

Food Systems Governance Depth and Nutrition-Sensitive Agriculture in Ethiopia: Understanding the Gap between Agricultural Production, Food Availability and Dietary Diversity

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Abstract

Ethiopia's National Nutrition-Sensitive Agriculture (NSA) Strategy (2017–2021) aimed to increase the production and consumption of diverse, nutrient-dense foods. However, limited evidence exists on how governance conditions shaped implementation across administrative levels and whether agricultural production gains translated into improved food availability and child dietary diversity. This study used a concurrent mixed-methods design to examine the 2017–2023 implementation trajectory of nutrition-sensitive agriculture following the launch of the NSA Strategy, covering both the formal Strategy period and continued implementation through 2023. Data sources included a structured desk review, secondary analysis of national datasets (Agricultural Sample Survey, FAOSTAT, and Ethiopian Demographic and Health Survey), and 51 key informant interviews conducted across federal, regional, and subnational levels. Qualitative analysis focused on leadership, financing, coordination, accountability, institutional capacity, and gender-responsive implementation. Although the Strategy achieved strong policy integration at the national level, implementation weakened at subnational levels. Persistent challenges included constrained financing, leadership turnover, inconsistent coordination, and output-oriented monitoring. Quantitatively, production of several nutrient-dense food groups increased through 2023; nevertheless, national per-capita availability remained substantially below Food-Based Dietary Guideline recommendations for most nutrient-dense food groups. Child minimum dietary diversity improved only modestly, rising from 14% in 2016 to 16% in the 2024–25 EDHS, remaining well below the Strategy's 40% target. Drawing on institutional theory, this study introduces Food Systems Governance Depth (FSGD) as an analytical lens to examine the extent to which governance functions become embedded, mutually reinforcing, and sustained across administrative levels. The findings reveal linked gaps along the production–availability–dietary diversity pathway and suggest that translating agricultural gains into adequate food availability and improved diets may depend on stronger FSGD alongside complementary food-system interventions.

1. Introduction

Over the past two decades, Ethiopia has achieved notable reductions in undernutrition, including declines in stunting and underweight among children under five. Nevertheless, malnutrition remains a major public health challenge. Persistent stunting, wasting, anemia, and micronutrient deficiencies, alongside rapid urbanization and shifting dietary patterns, have contributed to a growing double burden of undernutrition and diet-related non-communicable diseases [1, 2]. These trends reveal structural weaknesses in the food system that extend beyond food availability to affordability, physical and economic access, dietary quality, and equitable access to nutrient-dense foods [3].

Emerging evidence indicates that increases in agricultural production do not automatically translate into adequate availability of diverse, nutrient-dense foods or improved dietary quality and nutrition outcomes [4–6]. Broader food-systems frameworks recognize that nutrition depends not only on production but also on the availability, affordability, accessibility, utilization, and consumption of diverse foods [3]. Consequently, increasing agricultural output alone may be insufficient where institutional and

implementation constraints limit the capacity of food systems to generate adequate supplies of nutrient-dense foods and support their translation into healthier diets [5, 6]. Understanding these constraints therefore requires attention to the governance conditions shaping how food-system policies and interventions are implemented across administrative levels.

Governance is increasingly recognized as a critical determinant of multisectoral nutrition outcomes. Effective implementation of nutrition-sensitive interventions requires sustained political commitment, cross-sector coordination, adequate financing, accountability mechanisms, and institutional capacity across administrative levels [7, 8]. Yet policies that appear coherent at the national level frequently become fragmented during sub-national implementation [9, 10]. Existing concepts, including governance capacity, policy coherence, implementation fidelity, and institutionalization, have advanced understanding of implementation performance but provide limited insight into how governance functions become embedded, mutually reinforcing, and sustained across administrative levels, and why implementation strength may weaken as policies move from national formulation to sub-national delivery [7–10]. This challenge is not unique to Ethiopia; a recent systematic review of agri-food system governance in South Asia similarly concluded that policy commitment alone is insufficient without strong vertical coordination, accountability systems, and institutional capacity during implementation [11].

Following the launch of Ethiopia's National Nutrition-Sensitive Agriculture (NSA) Strategy in 2017, nutrition-sensitive agriculture became more explicitly integrated into agricultural policy and programming [12]. The Strategy sought to increase the production and consumption of diverse foods while promoting gender equity and strengthening multisectoral collaboration [12]. Previous studies have documented progress in policy integration and agricultural production, but limited evidence exists on whether these gains were sufficient to achieve adequate national availability of nutrient-dense foods or how governance conditions influenced implementation and the translation of food-system gains into improved dietary diversity [13–15]. Although the formal Strategy period ended in 2021, nutrition-sensitive agriculture activities and related institutional arrangements continued beyond the Strategy period through 2023, preceding the launch of the subsequent strategy in 2024.

This study examined the 2017–2023 implementation trajectory of nutrition-sensitive agriculture in Ethiopia, covering the formal 2017–2021 NSA Strategy period and continued implementation and institutional transition through 2023. It integrated qualitative evidence on governance and implementation with quantitative evidence on agricultural production and per-capita food availability through 2023, together with national evidence on child dietary diversity from the 2024–25 EDHS. Drawing on institutional theory and governance perspectives, we introduce Food Systems Governance Depth (FSGD) as an analytical lens for examining how financing, accountability, leadership, coordination, and institutional capacity become embedded, mutually reinforcing, and sustained across administrative levels. Specifically, the study examines how FSGD helps explain two linked food-system gaps: inadequate availability of nutrient-dense foods and the limited translation of food-system gains into improved child dietary diversity. Progress in child dietary diversity was considered in relation to the 40%

target established by the NSA Strategy, while recognizing that dietary diversity is influenced by multiple factors beyond agricultural food availability.

2. Results

2.1 Participant Characteristics

The 51 key informants represented a range of leadership, technical, and nutrition-focused roles across the institutional levels included in the study. The sample comprised senior leadership (n = 13), director-level technical experts (n = 24), and specialized nutrition focal persons (n = 14). Most participants (n = 42) had held their positions for at least two years during the implementation period, providing substantial retrospective insight into how nutrition-sensitive agriculture was translated from national policy into practice across administrative levels and diverse agro-ecological settings.

2.2 Governance Performance across Domains

The qualitative findings showed a consistent gradient in governance performance across administrative levels. Governance functions were generally more strongly institutionalized at the federal level but were less consistently embedded and sustained at regional and local levels. This pattern was evident across leadership, financing, coordination, accountability, institutional capacity, and gender-responsive implementation.

2.2.1 Leadership Ownership and Strategic Direction

Institutional ownership of the NSA Strategy was strongest at the federal level but weakened across administrative levels. Federal-level respondents consistently described the Strategy as successful in integrating nutrition objectives into broader agricultural policy frameworks, including the Ten-Year Development Plan and sectoral policies such as the National Horticulture Policy. One federal director explained:

Before the NSA Strategy, nutrition was seen as a health sector issue... it gave us a mandate to articulate how agriculture contributes to nutrition.

However, this policy momentum did not translate consistently into routine implementation at lower administrative levels. Regional respondents, particularly from pastoral settings, reported limited involvement during strategy design and considered the Strategy insufficiently adapted to local realities. This divergence was accompanied by weaker leadership continuity and institutional ownership at sub-national levels.

Leadership turnover was repeatedly identified as a mechanism disrupting implementation continuity. An Oromia respondent described the effect of frequent changes in senior officials:

It is difficult to say that it has been implemented as expected. Because of the frequent turnover of higher-level officials. An official who attended the training yesterday may not be in his position tomorrow, so if they [the FNCO] call another official, they will have to start from the scratch.

Thus, leadership was effective in establishing nutrition within the national agricultural policy agenda, but sustained ownership and continuity were less consistently maintained at sub-national levels.

2.2.2 Financing Architecture and Fiscal Capacity

Financing constraints were consistently identified as major barriers to implementation across administrative levels. Respondents described available resources as inadequate relative to planned activities, with implications for implementation continuity and the supporting functions required to sustain it. A federal coordinator stated:

As compared to our plan and performance, the budget is largely insufficient... we are not running as expected.

The absence of dedicated budget allocations at regional and local levels contributed to substantial reliance on externally funded projects. Respondents described stronger implementation during project-supported periods but difficulty maintaining activities following project closure. A regional official from Amhara noted:

There were good achievements during the project phase, but they declined after project closeout.

Financing constraints extended beyond the scale of direct interventions, affecting staffing, supervision, coordination, and monitoring. The findings therefore suggest that financing influenced not only the volume of activities implemented but also the extent to which implementation could be sustained within government systems.

2.2.3 Cross-Sectoral and Vertical Coordination

Coordination mechanisms varied substantially across administrative levels. Federal structures were generally perceived as more functional and capable of facilitating collaboration among sectors, whereas coordination became increasingly inconsistent at regional and local levels. Respondents identified differing planning cycles, sector-specific reporting systems, competing priorities, and limited resources as factors affecting sustained collaboration.

The distinction between formal coordination and sustained joint implementation was particularly evident in Oromia. One respondent noted:

During multisectoral planning there were 13 different sectors. But during evaluation there was none.

Similarly, respondents reported that formal NSA coordination mechanisms in some regions were not consistently functional during implementation. These findings indicate that the existence of

multisectoral structures did not necessarily ensure sustained coordination through implementation, monitoring, and evaluation.

The findings therefore point to a distinction between coordination mechanisms being formally established and coordination functions being operationally sustained across administrative levels.

2.2.4 Accountability and Monitoring Systems

Monitoring and accountability systems were predominantly oriented toward implementation outputs rather than downstream nutrition outcomes. Indicators commonly focused on agricultural inputs, activities, and immediate outputs, while mechanisms for routinely tracking dietary and nutrition outcomes were limited. One federal monitoring respondent explained:

From the beginning, there was no baseline data... progress could not be traced.

Weak harmonization across reporting systems and limited field supervision further constrained the capacity of monitoring systems to support implementation management. Although reporting requirements were maintained, field-level verification and systematic data-quality checks were not consistently conducted.

The qualitative findings were also reflected in discrepancies between complementary quantitative data sources. Differences between Agricultural Sample Survey (ASS) estimates and Ministry of Agriculture (MOA) administrative records, particularly for animal-source foods, reflected differences in data-generation and reporting systems. ASS estimates were based on nationally representative sampling, whereas MOA figures relied primarily on administrative reporting and projected yields.

One respondent summarized the broader problem of fragmented reporting:

As it was decentralized, regions reported by their own system. Federal reported its own only. As a country the report was not integrated.

The convergence of qualitative and quantitative evidence therefore identified accountability not simply as a reporting issue, but as a limitation in the capacity of the implementation system to generate, verify, integrate, and use information for performance assessment and adaptive management.

2.2.5 Frontline Institutional Capacity

Several institutional reforms strengthened the visibility of nutrition within the agriculture sector. In particular, the establishment and elevation of the Food and Nutrition Coordination Office (FNCO) represented an important organizational change. One federal official noted:

Previously the department was a case team under extension programs. After the NSA strategy, the minister decided to have a direct line of command.

However, these organizational reforms were not consistently matched by institutional capacity at sub-national levels. Respondents described shortages in staffing, limited career pathways, and excessive workloads, with implementation responsibilities in some regions concentrated among relatively few personnel. Historical restructuring of relevant professional career tracks was also identified as a constraint. A federal FNCO official explained:

Previously the FMOA had a career structure for Home Economics graduates, and later the structure was eliminated. This was a fault.

The evidence therefore showed a distinction between organizational reform at the center and sustained implementation capacity at the subnational level. Organizational visibility increased, but workforce capacity and institutional support systems remained uneven across administrative levels.

2.2.6 Gender-Responsive Implementation

Gender-responsive activities were incorporated into several NSA interventions, including backyard gardening, poultry and livestock production, improved access to agricultural inputs, income-generating activities, and training. A regional official reported:

We supported 309,691 women to participate in backyard vegetables, fruits, poultry, and milk goat production initiatives.

However, implementation of gender-related objectives was uneven. Respondents reported that gender units were under-resourced, financing for gender-transformative programming was limited, and routine monitoring did not consistently capture gender-sensitive indicators. Women's participation in production and marketing also did not necessarily translate into control over income generated from agricultural activities.

2.3 Agricultural Production, Food Availability and Child Dietary Diversity

2.3.1 Trends in Production of Nutrient-Dense Foods

To examine whether implementation of nutrition-sensitive agriculture following the 2017 NSA Strategy launch was accompanied by changes in agricultural production, production data from two complementary sources were examined: the nationally representative Agricultural Sample Survey (ASS) and Ministry of Agriculture (MOA) administrative records. The two sources were interpreted as complementary rather than definitive, recognizing their different data-generation and reporting procedures.

Aggregate production of several nutrient-dense food groups increased over the observation period, although the magnitude of change differed between the two data sources.

ASS data indicated increases in cereal production (+ 16.24%), pulse production (+ 14.20%), root crop production (+ 14.36%), vegetable production (+ 26.87%), fruit production (+ 46.61%), oilseed production (+ 1.93%), milk production (+ 22.04%), and egg production (+ 25.52%). MOA administrative records reported larger increases for several food groups, including cereals (+ 34.69%), root crops (+ 2.15%), vegetables (+ 189.50%), fruits (+ 171.47%), eggs (+ 218.54%), and poultry (+ 154.55%) (Tables 1 and 2).

Table 1
Production Trends for Staples and Nutrient-Dense Foods: reported by
the Agricultural Sample Survey Ethiopia (2016/17–2021/22)

Food group	2016/17 ASS	2021/22 ASS	% change
Cereals (quintals)	253,847,239	295,082,042	+ 16.24%
Pulses (quintals)	28,152,190	32,150,000	+ 14.20%
Root crops (quintals)	36,290,120	41,500,000	+ 14.36%
Vegetables (quintals)	7,764,130	9,850,000	+ 26.87%
Fruits (quintals)	7,639,400	11,200,000	+ 46.61%
Oilseeds (quintals)	8,397,800	8,560,000	+ 1.93%
Milk (litres)	3.13 billion	3.82 billion	+ 22.04%
Eggs (number)	145 million	182 million	+ 25.52%

Table 2
Agricultural production reported through Ministry of Agriculture
administrative data

Food group	2016/17 MOA	2022/23 MOA	% change
Cereals (quintals)	258,900,000	348,710,240	+ 34.69%
Root crops (quintals)	43,057,000	43,983,770	+ 2.15%
Vegetables (quintals)	8,126,000	23,524,720	+ 189.50%
Fruits (quintals)	7,924,000	21,511,400	+ 171.47%
Eggs (number)	1.23 billion	3.918 billion	+ 218.54%
Poultry (quintals)	44,000	1,120,000	+ 154.55%

The divergence between the two data sources was particularly pronounced for some food groups, including animal-source foods. ASS estimates were derived from nationally representative sampling procedures, whereas MOA figures relied primarily on administrative reporting and projected yields. The two sources therefore provided consistent evidence of an overall increase in production of several nutrient-dense food groups, while differing substantially in the magnitude of reported change (Tables 1 and 2).

The qualitative findings indicated that implementation activities increasingly moved beyond policy and capacity development toward tangible interventions, including distribution of biofortified crop, fruit and vegetable seeds and establishment of nutrition-focused production initiatives. However, implementation was disrupted in some settings by political instability and conflict.

Overall, the production findings indicate that gains in agricultural output occurred across several nutrient-dense food groups over the observation period. The subsequent analysis examined whether these production levels were sufficient to generate adequate national per-capita availability of nutrient-dense foods.

2.3.2 The Production–Availability Gap

To assess whether national food supplies were adequate relative to dietary recommendations, 2023 FAOSTAT food supply data were used to estimate national average per-capita availability and were compared with Ethiopian Food-Based Dietary Guidelines (FBDG) recommendations.

The combined availability of cereals, grains, roots, and tubers was estimated at 644 g/person/day, representing the highest per-capita availability among the food groups examined. In contrast, pulse availability was estimated at 62 g/person/day, below the FBDG recommendation of 80–120 g/person/day, with an estimated deficit of 18–58 g/day. Availability of nuts and oilseeds was 4 g/person/day, considerably below the recommended 10–20 g/person/day, representing a deficit of approximately 60–80% relative to the lower and upper ends of the recommended range.

The combined availability of meat, fish, and eggs was 24 g/person/day, compared with the recommended 60 g/person/day, representing a gap of 36 g/day, or approximately 60% below the recommendation. Milk and dairy products were available at 84 g/person/day, markedly below the recommended 300–400 g/person/day, resulting in the largest absolute gap observed among the food groups, at 216–316 g/day. Combined fruit and vegetable availability was estimated at 63 g/person/day, below the recommended 100–200 g/person/day, with a gap of 37–137 g/day. Availability of fats and oils was 19 g/person/day, below the recommended 30–40 g/day, corresponding to a deficit of 11–21 g/day (Table 3).

Table 3

National Per Capita Availability of Major Food Groups Relative to the Ethiopian Food-Based Dietary Guidelines, Ethiopia (2023).

Food group	National availability (g/person/day) (FAOSTAT, 2023)	Ethiopian FBDG recommendation (g/person/day)	Estimated gap
Cereals, grains, roots and tubers	644	3–4 servings/day*	Broadly adequate
Pulses	62	80–120	18 to 58 g/day
Nuts and oilseeds	4	10–20	6 to 16 g/day
Meat, fish and eggs	24	~ 60	36 g/day
Milk and dairy	84	300–400	218 to 318 g/day
Fruits and vegetables	62	100–200	28 to 128 g/day
Fats and Oils	19	30–40	11-21g/day
<i>*The Ethiopian FBDGs express recommendations for cereals as servings rather than grams; therefore, direct comparison should be interpreted cautiously.</i>			
<i>Sources: FAOSTAT Food Balance Sheets (2023); Ethiopian Food-Based Dietary Guidelines 2022.</i>			

2.3.3 Gains in Child Dietary Diversity

Child dietary diversity remained low alongside increases in production of several nutrient-dense food groups and persistent national food-supply gaps. The proportion of children aged 6–23 months achieving Minimum Dietary Diversity (MDD-C) increased from 14% in 2016 to 16% in the 2024/25 EDHS, remaining substantially below the NSA Strategy's 40% target.

The 2024/25 EDHS also indicated that complementary feeding remained heavily dependent on starchy staple foods, while consumption of several nutrient-dense food groups, including animal-source foods, legumes, and vitamin A-rich fruits and vegetables, remained limited.

Taken together, the quantitative findings identified a persistent gap across the food-system pathway. Increases in agricultural production across several nutrient-dense food groups were not accompanied by adequate national per-capita availability of most recommended food groups, while child dietary diversity showed only modest gains and remained substantially below the Strategy target.

2.4 Integrated Synthesis of FSGD

The qualitative and quantitative findings converged on a consistent pattern: implementation strength varied across administrative levels, with governance functions comparatively well established at the federal level but less consistently embedded and sustained at sub-national levels. This governance gradient provided an integrative basis for interpreting the persistent gaps observed along the production–availability–dietary diversity pathway.

At the federal level, stronger implementation was characterized by clearer policy ownership, organizational positioning, technical direction, and formal coordination mechanisms. At regional and local levels, however, financing, leadership continuity, multisectoral coordination, accountability, workforce capacity, and gender-responsive institutional support were less consistently sustained.

Cross-domain analysis identified three interrelated conditions that characterized stronger FSGD: predictable financing, outcome-oriented accountability, and institutionalized sub-national implementation capacity. These conditions were reinforced by sustained leadership, functional cross-sectoral coordination, and institutional ownership. Where these conditions were weak, implementation became increasingly dependent on externally supported projects, individual leadership, or short-term coordination arrangements.

The quantitative findings showed two related but distinct gaps that occurred alongside the observed governance gradient. First, although production of several nutrient-dense food groups increased through 2023, national per-capita availability remained below FBDG recommendations for most nutrient-dense food groups. Second, child dietary diversity showed only modest improvement and remained far below the Strategy's 40% target. Thus, the findings do not indicate a simple failure of agricultural production; rather, they identify weaknesses at successive points in the pathway from governance and implementation to production, from production to adequate food availability, and from food availability to diverse diets.

The convergence of qualitative and quantitative evidence therefore provides an empirical basis for FSGD as an integrative analytical lens. FSGD captures the extent to which governance functions are not only formally established at the national level but also embedded, mutually reinforcing, and sustained across administrative levels. The findings suggest that shallow institutionalization of these functions coincided with weaker sub-national implementation capacity and persistent gaps along the food-system pathway from agricultural production to food availability and child dietary diversity.

3. Discussion

This study examined the 2017–2023 implementation trajectory of nutrition-sensitive agriculture in Ethiopia following the launch of the National Nutrition-Sensitive Agriculture (NSA) Strategy in 2017. Although the formal Strategy period ended in 2021, nutrition-sensitive agriculture activities and related institutional arrangements continued through 2023, preceding the launch of the subsequent strategy in 2024. Using a concurrent mixed-methods design, the study developed Food Systems Governance Depth

(FSGD) as an integrative analytical lens for understanding implementation performance in multisectoral nutrition interventions.

Similar patterns have been reported in Nepal, where multisectoral planning established strong national governance structures but implementation networks became substantially weaker during program delivery [16]. Complementary quantitative evidence extending through 2023 showed that increases in agricultural production did not consistently translate into adequate availability of nutrient-dense foods, while later national dietary evidence indicated only modest gains in child dietary diversity. Collectively, these findings suggest that financing, accountability, leadership continuity, coordination, and institutional capacity were not consistently institutionalized across administrative levels. This pattern provides a plausible interpretation of why national policy commitments were not consistently translated into sustained implementation and may help explain the persistent gap between national policy ambition, implementation performance, and downstream dietary outcomes.

A second important finding concerns the pathway from agricultural production to food availability. Production of several nutrient-dense food groups increased during the period examined; however, these gains did not correspond to adequate national availability of many nutrient-dense foods. FAOSTAT estimates for 2023 indicated substantial shortfalls relative to the Ethiopian Food-Based Dietary Guidelines, particularly for milk and dairy products, other animal-source foods, fruits and vegetables, pulses, and nuts and oilseeds, whereas cereal availability was generally adequate [17, 18]. Thus, the evidence suggests a persistent production–availability gap: increases in agricultural production did not necessarily translate into sufficient national availability of nutrient-dense foods.

A further gap was evident at the level of child diets. Minimum dietary diversity among children aged 6–23 months was 14% in 2016 and 16% in the 2024–25 EDHS, remaining substantially below the Strategy's target of 40%. Although this comparison extends beyond the formal 2017–2021 Strategy period, the later national estimate provides an important reference point indicating that child dietary diversity remained substantially below the Strategy's 40% target. Considered alongside the qualitative findings and agricultural production and food-availability trends through 2023, the limited improvement in child dietary diversity points to a persistent production–availability–dietary diversity disconnect. These findings suggest that gains in agricultural production were not necessarily transmitted through the food system to adequate availability of nutrient-dense foods and, ultimately, to improved child dietary diversity.

These findings are consistent with a growing body of food-systems evidence demonstrating that increased agricultural production alone does not necessarily improve dietary quality or nutrition outcomes. The pathways linking agricultural production to diets are mediated by multiple factors, including market access, affordability, post-harvest systems, food environments, women's empowerment, maternal and child feeding practices, nutrition knowledge, caregiving and hygiene practices, and access to health and nutrition services [19–22]. The production–availability gap identified in this study should therefore not be interpreted as evidence that increased production is ineffective.

Rather, it indicates that production gains represent only one component of a more complex pathway through which food-system conditions influence dietary outcomes.

Financing emerged as one of the most persistent implementation constraints. The absence of dedicated and predictable budget lines at regional and local levels contributed to staffing shortages, planned activities without tagged implementation budgets, irregular supervision, fragmented monitoring, and heavy reliance on short-term donor-funded projects. Similar patterns of donor dependence and implementation discontinuity have been documented across several low- and middle-income countries [16, 21–23]. Bangladesh provides comparable evidence, where the sustainability of nutrition-sensitive agriculture interventions depended on the absorptive capacity of local institutions, effective multisectoral coordination, and governance arrangements extending beyond project funding cycles [24]. By contrast, Rwanda demonstrates how decentralized financing, stronger sub-national policy coherence, routine use of nutrition data, and performance-based accountability mechanisms can support greater reductions in child undernutrition [25]. These observations are also consistent with earlier stakeholder assessments in Ethiopia and Nepal identifying dedicated budget lines, clearer institutional mandates, and stronger national–sub-national linkages as prerequisites for effective multisectoral nutrition implementation [26].

Weaknesses in accountability systems further constrained implementation. The discrepancy observed between Agricultural Sample Survey (ASS) estimates and routine Ministry of Agriculture (MOA) administrative data is consistent with weaknesses in routine monitoring, data verification, and reporting systems identified through the qualitative findings. Whereas the ASS is based on nationally representative survey methods, routine administrative reporting relies largely on administrative records, projected yields, and self-reporting, which may contribute to differences in reported production estimates. Beyond data-quality concerns, monitoring systems remained predominantly output-oriented, emphasizing agricultural inputs and program activities rather than dietary and nutrition outcomes. Consequently, opportunities for adaptive management, cross-sector learning, and evidence-informed decision-making were constrained. Similar shortcomings have been reported across multisectoral nutrition programs where monitoring systems prioritize sector-specific outputs without adequately capturing downstream nutrition impacts [27–29]. These findings reinforce calls for integrated accountability systems that combine robust data verification with routine measurement of dietary and nutrition outcomes alongside agricultural performance.

Importantly, these governance constraints did not operate independently but reinforced one another. Limited financing constrained supervision, workforce development, and routine coordination, while frequent leadership turnover weakened institutional memory and implementation continuity, particularly at regional and woreda levels. Weak accountability systems further limited the ability of institutions to identify implementation bottlenecks and adapt activities based on evidence. This interaction suggests that implementation effectiveness depends not simply on the presence of individual governance components, but on the extent to which these functions reinforce one another and remain operational across successive administrative levels. Comparable implementation dynamics have been documented

elsewhere in sub-Saharan Africa, where ambitious multisectoral nutrition policies have frequently outpaced institutional implementation capacity [20, 23, 30, 31].

Gender-responsive implementation illustrates the same institutional challenge. Women's participation was incorporated into several NSA interventions, including backyard gardening, poultry and livestock production, agricultural input provision, and training. However, participation did not consistently translate into empowerment, control over income, or sustained gender-transformative change. Limited resources for gender units and weaknesses in gender-sensitive monitoring further constrained implementation. This suggests that gender responsiveness requires more than targeting women as beneficiaries; it requires institutional capacity, financing, monitoring, and accountability mechanisms capable of sustaining gender-responsive implementation across administrative levels. These considerations are particularly important because women's decision-making power, caregiving practices, and intra-household allocation of food can influence whether improvements in food availability translate into improved child diets [19–22].

The findings should also be interpreted within Ethiopia's broader operating context. During the period examined, the country experienced food-price inflation, political instability, localized conflict, and climate-related shocks that likely constrained agricultural production, household purchasing power, and dietary improvement [32, 33]. These contextual pressures should not be treated as competing explanations for the observed implementation gaps. Rather, they may have exposed or amplified underlying weaknesses in institutional resilience. Governance systems lacking institutionalized financing, effective accountability mechanisms, leadership continuity, and sustained coordination may be less able to maintain implementation momentum during periods of crisis [28, 36].

The principal conceptual contribution of this study is the proposal of Food Systems Governance Depth (FSGD) as an integrative analytical lens for examining implementation performance in multisectoral nutrition interventions. Rather than introducing additional governance dimensions, FSGD emphasizes the extent to which existing governance functions become embedded, mutually reinforcing, and sustained across successive administrative levels. The concept therefore shifts analytical attention from whether governance mechanisms exist at the national level to whether they remain functional as policies move through regional and local implementation systems.

In this study, three mutually reinforcing conditions were particularly important for greater FSGD: predictable financing, outcome-oriented accountability, and institutionalized sub-national implementation capacity. Leadership continuity and cross-sectoral coordination also supported the maintenance of these functions across administrative levels. Where these elements were stronger, implementation was more likely to be sustained; where they weakened, implementation became increasingly dependent on individual leaders, externally funded projects, or temporary coordination arrangements.

FSGD complements existing concepts such as governance capacity, policy coherence, implementation fidelity, and institutionalization [26, 29]. Its added value lies in directing analytical attention to the vertical

continuity and mutual reinforcement of governance functions across the food-system implementation pathway. A policy may be technically coherent and institutionally established at the national level while remaining shallow in implementation if financing, accountability, coordination, and capacity are not reproduced and sustained at the levels where implementation actually occurs. In this sense, FSGD provides a way of examining not simply whether governance functions are present, but whether they retain sufficient institutional depth to support implementation across administrative levels.

This perspective also helps interpret the quantitative findings. The observed increase in production alongside persistent gaps in the national availability of nutrient-dense foods and limited gains in child dietary diversity should not be understood as a simple failure of agricultural production. Rather, they illustrate the importance of the institutional and food-system processes connecting production with food availability and dietary practices. The findings point to two related but distinct bottlenecks: a production–availability bottleneck, in which increased production did not consistently result in adequate national availability of nutrient-dense foods, and an availability–dietary diversity bottleneck, in which available food supplies did not necessarily translate into diverse diets among young children. FSGD provides an analytical lens for examining whether the governance conditions required to address these bottlenecks are adequately embedded and sustained across administrative levels.

These findings have important implications for Ethiopia's revised National Nutrition-Sensitive Agrifood Systems Strategy (2024–2030) and for comparable initiatives in other low- and middle-income countries. Strengthening governance should be viewed not only as an administrative priority but also as an enabling condition for translating multisectoral policy commitments into sustained implementation and improved food-system outcomes.

Future strategies should therefore move beyond policy integration alone and prioritize predictable domestic financing, outcome-oriented accountability, leadership continuity, routine cross-sector coordination, and sustained sub-national implementation capacity. At the same time, governance strengthening should be complemented by investments in market systems, affordability, post-harvest infrastructure, food environments, gender-responsive programming, and maternal and child feeding and care practices. These complementary conditions are necessary because agricultural production alone cannot ensure that nutrient-dense foods become available, affordable, accessible, and ultimately incorporated into children's diets.

The practical value of FSGD lies in its potential to identify where and why implementation weakens as policies move from national formulation to local delivery and as agricultural outputs move through the food system toward consumption. Applying this lens during implementation of the revised strategy could help identify gaps in financing, accountability, leadership, coordination, and institutional capacity before they become binding constraints. More broadly, the findings suggest that achieving nutrition-sensitive agriculture objectives requires not only technically sound policies and increased agricultural production, but also governance systems capable of sustaining the pathway from policy commitment through implementation and production to adequate food availability and improved dietary diversity.

4. Limitations

This study has several limitations that should be considered when interpreting the findings. First, data collection in 2023 relied partly on retrospective accounts of implementation, which may have introduced recall bias. Second, the study included four purposively selected regions and may therefore not fully capture implementation experiences across all Ethiopian contexts, particularly settings affected by conflict and other disruptions. Third, the concurrent mixed-methods design was primarily descriptive and explanatory and does not support causal inference or attribution of observed agricultural or dietary changes to the NSA Strategy. Fourth, discrepancies between Agricultural Sample Survey (ASS) and Ministry of Agriculture (MOA) production estimates highlight limitations in the underlying agricultural data systems and require cautious interpretation of production trends. Fifth, the use of secondary national datasets limited examination of household- and community-level pathways linking agricultural production and food availability to dietary outcomes. Finally, although the 2024–25 EDHS provides the latest national evidence on child dietary diversity, it extends beyond both the formal 2017–2021 Strategy period and the 2017–2023 implementation trajectory examined in this study. These data therefore cannot be used to estimate the effect of the NSA Strategy and were interpreted descriptively as later national evidence of dietary outcomes.

5. Conclusions and Policy Recommendations

Ethiopia's experience with nutrition-sensitive agriculture following the launch of the National Nutrition-Sensitive Agriculture (NSA) Strategy in 2017 suggests that technically sound policy design and national-level policy integration alone may be insufficient to achieve intended nutrition objectives when governance functions are not consistently institutionalized across administrative levels. Examining the broader 2017–2023 implementation trajectory, this study identified a sequence of implementation and food-system gaps. First, although production of several nutrient-dense food groups increased through 2023, national per-capita availability remained below Ethiopian Food-Based Dietary Guideline recommendations for most nutrient-dense food groups. Second, child dietary diversity showed only modest improvement and remained substantially below the 40% target established under the NSA Strategy, although the latest dietary evidence extends beyond the formal Strategy period and was interpreted descriptively. Together, these findings indicate that the challenges extended beyond agricultural production to the governance and food-system conditions required to sustain implementation, increase the availability of nutrient-dense foods, and support improvements in dietary diversity.

This study proposes Food Systems Governance Depth (FSGD) as an integrative analytical lens for understanding implementation performance in multisectoral nutrition interventions. FSGD emphasizes the extent to which governance functions become embedded, mutually reinforcing, and sustained across administrative levels. The findings suggest that predictable financing, outcome-oriented accountability, leadership continuity, cross-sector coordination, and institutionalized sub-national implementation

capacity are important foundational conditions for translating national nutrition-sensitive agriculture commitments into sustained local implementation.

The findings have important implications for Ethiopia's revised National Nutrition-Sensitive Agrifood Systems Strategy (2024–2030) and for similar initiatives in other low- and middle-income countries. Strengthening the conditions underlying FSGD will require institutionalizing predictable domestic financing, outcome-oriented monitoring and accountability, leadership continuity, functional cross-sector coordination, and sustained sub-national implementation capacity. These governance measures should be complemented by investments in market systems, post-harvest management, food safety, food environments, gender-responsive programming, and maternal and child feeding and care practices. Such complementary actions are necessary because agricultural production alone cannot ensure that nutrient-dense foods become sufficiently available, affordable, accessible, and incorporated into children's diets

6. Methods

6.1 Study Design and Analytical Framework

This study employed a concurrent mixed-methods triangulation design to examine the 2017–2023 implementation trajectory of nutrition-sensitive agriculture in Ethiopia. The analysis covered the formal 2017–2021 National Nutrition-Sensitive Agriculture (NSA) Strategy period as well as continued implementation and institutional transition through 2023, preceding the launch of the subsequent strategy in 2024. Primary qualitative data were collected between August and October 2023 through key informant interviews. The study also included a structured desk review and secondary analysis of national quantitative datasets. The mixed-methods design enabled examination of governance and implementation conditions alongside trends in agricultural production, per-capita availability of nutrient-dense foods, and child dietary diversity, allowing convergence, complementarity, and divergence across evidence sources to be assessed.

The study was guided by an implementation science framework integrating institutional theory and public-sector governance perspectives [37, 38]. Rather than treating policy implementation as a discrete or static event, the framework conceptualizes implementation as a dynamic process through which formal policy mandates become embedded within organizational structures, institutional routines, financing arrangements, and implementation practices [37]. Five governance domains were examined: (1) leadership, (2) financing, (3) coordination, (4) accountability, and (5) institutional capacity. Gender-responsive implementation was examined as a cross-cutting dimension within these domains.

The analysis developed FSGD as a higher-order analytical lens. FSGD refers to the extent to which core governance functions become embedded, mutually reinforcing, and sustained across successive administrative levels. The construct was not treated as an independent variable or a directly measured index. Rather, it emerged through the integration of evidence across the five governance domains and

was used to interpret how differences in institutionalization and continuity across federal, regional, and subnational levels helped explain variation in implementation performance.

The analytical framework considered two related dimensions of implementation performance. The first examined governance conditions in relation to trends in agricultural production and the adequacy of per-capita availability of nutrient-dense foods. The second examined governance conditions in relation to child dietary diversity, including progress toward the 40% dietary-diversity target established under the NSA policy agenda. The production–availability–dietary diversity pathway was therefore used as an interpretive food-systems pathway rather than as a single empirically tested causal pathway.

To operationalize the governance domains for systematic analysis, each domain was translated into observable indicators embedded within the data collection tools. Leadership was assessed through evidence of policy ownership, institutional commitment, leadership continuity, and leadership turnover. Financing was assessed through dedicated budget lines, resource adequacy, domestic versus donor financing, budget predictability, and sustainability of funding. Coordination focused on the functionality of multisectoral platforms, vertical linkages, joint planning, supervision, and feedback mechanisms. Accountability was examined through monitoring systems, indicator selection, data quality, reporting, feedback, and use of information for adaptive management. Institutional capacity was assessed through staffing, technical skills, training, organizational structures, and continuity of institutional functions.

FSGD was refined iteratively during analysis and integration of the qualitative, documentary, and quantitative evidence. It was therefore used as an integrative explanatory construct rather than as a predetermined coding category or independent causal variable. This approach allowed the analysis to retain the specificity of the five governance domains while examining how their combined institutionalization across administrative levels helped explain differences in implementation conditions.

As illustrated in Fig. 1, the conceptual framework positions governance conditions, including leadership, financing, coordination, accountability, and institutional capacity, as operating across federal, regional, and subnational levels. These conditions influence implementation processes and may shape agricultural production and the adequacy of nutrient-dense food availability, while broader food-system conditions influence the extent to which available foods are translated into dietary diversity. The framework also recognizes feedback between implementation experience and policy and institutional adaptation across administrative levels.

6.2 Desk Review and Secondary Data Sources

A structured desk review was conducted in August 2023 to assess institutional embedding, financing patterns, coordination arrangements, and accountability systems associated with the strategy. Policy and regulatory documents reviewed included the NSA Strategy (2017), National Nutrition Program II (2016–2020), Seqota Declaration, National Food and Nutrition Policy (2018), Food and Nutrition Strategy (2021), and the Revised Agriculture and Rural Development Policy (2022). Sector-specific roadmaps, including the Horticulture Strategy and the Livestock Master Plan, were examined to assess integration

across agricultural sub-sectors. Administrative records included annual reports of the Federal Ministry of Agriculture (2017–2023), regional bureau performance reports, budget summaries, and project evaluations. FAOSTAT 2023 food balance sheet data were analyzed separately to estimate national per-capita food availability. Document analysis followed a structured content analysis approach incorporating both deductive and interpretive components.

Secondary quantitative data were drawn from the Ethiopia Demographic and Health Surveys (EDHS 2016), the Ethiopian Statistical Service (ESS) Agricultural Sample Surveys (2016/17–2021/22), the 2024–25 EDHS, and FAOSTAT 2023 data [1–3, 17, 39, 40]. Analysis focused on national-level trends in agricultural production, food availability, and child dietary diversity. Agricultural production data from 2016/17 to 2022/23 were examined to characterize changes before and during the broader 2017–2023 implementation trajectory, while FAOSTAT 2023 data were used to assess national per-capita food availability relative to the Ethiopian Food-Based Dietary Guidelines. Child minimum dietary diversity (MDD) among children aged 6–23 months was assessed using available EDHS data, including the 2016 baseline and the 2024–25 EDHS. Key indicators included production volumes of nutrient-dense crops, horticultural and livestock products, national per-capita food availability, and MDD.

6.3 Sampling Strategy and Rationale

The purposive selection of Amhara, Oromia, Afar, and Somali regions was driven by an analytical rationale to capture systemic variance across distinct socio-ecological configurations. Amhara and Oromia represent high-density, highland agrarian systems focused on crop-livestock intensification, while Afar and Somali capture lowland pastoral and agro-pastoral dynamics characterized by mobile populations, distinct dietary patterns, and fragile market linkages. This deliberate contrast allowed us to examine implementation across contrasting agricultural and administrative contexts.

Purposive sampling targeted individuals with decision-making authority, technical leadership, or operational responsibility for nutrition-sensitive agriculture implementation. A total of 51 key informant interviews (KIIs) were conducted across federal, regional, and zonal administrative levels. At the federal level ($n = 9$), participants included senior government leaders and technical officials responsible for agriculture, nutrition, planning, monitoring and evaluation, food security, livestock, horticulture, and related functions. At the regional level ($n = 20$), participants included senior bureau officials, technical directors, finance officials, and nutrition focal persons from the four selected regions. At the zonal level ($n = 8$), participants included department heads and technical or nutrition experts from the selected zones. This sampling approach ensured representation of both strategic decision-making and operational perspectives across administrative levels.

To capture broader institutional, research, and development dynamics, the sample included representatives from research and academic institutions ($n = 10$). This group comprised experts from the Ethiopian Institute of Agricultural Research (EIAR), the Melkassa Research Center, and regional agricultural research institutes, including the Amhara Agricultural Research Institute (ARARI), Oromia Agricultural Research Institute (ORARI), and the Somali Region Agricultural Research Institute

(SOWPARI). Faculty members from agricultural and nutrition departments at Bahir Dar, Haramaya, Jimma, and Jijiga universities were also interviewed. Finally, the institutional sample was complemented by development partners (n = 4), including technical experts from the Food and Agriculture Organization (FAO), Jhpiego, Alive & Thrive, and the Sasakawa Africa Association.

6.4 Data Collection and Quality Assurance

Semi-structured interview guides were organized around the five governance domains and implementation processes. Following an initial scoping phase, instruments were pre-tested and refined. Five trained qualitative researchers conducted the interviews in Amharic, Afan Oromo, or Afar. Interviews were audio-recorded with verbal consent, transcribed verbatim, and translated into English for analysis.

To ensure trustworthiness, dependability, and confirmability of the findings, investigator triangulation was operationalized through weekly debriefing sessions during fieldwork where researchers cross-examined emerging insights to mitigate individual subjective bias [20]. Detailed audit trails documenting raw coding alterations, context notes, and translation choices were preserved to maintain transparency.

6.5 Qualitative Analysis and Evidence Triangulation for Governance Assessment

Qualitative data were analyzed using a hybrid deductive–inductive thematic approach in ATLAS.ti Version 9. A structured codebook was developed a priori based on the five governance domains, with each domain further divided into specific indicator codes (e.g., under ‘financing,’ codes included ‘dedicated budget lines,’ ‘donor dependence,’ and ‘budget adequacy’). To strengthen analytical reliability, a random subset of 20% of the interview transcripts (10 of 51 transcripts) was independently double coded by two researchers. Discrepancies in code definitions and coding boundaries were discussed and resolved through iterative consensus meetings, and the codebook was refined accordingly. These quality-assurance procedures focused primarily on the deductive coding framework, while inductive theme development was refined collaboratively by the research team.

Patterns across governance domains were further explored using code co-occurrence analyses and comparison of themes across respondent groups. These patterns were interpreted alongside areas of convergence in informant perspectives emerging from regional-level debriefings to support assessment of the relative prominence of specific implementation challenges.

Quantitative and qualitative datasets were integrated during the interpretation phase using a systematic Triangulation Convergence Matrix. The integration process followed four sequential steps. First, qualitative data were independently analyzed across the five governance domains to identify recurring themes and implementation patterns. Second, descriptive analyses were conducted using three complementary quantitative data sources: Agricultural Sample Survey (ASS) data to assess agricultural production trends from 2016/17 to 2021/22 (<https://ess.gov.et/wp-content/uploads/2026/07/crop-livestock-product-utilization-2016-17-2009.pdf>, <https://ess.gov.et/wp-content/uploads/2026/06/report-on-area-and-production-of-major-crops-202122-2014-e.c.pdf>); 2023 FAOSTAT food balance sheet data

(<https://www.fao.org/faostat/en/#data/FBS>) to estimate national per-capita food availability relative to the Ethiopian Food-Based Dietary Guidelines (FBDG-2022), (https://ephi.gov.et/wp-content/uploads/2021/02/Booklet_web.pdf); and Ethiopian Demographic and Health Survey (EDHS) data (<https://ess.gov.et/download/ethiopian-demographic-and-health-survey-edhs-2016-report/>, <https://ess.gov.et/download/demographic-and-health-survey-2024-25/>) to assess child dietary diversity, including the 2016 baseline and the 2024–25 EDHS. Third, findings from the three quantitative datasets and the qualitative evidence were mapped side-by-side within a shared triangulation matrix to identify areas of convergence, complementarity, and divergence. Finally, qualitative findings and stakeholder perspectives were used to interpret governance mechanisms underlying observed gaps between agricultural production, food availability, and dietary outcomes. FSGD was not treated as an independent variable but as an explanatory analytical construct used to synthesize evidence across multiple governance domains during interpretation. The thematic codebook and the analytical process used to derive the FSGD construct are provided in Supplementary File S1.

Declarations

Author Contributions

Tamene Asayehu (Corresponding Author): Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Writing – original draft, Writing, review & editing, Visualization, Project administration.

Dr. Namakula Covic: Conceptualization, Methodology, Validation, Supervision, Writing review & editing.

Dr. Dessalegn Tamiru: Conceptualization, Methodology, Validation, Supervision, Writing – review & editing.

Prof. Tefera Belachew: Conceptualization, Methodology, Validation, Supervision, Writing – review & editing.

All authors reviewed and approved the final version of the manuscript.

Ethical Statement

This study received ethical approval from the Institutional Review Board of Jimma University (Reference No.: JHRPGN/574/). All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of the institutional research committee and with the Declaration of Helsinki. All participants were provided with detailed information about the study in their local language and gave verbal consent prior to participation. Participation was entirely voluntary, and participants were informed of their right to withdraw at any time without consequence. All data were anonymized and securely stored to ensure confidentiality and protect participants' privacy.

Data availability

The secondary data used in this study, including Agricultural Sample Survey (ASS), FAOSTAT food availability, and Ethiopian Demographic and Health Survey (EDHS) 2024/25 data, are publicly available from their respective data sources. The qualitative interview data generated and/or analyzed during the current study are not publicly available because they contain potentially identifiable information and were collected under conditions of confidentiality and informed consent. De-identified qualitative data may be made available from the corresponding author upon reasonable request, subject to appropriate ethical and confidentiality considerations.

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Tamene Asayehu (lead researcher) is a doctoral researcher and the principal investigator of this study in the Department of Nutrition and Dietetics, Jimma University, Ethiopia. His research interests include nutrition-sensitive agriculture, maternal and child nutrition, food systems governance, implementation science, and multi-sectoral nutrition policy.

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Competing Interests

The authors declare no competing interests

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References

1. Central Statistical Agency (CSA) [Ethiopia], ICF. Ethiopia Demographic and Health Survey 2016. CSA and ICF. (2016).
2. Ethiopian Public Health Institute (EPHI). [Ethiopia], ICF. Ethiopia Mini Demographic and Health Survey 2019: Final Report. EPHI and ICF (2019).

3. Food and Agriculture Organization of the United Nations. The State of Food Security and Nutrition in the World 2022: Repurposing Food and Agricultural Policies to Make Healthy Diets More Affordable. FAO. (2022).
4. Baye, K., Hirvonen, K., Dereje, M. & Remans, R. Energy and nutrient production in Ethiopia, 2011–2015: implications for supporting healthy diets and food systems. *PLoS One*. **14**, e0213182 (2019).
5. Wordofa, M. G. & Sassi, M. Impact of agricultural interventions on food and nutrition security in Ethiopia: uncovering pathways linking agriculture to improved nutrition. *Cogent Food Agric*. **6**, 1724386 (2020).
6. Hirvonen, K. & Hoddinott, J. Agricultural production and children's diets: evidence from rural Ethiopia. *Agric. Econ*. **48**, 469–480 (2017).
7. Gillespie, S., van den Bold, M., Hodge, J. & Herforth, A. Stories of change in nutrition: an overview. *Global Food Secur*. **13**, 1–11 (2019).
8. Nisbett, N., Gillespie, S., Haddad, L. & Harris, J. Why worry about the politics of childhood undernutrition? *World Dev*. **64**, 420–433 (2014).
9. Pelletier, D. L. et al. Nutrition agenda setting, policy formulation and implementation: lessons from the Mainstreaming Nutrition Initiative. *Health Policy Plan*. **27**, 19–31 (2012).
10. Brinkerhoff, D. W. & Bossert, T. J. Health governance: principal-agent linkages and health system strengthening. *Health Policy Plan*. **29**, 685–693 (2014).
11. Gillespie, S., van den Bold, M. & Hodge, J. Nutrition and the governance of agri-food systems in South Asia: A systematic review. *Food Policy*. **82**, 13–27 (2019).
12. Federal Democratic Republic of Ethiopia. National Nutrition-Sensitive Agriculture Strategy 2017–2021. Ministry of Agriculture. (2017).
13. Alehegn, M. & Shibru, T. Review of nutrition-sensitive agriculture interventions and their contribution to dietary diversity in Ethiopia. *Cogent Food Agric*. **8**, 2030875 (2022).
14. Ayana, G. et al. Linkages between health and agriculture sectors in Ethiopia: a formative research study exploring barriers, facilitators and opportunities for local level coordination to deliver nutritional programs and services. *BMC Nutr*. **3**, 36 (2017).
15. Mulugeta, A. et al. Challenges to joint planning, monitoring, and evaluation for nutrition-sensitive agriculture in Ethiopia: an exploratory qualitative study. *Agric. Food Secur*. **11**, 61 (2022).
16. Ruducha, J., Bhatia, A., Mann, C. & Torlesse, H. Multisectoral nutrition planning in Nepal: evidence from an organizational network analysis. *Matern Child. Nutr*. **17**, e13112 (2021).
17. Food and Agriculture Organization of the United Nations. Food Balance Sheet for Ethiopia [Data set]. FAOSTAT (2023). <https://www.fao.org/faostat/en/#data/FBS>
18. Federal Ministry of Health, Ethiopian Public Health Institute. *Ethiopia: Food-Based Dietary Guidelines* (Ethiopian Public Health Institute, 2022).
19. Ruel, M. T. & Alderman, H. Nutrition-sensitive interventions and programs: how can they help accelerate progress in improving maternal and child nutrition? *Lancet* **382**, 536–551 (2013).

20. Kadiyala, S., Harris, J., Headey, D., Yosef, S. & Gillespie, S. Agriculture and nutrition in India: mapping evidence to pathways. *Ann. N Y Acad. Sci.* **1331**, 43–56 (2014).
21. Ruel, M. T., Quisumbing, A. R. & Balagamwala, M. Nutrition-sensitive agriculture: what have we learned so far? *Global Food Secur.* **17**, 128–153 (2018).
22. Webb, P. & Kennedy, E. Impacts of agriculture on nutrition: nature of the evidence and research gaps. *Food Nutr. Bull.* **35**, 126–132 (2014).
23. Resnick, D., Haggblade, S. & Babu, S. Food system policy effectiveness: a review of evidence on governance and implementation capacity. *Global Food Secur.* **38**, 100112 (2023).
24. Sharma, I. K. et al. What influences the implementation and sustainability of nutrition-sensitive agriculture interventions? A case study from southern Bangladesh. *Sustainability* **13**, 12049 (2021).
25. Iruhiriye, E. et al. Understanding differential reductions in undernutrition among districts in Rwanda through the perspectives of mid-level and community actors on policy commitment and policy coherence. *Matern Child. Nutr.* **20**, e13640 (2024).
26. Kennedy, E. et al. Implementing multisector nutrition programs in Ethiopia and Nepal: challenges and opportunities from a stakeholder perspective. *Food Nutr. Bull.* **37**, S111–S123 (2016).
27. Harris, J., Drimie, S., Roopnaraine, T. & Covic, N. From coherence to commitment: changing actors and the governance of nutrition in South Africa. *Food Policy.* **92**, 101828 (2020).
28. Mbabazi, J., Biyaki, M. & Nantale, R. Multi-sectoral nutrition coordination in Uganda: challenges and opportunities. *Afr. J. Food Agric. Nutr. Dev.* **20**, 16423–16440 (2020).
29. Pelletier, D. L. et al. Nutrition agenda setting, policy formulation and implementation: lessons from the Mainstreaming Nutrition Initiative. *Health Policy Plan.* **27**, 19–31 (2012).
30. Gillespie, S., van den Bold, M. & Hodge, J. Nutrition policy and governance: what works? *Global Food Secur.* **23**, 100–108 (2019).
31. Kim, S. S., Avula, R. & Ved, R. The role of data systems in improving nutrition governance: lessons from India. *Global Food Secur.* **18**, 12–18 (2018).
32. Nisbett, N., Harris, J., Gillespie, S. & Johnstone, A. M. What drives and constrains effective leadership in tackling child undernutrition? Evidence from Bangladesh, Ethiopia, India and Kenya. *Food Policy.* **53**, 33–45 (2015).
33. Nisbett, N., Gillespie, S., Haddad, L. & Harris, J. Why worry about the politics of childhood undernutrition? *World Dev.* **64**, 420–434 (2014).
34. World Bank. *World Development Indicators: Ethiopia* (World Bank, 2022).
35. World Bank. *World Development Report 2021: Data for Better Lives*. World Bank. (2021).
36. Food and Agriculture Organization of the United Nations. *The State of Food Security and Nutrition in the World 2023*. FAO. (2023).
37. Scott, R. *Institutions and Organizations: Ideas, Interests, and Identities* 4th edn (Sage, 2014).
38. Bossert, T. Analyzing the decentralization of health systems in developing countries: decision space, innovation and performance. *Soc. Sci. Med.* **47**, 1513–1527 (1998).

39. Central Statistical Agency (CSA). [Ethiopia]. *Agricultural Sample Survey: Report on Area and Production of Major Crops*, Vols. 2016/17–2020/21 (CSA, 2017–2021).
40. Lincoln, Y. & Guba, E. G. *Naturalistic Inquiry* (Sage, 1985).
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Figures

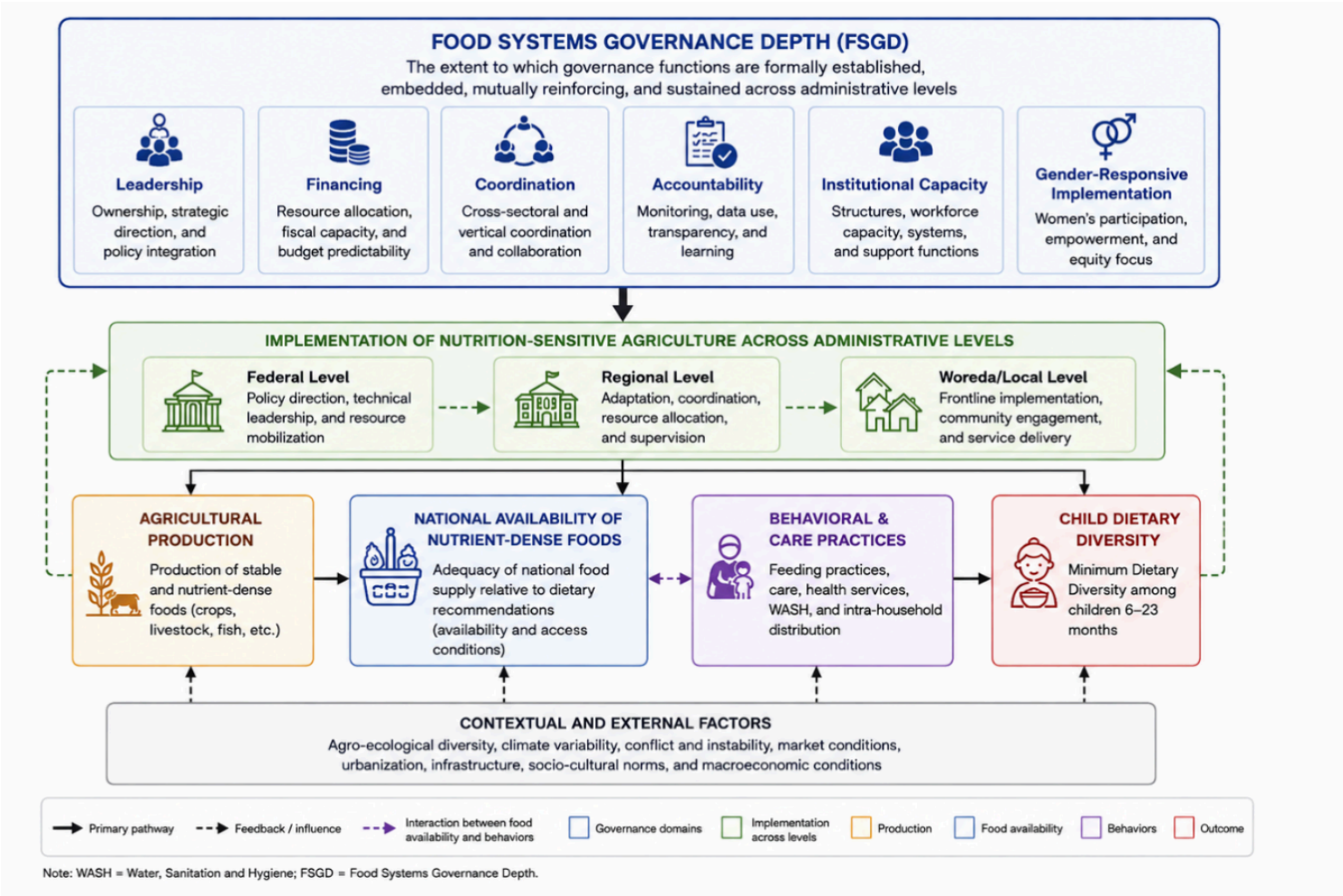


Figure 1

Food Systems Governance Depth Framework: Explaining Linked Gaps from Policy Implementation to Dietary Outcomes

Supplementary Files

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