are supported by sufficient resources
46 Channels to spread awareness are equipped with material resources
47 Channels to spread awareness are equipped with technological resources
48 Channels to spread awareness are equipped with human resources
49 Channels to spread awareness are financially secure
50 Channels to spread awareness operate legally in compliance with existing laws and regulations
51 Channel drivers are trusted by the government and other stakeholders
52 Channel drivers and the communication channels utilized are trusted by the population
53 Communication systems utilized are persistent and secure for long-term purposes
54 Involved stakeholders trust communication channels used
55 Different and multiple channels of communication are utilized to raise awareness among different target populations
56 A variety of effective channels of communication exist
57 Communication channels and systems are resilient to environmental and political change
58 Awareness can be spread in a socially acceptable way
59 Awareness can be raised among vulnerable/high risk target populations

E. Equipment/ Supplies

1 **Equipment/ Supplies to support effective delivery of clean drinking water and sanitation are in place**
2 Equipment/ supplies that may be required to allow access to/ development of clean water and sanitation facilities exits
3 Equipment necessary to source and water exists where required or can be developed where required (i.e. in rural or urban areas)
4 Equipment to access available groundwater exists or can be developed where required (e.g. large or small pumps)
5 Equipment to access available surface water exists or can be developed where required (e.g. equipment to draw water)
6 Other fixtures required to facilitate ease of access to clean water are sourced and installed (e.g hand pumps, taps, filters etc.)
7 Supplies that promote hygiene are made available to consumers
8 Supplies such as cleaning agents for purifying water are sourced and distributed
9 Cleaning supplies to promote household hygiene are sourced and distributed (e.g. floor disinfectants, detergents, dishwash soap, cleaning solutions)
10 Supplies that allow individuals to practice hygienic habits are sourced and distributed (E.g. soaps, shampoos, toothpaste, feminine hygiene products)
11 Equipment/ supplies that promote safe sanitation practices are available to all people
12 Equipment/ fixures to support safe collection and disposal of waste exists or can be developed or setup
13 Equipment/supplies that support hygienic practices at required locations exist (e.g. availability of soap and water at public toilets)
14 Equipment/supplies are available to public
15 Equipments/ supplies are economically accessible
16 Equipment/ supplies are functional

F. Workforce/ Talent

1 **Workforce/ talent to facilitate provision of clean drinking water and sanitation are in place**
2 Workforce/ talent can be **trained or educated** for their respective roles
3 Education/ training programs exist or can be developed for workforce/ talent within the WASH system
4 Training programs are accessible
5 Potential workforce/ talent can afford the available training
6 Potential workforce/ talent are willing to engage in training
7 Equal opportunity for obtaining training is provided to all interested candidates (e.g. gender, race, religion, physical abilities)
8 Potential workforce/ talent feel comfortable with training techniques adopted

9 Workforce/ talent is **willing to engage in employment**/roles available within the food value chain
10 WASH system offers employment opportunities
11 Various positions within the WASH delivery system required qualified individuals (e.g. civil engineers for planning and infrastructure development)
12 Compensation provided is attractive to potential workforce
13 Safe working conditions are provided
14 Employment provides satisfaction to engaged workforce
15 Employment enables professional growth for interested workforce/ talent
16 Equal opportunity for employment is provided to all interested candidates (e.g. gender, race, religion, physical abilities)

17 Country has **sufficient workforce** to support various aspects of the WASH system
18 Appropriately skilled labor can be sourced for construction and maintenance of water infrastructure
19 Acceptable working conditions exist at the contruction site

20 Locally sourced labor can be employed
21 Laborers are given adequate wages
22 Workforce/talent are employed to oversee operations of different segments of WASH
23 Workforce/talent are employed to manage segments of the system (e.g. water treatment plant manager, waste disposal site manager)
24 Workforce/ labor are employed for maintenance of facilities (e.g. maids, building cleaners)
25 Workforce/ labor are employed to facilitate distribution of water
26 Workforce/ labor are employed to facilitate transportation of water (e.g. driver of tanks that transport water)
27 Workforce/ labor are employed for maintenance of water distribution systems at community level (e.g. to repair broken pipes)
28 Workforce/ labor to facilitate maintenance of water fixtures and plumbing are available where required (e.g. plumbers)
29 Workforce/ labor are employed to facilitate collection, transportation and disposal of household waste (e.g. waste disposal vehicle driver)
30 Workforce/ operators for water quality surveillance exist or can be employed
31 Operators possess required skills for their roles
32 Operators can be sourced locally
33 Working conditions provided are appealing

34 Workforce/ talent who can **support and enable development** within the WASH system exist or can be identified and engaged when needed
35 Leadership who can be sought to overcome existing local challenges exist or can be elected
36 Researchers who can improve/ develop existing practices and technologies exist or can be sourced
37 Experts on climate variation and its influence on water availability are accessible where required
38 Experts on environmental impact of various activites within the food value chain are available/accessible where required
39 Private sector/ non-profit entities are available/ accessible where required
40 Experts on water resource planning and management are available/ accessible where required
41 Local operators for supporting systems (e.g. food, education, electricity) exist or can be appointed
42 Engineers required for infrastructure development exist or can be sourced

G. Capital/ Finances

1 **Capital/ finances to start/ support segments that facilitate effective delivery of WASH exist or can be procured**
2 Startup finances are accessible where required
3 Finances to access water source can be procured
4 Finances required to develop a water transportation system can be procured (e.g. Through transportation modes, by diverging existing water body)
5 Finances required to develop a water treatment facility can be procured
6 Finances required to develop a water distribution system can be procured
7 Finances required to develop a sanitation facility can be procured
8 Finances required to start a manufacturing plant to produce plumbing fixtures can be procured
9 Finances required to start a manufacturing plant that develops hygiene products can be procured

10 Finances required to maintain various segments of the WASH system in a region/community are available or can be procured
11 Entities that perform water sourcing have finances required and utilize it to support and maintain activities
12 Entities that oversee and perform water transportation have finances required and utilize it to support and maintain activities
13 Entities that oversee and perform water treatment/purification have finances required and utilize it to support and maintain activities
14 Entities that oversee and perform water distribution have finances required and utilize it to support and maintain activities
15 Entities that oversee and perform waste disposal have finances required and utilize it to support and maintain activities
16 Entities that support WASH system have required finances to support and maintain their activities (e.g. communication systems, hygiene product manfacturing systems)
17 Access to finances is created where not available (e.g. through banking units)

H. Practices/Mechanisms

Practices/ mechanisms to support effective delivery of of clean water and safe sanitation are in place

1. Water conservation practices are implemented
2. Mechanisms to **protect** water resources are implemented
3. Water bodies are protected from contamination
4. Water bodies are protected from overuse/misuse/ wastage
5. Water bodies are protected from depletion (e.g. due to climatic conditions)
6. Mechanisms to **preserve** water resources are implemented
7. Quality and quantity of water available is preserved as per acceptable standards
8. Mechanisms to **manage** water resources are implemented
9. Effective technical planning mechanisms are practiced to ensure appropriate water management
10. Water resource management and construction practices are designed to be effective for future population growth
11. Water resource management and construction practices are designed to avoid adverse environmental impact
12. Water resource management is practiced such that aquatic life is preserved
13. Existing water management practices ensure environmental sustainability
14. Effective planning and management of surface water bodies is ensured
15. Effective planning and management of watershed is practiced
16. Effective upstream and downstream water management is practiced to avoid drought/floods downstream
17. Effective planning and management of groundwater bodies is ensured
18. Mechanisms to monitor water resource management exist (e.g. by using waterpoint mapping systems)
19. Mechanisms to **restore** water resources are implemented
20. Water scarce areas are identified
21. Research entities and facilities to carry out study of locations and causes of water depletion exist

- Water scarce areas are prioritized based on degree of criticality
- The barrier(s) preventing access/ availability of safe water are identified
  - Barriers related to insufficient water availability are identified
  - Barriers related to depleting water sources are identified
  - Barriers related to contamination are identified
  - Barriers related to inefficient consumption are identified
- The barrier(s) preventing access/ availability of safe water are addressed
  - If water does not exist, means to provide water to the region is developed
  - If water source exists but is depleting, means to replenish water in the region can be developed
    - Mechanisms to overcome ground water depletion are developed where required (e.g. reducing consumptive water use)
    - Mechanisms to overcome surface water depletion are developed where required
    - Mechanisms to handle variations in climatic conditions (e.g. variations in rainfall) are developed where required (e.g. through effective storage mechanisms)
  - If water exists but is contaminated, means to treat water are developed (e.g. bioremediation processes are performed)
  - If water exists but is utilized inefficiently, means to conserve water are developed
- The barrier(s) preventing access/ availability of safe sanitation facilities are identified
- The barrier(s) preventing access/ availability of safe sanitation facilities are addressed
- Means to measure progress of improvement in conditions of water resource exists and is monitored

Commitment from the people of the region to conserve water resource has been obtained

- Leadership support and commitment to conserve water resource has been obtained
- Community support and commitment to conserve water resource has been obtained
- Institutional support and commitment to conserve water resource has been obtained
- Leaders, institutions and community are willing to work together to conserve water resources

Local regions dependent on rainfall for water are capable of handling **climate variations**

- People of the region are equipped with accurate climate forecasts
- Effective mechanisms exist to prepare people for forecasted rainfall in the region
  - Effective mechanisms exist to handle low rainfall (e.g. water collection techniques, judicious consumption/ mitigating demand, recycling/reuse techniques)
    - Effective mechanisms exist for agricultural sector to handle low rainfall (e.g. adaptable irrigation techniques, water resource management for farms and animals)

49 Effective mechanisms exist for industrial sector to handle low rainfall (e.g. recycling used water)
50 Effective mechanisms exist for domestic sector to handle low rainfall (e.g. rainwater harvesting, judicious water consumption techniques, recycling water - save water after cooking/ washing vegetables and use for other
51 Effective mechanisms exist to handle heavy rainfall and floods (e.g. drainage systems, practices to prevent landslides)
52 Effective mechanisms exist for agricultural sector to handle floods (e.g. drainage mechanisms, means to divert excess water)
53 Effective mechanisms exist for industrial sector to handle floods (e.g. means to protect machinery, divert flood water)
54 Effective mechanisms exist for domestic sector to handle floods (e.g. effective drainage techniques)
55 Effective mechanisms exist to prevent/ reduce/ overcome contamination due to flood water
56 Effective mechanisms exist to improve environmental conditions that are impacted by climate change and human activities (e.g. reducing soil degradation, deforestation)

57 The local water supply is treated to supply water with acceptable **quality standards**
58 Mechanisms to ensure effectiveness of infrastructure for water supply and sanitation systems exist or can be developed (e.g. check for leaks, check for quality aspects)
59 Measures to check effectiveness of water sourcing infrastructure and techniques exist
60 Measures to check effectiveness of water treatment infrastructure and techniques exist
61 Measures to check effectiveness of water storing infrastructure and techniques exist
62 Measures to check effectiveness of water distribution infrastructure and techniques exist
63 Measures to check effectiveness and sanitation of waste collection system exists
64 Measures to check effectiveness and sanitation of waste transportation system exists
65 Measures to check effectiveness and sanitation of waste disposal/reuse system exists
66 Infrastructure maintenance mechanisms exist and are practiced regularly
67 Collected sediments are regularly removed from water storage structures to maintain design capacity (e.g. from dams)
68 Functionality and operations of existing infrastructure are regularly checked and updated
69 Practices for domestic/individual water supply and sanitation in a region with no municipal supply exists or can be developed to meet local and projected water requirements (self-supply/ guided self-supply of water and sanitation)
70 Individuals/ communities have means to access water sources for their household consumption (e.g. through manually drilled wells, rainwater harvesting, rope pumps, pitcher pumps)
71 Individuals/communities have means to store water free of contamination (e.g. using robust tanks made of ferrocement)
72 Individuals/communities have means to treat water to be used (e.g. by boiling, chlorination, using water filters, other portable water purification techniques)

73 Individuals/communities have means to dispose waste (e.g. using pit latrines in a sanitary way, employing community-led total sanitation)

74 Infrastructure developed for consumers are based on their current habits to allow easy translation (e.g. designing pit latrines as opposed to a comord system for communities that are used to defecating in the open)

I. Awareness

1 **Country is aware of the availability of and means to access WASH facilities and practices to be followed**

2 Content used to spread awareness about WASH is effective

3 Content is based on formative research and has been proven to be effective

4 Content is culturally appropriate and aligns with values of target audience

5 Content motivates population to adopt hygienic behaviors and practices

6 Content is specific to context and target audience

7 Variations in literacy are surmountable

8 Content is sensitive to variations in literacy

9 Majority of the target audience finds content easy to understand (e.g. Use of more pictoral representations, avoidance of difficult words or phrases)

10 Content can sensitize population about WASH in order that communities adopt healthy behaviors

11 Populations are made aware of existing drinking water and sanitation policies

12 Awareness can be raised among **government officials and local leaders** about various aspects of WASH delivery system

13 Awareness can be raised among Government and local leaders about the need for better quality water and sanitation systems in the region

14 Awareness can be raised about the requirement to strengthen delivery of portable water in the region (e.g. statistics show a large percentage of the population is falling sick from consuming polluted water)

15 Population health and other factors that help assess water quality are monitored carefully

16 Awareness can be raised on the particular segment of the water supply chain that requires immediate attention in the region to allow adequate, secure and consistent water and sanitation delivery (e.g. pipe breakage, inadequacy of water of sanitation availability)

17 The water delivery system/ facility/ practice is carefully monitored

18 Awareness can be raised where people know about ways to maintain good health by accessing WASH but do not know how to avail it

19 Local leaders can be made aware of means to develop/ strengthen the water and sanitation supply chain

20 Local leaders and influencers of change are informed about means to setup/strengthen segments of the WASH supply chain that are found to be weak or non-existent

21 Local leaders and influencers of change are informed about existing WASH policies if required

22 Awareness can be raised among **potential and existing food system workforce/talent** about various aspects of the water and sanitation delivery system

23 Awareness can be raised among potential WASH system workforce (e.g. health communicators, water source unit operators) about opportunities in the WASH domain, and required qualifications/ certifications.

24 Awareness is raised about ways in which to engage in the WASH system

25 Job opportunities in the WASH system are appealing

26 Awareness can be raised among WASH supply chain segments about requirement to provide adequate and safe drinking water and sanitation facilities to all households

27 Awareness is raised about water quantity and quality requirements among target populations at the source of the water supply chain (e.g. well owner)

28 Awareness is raised among water treatment units about quality standards to uphold for delivery of safe drinking water

29 Awareness is raised among target populations about water quality checks, methods and certification requirements

30 Awareness is raised among water transporters and distributors about hygienic and safe practices while handling water to be consumed

31 Awareness can be raised among water and sanitation supply chain segments about mechanisms to provide adequate safe drinking water and sanitation facilities to all households

32 Awareness is raised among target populations about methods to develop/ strengthen water procurement and consumption processes

33 Water resource managers are informed about new technologies available to implement for better yield

34 Water resource handlers are informed about resource management techniques (e.g. ways to reduce wastage, ways to replenish water bodies)

35 Water resource owners (e.g. owner of well) are informed about avenues to sell their water

36 Water harvesters are informed about ways to prepare themselves for climate variations (e.g. safe and sanitary storing techniques)

37 Awareness is raised among target populations about methods to setup/strengthen water treatment units

38 Awareness is raised among target populations about methods to develop/strengthen water distribution networks and processes

39 Awareness is raised among target populations about methods to develop/strengthen waste collection, treatment and disposal networks and processes

40 Awareness is raised among target segments of the supply chain on methods to alleviate wastage of water

41 Awareness is raised on coping mechanisms/ adaptive capacities in times of risk or fluctuations in supply

42 Awareness is raised among waste collection system operators about safe handling practices

43 Awareness is raised among waste transportation personnel about safe handling pratices

44 Awareness is raised among waste treatment facility operators about safe handling practices

45 Awareness is raised among waste treatment facility operators about treatment methods and quality checks

46 Awareness is raised among waste disposal/ reuse facilities about safe handling practices
47
48 Awareness can be raised among **potential and existing food system partners** about various aspects of the water and sanitation delivery system
49 Possible partners can be approached to contribute to the WASH system
50 Prospective organizations within the country can be made aware of opportunities for engagement (e.g. Religious organizations, Civil Society Organizations(CSOs), Faith Based Organizations (FBOs), Other Non-profit organizations)
51 Awareness can be raised among non-profit groups about opportunities for engagement in the WASH supply chain
52 Possible private sector partners can be made aware of opportunities to engage in the WASH supply chain
53 Other potential partners can be identified and made aware of opportunities to engage in the WASH supply chain (e.g. institutions within the country, international partners etc.)
54
Awareness can be raised among **consumers** about various aspects of the water and sanitation delivery system
55 Awareness is raised among consumers about the importance of consuming safe drinking water and utilizing safe sanitation and hygienic practices
56 Target populations have a good understanding of what is "safe drinking water"
57 Target populations have a good understanding of what is "sanitation"
58 Target populations are informed about different diseases that can be avoided by consuming clean water (e.g. cholera, diarrhoea)
59 Target populations are informed about safe cooking and hygienic practices to follow when handling consumables (food)
60 Target populations are informed about the requirements to maintain sanitary areas used to dispose human/domestic waste
61 Target populations are informed about hygienic practices and their benefits (e.g. wash hands with soap after defecating, do not handle drinking water with contaminated utensils)
62 Target populations are informed about where to access safe drinking water
63 Target populations are informed about safe human and domestic waste disposal methods

64 Target populations are informed that they can (within limits) self-supply water for their households
65 Target populations are informed about how to manage water resources
66 Target populations are informed about simple everyday measures to ensure quality of water they consume
67 Target populations are informed that they can self-supply safe sanitation facilities for their households
68 Target populations are informed about the benefits of using better sanitation alternatives as opposed to current practice if required (community-led total sanitation)
69 Target populations are informed about how to safely handle self-developed sanitation facilities (e.g. close the latrine hole, keep sanitation and drinking water systems separate)
70 Target populations are informed about ill effects/ health impacts of unhygienic practices (e.g. polluting water bodies and indirectly spreading diseases by defecating near it)
71 Target populations (women) are informed about feminine hygiene and healthy practices related to menstruation and menstrual waste disposal techniques
72 Consumers are informed about where/how they can access sufficient safe drinking water and safe sanitation facilities
73 Populations are informed about water testing methods to identify certain impurities
74 Populations are informed about experience characteristics (that come from self-experiences) and credence characteristics (details they can find from third parties) to assess quality of water
75 Populations are informed about hygienic practices to follow while handling water (e.g. use clean water to wash hands, wash fruits/vegetables, use clean water while cooking, clean utensils)
76 Populations are informed about precautionary practices to follow to maintain safety while consuming water (e.g. boil water, use water purification kits to kill bacteria and remoe sediments)
77 Populations are informed about where they can obtain safe drinking water at affordable prices
78 Populations can be informed about where to access and how to use supplements that aid hygienic practices (e.g. water purification kits, soap for hands and utensils)

79 Populations are informed about how to build waste disposal systems to cater to household needs

J. Motivation

Country is motivated to engage in and support available WASH system

1 The beliefs, attitudes and perceptions of populations towards adopting safe drinking water and hygienic practices in different regions are understood

2 Effective channels and reliable means exist to perform a formative assessment of populations' beliefs, attitudes and perceptions

3 Mechanisms used to perform formative assessment are appropriate for specific context

4 Rigorous assessments are made to obtain comprehensive data on the knowledge and attitudes of people towards adequate safe drinking water and sanitation

5 Data collected from assessments are effectively analyzed

6 The analysis results are utilized to drive change in populations' motivation and behavior

7 Evidence-based intervention strategies are employed to motivate populations at different stages of change

8 Influencers of change are motivated to consider the need to provide access to adequate and safe drinking water and sanitation

9 Government, local leaders and influencers of change believe they can benefit population by facilitating awareness and access to WASH

10 Government and local leaders care for the greater good of the communities, regions and the nation

11 Leadership is convinced that improving access to WASH can improve economy

12 Leadership acknowledges that individual's consumption of safe drinking water use of good sanitation and hygiene practices has a long-term impact on their health, which in turn produces able-bodied workforce for the nation

13 Local leaders are inclined to strengthen household water supply and sanitation facilities by building the capacity of local talent

14 Skilled individuals are motivated to participate in the water and sanitation value-chain system
15 Working conditions promote interest in job opportunities (e.g. appropriate hours of work and good pay)
16 Jobs in water value-chain system are perceived as respectable
17 Equal opportunities are offered to all qualified applicants
18 Opportunities to volunteer and serve in segments of water management system are provided
19 Skilled individuals have an entrepreneurial trait
20 Skilled individuals have the capacity to manage a scalable water business (e.g. affordable trainings may be provided for capacity building)
21 Incentives to engage in water supply chain are attractive (e.g. banks provide subsidies for loans)
22 Procedure to obtain trainings/certifications required are not difficult (e.g. training on how to handle certain machinery/ equipment, quality certifications)

23 Target populations are motivated to consider benefits of utilizing WASH facilities
24 Barriers preventing consideration of purchasing clean water/ appliances to clean water (e.g. lack of finances to cover costs, water purifying instrument/ kit unavailable) are identified and overcome
25 Targeted strategies to facilitate equitable access to WASH are implemented
26 Viable private sector channels are considered and employed to overcome barriers (e.g. advertisements through trusted channels)
27 Communities are conscious about existing living conditions and possible healthier lives after effectively adopting WASH (e.g. consuming clean water and using safe waste disposal systems can reduce spread of diseases)
28 Individuals, families and communities feel empowered and believe they can create meaningful impact in their lives
29 Individuals and families care about their health and its linkage to WASH
30 Communities are aware of channels they can use to influence change in their lives
31 Communities believe they can create the change they want to see
32 Communities are aware that WASH is a shared national responsibility
33 Country has means to source sufficient water to provide for basic needs of all the people of the country

K. Enabling Resources

Country has or can develop enabling resources to facilitate system startup where required

Country has means to source sufficient water to provide for basic needs of all the people of the country

1. Climatic variations across country have been taken into account to aid water source identification
2. Sustainable water sources for regional utilization are identified
3. Sustainable local surface water bodies have been identified as sources (e.g. rivers, lakes, ponds, streams)
4. Sustainable local ground water has been identified as a source
5. The local water supply is resiliant to natural hazards
6. Involved water shed land is appropriately maintained to mange water supply/quality
7. Required water harvesting practices are sustainable given supply
8. The source(s) of water identified can support current and anticipated demand
9. Demand analysis is performed to understand clear need
10. Variations in population distribution can be accomodated
11. Water can be stored to accommodate mismatch in supply and demand
12. The sustainability of source and environmental impact is assessed
13. The water source can support economic activities (agriculture, industries) of region

14. An alternate supply of water can be identified to accommodate local needs (limitations)
15. A long-term solution can be developed (e.g., access to aquifer; desalination techniques)
16. In regions with no access to natural sources, an external source can be identified/developed
17. Relevant entities can develop strategies to improve particular situation (e.g. researchers, government, private sector partners, NGOs)
18. Appropriate entities can be identified to develop/implement alternate solutions
19. Entities' missions and visions align with community water resource development

20 Entities share a good relationship with regional communities and other institutions
21 Entity is credible to be entrusted with specific task
22 Entity is equipped with talent and facilities to aid in solution development
23 Entity is financially backed to develop and implement solutions
24 Alternate solutions developed are environmentally friendly
25 Alternate solutions are economically viable
26 New water solution can be designed to accommodate local incomes
27 New water solution can be designed to accommodate local tradition/norms
28 Community is willing to accept alternate solution
29 The opportunity for improved solutions is known by the local population
30 Appropriate and reliable channels of communication exist to aid in awareness
31 Leadership is supportive and influential in driving awareness
32 Community is willing to change present "compensating behaviors"
33 Community is optimistic about its future
34 Community values family wellfare
35 New water solution can be implemented while maintaining pride of culture
36 Community trusts involved stakeholders
37 Community is willing to take responsibility for its well being
38 Community can play a role in solution
39 Community can feel safe accessing/using new solution
40 Community trusts quality of (new) water solution
41 Technological solution is acceptable to the community
42 Path to access enabling resources is acceptable to community
43 Community leaders will be supportive of the new solution

44 Possible entities (organizations, institutions, companies) or resources (material, human capacity/know-how) can be identified to overcome existing challenges to enable equitable access/ availability of water and sanitation
45 **Economic barriers** can be overcome
46 Economic barriers with regard to creating water availability can be overcome
47 Sources are available to sponsor system start-up
48 Government allocates funds for Water, Sanitation and Hygiene (WASH)
49 Viable opportunities for industry engagement are utilized

50 Opportunities to obtain monetary aid from NGOs supporting development and/or Water, Sanitation and Hygiene (WASH) are utilized (e.g. USAID)
51 Options are available to gain/augement government financial support
52 The water treatment and distribution system is economically scaleable
53 Possibility of corruption can be circumvented
54 All entities in the WASH delivery system that utilize funds are held accountable for it
55 Bodies exist to regulate finances
56 A business model can be developed that accounts for variations in community purchasing power
57 The cost to access source water can be supported by the system business model
58 The cost to treat and distribute water can be supported by the system businesss model
59 The cost to maintain water system operations can be supported by the system business model
60 The cost to construct and maintain sanitation facilities can be supported by the business model
61 The cost to dispose waste water and sewage can be supported by the business model
62 Economic barriers with regard to creating water accessibility can be overcome
63 A viable pricing/payment mechanism exists for the local population
64 Pricing mechanism promotes judicious utilization of water
65 The economics of the system are appropriately tailored to local income levels
66 Households are willing to pay in exchange for clean water and sanitation facilities/ practices
67 Communities acknowledge that supplied water is a better alternative to existing water source

68 **Functional barriers** do not exist or can be overcome
69 Physical barriers that prevent delivery of clean water and sanitation facilties are overcome (e.g. through multimodal transportation)
70 Infrastructure developers have access to resources to enable development
71 Mechanisms to ensure effective functioning of water and sanitation infrastructure facilities exist
72 Facilities to maintain operation of infrastructure exists or can be developed
73 A maintenance approach can be designed employing local talent and resources for each infrastructure facility
74 Maintenance procedures at infrastructure facilities can be performed via local talent
75 Effective maintenance practices can be achieved
76 The water system is economically sustainable
77 Water system construction costs are self-sustained and/or reliably supported
78 Water system operating costs are self-sustained and/or reliably supported

79 Water system maintenance costs are self-sustained and/or reliably supported
80 Systems necessary to support effective functioning of the water and sanitation systems exist
81 Education system to educate population about hygienic practices and utilization of water and sanitation are available
82 Energy delivery systems are available where required
83 Healthcare delivery systems to monitor health of communities and to spread awareness about hygienic practices are available
84 Food production and delivery sector practices effective hygiene
85 Infrastructure for research to develop better technology and techniques to support water and sanitation systems exist
86 Physical barriers that prevent utilization of sanitation facilities and safe drinking water are overcome
87 Physical obstacles imposed by local terrain can be overcome
88 Physical barriers that prevent access to safe drinking water can be overcome by effective water distribution/ delivery mechanism
89 Physical barriers that prevent access to sanitation facilities can be overcome
90 Physical obstructions that act as barriers in connecting various parts of the water supply chain can be overcome

91 **Social barriers** do not exist or can be overcome
92 Social group biases do not exist or can be overcome
93 Religious barriers do not exist or can be overcome (e.g. religious group segregations/ ethnic group segregations)
94 Language variations/barriers between people from different regions can be overcome
95 Conflicts can be resolved
96 Territorial disputes can be overcome
97 Competing demands for water can be negotiated
98 Ownership conflicts influencing water access can be resolved
99 Local community member utilize available water and sanitation resources
100 Local community members are comfortable with self-supply water and sanitation practices
101 Local community members are comfortable with water supply and sanitation system
102 The water supply system can be operated in a manner consistent with local values
103 The sanitation system can be operated in a manner consistent with local values
104 Community trusts involved stakeholders
105 The water supplier(s) is/are willing to cater to regional needs without biases

106 Appropriate operator(s) can be identified to manage the water supply
107 Appropriate operator(s) can be identified to manage the public sanitation facilities (e.g. public toilets/latrines)
108 Local community members will be comfortable working for/ with the system operator(s)
109 Local and regional system operators are comfortable working with each other
110 Water supply system is free from any kind of monopolizing entity
111 Local sanitation system is free from any kind of monopolizing entity
112 Communities are willing to commit to use of hygienic practices, consumption of safe drinking water and utilizaation of sanitation system
113 Community is aware of benefits of practicing hygiene while handling water and waste
114 Community is willing to take responsibility for its well being
115 Community will reliquish present hindering behaviors in favor of desired behaviors
116 Community is optimistic about its future
117 Community values community wellfare
118 Community is comfortable with alternate solutions to existing systems, if proposed
119 Gender issues can be overcome
120 Jobs in the WASH system promote gender equality
121 Conflicts that arise because of gender differences can be overcome
122 Stigma and communication challenges because of gender differences can be overcome
123 Requirement for effective sanitation for women to manage mentrual hygiene is understood and accepted
124 Cultural barriers, if exist, can be overcome
125 Cultural barriers preventing consumption of safe drinking water are identified and overcome
126 Cultural barriers preventing hygienic practices are identified and overcome
127 Cultural barriers preventing utilization of sanitation facilities are identified and overcome (e.g. habit of defecating in the open)
128 Gender inequality, if exists, can be overcome (e.g. responsibility of collecting water being the responsibility of the women of the household)
129 Barriers related to workforce and employment availability, if exist, can be overcome
130 Barriers preventing regular availability of workforce are overcome
131 Barriers preventing regular availability of jobs are overcome
132 Treated water meets consumer expectations
133 Consumer feels safe accessing/using treated water
134 Consumer feels safe utilizing waste disposal systems (e.g. systems for disposal of human waste, domestic waste, waste water)

135 Awareness can be raised where people are aware of the requirement of WASH and how to access it but do not know how to overcome specific barriers

136 Existing barriers are identified

137 Skills related barriers are identifed (e.g. Insufficient workforce to support water supply/ sanitation system)

138 Wealth related barriers are identified (e.g. Financial capacity to purchase clean water is insufficient, financial capacity to engage in water and sanitation supply chain is insufficient)

139 Access related barriers are identified (e.g. Waste disposal system is not available in regional location, water distribution system unavailable)

140 Time related barriers are identified (e.g. water supply is operational only for limited hours)

141 Behavior/ Habit related barriers are identified (e.g. consistently defecating in the open)

142 Culture/religion/ tradition related barriers are identified (e.g. unhygienic practices of handling mentruation and menstrual waste)

143 Knowledge barriers are identified

144 Effective strategies to address specific barriers are developed

145 The barriers to be addressed are identified and prioritized

146 The impact on population due to a skill based barrier is assessed

147 The impact on population due to a wealth based barrier is assessed

148 The impact on population due to access based barrier is assessed

149 The impact on population due to a time based barrier is assessed

150 The impact on population due to a behavior based barrier is assessed

151 The impact on population due to a cultural barrier is assessed

152 Strategies to address specific high priority and high impact barriers are implemented based on prioritization

153

L. Adoption/ Habit conversion

Adoption of desireable bahavior among population is sustainable

1. Individuals/ communities that have chosen to adopt clean drinking water, safe sanitation and hygienic practices can be encouraged to maintain their engagement
2. Government and local leaders are motivated to continue supporting the requirements for delivery of safe drinking water and sanitation facilities
3. The outcomes of effectively providing WASH facilities to the people can be measured
4. Existing solutions are driving a year over year reduction in epidemics among populations
5. Existing solutions are driving a year over year improvement in child health (e.g. decrease in mortality rate of children under the age of five due to diseases like diarrhoea or cholera)
6. Provision of access to WASH facilities fosters health equity among communities
7. Households in communities are motivated to provide clean drinking water and sanitation for all members of the household
8. Households and communities can observe improvements in health of families who utilize WASH facilities
9. Water supply chain workforce is motivated to continue improving and facilitating delivery of safe drinking water for all
10. Workforce involved in water procurement process is motivated to continue supplying high quality water
11. Workforce involved in water treatment is motivated to continue producing safe water for household consumption
12. Workforce involved in water transportation/ storing process is motivated to continue maintaining the safety and hygiene standards set by the government
13. Workforce involved in water distribution process is motivated to continue distributing portable water to all
14. Workforce involved in sanitation systems are motivated to continue working towards the improvement of the overall health of the community
15. Partners continue to engage in WASH system
16. Private sector partners continue to aid in water and sanitation system

17 Non-profit organizations continue to aid in WASH system
18 Communities are presented with opportunities to volunteer and/or engage in the WASH system
19 Target individuals, families and communities are convinced about benefits of hygienic habits
20 Barriers preventing target populations from utilizing WASH are minimized or overcome
21 The priorities of individuals/families are assessed
22 Accessibility issues are identified
23 Healthy water and sanitation options are made a comparitively more appealing alternative to existing options (e.g. community starts to believe it is shameful to defecate in the open)
24 Families and households are exposed to convincing messages to prioritize safe drinking water and sanitation for all members of the family

M. Measures and Evaluation

Indicators to measure effectiveness of delivery of clean water and sanitation exist
1 The local water supply is treatable to acceptable water **quality standards**
2 Mechanisms to measure quality of water delivered by water delivery system exist or can be developed
3 Quality of water is ensured throughout the municipal water delivery system where it exists
4 Various properties of water are measured throughout the water supply system
5 Physical properties (e.g. temperature, turbidity) of water are measured at key locations in the water delivery system
6 Chemical contaminants/ properties (e.g. presence of chemicals, pH, dissolved oxygen) of water are measured at key locations in the water delivery system
7 Biological contaminants (e.g. presence of pathogens, algae, phytoplankton) of water are measured at key locations in the water delivery system

- Quality of water delivered meets standards set by the government
  - Physical quality measures for water delivered are met
    - Color of water delivered to the consumer is within permissible limits
    - Turbidity of water delivered to consumer is within permissible limits
    - pH of water delivered to consumer is within permissible limits
    - Taste of water delivered to consumer is not objectionable
    - Water delivered to consumer is odorless
    - Conductivity of water delivered to consumer is within permissible limits
    - Suspended matter in water delivered to consumer is not detectable
  - Chemical quality measures for water delivered are met
    - Total dissolved solids in water delivered to consumer is within permissible limits
    - Total hardness of water delivered to consumer is within permissible limits
    - Aluminium content in water delivered to consumer is within permissible limits
    - Chloride content in water delivered to consumer is within permissible limits
    - Total iron content in water delivered to consumer is within permissible limits
    - Sodium content in water delivered to consumer is within permissible limits
    - Sulphate content in water delivered to consumer is within permissible limits
    - Zinc content in water delivered to consumer is within permissible limits
    - Magnesium content in water delivered to consumer is within permissible limits
    - Calcium content in water delivered to consumer is within permissible limits
    - Inorganic contaminants in water are within permissible limits
    - Organic contaminants in water are within permissible limits
    - Radioactive materials in water are within permissible limits
  - Microbiological content in water delivered is within permissible limits
    - Total Coliforms in 100 mL water is absent
    - E.Coli in 100 mL water is absent
    - *Staphylococcus aureus* in 100 mL water is absent
    - Sulphate reducing anaerobes in 100 mL water is absent
    - *Pseudomonas aeruginosa* fluorescence in 100 mL water is absent
    - *Streptococcus faecalis* in 100mL water is absent
    - *Shigella* in 100 mL water is absent
    - *Salmonella* in 100 mL water is absent

40 Quality checks and measures are performed at an acceptable/effective frequency as outlined by the government (as er population served by unit)

41 Quality of water is paid attention to at household level irrespective of water source (i.e. municipal or self-supplied)

42 Measures to check quality of water to be consumed at household are practiced (e.g. check color, check odor, check taste, check turbidity)

43 Precautionary measures to ensure hygiene and quality of water are followed at household level (e.g. boiling water before drinking, washing hands with soap)

44 Quality of water consumed is measured through health indicators (e.g. investigation of outbreaks, overall health of a community)

N. Sustainability

Country has or can develop sustainable approaches to managing water resources

1 Water and sanitation supply system is sustainable

2 Water sourcing mechanisms in place are sustainable

3 Existing water sources are sustainable for current and projected requirements

4 Existing water sources are sustainable for current and projected individual/ household requirements

5 Existing water sources are sustainable for current and projected community requirements

6 Existing water sources are sustainable for current and projected regional requirements

7 Depleting water resources can be replenished and maintained for sustainability

8 All individuals (from different sectors like domestic, private sector, government, agricuture) are aware of depletion of water resources and its implications for them and future generations

Water, Sanitation and Hygiene [WaSH]
Success Factor Tree

- All individuals (from different sectors like domestic, private sector, government, agricuture) work towards improving current conditions of depleting water resources
- Quality of source water is maintained for sustainability (e.g. point of use (POU) techniques are used to maintain quality)
  - Responsibility of maintaining quality is borne by an entity
- Infrastructure for sourcing water is sustainable
- Workforce that performs water sourcing is sustainable
- Water sourcing system is economically self-sustainable
- Water sourcing for self-supply is sustainable (individual/ household water sourcing techniques are sustainable)
- Alternate water sourcing mechanisms are sustainable

Water treatment mechanisms are sustainable

- Infrastructure/local practices utilized for water treatment is/are sustainable for current and projected requirements
- Chemicals utilized for water treatment is sustainable available
- Processes utilized to perform water treatments are sustainable/ can be improved
- Processes utilized to monitor quality of water are sustainable/ can be improved
- Workforce for operation and maintenance of treatment unit/ plant are sustainable
- Water treatment units are economically self-sustainable
- Supporting systems required to run water treatment operations are sustainable (e.g. electricity)
- Household level water treatment options are consistently available (e.g. water treatment kits, water treatment devices)

Water storage systems are sustainable

- Infrastructure for water storage systems are sustainable for current and projected requirements
- Quality and integrity of water stored is maintained according to required standards
  - Effective means to maintain quality and quantity of store facility are carried out regularly (e.g. desedimentation of dams, cleaning of household tanks/sumps)
- Workforce to manage water storage is sustainable
- Water storage systems are economically self-sustainable

Water transportation system is sustainable

- Effective maintenance systems are in place to ensure efficient functioning of the system
  - Regular maintenance checks are carried out at various locations in the system
  - Skilled workforce exist to perform timely checks
  - Instruments and resources exist to perform effective checks and repairs
  - Operation and maintenance activities are economically sustainable

Waste collection and disposal systems are sustainable

- Solid waste collection, transportation, treatment and disposal/reuse systems are sustainable

40 Waste water collection, transportation, treatment and disposal/reuse systems are sustainable
41 Human waste collection, transportation, treatment and disposal/reuse systems are sustainable
42 Industrial waste collection, transportation, treatment and disposal/reuse systems are sustainable
43 Domestic waste collection, transportation, treatment and disposal/reuse systems are sustainable
44 Workforce to support waste collection, transportation and disposal/ reuse are sustainable
45 Waste collection, transportation, treatment and disposal systems are environment friendly
46 The integrity of the water supply can be maintained
47 Water quality is assessed and any contamination is detected at vital points in the water supply process
48 Policies exist to maintain acceptable standards of water quality thoughout water supply process over time
49 Qualified and credible regulatory bodies exist to enforce policies
50 Community health is monitored
51 Water contamination, if exists, can be identified
52 Facilities exist to study contamination
53 Appropriately skilled employees ultilize facilities for water contamination treatment processes
54 Employees have certain degree of education to back their credibility
55 Acceptable working conditions can be created in the system
56 Water contamination, if exists, can be quantified
57 Water contamination, if beyond normal safety standards, can be overcome
58 Treatment techniques used are as per policies
59 Mechanisms exist to execute treatment
60 Water treatment costs are self-sustained/ or reliably supported
61 The cost to treat and distribute water can be supported by the system businesss model

62 Sustainability can be maintained through mindful water consumption and effective water treatment (e.g. by utilizing demand-responsive approaches to water supply)
63 Regulations are adhered to across all **economic sectors** (primary, secondary, tertiary sectors)
64 Primary economic sector
65 Agricultural/ farming sector utilizes water efficiently based on national policies
66 Farmers are educated about efficient water resource management
67 Effective mechanisms exist to educate farmers
68 Farmers are willing to engage in education
69 Farmers can access education
70 Farmers can afford education

71 Farmers adopt and implement water consumption regulation techniques
72 Disputes related to water usage in agriculture are peacefully resolved
73 Farmers are prepared to handle variation in climatic conditions, effecting their water availability
74 Secondary and tertiary economic sectors
75 Dynamic pricing strategies are incorporated to regulate consumption
76 Manufacturers and service-providers maintain water consumption as per national policies
77 A thorough study is made to understand water consumption of each industry
78 Regluations based on industry requirements are deployed
79 Water usage is monitored and streamlined in industries and institutions
80 Industries and service providers self-assess water consumption and streamline it if need be
81 Water availability and consumption is assessed
82 Means to optimize water consumption are identified
83 New systems with reduced water consumption and implemented
84 Water footprint reduction efforts are controlled and maintained
85 Industrial discharge practices are regulated to protect water supply
86 Regulations are set for water treatment
87 Treatment procedures and quality aspects conform to regulations set for the industry
88 Regular checks are made to ensure effective treatment of waste water for environmental purposes
89 Treated water is reused to prevent depletion of water resources

90 Organizations and institutions that run the WASH system are sustainable
91 Administrative bodies responsible for components of WASH system can sustain themselves
92 Bodies responsible for policy development on WASH are sustainable
93 Bodies responsible for WASH workforce training curriculum development are sustainable
94 Bodies responsible for financing the WASH system are sustainable
95 Bodies responsible for evaluation of quality and safety of WASH services delivered are sustainable
96 Bodies responsible for infrastructure growth and expansion with regard to WASH are sustainable
97 Communication channels used to spread awareness among populations are sustainable
98 Policies that govern WASH are sustainable and enable long term growth and development in the country

99 Entities that support and facilitate WASH systems are sustainable
100 Education system to educate population about WASH are sustainable

101 Healthcare systems are sustainable
102 Food systems and cleanliness standards utilized are sustainable
103 Energy delivery systems are sustainable (e.g., fuel)
104 Access to electricity is achieved and sustainable

O. Resilience

1 **Country is equiped with a responsive water system that can overcome disruptions in resource/service supply**
2 Country is equipped with social safety nets at national and regional levels
3 Mechanisms to combat various crisis scenarios exist (e.g. methods to combat climate variations)
4 Assessment of risk and pre-identification risk management mechanisms exist
5 Local regions dependent on rainfall for water are capable of handling climate variations
6 People of the region are equipped with accurate climate forecasts
7 Effective mechanisms exist to prepare people for forecasted rainfall in the region
8 Effective mechanisms exist to handle low rainfall (e.g. water collection techniques, judicious consumption/ mitigating demand, recycling/reuse techniques)
9 Effective mechanisms exist for agricultural sector to handle low rainfall (e.g. adaptable irrigation techniques, water resource management for farms and animals)
10 Effective mechanisms exist for industrial sector to handle low rainfall (e.g. recycling used water)
11 Effective mechanisms exist for domestic sector to handle low rainfall (e.g. rainwater harvesting, judicious water consumption techniques, recycling water - save water after cooking/ washing vegetables and use for other purposes)

Water, Sanitation and Hygiene [WaSH]
Success Factor Tree

12 Effective mechanisms exist to handle heavy rainfall and floods (e.g. drainage systems, practices to prevent landslides)
13 Effective mechanisms exist for agricultural sector to handle floods (e.g. drainage mechanisms, means to divert excess water)
14 Effective mechanisms exist for industrial sector to handle floods (e.g. means to protect machinery, divert flood water)
15 Effective mechanisms exist for domestic sector to handle floods (e.g. effective drainage techniques)
16 Effective mechanisms exist to prevent/ reduce/ overcome contamination due to flood water
17 Effective mechanisms exist to improve environmental conditions that are impacted by climate change and human activities (e.g. reducing soil degradation, deforestation)
18 Country is equipped to safeguard drinking water and sanitation systems (urban and rural) against disasters
19 Country is equipped to handle epidemics
20 Country has mechanisms that can enable local communities to detect possible epidemics
21 Country has mechanisms to find the root cause of epidemic if there is one
22 Country has mechanisms that can enable local communities to measure the extent of damage
23 Country has mechanisms that can enable local communities to contain possible epidemics
24 Country has mechanisms to safeguard water and sanitation systems from effects of epidemics

Water, Sanitation and Hygiene

- ⬟ = National
- ■ = Regional
- ● = Community
- ▲ = Household
- ◆ = Individual

RECIPIENT COMMUNITIES

- CONSUMER HOUSEHOLD ▲
- AGRICULTURAL USERS ◆
- INDUSTRIAL USERS ◆
- SCHOOLS ◆
- COMMERCIAL USERS ◆

RESEARCHERS ◆

SUPPORT ORGS

- CIVIL SOCIETY ORGANIZATIONS ●
- NON-GOVERNMENTAL ORGANIZATIONS ●
- FAITH BASED ORGANIZATIONS ◆
- NON-PROFIT/ACTION GROUP ●

WATER UTILITIES

- WATER SOURCE OWNER ■
- WATER COLLECTOR ●
- WATER PURIFIER ●
- WASTEWATER SANITATION ●
- WATER STORAGE ●

DISTRIBUTORS

- PUBLIC/GOVERNMENT ●
- PRIVATE ●

COMMUNICATORS

- HEALTH COMMUNICATOR ●
- MEDIA/MARKETING COMPANY ◆
- TELECOMMUNICATIONS PROVIDER ◆

INFRASTRUCTURE

- FACILITY MANAGER ●
- FACILITY MAINTENANCE PROVIDER ●
- FACILITY PROVIDER ●
- TRANSPORTATION PROVIDER ●
- WATER EQUIPMENT SUPPLIER ●
- HYGIENE MATERIAL SUPPLIER ●
- LOCAL WORKFORCE ●
- CONSTRUCTION PROVIDER ●
- POWER PROVIDER ■
- LOGISTICS PROVIDER ●

WATER REGULATOR ●

HYGIENE

- HEALTH ORGANIZATION ●
- HEALTH EDUCATORS ●
- MEDICAL PRACTITIONER ●

LOCAL INFLUENCE

- CULTURAL ORGANIZATIONS ●
- LOCAL LEADERS ●
- COMMUNITY/PEER SUPPORT GROUPS ●
- RELIGIOUS ORGANIZATIONS ●

VOLUNTEERS ◆

LABOR ORGANIZATIONS ●

WATER IMPORTERS OR EXPORTERS ⬟

FOREIGN GOVERNMENT ⬟

FINANCES

- PRIVATE INVESTORS ●
- PUBLIC DONORS ◆
- GOVERNMENT FUNDING ●
- AID ORGANIZATIONS ●

GOVERNMENT

- ECONOMIC MANAGER ⬟
- INSPECTION AND EVALUATION AGENCYH ⬟
- PUBLIC HEALTH AGENCY ⬟
- QUALITY MANAGEMENT ⬟
- ENVIRONMENT AGENCY ⬟
- POLICY MAKER ⬟
- ENFORCEMENT AGENCY ⬟
- UN ⬟
- LOBBYIST ⬟

CONFLICT/RISK MANAGER ■

SYSTEM TEMPLATE

SYSTEM ELEMENTS	SYSTEM LINKAGES	RATIONALE	STAKEHOLDERS TO INVOLVE	GAP
SECURITY/SAFETY				
POLICY				
LEADERSHIP/ GOVERNMENT				
INFRASTRUCTURE				
EQUIPMENT/ SUPPLIES				
WORKFORCE/ TALENT				
CAPITAL/ FINANCES				
PRACTICES				
AWARENESS				
MOTIVATION/ ACKNOWLEDGEMENT OF NEED				
ENABLING RESOURCES				
ADOPTION/HABIT CONVERSION				
MEASUREMENTS AND EVALUATIONS				
SUSTAINABILITY				
RESILIENCE				

SYNTHESIS OF PRIORITY

SCOPE

- ☐ Individual
- ☐ Household
- ☐ Community
- ☐ Regional
- ☐ National

CONTACT FOR QUESTIONS:
innovation@purdue.edu

FACILITATOR'S GUIDE*

RFA DESIGN INPUT SESSION

INTRODUCTION

After completing the Comprehensive Issue Analysis working session, teams focusing on each sector will have identified and ranked up to three priority success factors that they believe could advance progress on the session sector if supported through research. Pursuing research on the priorities, however, will require development of a Request for Applications (RFA) to formally solicit proposals from researchers to address those aspects of the success factor that are viewed as non-existent or operating at a less than adequate level. To this end, the RFA Design Input session is intended to gather key inputs that will facilitate the design of an RFA to specifically address each priority.

*Authored by Joseph V. Sinfield, Romika R. Kotian, Margaret M. Busse Purdue University, Innovation and Leadership Studies Program

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REQUEST FOR APPLICATIONS DESIGN INPUT SESSION

Overview

Development of an effective RFA requires clear definition of the scope of the priority to be addressed, the desired objectives of the effort and related outcomes, the timing of the impact required, and a range of details that form the technical foundation of the request, while ensuring that it is not redundant with prior/existing efforts and is instead focused on closing gaps in our understanding of the topic under investigation. Additional insight into the contacts, collaborators, and partners that may help address the priority are also valuable, as well as thoughts on potential research pursuits that could inform means to address the priority. Ultimately, these are all inputs that participants in the R4D are likely to be able to inform from their knowledge and experience, and gathering this input is the focus of the RFA Design Input Session.

PREPARING FOR THE RFA DESIGN INPUT WORKSHOP – FACILITATOR

Request for Applications Workshop Activity

The success factors that were deemed priorities in the CIA working session should meet the following three criteria:

1. The success factor is **significant** to overall efforts to realize sector-specific outcomes
2. The success factor is **not currently realized** in the existing system in the region of interest today
3. There is great likelihood that **research** on that success factor **can help realize a desired state**

Each of the prioritized success factors was cast in the context of a system during the CIA session, and each priority's System Template now serves as a focus for the RFA Design Input activity.

With this as context, facilitation guidance for the RFA Design Input session is as follows:

Logistics

Location

Participants should return to the breakout rooms they utilized for the Comprehensive Issue Analysis activity to engage in the RFA Design Input session. The breakout rooms include the Royal Palm Room (which will be split into two sections), as well as the Acacia and Ebony Rooms.

Timing

May 8th, 09:40 – 13:00 (Session timing shaded on overall agenda below)

08:30 – 09:30	Plenary: Comprehensive Issue Analysis
09:40 – 13:00	Issue Analysis Breakout Sessions (4 concurrent 3-hour sessions, by sector)
	[Tea Break at 11:00 am for 15 minutes]
13:00– 14:00	Lunch
14:00 – 16:00	**RFA Design Input Session**

Objective

The objective of this session is for participants in each team to:

1. Contribute their experience and knowledge to record important information that will help shape RFAs to specifically address each priority success factor that they believe could advance progress on the session sector if supported through research.

Facilitator's Pre-workshop Preparation

Your role as the facilitator is to guide participants through the following activity and support productive discussion among participants. We hope to encourage participants to provide added context on the nature of the gap to be addressed at the core of the priority success factors identified in the CIA working session. To prepare for your role, please –

1. Read this guide completely
2. Review the System Template [Figure 1] and RFA Design Input Template [Figure 2] and be familiar with its content and organization
3. Participate in training provided for facilitators
4. Ensure that all the items required at your session, as provided in the checklist in this document, are available before you start your session

Team Formation

For Part 1 of this session, participants should remain in the same teams formed during the CIA session.

Session Materials

Each breakout room should have the following materials and supplies:

- Completed System Templates for each priority success factor (up to 3 per table) [see Figure 1 for illustration]
- RFA Design Input Template (at least 3 per table) [see Figure 2 for illustration]
- Flip charts (1 per table)
- Flip chart markers
- Pens/pencils
- Highlighters
- Sticky notes
- Pins or tape (depending upon room wall materials)

Room Preparation

The room should be set up with individual tables arranged to accommodate 5 to 6 people. Each table should be near a wall on which the previously developed System Templates are posted. A flip chart should also be arranged near each table. Each table should then be provided with 3 RFA Design Input Templates, as noted above, as well as markers, pens/pencils, sticky notes, and pins or tape.

Facilitating the RFA Design Input Session

As participants in this session should already be acquainted from prior activities, the working session should start off quickly with a brief introduction period and then progress in two phases. Attempt to adhere to recommended activity timing as much as possible.

Activity Introduction *(10 minutes)*

1. **Introduction** – You should initiate the session by gaining the attention of attendees.
2. **Instructions -** You will be giving participants at your session instructions on what will take place during the session and introducing the concepts and logic presented in this document. This presentation will be provided to you prior to the session for convenience and consistency.

Once general instructions are provided, the workshop activity can commence. The workshop is divided into two main parts and a description of each is provided in detail below. **Importantly, teams should complete activity Part 1 for <u>each</u> of their top priorities (up to three) in the 60-minutes allotted for the exercise to ensure that there is time for the final activity.**

Activity Details: Part 1: Team Completion of RFA Design Input Template *(60 min)*

In the first part of the activity, participants should develop one RFA Design Input template **for each of their priority success factors** (up to three), using insights from their system level work to shape the inputs recorded on the RFA Design Input template.

The **RFA Design Input Template** requests 8 categories of information that will help inform RFA design. See Figure 2.

1 – Problem Definition
2 – Scope
3 – Technical Foundations
4 – Work-to-date Information
5 – Cross-cutting Issues
6 – Potential Contacts, Collaborators and Partners
7 – Impact Potential
8 - Potential Research Initiatives

The following information should be recorded in each of these sections:

1 *Problem Definition*: Here participants should record a concise statement of the specific challenge related to their priority that they believe can be addressed through research, the motivation for this focus, and the objectives and/or outcomes sought from a related research effort.
2 *Scope*: The scope definition should include details on the intended beneficiaries of the effort, their geographic location, and any quantification of the scale of the problem to be addressed
3 *Technical Foundations*: The section should specify any technical fields or domains that participants believe should lead the research to address the outlined problem statement or could otherwise contribute a valuable perspective on the problem.
4 *Work-to-date Information*: In this section participants should record knowledge of any past or on-going efforts that are related to or directly address the stated problem, any known gaps in this work, and any funding sources that may be support related work
5 *Cross-cutting Issues*: Here participants can capture any dependencies of the stated problem on issues of gender, conflict, or government.
6 *Potential Contacts, Collaborators, and Partners*: Here participants can outline any specific individuals, groups, or organizations that they believe could play a valuable role in accelerating or enhancing the impact of research intended to address the stated problem
7 *Impact Potential:* Here, participants should outline expectations on the nature of the effort likely required to address the priority and the time likely required to achieve outcomes. Categorization of the anticipated effort as fundamental research, development using established knowledge, or ready implementation of existing knowledge/solutions would be helpful.
8 *Potential Research Initiatives:* In this section, participants are encouraged to record specific project ideas or initiatives that they believe would help illustrate the kind of work that could advance efforts to address the stated priority.

Teams should be encouraged to record any knowledge or experience they have that would improve and/or focus the development of an RFA to address the priority success factor under discussion.

Once an RFA Design Input Template is completed for one success factor, teams should move on to their next priority success factor.

In the last 5 minutes of the activity, the team should post their RFA Design Input templates on the walls around the room at a legible height and spacing. This will create a showcase of the RFA Design Input Templates that will be reviewed and enhanced by session participants in the second part of the session.

Activity Details: Part 2: Group Improvement of RFA Design Input Templates *(50 minutes)*

In the second part of the session, all breakout session participants should be encouraged to walk the room, examining each RFA Design Input Template. For any success factor on which they have experience, they should be encouraged to annotate the template either directly or through the attachment of a sticky note that could enhance the information already provided.

This should be a very dynamic activity and participants should be encouraged to move around the room, scanning all RFA Design Input templates.

At the end of the session, the facilitator should gather the participants, thank the group for their hard work and energy, and call out some measure of the success of the session (e.g., "We have identified xx priorities today from more than yy hundred at the start of the day – an achievement enabled only by your dedication to this process. Thank you for your engagement!")

End Products

By the end of the session, each team should have completed up to three RFA Design Input Templates – one for each of the topics prioritized by the teams – and gathered input from the collective set of participants in the session. All templates should be collected by the facilitator and delivered to the Purdue team for further analysis and review.

SYSTEM TEMPLATE

SYSTEM ELEMENTS	SYSTEM LINKAGES	RATIONALE	STAKEHOLDERS TO INVOLVE	GAP
SECURITY/SAFETY				
POLICY				
LEADERSHIP/ GOVERNMENT				
INFRASTRUCTURE				
EQUIPMENT/ SUPPLIES				
WORKFORCE/ TALENT				
CAPITAL/ FINANCES				
PRACTICES				
AWARENESS				
MOTIVATION/ ACKNOWLEDGEMENT OF NEED				
ENABLING RESOURCES				
ADOPTION/HABIT CONVERSION				
MEASUREMENTS AND EVALUATIONS				
SUSTAINABILITY				
RESILIENCE				

SYNTHESIS OF PRIORITY	SCOPE
	☐ Individual ☐ Regional ☐ Household ☐ National ☐ Community

Figure 1. System Template

RFA DESIGN INPUT TEMPLATE

1 - PROBLEM DEFINITION	3 - TECHNICAL FOUNDATIONS	5 - CROSS-CUTTING ISSUES	7 - IMPACT POTENTIAL
PRIORITY TO BE SOLVED WITH RESEARCH MOTIVATION OBJECTIVES/OUTCOME	TECHNICAL FIELDS/DOMAINS TO LEAD RESEARCH	e.g. GENDER EQUALITY, CONFLICT RESOLUTION	TIME TO IMPACT | NATURE OF REQUIRED EFFORT
2 - SCOPE	**4 - WORK-TO-DATE**	**6 - POTENTIAL CONTACTS/ COLLABORATORS/PARTNERS**	**8 - POTENTIAL RESEARCH INITIATIVES**
TARGET POPULATION GEOGRAPHIC LOCATION SCALE	PAST/ONGOING EFFORTS/RESEARCH GAPS IN WORK-TO-DATE FUNDING SOURCES	SPECIFIC ENTITIES THAT CAN ENHANCE IMPACT	e.g. DEVELOPMENT OR APPLICATION INITIATIVES, DATA COLLECTION & ANALYSIS, LITERATURE REVIEW, CASE STUDIES

Figure 2. RFA Design Input Template

Tips for Facilitators:

- Encourage participants to take ownership of the work products and activity deliverables. The facilitator should refrain from being a scribe.
- Encourage participants to use the templates to guide their work
- Encourage participants to convey their knowledge and experience – this is a key input for our collective success
- Encourage capture of both positive and negative case inputs that may help focus an RFA

Contacts for more information:

During the session three members of the Purdue Innovation Studies Program will be on-site to help in guiding the teams and/or answer questions: Prof. Joe Sinfield, Romika Roshan Kotian, and Maggie Busse.

In the interim, if you have any questions related to the CIA process or facilitation of the session feel free to contact the Innovation Science team at **innovation@purdue.edu**

GLOSSARY

RFA Design Input Template: A large-format printed document used to record the participant inputs on 8 key areas of information that can inform the design of a robust and focused Request for Applications to address the priority success factors identified in the CIA working session

System Template: A large-format printed document used to record the success factor priorities and related dependencies that a team believes warrant research based effort

Success Factor: Any of literally hundreds of resources, relationships, roles, or actions that likely must be in place to enable a functioning system capable of achieving desirable outcomes related to a sector

FREQUENTLY ASKED QUESTIONS

General Facilitation Questions

1. **What must I do as a Facilitator?**

   Ans. Facilitation is the process of enabling teams of people to collaborate in a cooperative manner to help them achieve their goal. You should move around the room and interact with participants to make sure all the teams are collaboratively progressing on the assigned task according to the provided timeline. Additionally, you will help any teams that are uncertain about how to execute certain steps of the activities.

   Below are some tips to help you with this process.
   Dos:
   - Do come prepared for the session by completing all required pre-work.
   - Do encourage participants to take turns voicing their opinions and comments along with listening to other participants' thoughts and views.
   - Do encourage participants to use the provided templates to guide their work.

   Don'ts:
   - Don't participate in or contribute to a team's brainstorming process for the activity.
   - Don't get side-tracked into long conversations with individuals or teams.

2. **How should I (facilitator) prepare myself for the RFA Design Input session?**

   Ans. Read this guide in its entirety and complete all tasks listed in the 'Facilitator's Pre-workshop Preparation' section of the Facilitator's Guide. Contact innovation@purdue.edu with questions you have about the facilitation before the session.

3. **What should I (facilitator) do if there are participants who are not actively involved in discussion?**

   Ans. These participants may be identified as the ones sitting quietly, on their phones or working alone. Ease these individuals into the process. Give them an opportunity to share their thoughts and ideas with their team by asking them what they think.

4. **How do I (facilitator) help a table that is finding it difficult to follow the process?**

   Ans. Start by asking the participants at the table to describe the step that they find difficult. Next ask them to describe what they think a solution might be. If what they describe aligns with the process they are required to follow, encourage them to implement their ideas. If not, guide them to their pre-read documents and explain what they need to do.

5. **What should I (facilitator) do if a table finishes early?**

   Ans. Request that the table summarize their work to you so you can assess if they have performed the required tasks as per instructions.

- If not, request that they iterate on the parts that they can improve.
- If they are indeed done with required deliverables encourage them to help other teams.

6. **How should I (facilitator) manage conflict of opinion? / How should I (facilitator) help a team that is finding difficulty in reaching consensus?**
   Ans. Discussions and debates on differences of opinion are an integral part of this session. Participants are required to reason with each other to complete the activity. If the debates go beyond appropriate limits, contact one of the managing facilitators (from the Purdue team) so that they can address the situation.

RFA Template Questions

1. **What should be written in the RFA Design Input Template?**
   Ans. The section on Activity Details, Part 2 of your Facilitator's Guide provides detailed information on completing the system template.

2. **Can participants brainstorm/ use a different method to fill the RFA Design Input Template than recommended?**
   Ans. Participants should be encouraged to utilize the proposed approach to ensure that all needed RFA Design Input details are captured. The procedure and template for the activity is designed to allow participants to understand the full scope of success factors that shape an RFA.

3. **Can a participant draw from their experience to inform inputs to inform the RFA Design Input Template?**
   Ans. Yes, and this should be encouraged, although input that is anecdotal should be noted as such.

4. **Can people send in more thoughts to shape RFAs after the working session?**
   Ans. Additions to the RFA Design Input process are always welcome. However, participants should recognize that only inputs gathered at the session will have timely influence on the request for applications (RFAs) that will result from the workshop, so providing inputs during this session is ideal.

General Session Related Queries

1. **What expectations should facilitators and participants have for the session?**
   Ans. The RFA Design Input session will be an active working session which involves collaboration between people from various backgrounds and disciplines.

2. **How will session outputs be used?**
   Ans. Completed RFA Design Input Templates will be used as guides to inform the Requests For Applications that will be developed and launched following the R4D event.

3. **What if a team is running out of time?**
   Ans. Monitor the teams to make sure they follow the provided timeline to prevent this from taking place. If at the end of any part of the session, you find teams that have not made sufficient progress, request the teams break up work to ensure capture of as many inputs to the RFA Design Input Template as possible in the time available.

4. **Will participants remain in the same teams as in the CIA session?**
   Ans. Yes, for the first two parts of the RFA Design Input session.

5. **On what basis are the teams formed?**
   Ans. Teams are pre-assigned to participants to ensure that perspectives from different disciplines are present at each table.

6. **What if participants would like to consult local stakeholders to obtain input from them?**
   Ans. Encourage them to do so if someone with relevant background is present at the session. Note also that each participant in a given breakout session will have a chance to comment on all RFA Design Input Templates during the third part of the activity.

7. **What materials will be provided to participants?**
   Ans. All materials listed in the attached checklist will be provided.

8. **How will funds be allocated toward priorities after the session?**
   Ans. Funds will be allocated through rigorous review of applications to the Request for Application (RFA) process that is being deployed by the LASER PULSE consortium.

9. **Can participants leave the room and work elsewhere?**
   Ans. No. The working session is designed to be a collaborative and interactive session that requires in-person engagement.

RFA DESIGN INPUT TEMPLATE

1 - PROBLEM DEFINITION

PRIORITY TO BE SOLVED WITH RESEARCH

MOTIVATION

OBJECTIVES/OUTCOME

2 - SCOPE

TARGET POPULATION

GEOGRAPHIC LOCATION

SCALE

3 - TECHNICAL FOUNDATIONS

TECHNICAL FIELDS/DOMAINS TO LEAD RESEARCH

4 - WORK-TO-DATE

PAST/ONGOING EFFORTS/RESEARCH

GAPS IN WORK-TO-DATE

FUNDING SOURCES

5 - CROSS-CUTTING ISSUES

E.G., GENDER EQUALITY, CONFLICT RESOLUTION

6 - POTENTIAL CONTACTS/ COLLABORATORS/PARTNERS

SPECIFIC ENTITIES THAT CAN ENHANCE IMPACT

7 - IMPACT POTENTIAL

TIME TO IMPACT

NATURE OF REQUIRED EFFORT

8 - POTENTIAL RESEARCH INITIATIVES

E.G., DEVELOPMENT OR APPLICATION INITIATIVES, DATA COLLECTION & ANALYSIS, LITERATURE REVIEW, CASE STUDIES