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Quantitative assessment of agrifood systems: methodology and applications

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Abstract

This paper presents a standardized methodology for assessing agrifood system (AFS) performance at country level to support evidence-based programming and action. Building on SDG distance-to-target approaches and food systems benchmarking frameworks, the method evaluates indicators across multiple AFS outcomes using two complementary assessment methods: a Current Status Assessment (CSA), which measures the normalized gap to global targets or benchmarks, and a Trend Assessment (TA), which captures the direction and pace of change over time using adjusted compound annual growth rates. Indicators are translated into intuitive performance classifications to identify relative strengths, structural gaps, stagnation, and emerging risks within a country's agrifood system. The combined CSA–TA results provide a structured diagnostic to prioritize underperforming AFS components for deeper analytical work and targeted interventions. By linking multidimensional performance measurement with strategic dialogue, the methodology strengthens the alignment between data, policy prioritization, and concrete actions for agrifood systems transformation.[1]

Keywords: agrifood systems, assessment, methodology, application

[1] The text and materials are free from any copyright violations

1. Introduction

Achieving the Sustainable Development Goals (SDGs) requires transformative changes in how food is produced, processed, distributed, and consumed. Agrifood systems (AFS) are central to this transformation, contributing to multiple SDGs while facing interconnected challenges related to climate change, environmental degradation, market volatility, demographic pressures, and persistent inequalities. These dynamics underscore the need for integrated and evidence-based policy responses. In this context, the UN Food Systems Summit and its follow-up processes have advanced a global food systems transformation agenda structured around action areas and transition pathways. The Food Systems Summit +2 further emphasized the need for countries to articulate national food systems pathways aligned with the SDGs, translating global commitments into country-specific priorities and coordinated actions across sectors. This agenda recognizes that food systems transformation is inherently multidimensional and requires progress across interlinked AFS outcome domains.

As countries move from pathway design to implementation, a key challenge is how to monitor and assess progress, which has led to a growing emphasis on the development of comprehensive indicator frameworks that capture agrifood system performance across multiple dimensions. Global initiatives such as the Food Systems Countdown Initiative (FSCI) have proposed structured indicator architectures to track food systems transformation while highlighting persistent data gaps (1). Building on these efforts, FAO developed a comprehensive AFS indicator framework (2), aligned with the SDGs, the Food Systems Summit +2 Action Areas, and FAO's Strategic Framework and "Four Betters" (3). The framework covers six desirable outcomes and two cross-cutting areas: i) enhanced production from pre- to post-production; ii) improved diets, nutrition, and health; iii) protection of the environment and natural resources; iv) improved livelihoods, reduced poverty, and inequality; v) increased resilience; and vi) better means of implementation. These are further organized into thematic areas and subthemes represented by qualitative and quantitative indicators capturing distinct dimensions of agrifood system performance.

This framework is operationalized through FAO's Analytical Support Mechanism for Agrifood System Country Programming and Evidence (SCOPE), a corporate initiative delivering high-quality data, research and evidence-based policy guidance aligned with national priorities and tied to regular UN programming moments to drive national agrifood systems transformation. Its analytical backbone begins with a performance assessment of the country-level state of the agrifood system, referred to as the Level 1 diagnostic. The objective of this assessment is to identify key systemic challenges within the agrifood system, which serve as strategic entry points for targeted policy and programming interventions.

Given the diversity of indicators, differences in measurement units, and the lack of universally defined targets for many non–SDG indicators, a coherent and adaptable assessment methodology is required. The performance assessment outlined in this paper provides a standardized and transparent basis for classifying indicator performance (from weakest to strongest) using normalized values, relative benchmarking, and, where applicable, progress toward defined targets. The methodology draws on established approaches, including FAO's SDG indicator assessment protocols (4,5) and incorporates benchmark-based comparisons in line with the FSCI framework (6,7) while being explicitly tailored to the diagnostic and programming prioritization objectives of SCOPE.

Accordingly, the performance assessment is designed to provide a holistic and structured view of a country's agrifood system performance, serving a dual purpose. First, it supports the prioritization of underperforming indicators and associated agrifood system themes within the country by identifying relative systemic weaknesses that constitute strategic entry points for deeper analytical investigation under Levels 2 and 3, and that are likely to warrant targeted policy and programmatic interventions. Second, through periodic repetition, it enables the monitoring of changes in agrifood system performance over time, with the initial assessment establishing a baseline against which future progress can be evaluated.

Existing approaches to AFS performance assessment

Early efforts to assess country performance have focused on single outcomes. FAO's methodologies for the Prevalence of Undernourishment (PoU) and the Food Insecurity Experience Scale (FIES) are prominent examples (8,9). Building on such metrics, a second group of approaches constructs composite indices that aggregate multiple indicators into a single score. The Global Hunger Index (GHI), the GlobalFood Security Index (GFSI), and the Food Sustainability Index (FSI) are some examples. Composite indices play an important role in communication and broad benchmarking, but reviews often highlight limitations for diagnostic use, including sensitivity to weighting and aggregation choices and the fact that aggregation can reduce traceability from an overall score back to specific system constraints (10,11). Motivated by these limitations, a third family of approaches has moved toward systems-oriented indicator frameworks. The FSCI proposes a system-oriented monitoring architecture structured around five thematic areas. The application of this framework highlights important trade-offs across themes and documents significant data gaps relevant for global monitoring (1). More recently, (7) propose a methodology to assess food system performance and progress using a subset of countdown indicators. Their approach evaluates country performance relative to global targets where available and relative to regional and income group benchmarks where targets are absent. A related strand of methodology draws on SDG-oriented progress assessment within the UN system. FAO and partners have developed statistical approaches that assess performance as a normalized distance to target and track progress over time using standardized trend metrics, such as compound annual growth rates, leading to indicator-level performance classifications (4,5). However, the lack of globally agreed targets for many agrifood indicators constrains direct application. Within this landscape, the SCOPE performance assessment methodology is positioned as a diagnostic-oriented extension of existing systems approaches. It aligns with SDG-style distance-to-target methods where explicit targets exist and draws on the benchmarking logic developed under FSCI and related work where such targets are absent. At the same time, it introduces a country-internal classification of indicator performance, designed specifically to identify relative weaknesses within a given agrifood system and to support prioritization of themes for deeper analyses, while enabling periodic repetition for performance monitoring over time.

Performance assessment methodology

The indicator-level performance assessment evaluates national progress in agrifood systems (AFS) transformation through a transparent, structured, and methodologically robust approach. It is designed to ensure analytical rigor, comparability, and policy relevance. The assessment is guided by four core principles: i) alignment with established conceptual frameworks (1,2); ii) consistency with established assessment methodologies (4); iii) multidimensional assessment by integrating current performance as well as changes over time; and iv) transparency and reproducibility including indicator dictionary and documented data and methods.

Based on these principles, two complementary performance assessment methods are applied: a Current Status Assessment (CSA) and a Trend Assessment (TA). Together, they provide a structured diagnostic of where agrifood systems performance currently stands, how it is evolving over time, and how far it remains from defined targets or benchmarks. These scores and classifications do not establish causality or prescribe specific policy interventions. Rather, they translate complex AFS data into decision-relevant signals to identify systemic bottlenecks and inform evidence-based prioritization for programming and policy.

Current status assessment (CSA)

The CSA offers a snapshot of a country's AFS performance at the indicator level, using the most recent available data. It shows where the country stands relative to the global target or benchmark by calculating the distance to the target (or benchmark) for each indicator. This assessment enables the identification of AFS indicators (and associated subthemes) that are furthest from the benchmark level of performance.

The CSA incorporates two complimentary metrics: 1) the CSA performance score and 2) the CSA performance classification.

1. CSA performance score (d_{it})

The CSA performance score quantifies the performance of each indicator relative to global targets or benchmarks (regional/income). Scores are normalized such that a higher value indicate a greater distance from the target/benchmark. These scores serve as the underlying input for the CSA performance classification. It also allows for monitoring changes over time through periodic recalculation as new data become available.

The methodology to calculate the performance score depends on the type of indicators: indicators with numerical targets and indicators without numerical targets.

Indicators with numerical target

When indicators are accompanied by an explicit numerical target - whether global, regional, or country specific- *(e.g. SDG, EAT Lancet diet),* the CSA performance scores are calculated using the distance to target normalization approach (4). The score expresses the gap between the observed indicator value x_{it} for country *i* in year *t*, and the target value x_i^*, as a normalized distance. The direction of normalization depends on the normative orientation of the indicator (whether progress is defined by increasing or decreasing values).

The normalized distance for indicators can be expressed as follows:

$$d_{it} = \begin{cases} \dfrac{x_i^* - x_{it}}{d_{max}} = \dfrac{x_i^* - x_{it}}{x_i^* - x^{(w)}} & when\ normative\ direction\ =\ increase\ over\ time \\ \dfrac{x_{it} - x_i^*}{d_{max}} = \dfrac{x_{it} - x_i^*}{x^{(w)} - x_i^*} & when\ normative\ direction\ =\ decrease\ over\ time \end{cases}$$

Where $x^{(w)}$ is the worst value observed among countries in year *t*, x_{it} is the indicator value for country *i* in year *t*, x_i^* is the indicator's target value for country *i*. It should be noted that, in the case where all countries in the world must achieve the same indicator value by the end of a specific year $x_i^* = x^* \ \forall i$. A small tolerance value (1e-6) was added to the denominator to prevent division by zero and reduce numerical instability.

In all cases, a value of $d_{it} =< 0$ means the country has already met the target. Larger positive values indicate greater distance to the target and therefore weaker performance.

Indicators without numerical targets.

For indicators without explicit numerical targets, this CSA adopts a benchmarking approach to evaluate how a country is performing relative to its peers. Instead of looking at a country's progress in isolation, this approach compares a country's normalized indicator values with corresponding regional benchmarks or income level benchmark. This comparative framework enables situating countries within appropriate structural and developmental contexts.

Performance scores are computed by dividing the difference between the normalized benchmark value and the country's normalized value by the distance between the normalized benchmark value and the worst observed value (for normalized distance to target). Since the normalization restricts the value to 0-1 and already adjusted for directionality, the following formula is used:

$$d_{it} = \frac{x_i^* - x_{it}}{d_{max}} = \frac{x_i^* - x_{it}}{x_i^*}$$

Where x_{it} is the indicator value for country i in year t, x_i^* is the value of the benchmark reference for country i.

A value of d_{it}=<0 indicates that the country matches the benchmark. Positive values reflect a greater distance below the benchmark.

2. CSA performance classification

Once all indicators performance scores d_{it} are computed, they are ranked and divided into quintiles, placing each indicator into one of five performance groups (from strongest to weakest). This classification is country focused as it evaluates indicator performance relative to the country's own distribution of scores[2]. The objective is to identify subthemes that perform relatively worse than others within the same country and therefore warrant targeted programming or policy attention.

Because the quintile thresholds are recalculated for each iteration, the resulting performance categories are relative rather than absolute. Consequently, classifications are not directly comparable over time: an indicator classified in the highest performance group in year t does not necessarily reflect the same absolute level of performance as an indicator classified in the highest group in year $t + 1$. For this reason, the quintile-based classification is not suitable for monitoring temporal progress.

The classification is expressed as:

[2] The CSA performance classification identifies *what is working and what is not* across the AFS. It highlights imbalances across AFS indicators (and related themes) - such as productivity, inclusiveness, sustainability, or resilience; helping to pinpoint specific subthemes that are underperforming relative to others within the country. As the results of this classification are not directly comparable across different iterations of the exercise, it cannot be employed for the purpose of monitoring progress over time

$$C_{it} = \begin{cases} 1 & \text{if } d_{it} \le q_{20\%} \\ 2 & \text{if } q_{20\%} < d_{it} \le q_{40\%} \\ 3 & \text{if } q_{40\%} < d_{it} \le q_{60\%} \\ 4 & \text{if } q_{60\%} < d_{it} \le q_{80\%} \\ 5 & \text{if } d_{it} > q_{80\%} \end{cases}$$

Where d_{it} is the distance calculated as above, and q are the quintile cut-offs. C_{it} is the classification of d_{it}into 5 classes.

Quintile	Assessment category	Assessment symbol
$q_{80\%} < d_{it} \le q_{100\%}$	5 - Strongest performance	●
$q_{60\%} < d_{it} \le q_{80\%}$	4 - Strong performance	●
$q_{40\%} < d_{it} \le q_{60\%}$	3 - Average performance	●
$q_{20\%} < d_{it} \le q_{40\%}$	2 - Weak performance	●
$q_{0\%} < d_{it} \le q_{20\%}$	1 - Weakest performance	●

Indicators wherein no assessment can be conducted are marked with grey circles (●).

Using quintile-based classification allows the CSA to reflect the specific context of the country, identify internal performance patterns, highlight the most lagging areas, and provide clear policy diagnostics by signalling which parts of the agrifood system require urgent attention.

2.2 Trend assessment (TA)

The TA reveals how an AFS indicator (and associated AFS subtheme) performance is evolving over time. It adds a temporal perspective, showing whether performance in each area is improving, stagnating, or declining, and thus where structural or policy constraints may be slowing progress. In line with the CSA, the TA also include two metrics: the TA performance score and the TA performance classification. Both metrics are comparable when calculations are updated; they can thus be used for monitoring changes of trends over time[3].

1. TA performance score ($CAGR_a$)

TA performance score quantifies the progress of the indicator over time by using historical and current data points. This is an input to the TA performance classification metric. The Compound Annual Growth Rate (CAGR) is calculated for each indicator, following the methodology outlined by (5) and implemented at the FAO Data Portal in assessing the progress of countries for the SDG indicators. The CAGR measures the rate of change over time and represents growth or decline that compound over multiple periods. This will be based on the historical data of the indicator and will be computed by the following formula, where $x_{it_0}$is the indicator value at the baseline year and x_{it} is the indicator value for the latest year. T is the latest year and t_0 is the baseline year.

Actual growth:

[3] Tracking this score over successive periods allows assessment of whether performance trends are accelerating, decelerating, or reversing, offering insight into the consistency and direction of change.

$$CAGR_a = (\frac{x_{it}}{x_{it_0}})^{\frac{1}{t-t_0}} - 1$$

To ensure consistency with the normative direction of improvement, the sign of CAGR$_a$is reversed (multiplied by –1) for indicators where a decrease in the indicator value represents progress. This adjustment ensures that positive values consistently indicate improvement, and negative values indicate deterioration across all indicators.

A positive $CAGR_a$ indicates improvement in the indicator between the baseline year and most recent year), whereas a negative $CAGR_a$ reflects deterioration over time. The magnitude of the CAGR provides insight into the rate of change, thereby indicating the speed at which performance is improving or declining.

2. TA performance classification

The **TA performance classification** categorizes the direction and magnitude of change in each indicator on a five-level scale (improving, stagnating, or declining), thereby facilitating intuitive interpretation of temporal dynamics. It provides a complementary temporal insight for the AFS performance, in addition to the CSA performance classification.

Following (4) criteria for classifying indicators, the calculated TA performance score ($CAGR_a$) are grouped into the following performance categories:

Range of CAGR	Assessment category	Assessment symbol
$CAGR_{a,adjust} < -0.01$	Significant deterioration since baseline year	↓ (red)
$-0.01 \leq CAGR_{a,adjust} < -0.005$	Deterioration since baseline year	↘ (orange)
$-0.005 \leq CAGR_{a,adjust} < 0.005$	No change since baseline year	→ (yellow)
$0.005 \leq CAGR_{a,adjust} \leq 0.01$	Improvement since baseline year	↗ (light green)
$CAGR_{a,adjust} > 0.01$	Significant improvement since baseline year	↑ (green)

Indicators that have already met a globally defined target under the CSA are explicitly labelled as **"TARGET MET"** within the TA performance classification to signal that no further improvement relative to the defined target is required. Indicators for which insufficient or inconsistent data prevent an assessment are denoted with a grey circle (●).

3. Indicator requirements and processing for performance assessment

The performance assessment described in the previous section requires a careful selection and preparation of indicators. This section describes the processing choices made.

3.1 Requirements for indicator inclusion

Indicators were broadly classified as: (i) continuous (ratios, percentages, rates), (ii) categorical, and (iii) index-based. This classification provides a basis for applying consistent processing and normalization methods across diverse AFS themes. Indicator types such as ratios, percentages, or rates are preferred because they allow scale-independent comparison, whereas absolute indicators (e.g. total production or emissions) mainly capture system size and may distort performance analysis. From the 158 indicators in the FAO framework (2), 93 expressed as ratios, percentages, rates, or other normalized measures were retained. Indicators available exclusively as absolute values were excluded from the performance analysis. Table A1 in the appendix lists all indicators included in the assessment.

3.2 Normative direction

Normative orientation is determined in a transparent and systematic manner, drawing on both indicator definitions and their thematic placement within the broader AFS framework. Out of the 93 indicators which are suitable for country performance assessment, 55 indicators were tagged according to their normative direction as positive (higher values indicate improvement), 30 as negative (higher values indicate deterioration), and 8 as neutral (no inherent direction). Only the 85 indicators with a clear positive or negative orientation were retained for performance assessment. Indicators whose interpretation was highly context-sensitive—such as food import dependency or fertilizer use—were tagged as neutral and excluded from the performance assessment to preserve methodological consistency and analytical transparency. Table A1 provides an overview of the normative direction assigned to each indicator.

3.3 Temporal anchoring: baseline and latest observations

The preferred baseline year is 2015, consistent with the conceptual baseline of the SDG framework. When data for 2015 were unavailable, the closest observation within the 2012–2015 window was used. This approach maintains alignment with the SDG reference year while limiting distortions that could arise from selecting observations too distant from the baseline. For the most recent observation, 2024 was selected as the preferred reference year, reflecting the latest reporting cycle. Where 2024 data were unavailable, observations from 2021 onward were accepted. This three-year window strikes a balance between ensuring policy relevance through up-to-date information and avoiding the use of outdated data that could misrepresent recent performance trends.

3.4 Targets and benchmarks for performance assessment

Where available, numerical global targets were used as reference points, drawing on operational target values defined in (4). Targets expressed as relative change (e.g. “doubling the baseline value”) were also included once translated into measurable values. In total, 19 global targets were identified across the themes of the AFS indicator framework. For indicators lacking explicit global targets, benchmarks were developed using either geographic regions following the United Nations Standard Country or Area Codes for Statistical Use (UN M49), or income groups, based on the World Bank’s GNI per capita classification. To ensure representativeness, benchmarks were generated only when at least 50 percent of countries within the reference group had available data (in line with UN SDG reporting). In line with the (7), countries were ranked according to their most recent observations, and benchmark values were defined based on the performance of countries at the top (above the 80th percentile) or bottom (below the 20st percentile) of the distribution, depending on the indicator’s normative direction. The top performer benchmark approach provides a target-oriented reference grounded in the performance of leading countries.

3.5 Data preprocessing and normalization

Outliers were addressed using winsorization, with values below the 5th percentile and above the 95th percentile replaced by the corresponding threshold values. To address skewness and accommodate zero or negative values, the inverse hyperbolic sine (IHS) transformation was applied following winsorization. The IHS transformation approximates logarithmic behaviour for large values while remaining well-defined at zero and for negative observations, allowing consistent treatment across indicators with heterogeneous distributions. All transformed indicators were subsequently normalized to a 0–1 scale using a min–max approach, in line with SDG progress measurement approaches following (4). For indicators with a positive normative direction, higher transformed values correspond to higher normalized scores; for indicators with a negative normative direction, the scale was inverted so that higher scores consistently reflect better performance.

To preserve comparability between national indicators and reference points, the same preprocessing steps—winsorization, transformation, and normalization—were applied to all benchmark and target values. This ensures that country values, regional and income-group benchmarks, and global targets are evaluated on a common and methodologically consistent basis.

4. Translating methodology into practice: evidence for country programming

Country examples

To illustrate the practical application of CSA and TA classifications, this section presents selected country examples. For Timor-Leste see table 3, and for Kazakhstan see table 4. These examples demonstrate how the combined interpretation of current performance and recent trends can reveal meaningful performance patterns that may not be evident when each dimension is considered separately. For clarity and analytical focus, the discussion concentrates on a single outcome within one country.

4.1.1 Timor-Leste

Assessment of Timor-Leste's protected environment and natural resources

Across agrifood system outcomes and cross-cutting areas in Timor-Leste, indicators related to the protected environment outcome are predominantly among the weakest performers in the country when assessed against relevant targets or benchmarks (using South-East Asian countries as the reference group). This concentration of weak current performance highlights environmental protection and natural resource management as a significant area of concern compared to other areas of the AFS.

When CSA and TA classifications are examined jointly, several emission-intensity indicators—covering rice, beef, chicken, and goat production—emerge as priority risks. These indicators are not only among the weakest performers relative to other indicators in the country, but have also deteriorated between the baseline year and the most recent observation. Similarly, water stress indicators show weak current performance and little to no improvement over time. Together, these patterns point to persistent structural gaps combined with unfavourable or stagnant trajectories, underscoring the need for closer analytical attention and sustained programmatic support.

In contrast, land-related indicators such as cropland nitrogen use efficiency and the proportion of degraded land display moderate to strong current performance relative to other indicators in Timor-Leste. However, both indicators have worsened over the assessment period. Despite their comparatively strong current status, the negative trends constitute early warning signals that recent gains may not be sustained unless underlying drivers are addressed.

4.1.2 Kazakhstan

Assessment of Kazakhstan's improved diets, nutrition, and health

Among the agrifood system outcomes and cross-cutting areas in Kazakhstan, indicators related to improved diets, nutrition, and health are predominantly among the strongest performers in the country when assessed against relevant targets or benchmarks (using upper middle-income countries as the reference group). This outcome area therefore represents a relative strength within Kazakhstan's agrifood system.

Table 3: Agrifood System performance assessment for Timor- Leste

Enhanced production

Total factor productivity [Index]	red ●	↓
Yield - Rice	red ●	↓
Water use efficiency in agriculture	red ●	↓
Yield - Beef	red ●	↘
Value of agri production [USD_PPP/ha]	red ●	→
Yield - Chicken	red ●	→
Agriculture value added per worker [USD]	red ●	↑
Yield - Oilcrops (Cake equivalent)	orange ●	↓
Yield - Root and tubers	orange ●	↓
Yield - Oilcrops (Oil equivalent)	orange ●	↓
Yield - Vegetables	orange ●	↓
Yield - Sheep and goat	orange ●	→
Yield - Pulses	orange ●	↗
Yield - Pig	yellow ●	→
Yield - Citrus	yellow ●	→
Yield - Eggs	yellow ●	→
Yield - Fruits	yellow ●	↑
Cultivated area equipped for irrigation	light green ●	→
Permanent meadows and pastures [%]	dark green ●	→
Agriculture area under organic agric [%]	dark green ●	↑
Firm's biggest obstacle: transportation	dark green ●	↑
Int'l instruments to combat IUU fishing	dark green ●	TARGET MET

Improved diets, nutrition and health

Children under 5 who are stunted [%]	orange ●	↑
Prevalence of undernourishment [%]	yellow ●	↓
Anemia among women [%]	yellow ●	↘
Mod. or severe food insecurity (total) [%]	yellow ●	grey ●
Mod. or severe food insecurity (male) [%]	yellow ●	grey ●
Mod. or severe food insecurity (female) [%]	yellow ●	grey ●
Obesity in the adult population [%]	light green ●	↓
Severe food insecurity (total) [%]	light green ●	grey ●
Severe food insecurity (male) [%]	light green ●	grey ●
Severe food insecurity (female) [%]	light green ●	grey ●
Children under 5 who are overweight [%]	dark green ●	TARGET MET

Protected environment and natural resources

Emissions intensity - beef	red ●	↓
Emissions intensity - buffalo	red ●	→
Water Stress (Agri) [%]	red ●	→
Emissions intensity - sheep	red ●	↗
Emissions intensity - rice	orange ●	↓
Emissions intensity - chicken	orange ●	↓
Emissions intensity - goat	orange ●	↓
Water Stress (Total) [%]	orange ●	→
Emissions intensity - pig	orange ●	→
Cropland nitrogen use efficiency [%]	yellow ●	↓
Proportion of degraded mountain land	light green ●	↓
Emissions intensity - cereals excluding rice	light green ●	↓
Emissions intensity - eggs	light green ●	↑
Terrestrial KBAs protected areas (%)	dark green ●	TARGET MET

Improved livelihoods, reduced poverty and inequality

Universal health coverage, [INDEX]	yellow ●	↑
Share of agri emp in total (total) [%]	light green ●	↓
Share of agri emp in total (male) [%]	light green ●	↓
Share of agri emp in total (female) [%]	light green ●	↓
Share of AFS emp in total [%]	light green ●	↓
Firm's biggest obstacle: inadequately educated workforce	dark green ●	↑
Remittances as a proportion of GDP (%)	dark green ●	↑
Access to electricity (total)	dark green ●	TARGET MET
Access to electricity (urban)	dark green ●	TARGET MET
Access to electricity (rural)	dark green ●	TARGET MET

Increased resilience

Indicator of Food Price Anomalies (IFPA)	light green ●	↓

Better means of implementation

Agriculture orientation index	red ●	↑
Mobile ownership (% of population)	red ●	grey ●
Firm's biggest obstacle: access to finance	orange ●	↗
Government effectiveness index	orange ●	↑
Statistical performance indicators	orange ●	grey ●
Agri share of gov't expenditure	yellow ●	↓
2.a.1 Agriculture value added share of GDP	light green ●	↓
Civil society participation index	light green ●	↑
Firm's biggest obstacle: licensing and permits	dark green ●	↑
Firm's biggest obstacle: customs and trade	dark green ●	↑

Kazakhstan performs particularly well on food security indicators, having met SDG targets for undernourishment—maintained below 2.5 percent since 2015—as well as for all food insecurity indicators, including moderate or severe food insecurity and severe food insecurity across total, male, and female adult populations. These indicators remain at very low levels, generally around 2 percent or below. Child nutrition outcomes have also improved over time, with stunting declining from 8.9 percent in 2015 to 4.4 percent in the most recent year.

While overweight prevalence among children under five currently shows only moderate performance relative to other indicators in the country, it has declined from 10.6 to 8.7 percent over the assessment period. This positive trend suggests meaningful progress and potential for further improvement if gains are sustained through continued attention to dietary quality and nutrition-sensitive interventions. In contrast, anaemia among women of reproductive age represents a notable area of concern. Current performance is relatively weak, and the trend is unfavourable, with prevalence increasing slightly from 29.0 to 30.5 percent, remaining well above global targets. Adult obesity indicators, while still performing relatively well in comparison to other national indicators, have worsened between the baseline and the most recent year. This combination of strong current status and deteriorating trend constitutes an early warning signal, highlighting the need for proactive programmatic attention to prevent further erosion of nutrition and health outcomes.

Table 4: Agrifood System performance assessment for Kazakhstan

Enhanced production

Yield - Cereals	● (red)	↓
Agriculture area under organic agric [%]	● (red)	↓
Yield - Pulses	● (red)	↘
Value of agri production [USD_PPP/ha]	● (red)	→
Yield - Oilcrops (Cake equivalent)	● (red)	→
Agriculture value added per worker [USD]	● (red)	↑
Yield - Oilcrops (Oil equivalent)	● (red)	↑
SDG 2.4.1. Productive and sustainable agri	● (red)	↑
Water use efficiency in agriculture	● (red)	↑
instruments to combat IUU fishing	● (red)	● (grey)
Cultivated area equipped for irrigation	● (orange)	↓
Yield - Citrus	● (orange)	→
Yield - Beef	● (orange)	→
Logistics performance index	● (orange)	→
Yield - Pig	● (orange)	↗
Yield - Sugar crops	● (orange)	↑
Yield - Eggs	● (yellow)	↘
Yield - Fibre crops	● (yellow)	→
Yield - Sheep and goat	● (yellow)	↗

Improved diets, nutrition and health

Anemia among women [%]	● (orange)	↘
Children under 5 who are overweight [%]	● (yellow)	↑
Prevalence of unaffordability [%]	● (yellow)	● (grey)
Obesity in the adult population [%]	● (light green)	↓
Children under 5 who are stunted [%]	● (light green)	↑
Pop. using safely managed drinking water	● (green)	↗
Mod. or severe food insecurity (total) [%]	● (green)	TARGET MET
Mod. or severe food insecurity (male) [%]	● (green)	TARGET MET
Mod. or severe food insecurity (female) [%]	● (green)	TARGET MET
Severe food insecurity (total) [%]	● (green)	TARGET MET
Severe food insecurity (male) [%]	● (green)	TARGET MET
Severe food insecurity (female) [%]	● (green)	TARGET MET
Cost of a healthy diet	● (green)	● (grey)

Protected environment and natural resources

Water Stress (Total) [%]	● (red)	↓
Water Stress (Agri) [%]	● (red)	↘
Emissions intensity - beef	● (orange)	↓
Emissions intensity - goat	● (orange)	↓
Freshwater KBAs protected areas (%)	● (orange)	→
Emissions intensity - eggs	● (yellow)	↓
Emissions intensity - milk	● (yellow)	→
Emissions intensity - rice	● (yellow)	↑
Emissions intensity - chicken	● (light green)	→
Terrestrial KBAs protected areas (%)	● (light green)	↗
Emissions intensity - cereals	● (light green)	↗
Emissions intensity - sheep	● (green)	→
Cropland nitrogen use efficiency [%]	● (green)	↑

Improved livelihoods, reduced poverty and inequality

Share of agri emp in total [%]	● (red)	↓
Share of agri emp in total (male) [%]	● (red)	↓
Remittances as a proportion of GDP (%)	● (red)	↓
Share of agri emp in total (female) [%]	● (orange)	↓
Social protection coverage (total)	● (orange)	↑
Social protection coverage (male)	● (orange)	↑
Social protection coverage (female)	● (orange)	↑
Poverty headcount ratio ($8.3 a day)	● (yellow)	↑
Access to electricity (total)	● (green)	TARGET MET
Access to electricity (urban)	● (green)	TARGET MET
Access to electricity (rural)	● (green)	TARGET MET
Universal health coverage, [INDEX]	● (green)	TARGET MET
Poverty headcount ratio ($3.0 a day)	● (green)	TARGET MET
Poverty headcount ratio ($4.2 a day)	● (green)	TARGET MET
Social protection adequacy (total)	● (grey)	↑
Social protection adequacy (male)	● (grey)	↑
Social protection adequacy (female)	● (grey)	↑

Increased resilience

Indicator of Food Price Anomalies (IFPA)	● (green)	TARGET MET

Better means of implementation

2.a.1 Agriculture value added share of GDP	● (red)	↓
Civil society participation index	● (orange)	↑
Government effectiveness index	● (yellow)	↑
Statistical performance indicators	● (yellow)	● (grey)
Mobile ownership (% of population)	● (yellow)	● (grey)
Agriculture orientation index	● (green)	↓

5. Conclusion

Transforming agrifood systems is indispensable for achieving the Sustainable Development Goals. Yet transformation requires more than ambition: it requires a clear, structured, and evidence-based understanding of where countries stand, how their systems are evolving, and which areas warrant strategic attention. This paper has presented a transparent and reproducible methodology for assessing AFS performance at country level, designed precisely to meet this need. Building on established SDG monitoring approaches and system-oriented benchmarking frameworks, the methodology combines a CSA and a TA to generate a multidimensional diagnostic of agrifood system performance. The CSA identifies structural gaps by measuring the normalized distance to targets or benchmarks, while the TA captures the direction and speed of change over time. Together, they provide a coherent framework for distinguishing between persistent weaknesses, emerging risks, sustained strengths, and areas showing early signs of improvement. The objective of this approach is not to prescribe policies or establish causality. Rather, it serves as a strategic entry point for prioritization. By systematically identifying underperforming indicators and subthemes within a country's agrifood system, the diagnostic guides the selection of priority areas for deeper analytical work. In doing so, it strengthens the link between data, analysis, and programming, ensuring that limited analytical and policy resources are directed toward the most critical leverage points for transformation. At the same time, indicator-based performance assessment has inherent limitations. CSA and TA rely exclusively on quantitative data and are therefore constrained by data availability, frequency, coverage, and quality. Benchmark-based comparisons depend on the robustness of reference groups, and country-relative classifications must be interpreted carefully, particularly in contexts where overall performance is uniformly strong or weak. Moreover, trends derived from two-point comparisons cannot fully capture short-term volatility or non-linear dynamics. For these reasons, this performance assessment should not be interpreted in isolation. Quantitative diagnostics must be complemented by qualitative country knowledge, institutional and policy analysis, and review of existing evidence. In sum, the methodology provides a standardized yet adaptable framework for diagnosing agrifood system performance in support of national programming. By translating complex multidimensional data into structured and interpretable signals, it strengthens evidence-based dialogue, supports strategic prioritization, and contributes to more coherent and impactful agrifood systems transformation aligned with national development objectives and global commitments.

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