

IDENTIFYING INDICATOR NEEDS FOR FOOD SYSTEM TRANSFORMATION

INSIGHTS FROM CONSULTATIONS WITH STAKEHOLDERS IN FIVE
AFRICAN COUNTRIES



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SUMMARY

As part of the Nourishing Food Pathways (NFP) programme, GAIN is working to strengthen efforts to understand and measure progress on food system transformation. Clear progress measures can provide decision-makers with the visibility and the flexibility to course-correct as needed to realise the desired impact, and can help to ensure accountability for action. To this end, one of the workstreams under NFP aims to develop, test, and validate novel methods and metrics for assessing food systems transformation. To ensure that this work is grounded in local food system stakeholders' needs and preferences, GAIN worked with Food Systems Foresight to solicit input from national stakeholders across five African countries (Ethiopia, Mozambique, Nigeria, Tanzania, and Kenya) on priority indicator gaps for monitoring food systems transformation. This paper reports on the outcomes of that work.

After an analysis of each country's food system transformation pathway and the 'theory of change' underlying it, interactive stakeholder workshops were held across the five countries, each with 14 to 23 participants spanning the public sector, private sector, and civil society/academia, as well as various subjects (e.g., agriculture, health, environment). Participants brainstormed indicator gaps and ideas for filling them, which were later categorised according to meaningfulness, measurability, and moveability. Across all five countries, some similar themes emerged, such as training and capacity building and access to information. There was a strong focus on the food supply chain, and particularly food processing and storage, as an area of the food system on which more information was needed. Women and youth were mentioned as groups requiring particular attention in metrics/methods development, including both their productive roles and their engagement in food system governance. The results from the workshops will be used to inform GAIN's future work in developing metrics and methods to understand and help track food system transformation.

KEY MESSAGES

- Tracking food system transformation requires appropriate metrics and methods – many of which do not yet exist.
- To understand stakeholder needs for metrics and methods related to food system transformation, GAIN held a series of stakeholder consultation workshops in five countries in Africa in 2023.
- Through these, stakeholders identified priority themes for tracking and understanding food system transformation, for which they felt there were currently gaps in metrics and methods.
- Across the five countries, similar themes emerged, including capacity building, access to information, food processing and storage, and the engagement of women and youth in the food system.

BACKGROUND AND OBJECTIVE

The Nourishing Food Pathways (NFP) programme seeks to accelerate progress towards The Sustainable Development Goals (SDGs, particularly SDG 2 on 'Zero Hunger') by supporting inclusive and coherent food systems transformation in ten countries. Building on the 2021 UN Food Systems Summit (UNFSS), it aims to support and strengthen the design and delivery of national food systems transformation pathways—i.e., visions for how a country would like its food system to change to better achieve social, economic, and environmental goals (1). Among other aims, the programme seeks to strengthen in-country support systems to continue to develop and to deliver their national food systems transformation pathways; it also seeks to serve as inspiration and guidance for other countries and stakeholders seeking to advance food system transformation.

As part of NFP, the Global Alliance for Improved Nutrition (GAIN) is working to strengthen efforts to understand and measure progress on food system transformation. Clear progress measures can provide decision-makers with the visibility and the flexibility to course-correct as needed to realise the desired impact, and can help to ensure accountability for action (2,3). To this end, one of the workstreams under NFP aims to develop, test, and validate methods and metrics for assessing food systems transformation in the focus countries. The focus is placed on identifying gaps in methods and metrics, as opposed to gaps in data – i.e., places where an accepted indicator does not yet exist, as opposed to those where an indicator exists but has not yet been widely collected. The work aims to complement other existing food system data and monitoring initiatives, such as the Food Systems Dashboard and Food Systems Countdown Initiative

BOX 1. Connection to the Food Systems Dashboard and Food Systems Countdown Initiative

The work of NFP on identifying needs for novel metrics and methods for food system transformation and trying to fill them complements two existing initiatives with which GAIN is involved. **The Food Systems Dashboard (FSD)** is an online platform for displaying a comprehensive set of indicators related to food systems, spanning from drivers of food system change (like urbanisation rates) to outcomes of food systems, like greenhouse gas emissions and overweight/obesity rates. **The Food Systems Countdown Initiative (FSCI)** is an international scientific collaboration that seeks to identify and track a manageable number of indicators (currently 50) to inform progress on and spur accountability for food systems transformation.

Both initiatives rely on existing indicators and data—they do not collect novel data. In contrast, the work described here seeks to identify gaps and develop *new* metrics and methods, including through primary data collection where needed; it builds on the gaps identified by both the FSD and FSCI in doing so. The present work also focuses more on process-related indicators and others likely to demonstrate change in the short- to medium-term, while the FSCI has focused primarily on longer-term outcomes.

(see Box 1).

Since this work is meant to be grounded in local food system stakeholders’ – particularly policy actors’ – needs and preferences, understanding those needs and preferences was an important first step in the process. To this end, GAIN engaged the consultancy Food Systems Foresight, which worked with data collection partner Qualiquant, to solicit input from national stakeholders across five African countries (Ethiopia, Kenya, Mozambique, Nigeria, and Tanzania) on priority indicator gaps for monitoring food systems transformation. This process included interactive stakeholder workshops held across the five countries in autumn 2023. This paper reports on the outcomes of that work, including mapping suggested indicator themes onto a food systems framework (1).

OVERVIEW OF THE METHODS & WORKSHOPS

The objective of the work was to identify and prioritise locally relevant indicator gaps to monitor transformation by:

- Articulating a nationally specific theory of change for food system transformation based on the relevant National Pathways documents
- Soliciting the input of local stakeholders to identify and prioritise gaps in
- intermediate indicators to track & assess progress along that theory of change
- Synthesising the prioritised indicator gaps, using mutually agreed upon criteria

This process is summarised in Figure 1. In the first step, we created a Minimum Viable Theory of Change (MVToc) for each country by synthesising the country’s national pathways document; this was reviewed by local food system policy experts in the relevant GAIN country office. This was created using the UNFSS pathways document as the original source, and maintaining as much of the original content as possible.¹ In some cases, content was inferred or summarised for brevity; this was indicated in italics in the revised version. An example pathway for Mozambique is given in Figure 2; all others are included in Annex 1.

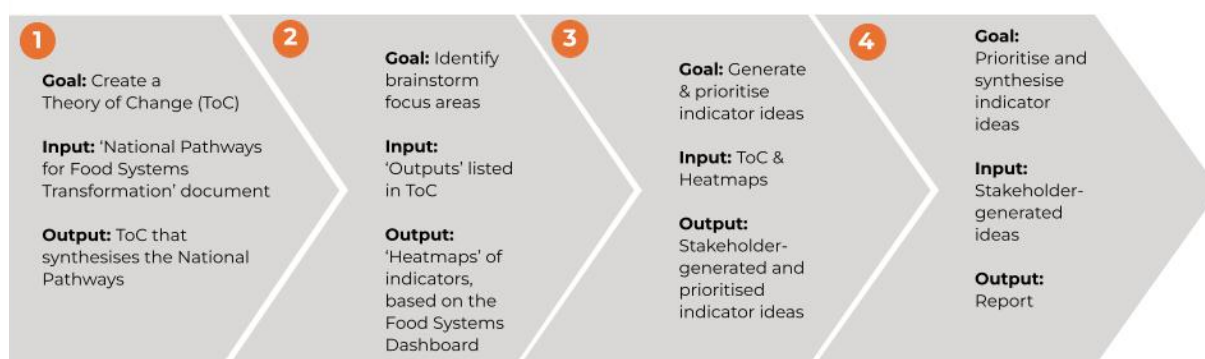
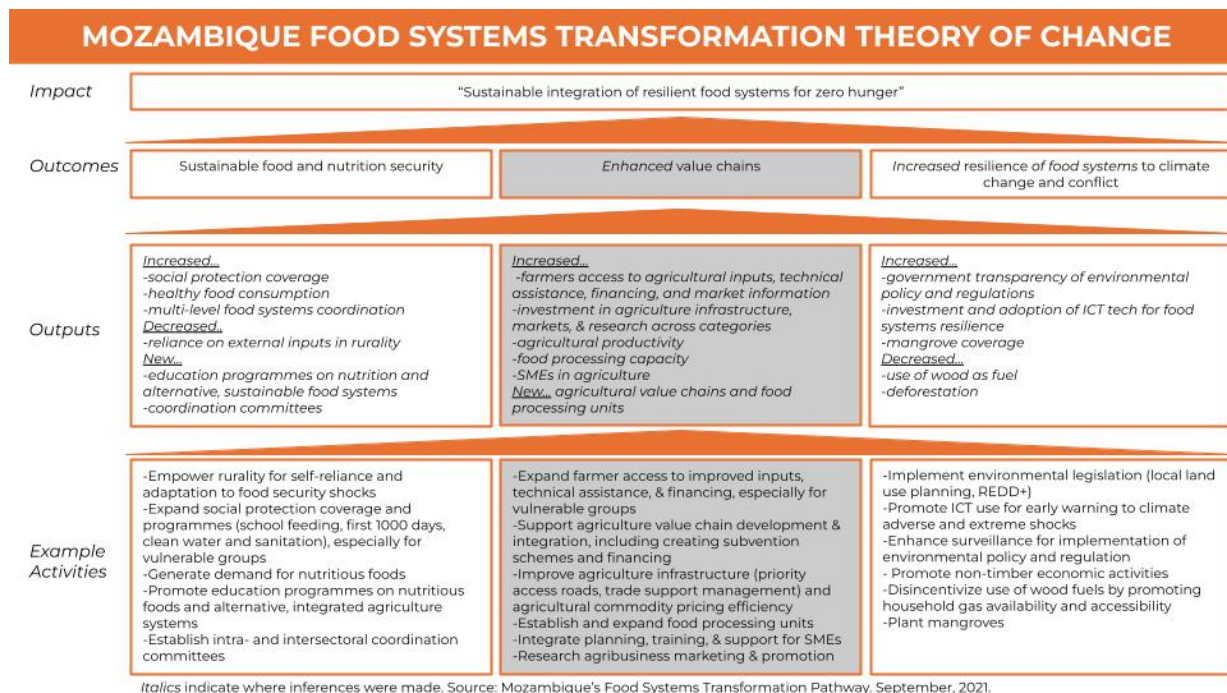


Figure 1. Process Followed to Identify Ideas of Indicator Gaps

We then crafted indicator heatmaps that compared identified MVToc outputs to existing indicators on the Food Systems Dashboard (4). This allowed us to colour code areas into whether they were supported with sufficient indicators (green), insufficient indicators (orange), or no indicators (red).

¹ The UNFSS pathways documents can be found at <https://www.unfoodsystemshub.org/member-state-dialogue/dialogues-and-pathways/en>



Italics indicate where inferences were made. Source: Mozambique's Food Systems Transformation Pathway. September, 2021.

Figure 2. Example of a Theory of Change Development from a Food System Transformation Pathway for Mozambique

We then held a half-day, in-person participatory workshop with stakeholders in each country. Participants were selected to represent multiple sectors, food systems areas, and include more technical experts, given the technical focus of the meeting. Equal gender representation was targeted. The facilitation team was led by Food Systems Foresight (with one lead facilitator) and supported by Qualiquant (with two support facilitators).

The workshop itself consisted of three kinds of activities:

1. Familiarising participants with the MVToc and existing indicators (done by independently reading through an excerpt of the MVToc, in thematic groups);
2. Generating ideas for new indicators to fill gaps by brainstorming and sketching out up to three indicators each stakeholder felt she/he would look at in the future to know that the country had succeeded at achieving the outcome her/his group was working on, then independently reviewing the heatmap and selecting an 'orange' or 'red' indicator and brainstorming indicators to fill the gap;
3. Categorising these indicators according to their meaningfulness for national food system transformation as well as their expected ease of measurement.

A high-level workshop agenda can be seen in Table 1; there were some variations in this across countries, to adapt to the time available. The workshops were held in person in August-September 2023. The number of attendees ranged from 14 to 23. We aimed to have representation across three main sectors: public sector (government), private sector (businesses), and civil society and academia, but it was not always feasible to identify relevant and willing private-sector participants.

Table 1. High-level workshop agenda

Activity	Approximate Duration
Opening, introduction, context-setting, and objectives	40 min
Refresh on National Pathways using MVToC	20 min
Exercise 1: Small group outcome-indicator focused brainstorm activity: “Newspaper of the Future”	70 min
Tea & coffee break	15 min
Exercise 2: Refresh on existing indicators and individual output-indicator focused brainstorm activity using heatmaps	35 min
Exercise 3: Small group prioritisation activity using 2x2 matrix	40 min
Closing, next steps, & feedback	20 min

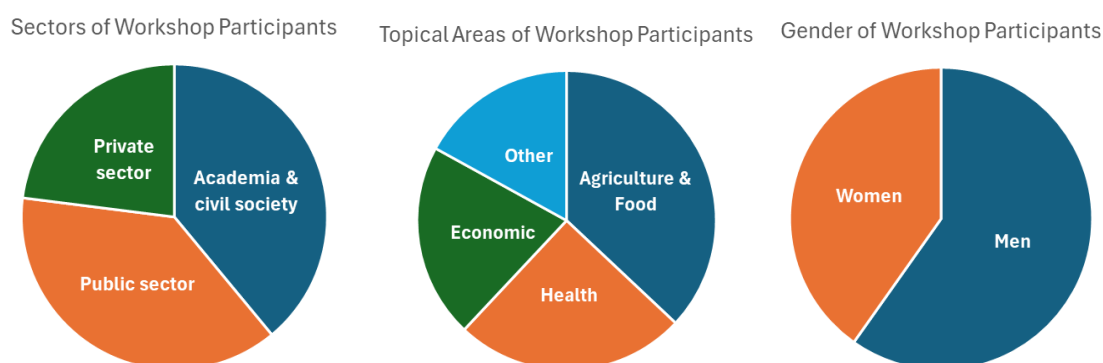


Figure 3. Demographics of participants across five national stakeholder workshops

A descriptive summary of workshop participants across the five countries is shown in Figures 3. In Ethiopia, one participant came from the private sector, with the remainder split evenly between public sector and civil society/academia; 57% were from agriculture/food, 26% from health, and only one from environment. In Kenya, attendees were split into approximately equal shares across civil society/academia, private sector, and public sector, with around half coming from agriculture/food, 26% from environment, and 16% from health. In Mozambique, attendees were split approximately 60-40 between civil society / academia and the public sector and mostly represented the agriculture/food sector, health sector, and economic sector, with only one participant from the environment sector. In Nigeria, 63% of participants came from the public sector, with only one from the private sector and the remainder from civil society/academia; 37% came from health, 21% from agriculture/food, and 10.5% each from emergency response and industry/finance. In Tanzania, half of participants came from civil society/academia, with the remainder approximately split between the public and private sectors; 43% were from agriculture/food, 36% from health, and 21% from other, with none from environment. Kenya, Mozambique, and Nigeria had relatively even gender breakdowns, but in Ethiopia and Tanzania, 70% and 86% of attendees, respectively, were men.

Following the workshop, the Food Systems Foresight team ensured that the categorisation included all prioritised stakeholders’ ideas, then conducted a thematic

cluster analysis. In this analysis, we categorised each indicator by one of the 29 sub-categories on the FSD or indicated where a category did not exist, and then clustered similar ideas by theme. After clustering and assigning themes, we eliminated themes that were already represented on the FSD to a somewhat sufficient level and clustered the remaining themes across FSD categories.

The first output from this process was a matrix that displayed specific indicator ideas and categorised these ideas in terms of meaningfulness for food system transformation, ease of measurement, and likelihood of change in less than three years. The second was a synthesis of all ideas, at the thematic level, by country.

WORKSHOP OUTCOMES: STAKEHOLDER INDICATOR IDEAS

The proposed indicators were mapped onto matrices of relevance, measurability, and moveability, as shown in Annex 3. Upon aggregating the relevant stakeholder-generated indicator ideas, thematic clusters emerged. In the following sub-sections, these key themes are discussed by country. The final section of the paper synthesises these themes across all five countries.

MOZAMBIQUE

Education, training, and capacity building indicator gaps were described across multiple subjects, mainly focused on producers and small- and medium-sized enterprises (SMEs). Stakeholders were interested in measuring training for agricultural practices, commercial agriculture and agribusiness, food processing, food transport, food storage, and market information systems. There was similar interest in tracking producers and SMEs' access to technical assistance. In contrast, ideas related to measuring nutrition training and nutrition education (including gardening) focused on communities and participants in social protection systems. Participants also voiced a gap in understanding which channels were most effective for capacity building (e.g., the use of community-agents, peer-learning, or local artists to disseminate messaging).

Access to information emerged as an indicator gap theme most clearly in relation to farmers and SMEs. Having visibility into information on markets and finance were the topics of most interest, followed by understanding mobile phone utilisation as a channel for information.

Within food supply chains, several indicators were highlighted. **Productivity of and participation in agribusinesses and SMEs** were of great interest to stakeholders across food supply chains. Stakeholders were keen to have information relating to the prevalence of these 'classes' of businesses, the value they add, and the valorisation of their products.

Investment in and value-addition of marketing and promotion emerged as a prominent indicator area for stakeholders. The ideas generated were mainly related to investment in marketing and promotion and the added value of these activities. This category links to that on SMEs and agribusinesses. **Channels for producers and processors to sell** also surfaced in stakeholder indicator ideas. There was interest in tracking the most effective mechanisms for producers to sell their products, including markets, out-grower schemes, and contract farming. There was also one mention of processors' access to institutional markets.

Processing units, companies, and products appeared in indicator ideas across categories. Stakeholders expressed interest in understanding processing capacity (i.e., number of units, companies, and products), both nationally and locally disaggregated. Stakeholders also expressed a desire to track availability and consumption of processed food products, including nutritious foods. **Storage and distribution infrastructure** existence was cited as an indicator gap by stakeholders. **Access to and quality of inputs** was noted by several stakeholders as an indicator gap, although with no indication of which kinds of inputs should be prioritised.

Multi-level governance and committees was a heavily cited indicator gap. Stakeholders identified understanding the number of committees, the geographic level at which they operate, and their sectoral makeup. Gaps were also identified around knowing the frequency of meetings, planning sessions, and events and the presence of reports and plans. This gap maps to a priority in the UNFSS Pathways document for coordination committees within and across sectors.

At the outcome level, **employment** within food systems was a gap of great interest to stakeholders. Ideas to fill this gap ranged from tracking employment and participation within types of business (e.g., SMEs) to local job opportunities to ownership of agricultural companies.

Energy-related indicators also emerged across several sub-categories. This included monitoring the utilisation of less-carbon-intensive energy sources (specifically biofuel) and affordability of energy for rural populations (specifically electricity and cooking gas).



Figure 3. Stakeholders participating in the workshop in Mozambique

KENYA

Education, training, and capacity building were described across multiple outcome categories, ranging from indicator gaps in primary school and higher education in agriculture; in community capacity building; and in technical assistance quality/quantity. Topics ranged from agriculture to environmental protection to technology. **Access, use, and quality of digital infrastructure** also emerged as an indicator gap theme, most clearly in relation to upstream agriculture for input supply and farming. Specifically, stakeholders were interested in market information for farmers, early warning systems, and e-extension services. This cross-cutting theme speaks to a desire amongst stakeholders to understand not just when, but how digital tools are being used across areas of the food system. Information on **Public-private partnerships** related to financing and financial architecture to resource food systems was also highlighted as a gap.

With regards to food supply chain indicators, **traditional, indigenous, organic, and/or local food** appeared as indicator gaps on their own or in combination with other proposed indicators; traditional and indigenous food were most mentioned. The stakeholder ideas ranged from input supply all the way to consumption. **Youth employment, productivity, and entrepreneurship** were noted by stakeholders are important topics, both in general, as well as specifically for activities such as farming and midstream activities. Women's entrepreneurship was also mentioned.

Use of renewable energy in food systems was referenced only once in the prioritised matrices but is notable as it speaks to a desire to monitor both energy source and use within the food system, which could have greater transformation potential. Visibility into this and other climate-smart investments could highlight the centrality of food production as a leverage point in climate change mitigation. **Food waste** emerged in varying proposed indicator gaps, including household composting and redirecting waste back to consumption. **Access to and affordability of inputs** was noted by several stakeholders but was usually specific to a class of input, such as organic fertiliser or specific kinds of seeds. The affordability dimension of this gap is notable insofar as it highlights food systems equity; a relevant affordability indicator would provide insight into the true accessibility of these nature-positive inputs. Across outcomes and FSD categories, stakeholders indicated a desire to better understand **smallholder's participation in food production systems**. These ideas mainly focused on disaggregation of indicators related to access to technology, markets, and financial products (e.g., irrigation, crop and livestock insurance).

Diversity of participation in governance and government initiated-activities was noted by stakeholders, particularly as it related to community-based and grassroots organisations. Indicators on government funding for initiatives and diversity of government procurement were also listed.

ETHIOPIA

Education, training, and capacity building were described across three topics. First, stakeholders' ideas for indicators referenced improved nutrition literacy, including through community focal people and women. This pattern suggests an overarching interest in optimising channels to improve nutrition. Second, there were many mentions of indicators of technical assistance and extension services for farmers, including both in-person and digital channels. Third, there was a desire to monitor experts, institutions, and households trained in 'food systems thinking.' While not explicitly defined by stakeholders, this interest mirrors the global—and national—pivot towards systems approaches and local empowerment; it also recognises interactions between different outcomes, such as health and environment. **Access to and use of digital infrastructure** emerged as an indicator gap theme, most clearly in relation to midstream food supply chains. Interests lay primarily in access to market information, online trading systems, and online grading systems.

Gender-based violence was one of the very few direct mentions of women in Ethiopian stakeholders' indicator ideas. Gender-based violence is still prevalent in Ethiopia and often intersects with issues such as food insecurity and conflict (5). This interaction may underline stakeholder interest in this indicator

Considering food supply chain indicators, **new agricultural inputs, technologies, and innovations** were a high priority amongst stakeholder ideas. Ideas ranged from tracking research and investment down to adoption by farmers. There were few specifics about which types of inputs, technologies, and innovations should be measured or what kind of effects they might have. **Indigenous or traditional food** indicators emerged across food supply chain segments, from production = to product availability and consumption. **Fortified and biofortified foods** similarly emerged as a specific indicator gap across supply chain segments, though it also included a focus on input supply, in addition to production, processing, and availability.

Production of **nutrient-dense foods** was another indicator gap of interest to stakeholders. Mentions were concentrated upstream in production including input supply, volume produced, and incentivisation. There were mentions further downstream, but increasing production was overwhelmingly most mentioned. **Access to inputs** was noted by several stakeholders, with a particularly strong focus on timeliness, as well as notable interest in organic and natural fertilisers. Also of special note was an interest in national production of inputs. **Contract farming and warehouse receipt systems** were mentioned multiple times by stakeholders seeking to understand both their presence and use by farmers. This speaks to a desire to better understand movement of food from the farmgate downstream, document volumes, and improve the market-orientation of production systems.

Food safety was an important indicator gap category that appeared frequently. Mentions ranged from presence of standards to implementation of practices to regulation. Interestingly, regulation included citizen participation in regulation. This interest maps to one of the top-line outcomes in the National Pathways on improving food safety. Finally, measuring the impact of **food loss on climate** was noted by stakeholders.

TANZANIA

Education and capacity building emerged as a theme across three main topics: decreasing food loss, access to extension services, and financial literacy. While all three are assumedly geared more towards upstream actors in food systems, this was not explicitly articulated. Most indicator ideas were geared towards improvements in physical resources and infrastructure rather than human capital, making this category a slight anomaly.

Digital market information infrastructure surfaced as an indicator gap. **Lending in food systems** was also an indicator gap, focused on financial institutions. Stakeholders articulated specific interest in agricultural lending portfolios and rates of approved loans. **Physical activity** was of interest, both in terms of understanding levels of physical activity among Tanzanians, as well as access to and availability of physical infrastructure for exercise.

Participation and inclusion of marginalised groups emerged several times in indicator ideas related to policy and other efforts to increase inclusion, actual counts of participation and leadership, and access to resources. Most references were made to **gender and women**, followed by **youth**, followed by 'historically marginalised groups' in general. Interest was in participation in upstream agriculture as well as food systems broadly.

Distribution and storage infrastructure was one of the most-cited indicator gaps by stakeholders. The bulk of mentions related to road infrastructure, including details about quality ranging from pavement to signage. There were also mentions of storage infrastructure including cold chain storage. **Production- and processing-related technology** was a frequently mentioned indicator gap. When not mentioned as a broad category, ideas specifically mentioned novel communications technology-related tools, digital tools (e.g., moisture metres), and climate-smart technology (e.g., solar irrigation). Upstream production-related technology was of more interest, though there were a couple of mentions of post-harvest technology. **Electricity** emerged as an indicator gap relating to coverage, quality, and its uses. Regarding the former two, there was interest in access, voltage, and affordability of electricity. More notably, stakeholders want to understand how electricity is being used, including for appliances such as fridges and heating as well as 'productive use' in general. This further underscores national priorities to upgrade physical infrastructure both in terms of coverage and quality.

Food safety practices were noted a couple of times by stakeholders across multiple categories, including upstream handling. **Governance** emerged as another perceived indicator gap. There was pronounced curiosity around policy regarding **private-sector investment in food systems**, suggesting a priority around enabling environments for food-related businesses. Stakeholders identified a gap around **government budget allocations**, which could speak to an interest in transparency in funding as well as signal commitment to food systems transformation-related activities.

School meals were a particularly important indicator gap for Tanzanian stakeholders, due to these programmes' explicit inclusion in the national pathway. Ideas on school meals included general provision and consumption, consumption of fortified foods, and an understanding of **school food environments** in general. Overall, this speaks to a priority around nutrition and health of school-aged children.

NIGERIA

Overwhelmingly the largest category for stakeholder ideas was **training and education**. The most frequently cited cluster of desired indicators was in counting trainings (or trainees) focused on topics such as improved or climate-smart agricultural processes and technology; processing technology; food safety guidelines; early warning tools; and health and nutrition. Most of these trainings were intended for producers, with some interest in **disaggregation by women and youth**. Great interest was also expressed in more qualitative indicators on the **quality and relevance** of the training as well as rates of adoption. The interest in upskilling ranged across all levels of education, from primary school to non-institutional training. **Access to information** appeared as another emergent category of potential indicator gaps. There was an expressed desire for more agricultural information, market information, and climate-smart data for producers, as well as new ways to access the data either by establishing new channels or platforms and/or strengthening or expanding existing ones (i.e., phone networks, radio, market boards).

Within food supply chains, **processing and storage practices and technology** were of great interest to stakeholders in Nigeria. Specific mentions of local processing, on-farm preservation, indigenous techniques, and semi-preservation were made throughout stakeholder ideas on this category. This indicates an interest in practices employed as

opposed to more traditional indicators on 'volume processed' or facilities available. Interest in **youth and women's involvement** was also expressed.

Last-mile linkages and access to markets emerged as a theme throughout the stakeholder ideas. On the linkage side, this included interests in transportation infrastructure and proximity of farms to markets. On the access to markets side, ideas included linking off-takers to farmers and the quantity of free trade zones.

Diversity of participation and leadership in food supply chains surfaced as a theme, primarily across the production and processing segments. Stakeholders indicated an interest in understanding **women's and youth participation** in these spaces as well as their leadership of organisations (e.g., producers' organisations or processing groups). **Access to modern agricultural inputs and tools** was another area stakeholders wanted to understand better, emphasising 'modern' and 'improved,' rather than simply access.

Food passing screening for national and international markets was also a topic noted by stakeholders. There was particular interest in the gap between the food that passed versus did not pass screening or testing. **Food safety guidelines and regulations** were noted several times across different formats, suggesting great interest in the infrastructure supporting food safety from the government side. **Food waste tracking** at the household level, and specifically composting, emerged as another area of interest.

Early warning systems were of interest to stakeholders, both generally and specifically regarding pollution; early warning systems are a national priority in Nigeria also evidenced by their inclusion in the name of one of the six clusters in Nigeria's national pathway. **Food supply shock buffers**, an important lever for systems intervention, were noted specifically in terms of the number of grain reserves established. Finally, indicators on the **consultation of vulnerable groups** emerged related to livelihoods, poverty, and equity. There was interest in understanding the 'wants' and 'needs' of vulnerable groups to meet their food needs. This may speak to human-centredness, inclusivity, and potentially even self-organisation in the design of social protection systems.

SYNTHESIS & DISCUSSION

A of stakeholder-ideas is presented in Annex 2, organised by components of a guiding food systems framework (1) and coded into themes to draw out patterns in stakeholder-identified topics; these rows illustrate some priority areas for developing new indicators.

Across all five countries, some similar themes resonated. Education, training, and capacity-building indicator gaps were discussed in all five countries – prominently and spanning various topics. There was a particular focus on training for food supply chain actors and on understanding quality of training, not just quantity. Given the robustness of this category, it is clear that stakeholders both value and lack visibility into the process of upskilling the range of actors working within food systems, as needed to sustain food systems transformation.

Access to information also emerged as a common topic, including information on markets and access to finance. Related to this was access, use, and quality of digital infrastructure, which was prominent in Kenya, Tanzania, and Ethiopia. This category speaks to a desire among stakeholders for increased visibility into markets and pricing, as

well as improved tracking of food items from the farm to consumers; it also demonstrates the importance of information flows as an impactful leverage point for systems change.

Overall, most stakeholders focused their consideration on the food supply chain (as opposed to food environments, consumer-level factors, policy, etc.). Across all countries, there was a strong focus on understanding food system businesses, including their contributions, participation rates, value addition, productivity, technology adoption, and similar. There was also considerable interest in understanding employment and livelihood quality within food systems. This speaks to a desire to understand how the agri-food private sector contributes to the economy in terms of both employment and ownership and how to better support market-oriented agriculture and food production.

Considering specific parts of the food supply chain, food processing was also a resonant theme across most countries, including capacity for domestic processing and consumption of processed foods (whether nutritious or less so). Agricultural input access (including support to purchase inputs), technology adoption, and storage and distribution infrastructure were also mentioned across several countries.

In terms of particular population groups, women and youth were mentioned as key themes in most countries, including both their productive roles (e.g., employment, productivity, and entrepreneurship) and, to a lesser extent, their engagement and inclusion in policy-making and other aspects of food system governance. In several countries, traditional, indigenous, organic, and/or local foods, all aspects of local 'food culture', appeared as a common theme, spanning from input supply all the way to consumption. This focus reflects stakeholders' interest in additional indicator categories for food crops, rather than being limited to indicators just for traditional ones (i.e., grain/cereals). Energy-related indicators, particularly around 'green' energy sources, were also mentioned in a few countries, speaking to the desire to foster an environmentally sustainable food system transition.

Areas that were comparatively less discussed included food environments, consumer behaviour and individual consumer factors, and policies. Food system workers were nowhere near as prominent in the discussions as entrepreneurs, SMEs, and farmers. Children as consumers (as opposed to supply chain actors or in policy), climate change mitigation (beyond green energy) and adaptation, and blue foods (i.e., fish, seafood, and aquatic plants) were discussed less than in many other food systems documents and forums. Lending and financial flows emerged as a relevant theme in Tanzania, likely reflecting the desire for increased capital to finance transformation and development, but was not widely mentioned in other countries. Only in Nigeria was there a clear focus on presence in export markets and the ability to serve them competitively.

Some caveats to the analysis should be noted. While the stakeholder feedback on the workshops was very positive overall, some attendees felt the time allotted was too short to fully grapple with the complex topics at hand. The results are also very much shaped by the stakeholders who attended the workshops, who tended to be predominantly from the agriculture/food sector; environmental indicators, in particular, may have been more prominent if there had been greater inclusion of environment-focused stakeholders. Stakeholders' inputs are also biased based on what was most prominent in the pathways and the specific wording used therein (e.g., demonstrated by the prominence of school meals in Tanzania, where it was explicitly mentioned in the pathway –compared to the other countries where such programmes also exist). The focus on training may be largely

due to the traditional focus of development programmes on training, and an assumption that future transformation must follow this prior path—which may not be the case.

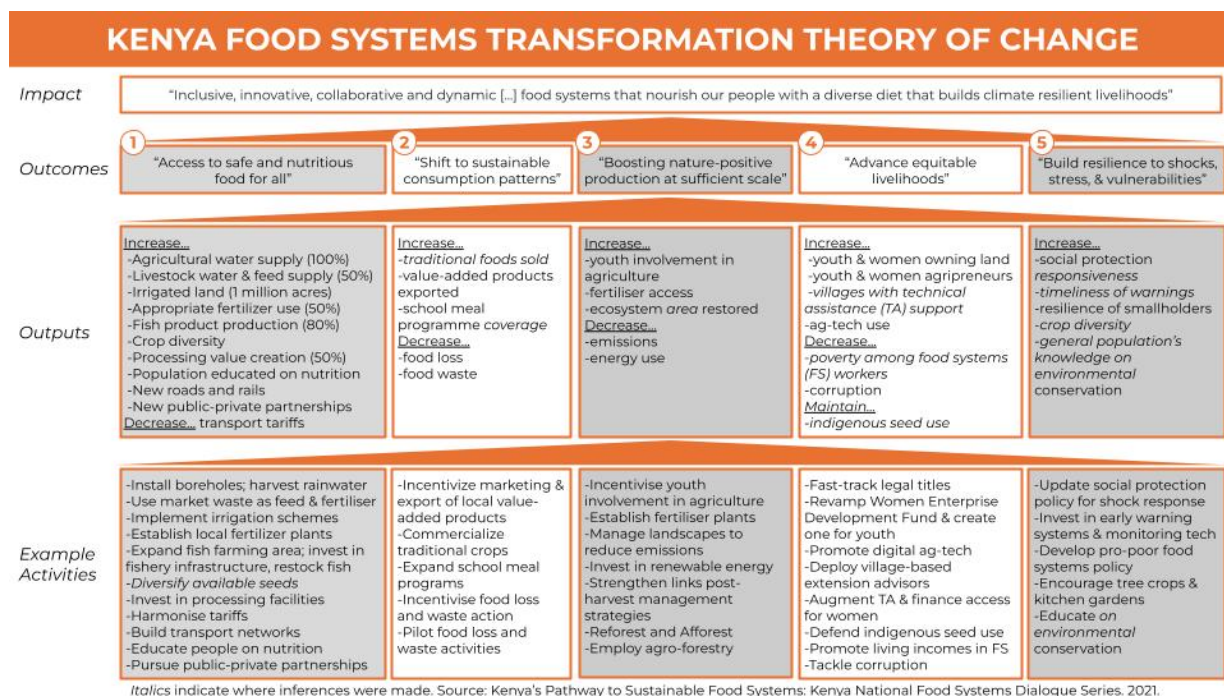
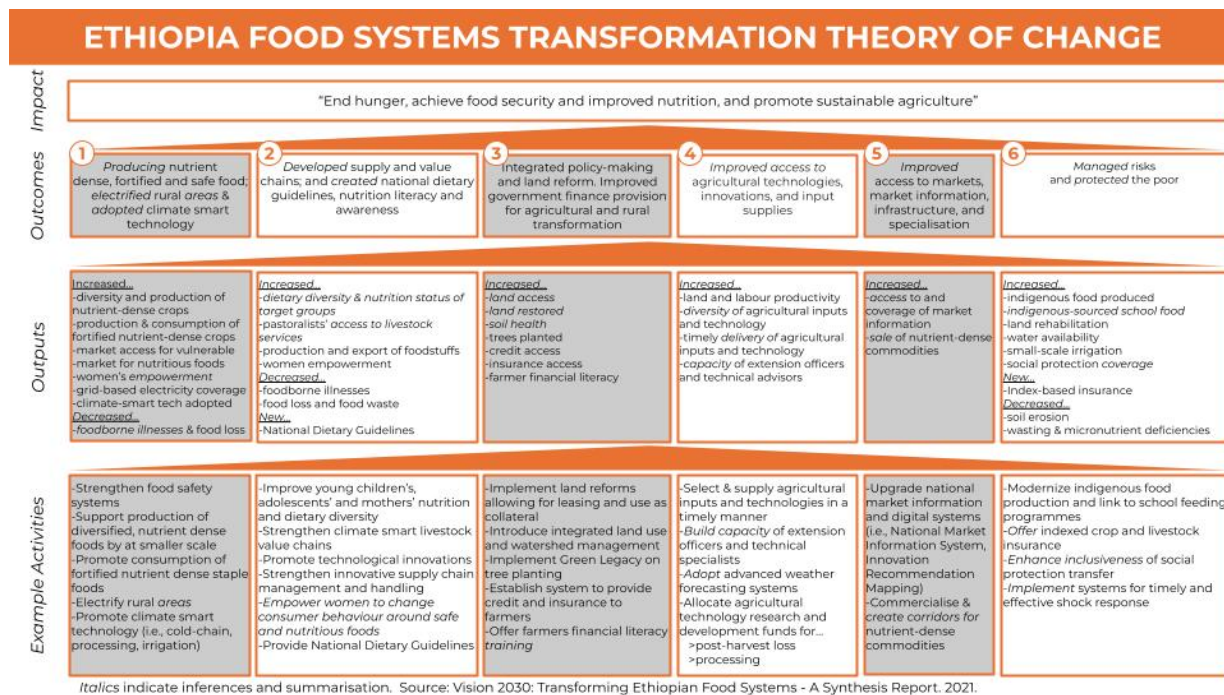
Finally, many participants struggled to identify true gaps in indicators as opposed to gaps in data. Most specific suggestions indicated topics on which data might be missing within that specific context, but for which there was not necessarily a need to conceptualise a novel metric or method more broadly—i.e., an indicator either already existed or could be easily defined. While useful, this did not respond directly to our interest in identifying areas where no relevant indicators existed and new conceptual metric-design work was needed. As such, we focused the analysis on the main *themes* that were discussed, as opposed to specific indicators. This experience highlights the challenge of engaging with non-specialist audiences on the topic of metric and method gaps, which is both a highly technical topic and requires highly specific, in-depth, and comprehensive expertise to know the metrics or methods related to a topic and assess whether a gap truly exists.

Moving forward, GAIN will use the results of this analysis, as well as insights from subsequent workshops held in Asian countries, to identify priority topics for new metrics and methods development. In addition to the stakeholder preferences captured here, our topic identification will consider other criteria, such as feasibility, generalisability to a wide set of contexts, and sensitivity to change on short time scales (e.g., process and intermediate outcomes, as opposed to ultimate outcomes). By helping to identify and fill gaps in metrics and methods for measuring food system transformation, we hope to contribute to accelerating that transformation as well as documenting progress and processes to inform future efforts.

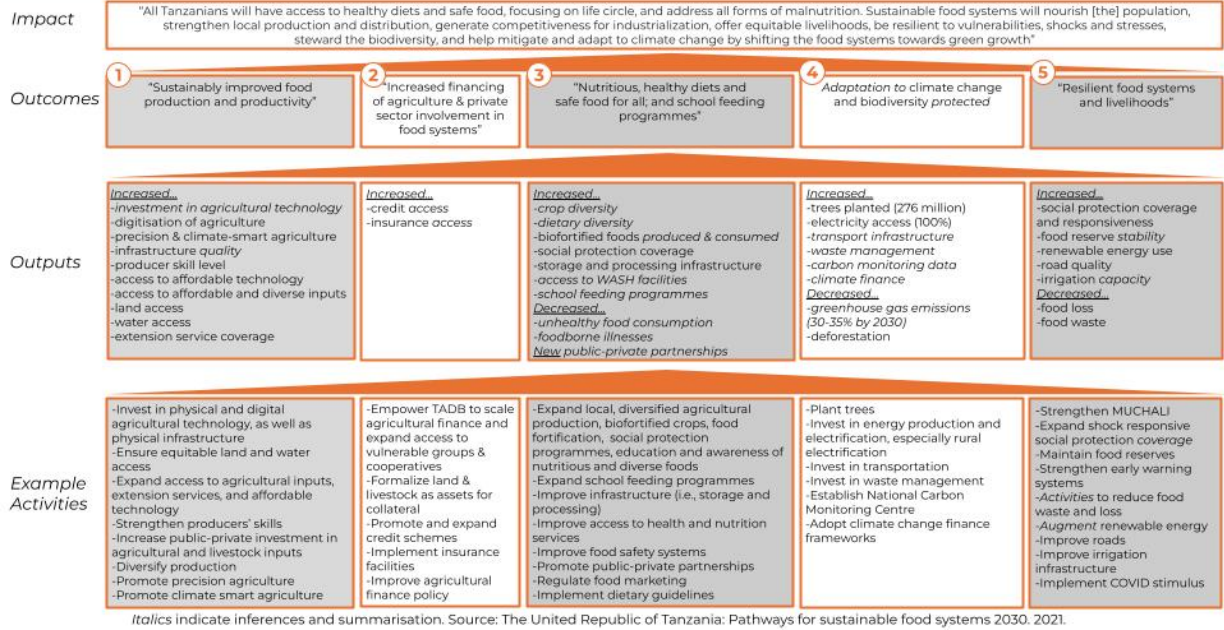
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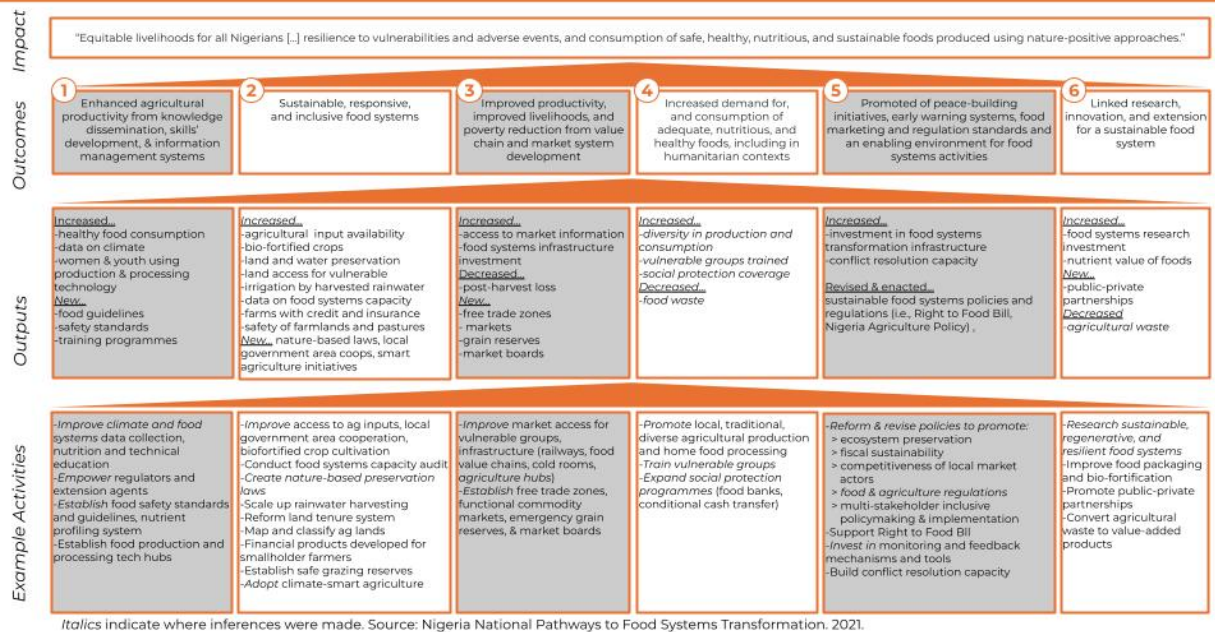
ANNEX 1: THEORIES OF CHANGE



TANZANIA FOOD SYSTEMS TRANSFORMATION THEORY OF CHANGE



NIGERIA FOOD SYSTEMS TRANSFORMATION THEORY OF CHANGE



ANNEX 2: SUMMARY OF INDICATORS BY THEME

Section	Sub-section	GAIN-coded themes	National stakeholder identified topics and indicator ideas	Country
Drivers	Biophysical, climate, and environment	CSA (climate smart Ag)	Adaptation & mitigation for climate-related food (production) impacts; use of modern agricultural tools that can adapt CSA	TZ
		CSA	Monitoring energy sources that are less carbon intensive (biofuel specifically); affordability of 'clean' energy for rural populations in particular	MZ
	Income growth and distribution	Livelihood; Gender	Employment, wages across food system and gender differentials	MZ
		Livelihood	Tracking level of employment/ participation/ Ag productivity per worker, per sector	MZ
		Capital	Financial literacy for food system actors (producers, vendors, groups along value chain)	TZ
		Livelihood; Inclusive	Number of youth employed (including women) in agri-business, storage, processing	TZ,NG
		Capital; Inclusive; Gender	Access to capital, resources for upstream agriculture involvement; specifically youth and women	TZ
	Socio-cultural dynamics	Inclusive	Participation, inclusion, involvement of marginalized groups in decision-making, specifically youth and women	NG, TZ, ET
		Accessibility; Local FS	Urbanization/ accessibility to markets, food environment measures	TZ, NG
	Food supply chains	Food production systems and inputs	Capital; Inclusive	Subsidies (# and value) received by farmers, assistance scheme for food producers (assistance card for farmers); accessibility of inputs (self-reliance of each country); Lending portfolios, loan approval rates in food production
Inclusive			Young people in food production, proportion of small-scale farming	KE
Private sector			Private sector producers' contribution to economy (employment)	MZ
Local FS			Develop/ incentivize local food production, cultivation of local [nutrient dense] food types;	ET

			frame as strengthened local food system (vs reliance on international or cross-national imports)	
		CSA; Tech; Local FS	Track willingness/ adoption by food producers for incentivized production practices, inputs for environmental improvement (or disincentivised detrimental ones); Focus on modern approaches for upstream production and post-harvest (digital tools, climate smart tech, soil irrigation strategies)	ET, NG, TZ
Food storage, loss, distribution, transport		Local FS; equitable distribution & access	Facilities available for processing/ storing practices and technology, emphasis on local (vs large scale) processing, on-farm preservation, indigenous techniques, and semi-preservation	NG
		Data; CSA	Access to and use of digital infrastructure in midstream food supply; farmer and SMEs access to market and pricing info; visibility of CSA, tracking food items from farm-gate downstream	ET, TZ, KE, NG, MZ
		Cold chain	% of stored space, capacity comprised of fresh, perishable produce; cold chain storage (beyond existence, measure utilization)	TZ, MZ
		Loss; CSA	Linking food loss to utilization or salvage efforts; link to greenhouse gas emissions and incentives to decrease loss	ET, TZ
Retail, Markets and Waste		Equitable distribution & access; Capital	Channels / mechanisms for producers to reach markets, grower schemes / investments; Promotion/ incentivizing/ accessibility of these mechanisms	MZ
		Tech; SMEs; Training/ Practices; Data	Technology adaptation, new uses, coverage(production, research, food processing & storage); Tech and extension services for farmers & SMEs, linking improvements to trainings; Farmer field schools adopting technology in their modules	ET, TZ, MZ, NG, KE
Food processing and packaging		Training/ Practices; Local FS	Guiding framework for supporting food processing practices towards health and sustainability (including pre and post-processing); richer description of processing	MZ

			capacity (i.e. number of units, companies, and products), disaggregated locally by community/ market population	
Food Environments	Food avail, affordability, properties	Training/ Practices	Training, adaption into practice (medical, public health, food safety) of food handlers	TZ
		Affordability; Accessibility; Processed	Distribution of affordable food, accessibility to low-income consumers; Availability and consumption of processed food products including nutritious foods	MZ
		Training/ Practices; Data; Safety	Food safety capacity building of lab technicians to inform food safety indicator thresholds, link to policy and regulation realities; upstream handling behaviors; monitoring food safety screening/ testing for export markets; consumer adherence to standards for food safety regulations	ET, NG
		Processed; Blue food	Availability and consumption of aquatic foods; Added value of fishery products	MZ
Individual Factors	Consumer Behaviors	Waste	Food waste at consumer-level; food waste disposal procedures in place/ adherence; measuring recycling/ composting as a behavior change	NG, KE
	Cognitive	Awareness; Diet diversity; Inclusion; Gender; Food relationship	Knowledge about balanced diet; women and local community-led 'food and nutrition literacy'; Promotion of certain diverse, 'healthy' eating patterns/ foods, documenting where/ how it contradicts eating/ cooking norms or local customs	ET, MZ,
		Local FS; CSA	Traditional knowledge, folklore regarding local foods; "Forgotten foods"; changes in local food consumption vs. foods produced locally	ET, KE
Aspirational	Inclusive; food relationship	Monitoring how vulnerable groups (youth, women and key local populations facing food insecurity) perceive their own 'wants' and 'needs' as being met (or not) for their individual food goals	NG	
Outcomes	Diets	Schools; Local FS	School meals & food environments aligned with national nutrition goals/ FBDGs;	TZ

			procurement of fortified foods/ local foods	
	Health	Local FS, Inclusive; Political will	Diversity of individuals and meaningful participation (empowerment) in local food system governance; Inclusion of grassroots and community- based organizations; Government funding for resulting initiatives; Interest in the democratization of food systems transformation	KE
Cross-cutting	Policy actions & enabling env.	Private sector	Document, describe private sector engagement, enabling environment for business to support nutrition/ food goals; rate of new and retained partnerships, financial architecture	TZ, KE
		Local FS; Political will; Inclusion	MZ: multi-level governance and committees (geographic levels, frequency of meetings and inclusion across sectors)	MZ

ANNEX 3: INDICATOR MATRIXES

Please see separate document posted on the same landing page as this paper.



ABOUT GAIN

The Global Alliance for Improved Nutrition (GAIN) is a Swiss-based foundation launched at the UN in 2002 to tackle the human suffering caused by malnutrition. Working with governments, businesses and civil society, we aim to transform food systems so that they deliver more nutritious food for all people, especially the most vulnerable.

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