Global Food System Index
Project Proposal

Prepared by IFPRI, World Bank, Rabobank, Landesa and WEF Global Challenge on Food Security and Agriculture

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Executive summary

Despite the critical role the global food system plays in ensuring human and ecological well-being, a tool to understand its many moving parts does not yet exist. While indices on selected parts of food systems have been created (i.e. Global Nutrition Report and Global Hunger Index), an integrated measurement framework evaluating the different dimensions of food systems is still lacking. Leading international experts, gathered in the Global Agenda Council (GAC) on Food and Nutrition Security of the World Economic Forum, are of the opinion that such a framework would add significant value for governments, policy makers, research institutions and actors in food supply chains.

A working group of the GAC has taken this idea forward and has developed a Concept Note and a Project Proposal for a Global Food System index (GFSI). This report contains the Project Proposal for the development and use of the GFSI. The GFSI will be a comprehensive measure that embraces all dimensions of the global food system from production to consumption. It aims to provide a broad and practical tracking and monitoring tool of national food systems to ensure sustainable food and nutrition security for all, and relatedly, to support the achievement of multiple Sustainable Development Goals (SDGs).

The time to develop this Index is now, given the increasing attention for the well-functioning of food systems, the ongoing search for elements of effective food policy, and the ambition to end global hunger and malnutrition as laid down in the recently adopted Sustainable Development Goals of Agenda 2030. Governments, policy makers, global and local food companies and development agencies all benefit from a measurement framework that assesses the strength of countries' food systems in their various dimensions, in the light of the challenges of food and nutrition security, poverty and hunger, climate change, depletion of resources and population growth.

The purpose of this work plan is to provide a concise overview of the importance, objectives, proposed activities, and anticipated use of the GFSI; to develop an international coalition of partners contributing to the development and use of the Index; and to seek funding from donor organizations for the detailed design, development and operations of the Index.

The overall aim of the GFSI is to improve the understanding of the performance of national food systems across six key dimensions: Nutritious and healthy consumption, market linkages and enabling environment, productivity, resource efficiency, environmental sustainability and climate resilience, and social sustainability. Each dimension will be comprised of a parsimonious set of indicators that describe the food system's performance in that dimension, and will include relevant indicators on policies and drivers of change that can support such performance. The purpose of the GFSI will be to help stakeholders prioritize investments and assess policy and institutional support. Further, the GFSI represents a uniquely comprehensive tool for measuring performance toward multiple SDGs by tracking and monitoring country-level progress toward improving their food systems across the six dimensions outlined. It will allow countries to benchmark the outcomes of their food policy on each of the 6 dimensions, identifying both strengths and weaknesses via-á-vis their peers.

Given the many potential uses for a tool to track national food systems, the GFSI will respond to the need for a rigorous yet easily comprehensible measurement of the performance of national food

systems. Its concise data packaging and easy-to-understand presentation will allow for practical application both in lay settings and specialized fields. Yet despite its ease of use, the Index will be constructed with careful statistical rigor around the six key dimensions, and will incorporate the most relevant data and indicators. It will also respond to new data and indicators as they become available, particularly those that will be used for the SDGs. By means of a structured user feedback mechanism and through continued scientific advisory by an independent technical committee, the GFSI will continuously be updated and will also be a tool to identify and fill data gaps for relevant indicators.

Our scope for the development and use of the GFSI is 15 years, coinciding with the plan period of the SDGs in the Agenda 2030. In our budgeting estimate, we have included the development of the GFSI based on the Concept Note as well as operations and maintenance of the Index for a period of 3 years.

The development and logical design of the GFSI is being led by the Working Group of the GAC on Food and Nutrition Security. The technical design, implementation and operations will be done by a host organization to be selected. Both phases will be executed under a governance structure to ensure strategic and technical guidance, as indicated in the sequel of this proposal. After describing the concept of the GFSI, the proposal covers six work packages to develop and launch the initiative. The proposal describes potential synergies with other initiatives that are active in this space, to avoid duplication of work and reduce development time until initial release.

The GFSI Concept Note and this Project Proposal will be submitted to potential donor agencies. We kindly ask for your support in developing and implementing the GFSI. With your support, we can select a host organization and take this promising measurement framework forward. We *can improve* food systems when we *know* – when we know of their current performance and resilience, when we can benchmark them against best practices in peer country groups, and when we can identify dimensions and individual KPIs that most effectively lever the improvement of the entire food system. The members of the World Economic Forum's Global Agenda Council on Food and Nutrition Security would highly appreciate your support for this ambitious and pivotal project.

Working Group of the Global Agenda Council on Food and Nutrition Security:

IFPRI[1]
Landesa
Rabobank
World Bank Group Agriculture Global Practice
World Economic Forum Global Challenge on Food Security and Agriculture

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[1] Under its Compact2025 initiative.

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Background, rationale, and objective

A food system that sustainably provides food security and nutrition for all is essential to promote and maintain the well-being of all people and of the planet. Food security, defined by the Food and Agriculture Organization (FAO), exists when "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (Source: FAO SOFI 2011[2]). The four pillars of food security are availability, access, utilization and stability. These, combined with nutrition and sustainability, provide the foundations of a desirable food system. Such a food system will be key to achieve multiple Sustainable Development Goals (SDGs). For these reasons, a Global Food System Index (GFSI) is critical to monitor and track progress toward a desired food system.

By providing decision makers with a broad and practical tracking and monitoring tool, the GFSI would support the World Economic Forum's Global Agenda Council on Food and Nutrition Security mandate of ensuring sustainable food and nutrition security for all. The GFSI will aim to fill a gap among a crowded field of indexes and indicators; while many indexes exist, none distills the complexities of the entire food system into a single index or set of indexes.

The GFSI will be developed and disseminated to help users prioritize investments in food systems, assess the policy and institutional support for climate smart practices and sustainable systems, and track the development impacts of food systems (among other uses). It will allow users to dynamically work with the various dimensions of the Index to better understand the complexities of food systems. Users of such an index may come from various sectors and spheres, including decision makers in governments, international organizations, the private sector, donor agencies, civil society, and academia.

Drawing from the UN Secretary General's Zero Hunger Challenge, a food system is defined as a system that "embraces all elements (environment, people, inputs, processes, infrastructure, institutions, et cetera) and activities that relate to the production, processing, distribution, preparation, and consumption of food and the outputs of these activities, including socio-economic and environmental outcomes." Understanding the many moving parts of a food system requires a tool; in this case, an index.

This concept note lays the foundation for the index we aim to develop. Our attempt here is not to challenge or resolve abstract questions on the concept and definitions of food systems, but rather to create an evidence-based tool, useful to practitioners, for understanding the complexities and improving the quality of food systems that affect people's lives.

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[2] http://www.fao.org/docrep/meeting/026/MD776E.pdf

Concept of the Global Food System Index

Defining the Global Food System Index

An ideal global food system would successfully address challenges to human and ecological well-being across all of its aspects. To track progress toward such a system, the GFSI would cover six key dimensions: Nutritious and healthy consumption, market dynamics, enabling environment, productivity and resource efficiency, environmental sustainability and climate resilience, and social sustainability.
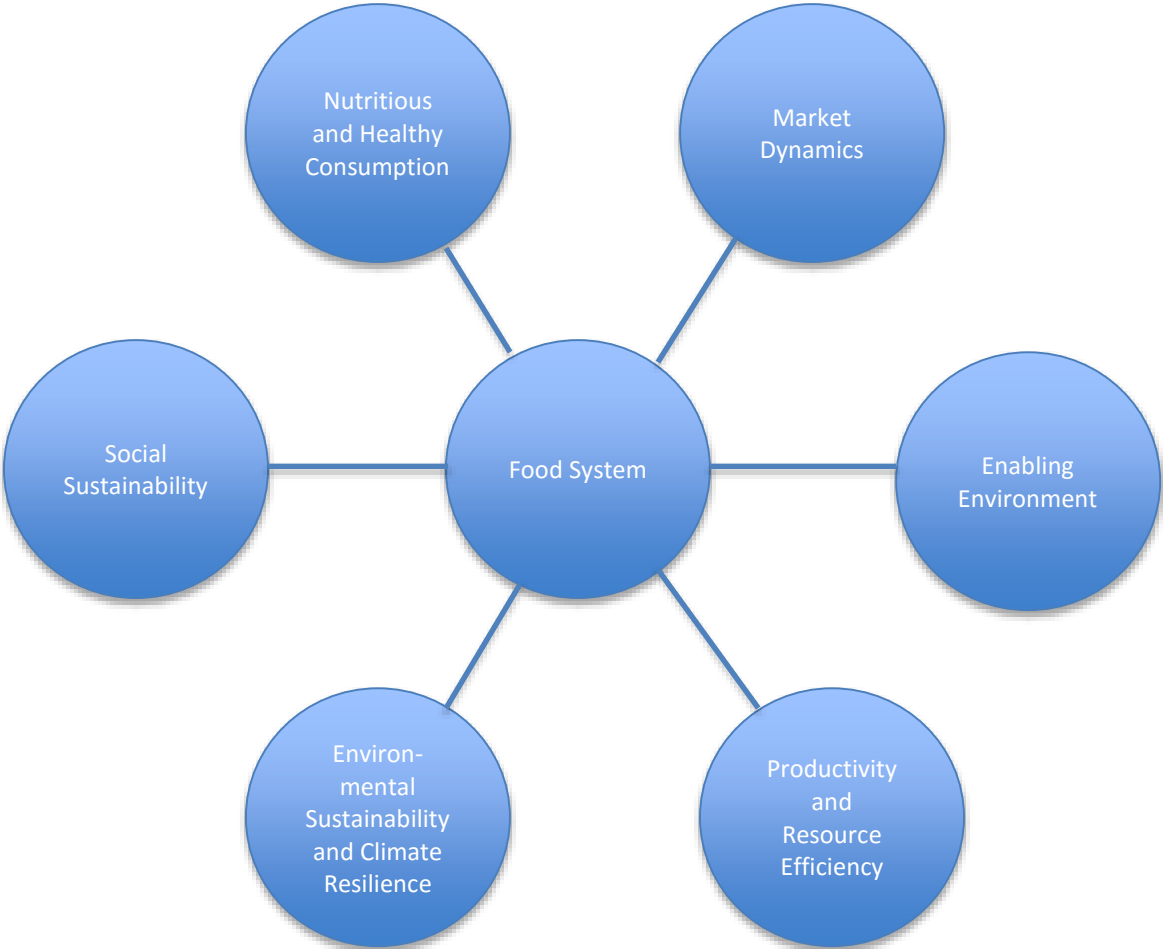
The 6 dimensions are defined in detail in the Global Food System Index Concept Note, version 2.1.

Constructing the Global Food System Index

Given the exploration of existing indices (see the table in the Concept Note), the proposed GFSI will be of value to those interested in a holistic measure of the status and progress of a country's food system in an easy to understand fashion (see Figure 1 which depicts the status of a hypothetical food system for two countries).

Figure 1: Hypothetical depiction of two countries' food system index
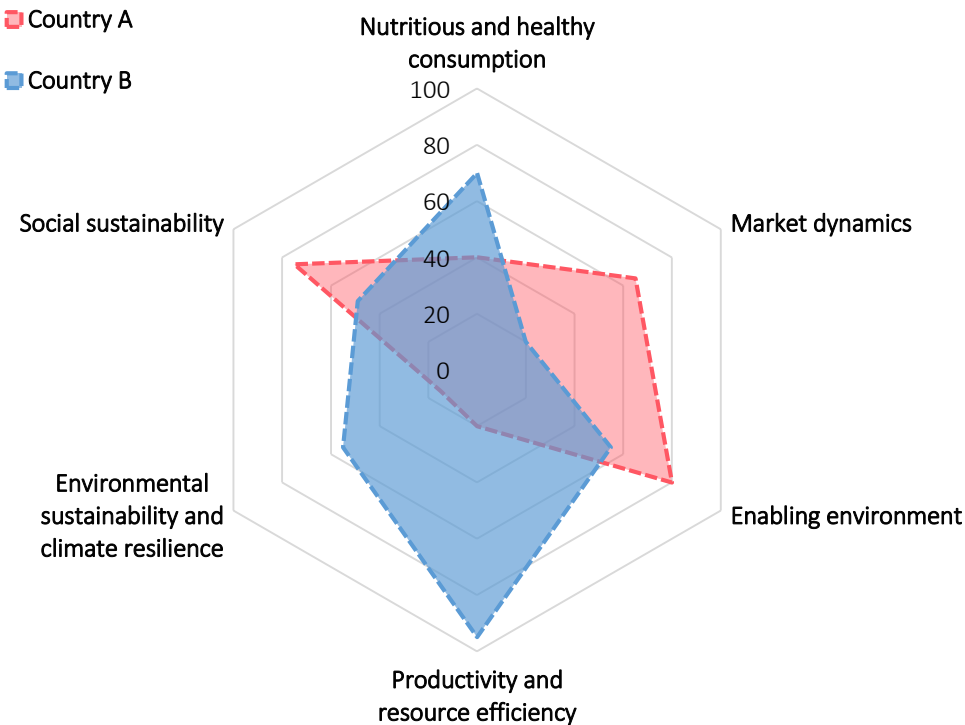
Composite food system scoring

While it is tempting to aggregate all six dimensions into a composite index that ranks national food systems, there is no clear methodological basis to do so. "Ranking" countries in one overall index is generally found adverse to initiating an open discussion on the various strengths and weaknesses of a country's food system, and frequently leads to a methodological discussion instead. At the same time, a composite score is preferred for attracting attention to the Index and to food systems assessment. It also helps countries in assessing the progress, or backsliding of their own food system over time.

The GFSI user interface will provide an accessible snapshot of a country's food system in the form of a "dashboard" with scores on each dimension. It will also provide functionality to assign weights to each dimension, thus allowing users to construct their own composite index. Lastly, it will provide functionality to graph the development of food system scores per country over time, both on individual dimensions and on composite level. The GFSI team will experiment with a weighting system by itself, and publish a weighting system arriving at a composite score if and when a clear methodology for

assigning weights has been established. One of the options here is to take the average of weights proposed by a list of experts (to be advised by the GFSI expert panel). The weighting model can be further adjusted based on the outcomes of uncertainty and sensitivity analyses. This approach aims to secure transparency of the methodology while improving robustness of the resulting model.[3]

Trend analysis and drivers of change

While absolute measures of a food system are of great worth in themselves, for policy development and agenda setting it may add great value to enhance the functionality to include trend analysis, regression analysis, identification of drivers of change and scenario analysis. This can be facilitated both by a data and calculatory environment, but also by space to include theories or discussions of food systems modeling and food policy. Thus, the platform can become a discussion forum and facilitate discussions on food policy and food systems development.

Data selection and data management

The selection of indicators will to large extent depend on data availability and frequency and coverage of data collection. Indicator selection and data collection for the GFSI will be aligned with and learn from other initiatives, including the data gathering initiative for the SDGs (a.o. by FAO Stats). Ultimately, to improve measurement toward a desired global food system, efforts and resources should also be concentrated on supporting an index that integrates new and timely data for each of the six dimensions of the global food system. Ongoing efforts to develop statistical capacity and generate new data in developing countries will be leveraged.

Expanding on previous investment in index composition

Developing the GFSI will require building a database of food system indicators. A potential collaboration with Brookings *Ending Rural Hunger* (ERH) initiative can provide an opportunity to get a head start in the construction of the database backing the Index as well as the web interface. While the ERH database does not overlap entirely with the requirements of the GFSI, much of the data underlying each initiative's measurement framework is similar. Working together with ERH could reduce the confusion of presenting parallel food system tracking frameworks while simultaneously reducing costs.

Dynamic modeling and incorporation of new data and insight

While the initial logical and technical design of the GFSI will be executed with due care and level of detail, we are well aware that our data model will evolve over time, that initially not all desired data will be available and also that the momentum around the SDGs requires quick availability of the first release of the GFSI. We will therefore strive to deliver a first release on relatively short notice (within a year of initiation of the 6 work packages), that does not necessarily need to be 100% complete but can be updated and improved based on user feedback and recommendations from our technical experts panel.

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[3]   This same approach of establishing weightings will also be used to construct the scores on each dimension from the scores on the underlying KPIs in that dimension.

User interface

The user interface of the GFSI will disclose the data in a well-organized and accessible way through an independent website. The user interface will allow users:

- To log in, and to save their preferences and work environment as users.
- To retrieve, order and graph data by country, by GFSI dimension and by time period.
- To retrieve data on underlying parameters and on the source and timeliness of these data.
- To retrieve information on identified data gaps.
- To form benchmark groups of countries and graph spider webs per group.
- To attach weights to dimensions and calculate composite scores.
- To perform a trend analysis by country and by dimension by time series on both the composite score and individual dimension scores.
- To perform regression analysis on GFSI dimensions and sub-indicators.
- To post theories, thoughts, experience and lessons learned on food systems, food systems development and food policy.
- To provide feedback to the GFSI team and propose model, data and user interface improvements.

Hosting

Beyond compiling the underlying database and constructing the Index, the GFSI must be operationalized and maintained in the long term. Changes to the analytical framework will likely be made to accommodate new data and indicators that will be developed, particularly those that will directly measure progress for the SDGs. Identifying a host organization where the GFSI can be run, kept operational, and updated with frequency will be key for its long term viability and use. A short list of potential host organizations has been assembled.[4]

In concurrence with donors, we will obtain technical and financial proposals from a selected shortlist of candidate hosting institutions, or, alternatively, select one preferred host organization from our list below, and obtain an independent expert opinion on the market conformity and technical and financial viability of the proposal of that host organization. Regardless the choice for host organization, it is assumed that IFPRI will remain involved in model maintenance and development.

System maintenance

The work plan in the next chapter describes the steps required to get the project off the ground. It also prepares for the ongoing system maintenance of the project. Keeping the GFSI operational and updated will require system maintenance to the underlying database as well as the analytical framework to accommodate and adjust for new or updated indicators. The resources will be needed to maintain and update the GFSI. For example, the GFSI will require that a database be created or migrated and adapted from an existing database, and then later be updated and maintained on a server hosted by the GFSI initiative.

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[4] Candidates include Wageningen UR (University and Research Centre) NL, Cornell University US, RIVM NL, ZEF Germany, Max Planck Institute Germany, IDS GB, MSU US and IFPRI US.

An indicative budget for development and system maintenance per annum is also given in the next chapter. Upon shortlisting of one or more potential host organizations, actual quotes can be obtained with which the budget can be validated, refined and recalibrated where necessary.

Communications Plan

The success of the GFSI is only partially dependent on its diligent logical design and rigorous and faultless technical implementation – and to large extent also on communications and its (perceived) relevance of the GFSI findings to global food policy discussions and the implementation of the SDGs.

As part of the overall project management, a detailed and well resourced communications plan will accompany the technical work. Incubated in the context of the WEF's Global Agenda Council on Food and Nutrition Security, the GFSI can benefit from the unequalled convening power of the Forum, but also from the research networks of IFPRI, CGIAR, universities and think tanks like Harvard, MIT, Wageningen, Cornell, Brookings Institute and others, from the highest level international policy networks in which the World Bank Group participates, from topic-oriented organizations who are part of the GAC, from representatives of leading producer and consumer organizations, and last but not least from private sector industry leaders such as Unilever, Rabobank, DSM and others.

Work Program and Indicative Budget

This work program is designed for the further design, development and implementation of the GFSI over a 2-year period, followed by and partly overlapping with a period of the first 3 years of operations and maintenance. Specific expected outputs of the program are indicated in Annex 1.

This project will include a number of work packages (see Figure 2). The main activities of each of the work packages are briefly discussed below. While the 6 work packages denote the main components involved in the development of the GFSI, these should not be interpreted as isolated sets of activities. There will be fluidity and some necessary overlap among the various activities mentioned below, contributing to product developments throughout the plan period. The work program includes ongoing system maintenance work that will be necessary to keep the GFSI and its underlying database operational and frequently updated.

Figure 2: Work packages (WPs) to develop and operate the Global Food System Index
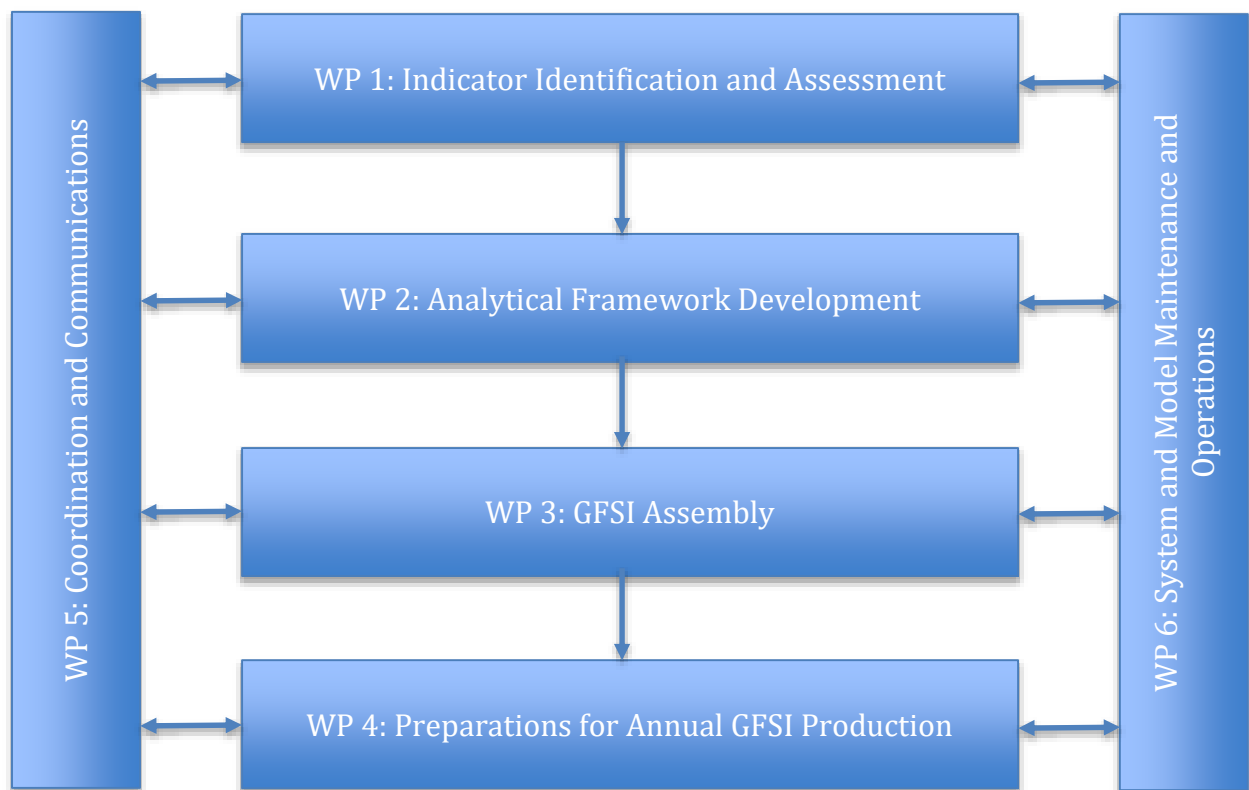
Work Package 1: Indicator Identification and Assessment

- Further identifying indicators for the six dimensions of the GFSI
- Selection of GFSI indicators according to a careful assessment of best available indicators
- Identification of data gaps
- Data collection and data cleaning
- Led by IFPRI, involvement of Host Organization on technical availability of data

- Output 1: Detailed design of GFSI, indicator selection and data model
- Output 2: Initial data gap report

Work Package 2: Analytical Framework Development

- Development of an analytical framework for index construction
- Standardizing and weighting the GFSI variables
- Testing the robustness of the GFSI variables
- Led by IFPRI, involvement of Host Organization to ensure continuity towards implementation
- Output 3: Analytical framework report
- Output 4: Data model assessment report

Work Package 3: GFSI Assembly

- Piloting GFSI in 5 countries[5]
- Scaling up GFSI
- Database Programming
- Data Management Programming
- User Interface Programming
- Led by Host Organization, evaluation and model maintenance by IFPRI
- Output 5: Flagship report on GFSI design, test and pilot results, and initial release
- Output 6: Executable system, including database design, data management procedures and system, user interface, website design and feedback handling procedures

Work Package 4: Preparations for Annual GFSI Production

- Development of an institutional framework of partnering organizations that will ensure the annual production of the GFSI
- Development of a plan that ensures the annual production of the GFSI for at least 15 years, clearly indicating the resources that will be needed
- Handover to Operations and Maintenance Phase
- Production test and acceptance
- Led by Host Organization, governance aspects by Coordinating Team
- Output 7: Governance framework, terms of reference for each entity, proposed participant list
- Output 8: Operations and maintenance plan
- Output 9: Production test report and acceptance

Work Package 5: Coordination and Communication

- Outreach activities
- Project management and project governance
- Led by Project Management, initially GAC, later Coordinating Team, advised by Host Organization
- Output 10: Communications strategy
- Output 11: Project plan

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[5]   Proposed countries: Bangladesh, Ethiopia, Malawi, Netherlands, Peru

Work Package 6: System and Model Maintenance and Operations

- Updating the GFSI analytical framework according to new data or indicators
- Maintaining and updating the underlying database
- Version management and documentation
- Operations for a 3-year period (budgeted) resp. 15 year (foreseen operational period)
- Led by Host Organization and IFPRI
- Output 12: Data model, database model and user interface updates incl. version documentation

Indicative budget

A preliminary – and only indicative – budget was retrieved by comparing the development and annual operations and maintenance of the GFSI to budgets of a few other indices and measurement frameworks. Typically, initial development of these indices ranges between USD 3 – 10 mln and annual operations and maintenance between USD 2 – 5 mln.

The greatest unknown variable here is the data gaps that will surface, and the cost of data collection to fill those gaps. Data gaps will be indicated in the "Data gap report" that the GFSI team will produce on an annual basis. Given the potentially huge cost to cover any significant data gaps on a global scale, we will separately seek funds on a topic-by-topic basis, or relate to interest groups for those specific topics, and thus exclude that part of the budget from the indicative budget requirements presented here. A relatively small budget provision has been included in the annual operations and maintenance budget to close smaller data gaps only.

Secondly, the user interface can be expanded at length, i.e. to support theory development, extensive trend- and scenario analysis, statistical analysis etc. As the Global Agenda Council has indicated that it prefers a relatively soon implementation of a somewhat restricted data model and functionally basic user interface over a longer stretched development of a more elaborate system, we will have to make trade-offs here for the sake of time. Again, any functional development beyond the reservation for annual maintenance and updates, will be funded separately if and when necessary.

Our indicative budget estimate at this moment for development and annual operations and maintenance then, is:

- Development (work packages 1 – 4):   USD 3 – 5 mln   once[6]

- Operations and Maintenance
    - Secretariat, governance costs, model maintenance   USD 1 mln   per annum
    - Operations, technical and functional maintenance   USD 1.5 mln   per annum
    - Reservation for new data   USD 0.5 mln   per annum
    - Reservation for new functionality   USD 0.5 mln   per annum

This estimated budget needs to be refined and recalibrated in collaboration with host organization, donors and potential other partners. At this point, we aim to raise funds for the initial development of the Index (to be realized between mid 2016 and mid 2017) and for three years of operations and maintenance (between mid 2017 and mid 2020). Upon evaluation of the Index in 2019, we aim to extend the horizon of our fundraising, eventually to cover the full period until 2030.

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[6]   If a smaller amount can be separated as seed funding prior to finalizing the full funding, this will allow IFPRI and the WEF Working Group to continue the detailed design of the GFSI.

Governance and partnerships

Governance structure

The GFSI shall be positioned as neutral instrument, neither politically nor organizationally biased. It will derive its legitimacy from a platform of (organizations of) scientists, topical experts and R&D leaders and its impetus to update and improve from a transparent and easily accessible user feedback mechanism.

Figure 3: Proposed governance structure

Implementing the work packages to develop the GFSI and its outputs will require strategic oversight, technical advice, and day-to-day management. The governance structure of the project, depicted in Figure 3, is proposed to be comprised of several levels:

1. A **Stakeholder Group** will be the decision-making body for the GFSI. It will set priorities for further development, assign budget, provide strategic guidance and promote the use of the GFSI among various stakeholders. It will set the Terms of Reference for its advisory committees and will contract work to the Development and Host Organizations through its Coordination Team. Thus, the Stakeholder Group will give the Coordination Team, Host Organization, and IFPRI as Development Organization their mandates.
   The Stakeholder Group will include representatives from donor agencies, national governments, business and farmer groups, civil society, the host organization, the Chairperson of the Expert Advisory Board, IFPRI, and the WEF Global Challenge on Food Security and Agriculture.
   The Stakeholder Group will select an Independent Chairperson for itself for a two-year term.

2. An **Expert Advisory Board** will provide expert advice on performance measurement of food systems and on how best to model and construct the GFSI and improve it over time, particularly as new data and indicators become available. By its composition of a diversity of highest-quality scientists and researchers from renowned institutions, it lends credibility and accountability to the GFSI. Besides its primary advisory role towards the Stakeholder Group, the Expert Advisory Board will also advise the Host Organization on prevailing topics.

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It will include representatives from internationally renowned R&D institutions on food systems, food policy and agriculture (including CGIAR); universities renowned for their research in this field and national agriculture research centers; multilateral development agencies; the business community; farmer organizations; civil society; and UN. Attention will be paid in selecting Expert Advisory Board members with specific expertise across the six dimensions of the GFSI, along with ensuring global representation.

The Expert Advisory Board will also include regional and focal country representatives, who will give input on the GFSI model and will help validate data and fill data gaps. To identify these representatives, the Coordination Team will closely connect with regional representatives (e.g. from the European Union and African Union Commission), existing networks, and on a case-by-case basis, focal people in select countries.

The Stakeholder Group will elect one of the Expert Advisory Board members to serve as Chair for a two-year term. It is expected that the Expert Advisory Board convenes (physically or virtually) at least twice a year. Participants of the Expert Advisory Board are invited to participate by the Stakeholder Group and will do so according to the Terms of Reference for the Expert Advisory Board approved by the Stakeholder Group.

3. A **Coordination Team** will serve as the liaison across all the various entities in the GFSI governance structure. It will aid in communication across bodies, manage contracts, and help to promote and disseminate the GFSI. It will operate according to its mandate as set by the Stakeholder Group and under direct guidance provided by the Independent Chairperson.

4. A **Host Organization** will be contracted to manage the day-to-day operations required for the GFSI. They will be in charge of maintaining and updating the model, program management, ensuring quality of the GFSI and related outputs, and in implementing the GFSI.

5. IFPRI as the **Development Organization** will provide technical support in the initial GFSI model development, analytical framework, and ongoing model maintenance.

Terms of Reference will be developed to define the mandate, membership and operating procedures for the entities in the GFSI governance structure. Various models for detailing this governance exist (i.e. governance of the Global Nutrition Report), but the basis of it is separation of expert advice, stakeholder representation and management overseen by the Stakeholder Group.

Partnerships

While the GFSI will be a unique and valuable tool to inform decision-making on the six dimensions of food systems, there are many strong initiatives that are doing work in this space. Opportunities to complement and be strengthened by other initiatives, avoid duplication of work, and leverage each other's strengths have been explored. Discussions with the Food and Agriculture Organization (FAO), the UN Statistical Division, Deloitte, and others have been useful to share knowledge and experiences. Further, exploratory discussions on potential synergies with the *Ending Rural Hunger* initiative from Brookings have presented an option for collaboration.

Working together with ERH has potential strategic and operational benefits. First, presenting a single new measurement frameworks for food systems would reduce confusion and allow for each initiative's networks to be accessed to promote the use of a unified tool. Additionally, leveraging the work each initiative has already done—in particular bringing together the conceptual framework of the GFSI with the database and web interface developed by ERH—could reduce the resources required to develop a global food system index both in time and money.

Annex 1: Contact details

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