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Forum for Agricultural Research in Africa

StEPPFoS
Strengthening Evidence-Based Policy and Practice for Sustainable Food Systems under the AU-EU Partnership

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Survey Report Identifying Capacity Gaps and Relevant Data Sources for Target Groups/Institutions

StEPPFoS Deliverable Report: D1.1

Funded by
the European Union

This project has received funding from the European Union's Horizon Europe Research and Innovation programme under Grant Agreement No. 101136770

Deliverable NO: D1.1

Title: Survey report identifying capacity gaps and relevant data sources for target groups/institutions.

Funding scheme:	Horizon Europe
Project Acronym:	StEPPFoS
Project Full Title:	Strengthening Evidence-Based Policy Practice for Sustainable Food Systems under the EU-AU Partnership
Grant Agreement n°:	101136770
Project duration:	48 months

Published by the StEPPFoS Consortium

Dissemination Level: **Public**

This project has received funding from the European Union's Horizon Europe Research and Innovation programme under Grant Agreement No. 101136770

DOCUMENT INFORMATION

Project number	101136770	**Acronym**	StEPPFoS
Full title	Strengthening Evidence-Based Policy Practice for Sustainable Food Systems under the EU-AU Partnership.		
Project URL	http://www.panap-StEPPFoS.org		
Document URL			
EU Project Officer	Adelma Di Biasio (REA – EC Jan 2024- Nov 2024) / Celine Dondeynaz (REA - EC) Dec 2024 to date		

Deliverable	**Number**	D1.1	**Title**	Survey report identifying capacity gaps and relevant data sources for target groups/institutions
Work Package	**Number**	WP1	**Title**	Evidence to support the development of consortium activities

Date of delivery	**Contractual**	M09	**Actual**	M09
Status	Version 1		Final	
Final review		**Formatting by WP1**		
Type of document	☐ prototype **X report** ☐ demonstration ☐ other			
Dissemination level	**X public** ☐ confidential			

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Abstract	This report submitted as Deliverable D1.1 presents the outcomes of a comprehensive survey conducted under the StEPPFoS project. The purpose of this survey was to identify capacity gaps and relevant data sources for targeted groups and institutions. Deliverable D1.1 is a key output under Task 1.1 of Work Package 1 (WP1) of the StEPPFoS project. WP1's overarching goal is to synthesize and document evidence that will support the development of Consortium activities, laying a foundation for the entire project's success. The analysis of capacity-building initiatives among policy and non-policy institutions reveals a strong commitment to staff development. Non-policy institutions emphasize regular training, with 85% conducting capacity development on a semi-annual or quarterly basis. Policy institutions, however, extend their focus to

	include external stakeholders, fostering collaboration. Both institution types align capacity-building efforts with strategic objectives, with 53.9% of policy institutions using employee feedback for assessments. However, there are some remaining gaps, as 19.2% of institutions lack formal structures for assessing capacity needs. Key skills required include analytical capabilities, stakeholder engagement, and technical expertise, particularly for evidence-based policymaking. Non-policy institutions also report a need for improved economic modelling skills, with limited expertise in advanced techniques. The study also underscores the need for enhanced capacity in economic modelling, particularly within non-policy institutions. Although some researchers have received training in the use of economic models such as CGE and econometric models, many institutions reported limited expertise in this area. The findings suggest a need for targeted capacity-building initiatives that focus on developing researchers' skills in advanced economic modelling techniques, which are crucial for conducting in-depth policy analysis and evaluating the impact of agricultural and economic policies. Key recommendations from the study include developing formal structures for capacity needs assessment; tailoring Capacity-Building to Specific Institutional Objectives; expanding Training on Economic Modelling and Analytical Tools; and integrating capacity building into ongoing projects.
Keywords	AU, EU, StEPPFoS, PANAP, Capacity Gap, Policy, Institutions, Survey, Data,

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StEPPFoS

Strengthening Evidence-Based Policy and Practice for Sustainable Food Systems under the AU-EU Partnership

D1.1. Survey Report Identifying Capacity Gaps and Relevant Data Sources for Targeted Groups and Institutions

Capacity Needs for Evidence-Based Policy Making

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Abbreviations

AFSH-AP	Africa Fertilizer and Soil Health Action Plan
AU	African Union
AUDA-NEPAD	African Union Development Agency – New Partnership for Africa's Development
CAADP	Comprehensive Africa Agriculture Development Programme
CGE	Computable General Equilibrium
CORAF	West and Central African Council for Agricultural Research and Dev't
CSIR	Council for Scientific and Industrial Research
CSO	Civil Society Organization
DRC	Democratic Republic of Congo
ECOWAS	Economic Community of West African States
EPRC	Economic Policy Research Centre (Uganda)
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical Database
FANRPAN	Food, Agriculture and Natural Resources Policy Analysis Network
FARA	Forum for Agricultural Research in Africa
FNSSA	Food and Nutrition Security and Sustainable Agriculture
GIS	Geographic Information Systems
ICARDA	International Center for Agricultural Research in the Dry Areas

IFPRI	International Food Policy Research Institute
IAR4D	Integrated Agricultural Research for Development
ISSER	Institute of Statistical, Social and Economic Research
KIPPRA	Kenya Institute for Public Policy Research and Analysis
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
NAIP	National Agricultural Investment Plan
NARS	National Agricultural Research Systems
OECD	Organization for Economic Co-operation and Development
PANAP	Pan-African Network for Economic Analysis of Policies
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
StEPPFoS	Strengthening Evidence-Based Policy and Practice for Sustainable Food Systems under the AU-EU Partnership
STI	Science, Technology and Innovation
STISA	Science, Technology and Innovation Strategy for Africa
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNIVE	University of Venice
UFHB	Université Félix Houphouët-Boigny
WP	Work Package

1. Introduction

1.1 Background and purpose of the report

The Strengthening Evidence-Based Policy and Practice for Sustainable Food Systems under the AU-EU Partnership (StEPPFoS) Project aims to offer an innovative approach to link the activities of the Pan-African Network for Economic Analysis of Policies (PANAP) to those of the Food and Nutrition and Sustainable Agriculture (FNSSA) through capacity building and multi-stakeholder engagement. StEPPFoS is a four-year project which started on 1st January 2024 and will end on 31st December 2027. The project is being implemented through eight (8) work packages and will achieve four (4) specific objectives which together are aimed at supporting the FNSSA 10-year roadmap and the global transition towards sustainable food systems transformation. The specific objectives are: (1) to improve capacities of research, academic, public sector, private sector, and civil society stakeholders and institutions involved in evidence-based policy analysis that support food and nutrition security and sustainable agriculture, (2) to enhance science-policy interface that supports science-based decision-making processes and experiences in support of agro-policy and inclusive transformation of national agrifood systems in Africa, (3) to improve strategies that promote scientific support within policy development in Africa and in Europe using digital technologies and information systems to accelerate the translation of research results into policies, and (4) to expand and strengthen the PANAP Network to support African countries with research on economic analysis of policies focusing on Food Systems and their sustainable transition.

Despite increasing recognition of the importance of evidence-based policymaking for food and nutrition security and sustainable agriculture, many African countries continue to face persistent challenges in translating research outputs into effective policies. These challenges are particularly pronounced in the areas of institutional capacity for policy impact analysis, availability and accessibility of relevant data, and the effectiveness of research–policy linkages. While numerous institutions generate valuable research and data on agri-food systems, these resources are often fragmented, underutilised, or misaligned with policy needs. Moreover, capacity disparities across research institutions, government agencies, civil society, and the private sector limit the ability of stakeholders to engage meaningfully in policy processes and to apply robust analytical tools in decision-making.

A knowledge gap therefore exists regarding the specific capacity constraints faced by key actors involved in evidence-based policy analysis for food systems, as well as the types, quality, and accessibility of data sources available to support such analysis. Existing assessments are either outdated, geographically limited, or insufficiently disaggregated across stakeholder groups, making it difficult to design targeted

and demand-driven capacity development interventions. Addressing this gap is essential for strengthening science–policy interfaces, improving policy coherence, and ensuring that food systems transformation efforts are grounded in robust empirical evidence.

Therefore, this report presents the findings from two desk reviews of literature complemented by a survey conducted under the StEPPFoS project. Task 1.1 conducted a 2 desk reviews; the description and analysis can be found in **Annex 1** and **Annex 2** of this deliverable (D1.1). However, the information gathered from the literature was only limited, therefore, this task decided to conduct a survey to get more precise information about the capacity gaps and training needs for WP2 or/and the StEPPFoS consortium activities The purpose of this survey was to identify capacity gaps and relevant data sources for targeted groups and institutions. Deliverable D1.1 is a key output under Task 1.1 of Work Package 1 (WP1) of the StEPPFoS project. WP1's overarching goal is to synthesize and document evidence that will support the development of Consortium activities, laying a foundation for the entire project's success. Specifically, WP1 aims to:

1. Identify existing gaps in institutional capacity for policy impact analysis.
2. Examine gaps in research-policy linkages.
3. Explore synergies and trade-offs between economic and agri-food research and policies.

Task 1.1, aligned with the first objective of WP1, is dedicated to reviewing, identifying, and analysing existing capacity gaps while mapping ongoing policies within the targeted regions. The overall objective of the survey is to assess institutional and individual capacity gaps, as well as the availability and use of relevant data sources, among key stakeholders involved in evidence-based policy analysis for food and nutrition security and sustainable agriculture, in order to inform targeted capacity development and strengthen science–policy linkages under the StEPPFoS project.

Specific objectives are;

(1) to improved capacities of stakeholders

(2) to chanced science-policy interface

(3) to improve strategies that promote scientific support within policy development

(4) to expand and strengthen the PANAP Network. StEPPFoS will be implemented through its 8 work-packages (WPs) over a period of 48 months.

The task spanned 18 months (M01- M18) and was led by the Forum for Agricultural Research in Africa (FARA) with the collaborative support of StEPPFoS partners such as Regional Universities Forum for

Capacity Building in Agriculture (RUFORUM), Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), Council for Scientific and Industrial Research (CSIR), University of Venice (UNIVE), Université Félix Houphouët-Boigny (Unifelix), and Kenya Institute for Public Policy Research and Analysis (KIPPRA).

2. Approach and Methodology

2.1 Target and scope

To meet the objectives of Task 1.1, the survey focused on both PANAP and non-PANAP member institutions. The primary aim was to identify and analyse existing capacity gaps in evidence-based policymaking, particularly in institutions within PANAP member countries using a survey instrument (Annex 3). This survey was conducted as a follow-up to the 2 desk reviews (**Box 1 and Box 2**), which identified capacity gaps at an aggregated level but did not provide sufficiently information or insight into the specific needs of individuals and institutions. The survey therefore aimed to generate detailed, demand-driven evidence to inform the design of targeted capacity-building and training interventions for PANAP member countries. The survey was conducted in collaboration with Task 1.2 which focused on Mapping Projects and Policies of the PANAP network. This is because both tasked purposively identified the same sample target, PANAP and non-PANAP networks.

The survey honed in on research skills and facilities needed to develop, apply, and communicate ex-ante economic impact analysis using quantitative methods and modelling for African agri-food systems. This assessment included an evaluation of the skills and institutional infrastructure required for conducting ex-ante impact policy research, alongside barriers to the dissemination, communication, and uptake of evidence-based decision-making. The survey was conducted online, between June and August 2024.

To enrich the findings, a desk review was conducted to identify relevant data sources and existing qualitative and quantitative methodologies for economic impact and policy assessment. The review placed significant emphasis on elements of replicability and scalability, particularly concerning the existing PANAP models and their adaptability to different contexts.

2.2 Survey execution

The data collection for this report was achieved through an online survey sent to both PANAP and non-PANAP institutions, including potential PANAP members identified for the expansion of the PANAP network. Two distinct survey instruments were developed: one targeted at policy-related institutions and the other at non-policy institutions. The Survey Instrument (questionnaire) of the survey can be found in **annex 4 of D1.2**. The survey instruments underwent a rigorous validation process by the

StEPPFoS project consortium members. The instrument was further ethically reviewed and approved by the University of Ghana, Ethical Review Board. (**Certified Protocol Number: ECH 339 23-24**)

A total of eighty (80) institutions, comprising of both PANAP and non-PANAP members were contacted. This was because, the institutions formed part of the PANAP network and are relevant for the survey. Of these, forty (40) institutions completed and returned the survey, resulting in a 50% response rate. Out of the forty (40), fourteen (14) were classified as non-policy related institutions, the focus of the study, while the remaining twenty-six (26) were policy related institutions. While this response rate was somewhat lower than anticipated, it reflects the inherent challenges of administering online surveys, particularly across a diverse and geographically dispersed set of institutions. Despite multiple direct follow-ups to unresponsive institutions, the team was only able to achieve a 50% response rate within the given time frame. The respondents included 65% policy-related institutions and 35% non-policy institutions, providing a broad perspective on the capacity gaps and needs within the network.

2.3 Data analysis

The data analysis for this study primarily utilized descriptive statistics to effectively summarize and interpret the survey responses gathered. This analytical approach enabled a clear and concise presentation of key findings, including the distribution of capacity gaps, the presence of institutional deficiencies, and the availability of specific skills and infrastructure among the surveyed institutions. This approach did not only reveal the state of institutional capacities but also informed the strategic direction for the development of training modules and capacity-building activities in subsequent phases of the StEPPFoS project. The results are presented in charts, tables and word maps for ease of visualization.

2.4 Utilization of the survey findings

The findings from this survey are expected to play a critical role in informing the development of targeted training modules, which will be integrated into the Consortium's broader capacity-building efforts. These modules will be designed to address the identified gaps and needs, enhancing the ability of institutions within the PANAP network to conduct high-quality, evidence-based policy research. Additionally, the insights gained from the desk review will contribute to the refinement of methodologies and the development of scalable and replicable models that can be applied across different contexts within the African agri-food sector.

The report provides a vital foundation for the StEPPFoS project's ongoing efforts to strengthen individual and institutional capacities and foster more effective research-policy linkages. As the project progresses, the findings from this survey will guide the development of tailored interventions that are responsive to the specific capacity needs and challenges identified, ultimately contributing to the realization of the project's overarching goals, thereby sustainable food transformation in Africa.

Following the introduction, the report is divided into eight key sections that outline the study's findings and provide actionable insights. The second section presents a brief overview of the institutions involved, while the third section focuses on their efforts in capacity building. The fourth section delves into their methods for policy analysis, and the fifth examines how their organizational structures support data-driven, evidence-based policymaking. The sixth section evaluates strategies to promote gender responsiveness within institutional projects. The seventh section identifies the challenges faced by institutions in assessing program impacts, and the eighth section explores their readiness to engage in activities under the StEPPFoS project. The report concludes with a final section that synthesizes conclusions and offers recommendations.

Box 1: Overview of 1st desk review findings

This desk review has provided a foundational assessment of policy capacity gaps across PANAP member countries, drawing attention to the structural, institutional, and human resource limitations that constrain effective evidence-based policymaking in Africa's agricultural sector. The desk review was conducted mainly through document review, content analysis, literature review, gap analysis, and comparative analysis of findings. The review has shown that while most countries have developed progressive agricultural and science-based policy frameworks aligned with continental priorities such as CAADP, substantial disparities persist in their implementation, coordination, and learning mechanisms. Specifically, the analysis revealed systemic weaknesses in domestic financing for policy research, coordination between institutions, technical capacity for data-driven analysis, and institutional incentives for policy uptake and adaptation. These gaps collectively reduce the responsiveness and sustainability of agricultural policies in addressing the continent's food systems transformation agenda.

Across regions, East African countries tend to exhibit higher analytical and institutional capacity, largely due to stronger think tank ecosystems and government–research collaboration, while West and Central Africa continue to face challenges related to fragmented governance, inadequate resourcing, and dependence on donor-driven initiatives. North Africa, on the other hand, demonstrates solid research infrastructure but struggles with centralized governance that limits policy inclusiveness and innovation. The comparative analysis therefore underscores the importance of context-specific capacity development strategies that reflect each region's political economy, institutional maturity, and data readiness.

Despite the robustness of this review, it is important to acknowledge that desk-based analyses have inherent limitations. The availability, consistency, and quality of publicly accessible documents varied significantly across countries, with some key policy reports and evaluation studies unavailable or outdated. Language barriers also limited the inclusion of materials from Francophone and Lusophone countries, while gaps in national data repositories constrained cross-country comparability. These limitations inevitably restricted the depth of the analysis and point to the need for primary data collection to validate and expand upon the findings presented here.

Furthermore, the desk review identifies capacity gaps only at an aggregated level and does not capture the detailed, institution-specific or individual-level needs required to design targeted and demand-driven training interventions for capacity strengthening across PANAP member countries.

To address these gaps, a complementary research survey will be conducted as a follow-up to this desk review. The survey will focus on PANAP member institutions to gather further evidence. This mixed-method approach will enable triangulation of the desk review findings, providing a richer and more accurate picture of policy capacity across the PANAP network.

In conclusion, this review has laid the groundwork for a deeper, evidence-informed inquiry into the determinants of policy capacity in Africa's agricultural and food systems. By combining desk-based analysis with survey data, the next phase of the study aims to generate actionable insights that will inform targeted interventions under the StEPPFoS Project, ultimately strengthening Africa's ability to design, implement, and sustain transformative, evidence-based agricultural policies.

Box 2: Overview of 2nd desk review findings

This second desk review which was conducted by using documents review, literature reviews, content analysis, comparative analysis, as well as gap analysis identified significant methodological, data-related, and institutional capacity gaps that constrain PANAP member countries' ability to undertake robust food and nutrition policy impact analysis. Although a broad set of qualitative, quantitative, and economy-wide analytical tools is available, their effective use is limited by weak data infrastructures, insufficient technical skills, fragmented institutional mandates, and inadequate integration of qualitative and quantitative approaches.

Data limitations remain a critical bottleneck. The absence of regularly updated Social Accounting Matrices (SAMs), incomplete administrative and programme datasets, and low-frequency household surveys substantially reduces the feasibility and reliability of advanced analytical techniques, including Computable General Equilibrium (CGE) modelling, quasi-experimental evaluations, and mixed-methods impact assessments. While pockets of excellence exist in survey implementation and modelling, these capacities are unevenly distributed and often reliant on external technical support.

Qualitative analysis capacity, though increasingly recognised, is constrained by small and non-representative samples, weak methodological documentation, limited use of computer-assisted qualitative data analysis software (CAQDAS), and insufficient triangulation with quantitative findings. As a result, the generation of actionable evidence on behavioural dynamics, implementation bottlenecks, equity dimensions, and system-level drivers of food and nutrition security remains limited.

The review further highlights that scalability and replicability of policy analysis are severely constrained by systemic weaknesses across data systems, human capacity, and institutional arrangements. The lack of harmonised, high-frequency, and interoperable datasets undermines the consistent application of advanced modelling and evaluation approaches across countries and contexts, limiting cross-country comparability and learning.

Analytical skills are unevenly distributed, with advanced econometric, modelling, and impact evaluation expertise concentrated among a small number of institutions and individuals. At the same time, qualitative research is hindered by gaps in CAQDAS proficiency and inconsistent quality assurance standards. These capacity gaps are compounded by institutional fragmentation, with responsibilities for food and nutrition policy analysis dispersed across sectors and organisations, inhibiting sustained, system-wide evaluation practice.

Collectively, these findings underscore the need for a coherent and coordinated capacity strengthening strategy encompassing investments in data systems, human capital development, and institutional integration. Such an approach is essential to enable PANAP institutions to generate high-quality, contextually relevant, and replicable evidence, and to support the scaling of evidence-based policy approaches for Africa's agrifood systems transformation.

3. Brief Profile of the Institutions

3.1 Types of Institutions

The survey engaged institutions from various ecosystems, including universities (academia), government policy institutions, international and national non-profit organizations, research institutions, and other specified policy institutions such as think tanks. Among these, non-profit organizations were the most responsive, comprising 33.5% of the total participating institutions. This was followed by academic institutions at 22%, and research institutions at 19.6%. Government institutions and policy think tanks had the lowest participation rates (Figure 2.1).

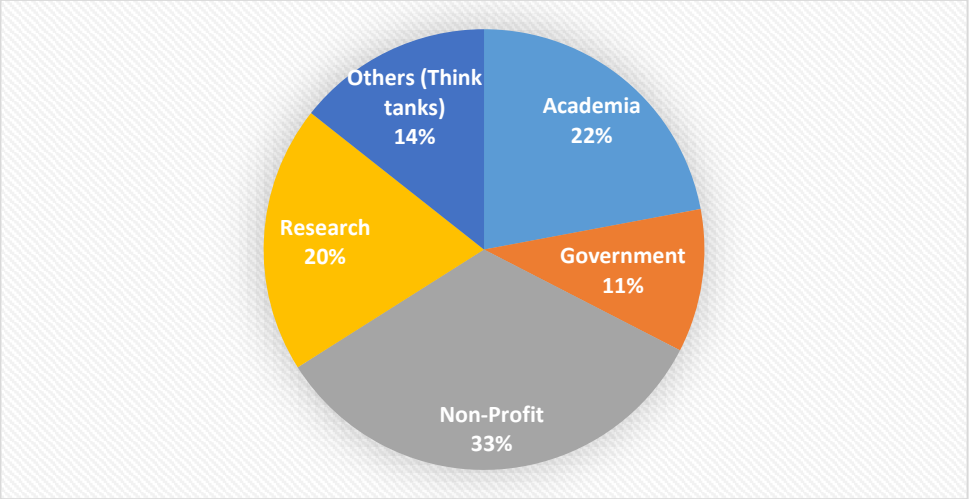

Figure 3. 1:Types of institutions participating in the survey

Source: StEPPFoS Online survey

While the strong participation from non-profit organizations is commendable, a higher involvement from academic, research, and government institutions would have been ideal to enhance the role of local entities in driving evidence-based policymaking. Increasing the participation of these institutions is crucial for bolstering African research and science-policy communications capacities and ensuring that the PANAP network can effectively support food system transformation through evidence-based policies. Expanding the PANAP network at the country level, particularly by involving more government institutions, could significantly benefit local policy-making efforts. This would allow these institutions to access capacity-building initiatives provided by PANAP, ultimately strengthening their role in shaping sustainable food systems.

3.2 Country representation of participating institutions

The survey targeted PANAP and non-PANAP organizations across both EU and AU member countries, with a particular focus on PANAP members on identifying capacity gaps and strengths related to agrifood systems within these regions. Out of the forty (40) institutions (representing 18 countries) that took part in the survey five (5) were from EU member states—specifically Italy, Spain, Finland, the Netherlands, and Germany. The remaining thirteen (13) countries were AU member states, encompassing a wide geographic spread across Sub-Saharan Africa, with no participation from North African countries. Institutions from Nigeria and Uganda showed the highest levels of participation with ten (10) being PANAP institutions while the remaining were non-PANAP member institutions.

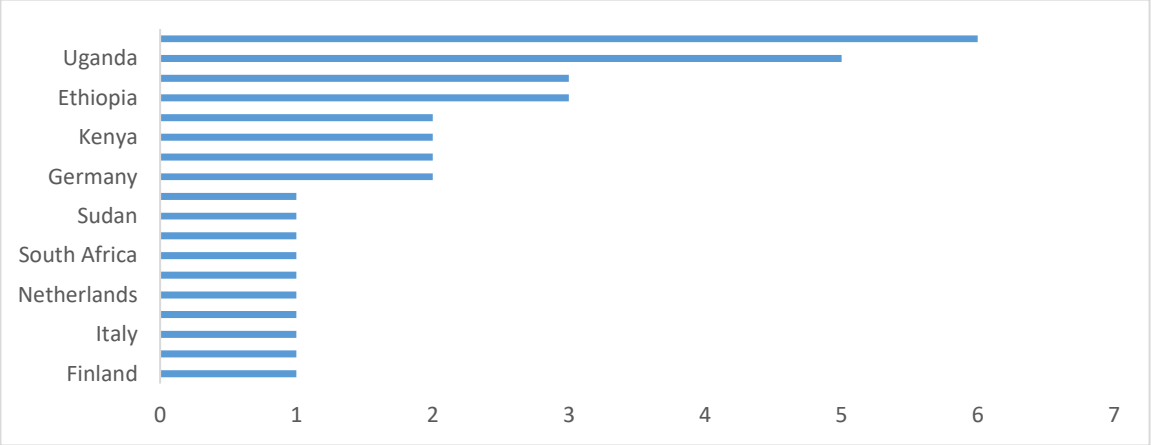

Figure 3. 2:Represented countries of participating institutions

Source: StEPPFoS Online survey

This distribution highlights the significant engagement from African institutions, particularly in West and East Africa, where Nigeria and Uganda are located. The strong participation from these countries suggests a keen interest in leveraging the PANAP network to address local challenges and build capacity for evidence-based policymaking. However, the absence of representation from North Africa indicates a potential area for future outreach and engagement, ensuring a more inclusive and comprehensive approach to food system transformation across the continent. The participation of EU institutions also provides a valuable opportunity for cross-regional collaboration, sharing best practices, and enhancing the impact of the PANAP network across both continents.

3.3 Year of establishment of participating institutions

It is encouraging to note that the participating institutions in the survey have on average, a substantial number of years of experience in their respective fields, whether in research, policymaking, academia,

or as policy think tanks. The average age of these institutions was found to be 29.6 years, with the youngest institution having three (3) years of experience and the oldest being in existence for 64 years. This wide range of experience is indicative of the deep expertise and institutional knowledge within the participating organizations. The significant number of years in operation suggests that these institutions have not only established themselves in their fields but also possess the resilience and capability to continue building and expanding their capacities. This is crucial for driving forward the goals of the StEPPFoS project, as it ensures that the institutions involved have the experience and understanding needed to effectively contribute to and benefit from the capacity-building initiatives and policy impact analyses that the project aims to deliver.

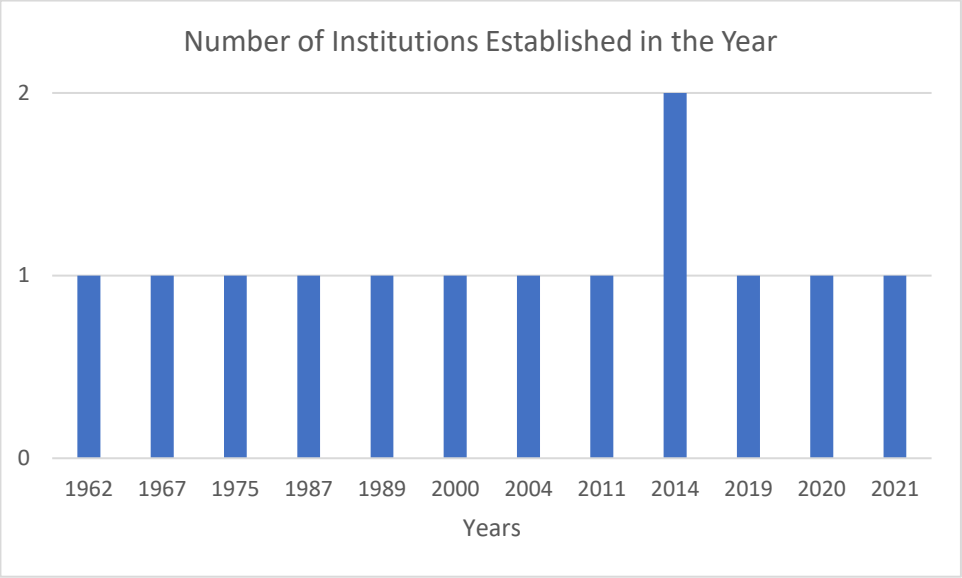

Figure 3. 3:Year of establishment

Source: StEPPFoS Online survey

Moreover, the longevity of these institutions underscores their potential as stable partners in long-term efforts to strengthen evidence-based policymaking and research capacities within the agri-food systems of Africa and Europe. Their continued engagement in such initiatives will likely play a pivotal role in the successful implementation and sustainability of the StEPPFoS project's objectives.

4. Capacity Building Initiatives of Participating Institutions

4.1 Assessment and prioritization of capacity needs

For **non-policy institutions**, the survey further enquired if institutions regularly conduct capacity development for their staff. Three institutions (27%) reported holding these programs occasionally, on an "as needed" basis, allowing them to respond promptly to specific requirements or emerging challenges.

An equal percentage of institutions conduct their training sessions quarterly and semi-annually, aligning them with quarterly and mid-year evaluations respectively. Meanwhile, two institutions hold capacity development sessions annually, which could indicate a more comprehensive but less frequent approach to training. This implies that non-policy institutions are committed to ongoing staff development, ensuring that most of their workforce receives regular training, which is typically scheduled semi-annually or quarterly.

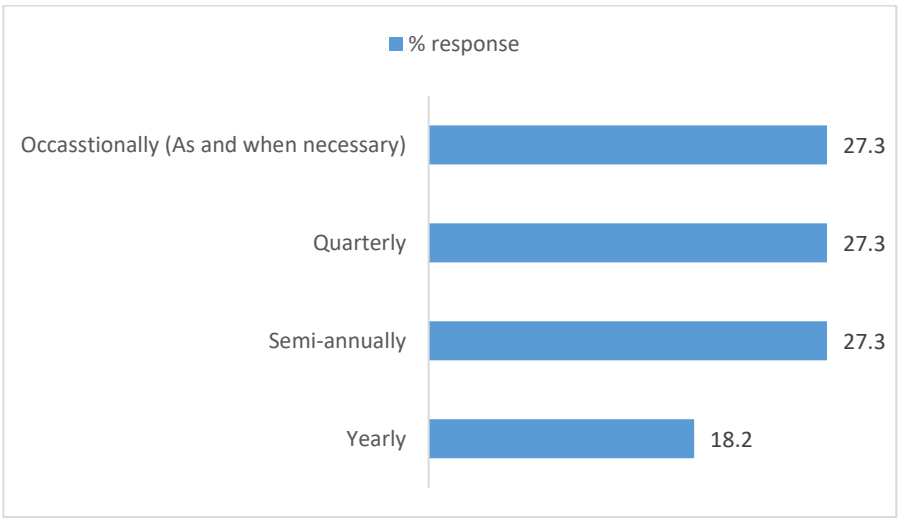

Figure 4. 1:Frequency of capacity needs assessment

Source: StEPPFoS Online survey

The survey further revealed that organizations employ a variety of assessment and prioritization criteria to address the capacity needs of their staff, which can broadly be categorized into ***staff-centered*** and ***institution-centered*** approaches. Staff-centered methods include gathering employee feedback and conducting performance evaluations, allowing organizations to tailor capacity-building efforts to the specific needs and aspirations of their workforce. For instance, in Figure 3.4, employee feedback is utilized by 53.9% of the policy institutions surveyed (bottom panel), while performance evaluations

were used by 42.3%, highlighting the emphasis on directly addressing the developmental needs identified by staff members themselves.

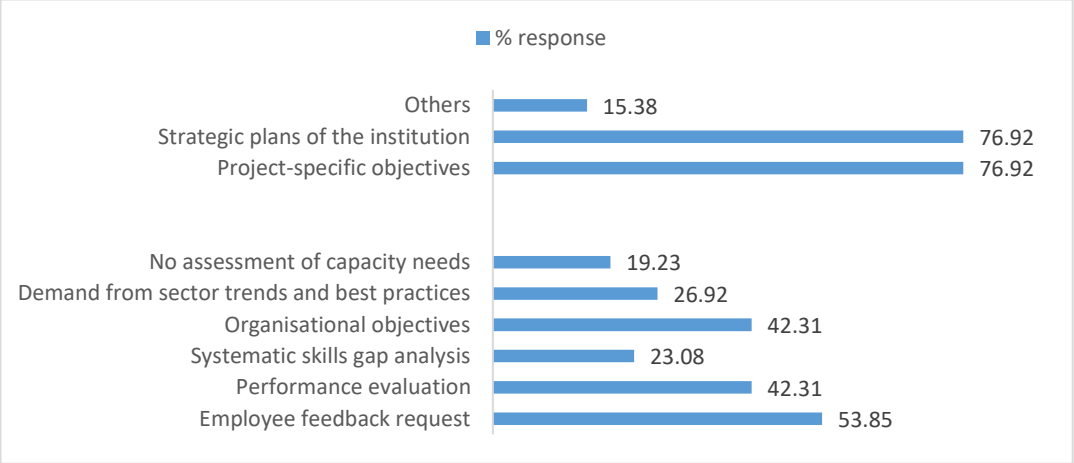

Figure 4. 2:How institutional capacity needs are assessed and prioritized

Source: StEPPFoS Online survey

On the other hand, **institution-centered** approaches focus on aligning capacity-building initiatives with the broader objectives and strategic goals of the organization. This includes systematic skills gap analyses, which help organizations identify areas where staff skills are lacking relative to the institution's needs, and alignment with organizational objectives and strategic plans, which ensure that capacity-building efforts contribute to the institution's long-term vision. Among policy institutions, 42.3% reported using organizational objectives as a key criterion for assessing capacity needs.

Non-policy institutions (top panel) place a strong emphasis on project-specific objectives and strategic planning when prioritizing capacity needs. Approximately 77% of these institutions reported that their capacity-building efforts are driven by the specific goals and requirements of ongoing projects, as well as the strategic plan of the organization. This approach ensures that staff development is directly linked to the success of current initiatives and the institution's overall mission, reinforcing the idea that capacity building is not conducted in a vacuum but is purposefully aligned with the institution's priorities.

Despite these structured approaches, the survey also uncovered that 19.2% of the institutions reported the absence of any formal structure for assessing capacity needs. This gap indicates an area for improvement, as a lack of systematic assessment can lead to missed opportunities for enhancing staff skills in alignment with both individual and organizational goals.

It can be deduced that the adoption of these varied assessment criteria reflects a thoughtful approach to capacity building, where efforts are made to ensure that training and development are not only relevant to the individual needs of staff but also strategically aligned with the broader objectives of the institution. This alignment is crucial for maximizing the impact of capacity-building initiatives, ensuring that they contribute meaningfully to both the professional growth of employees and the achievement of organizational goals.

4.2 Required skills for evidence-based policy making

Using thematic analysis, the study further assesses the skills or competences respondents perceive their institutional staff, that is for both policy and non-policy related institutions, require to strengthen their capacity for evidence-based policy making.

To strengthen capacity for evidence-based policymaking in sustainable agrifood systems, staff in **non-policy related institutions** need skills in communications, stakeholder engagement, and effective storytelling to translate research into actionable policies. Technical knowledge in good agricultural practices, climate change risk management, and the use of new technologies is vital for promoting sustainability. Additionally, understanding policy systems, modelling agricultural growth scenarios, project management, and policy impact analysis are crucial for informed decision-making and implementation.

Key Skills Required in non-policy related institutions (*in no specific order*):

1. Communication and stakeholder engagement
2. Effective reporting and storytelling
3. Good agricultural practices and climate risk management
4. New technologies and their application
5. Understanding policy systems
6. Modelling agricultural systems
7. Project management and development
8. Policy impact analysis

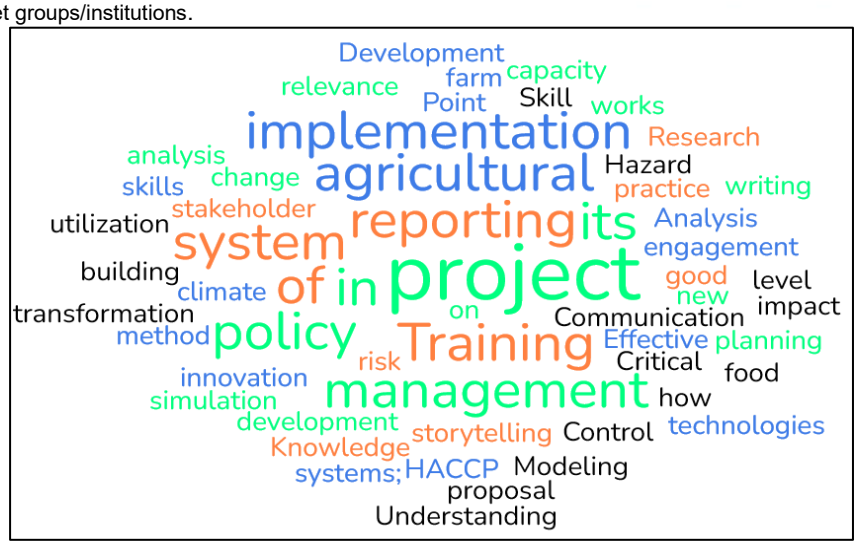

Figure 4. 3:Required skills for non-policy institutions

Source: StEPPFoS Online survey

Policy institutions moreover mainly focused on the need for strong analytical skills for data interpretation, policy analysis, and decision-making. Competencies in research methodologies, monitoring and evaluation, and science-policy communication are essential for gathering, synthesizing, and communicating evidence to inform policy decisions. Additionally, skills in project management, stakeholder engagement, and the use of digital tools and technologies, such as data management software and climate-smart agricultural practices, are crucial for implementing and assessing effective policies.

Key Skills Required in Policy institutions:

1. Analytical skills (data analysis, synthesis)
2. Research methodologies and impact evaluation
3. Science-policy communications
4. Policy analysis and development
5. Monitoring and evaluation (M&E)
6. Digital tools and data management
7. Stakeholder engagement and advocacy
8. Project management and decision-making
9. Understanding of agricultural practices and technologies
10. Ethical and inclusive decision-making
11. Leadership, teamwork, and communication skills

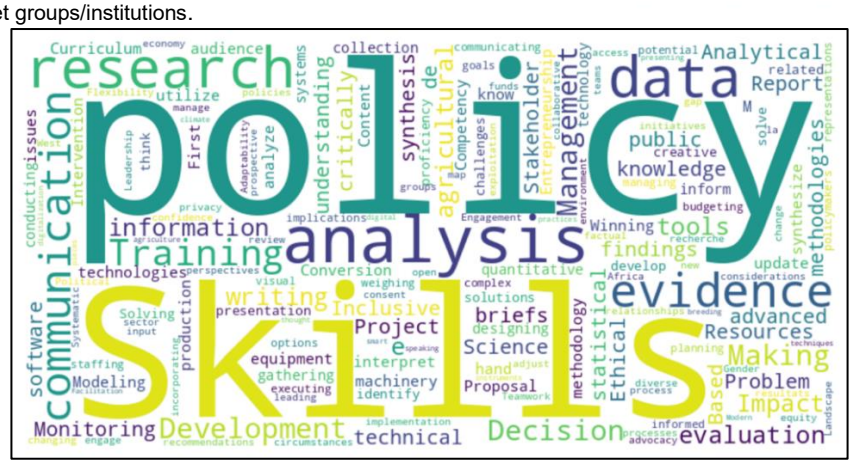

Figure 4. 4:Required skills for policy institutions

Source: StEPPFoS Online survey

4.3 Initiatives taken by institutions to build capacity of staff

Organizations are implementing a variety of initiatives aimed at building the capacities of their staff, ranging from dedicated training workshops to mentorship opportunities. Among these initiatives, regular training sessions through workshops and seminars emerge as the most widely implemented, with approximately 81% of policy-related institutions and 83% of non-policy institutions reporting the use of this method, as illustrated in Figures 7 and Figure 8. These sessions serve as a fundamental approach to enhancing staff skills and knowledge, ensuring that employees stay up to date with the latest developments in their fields.

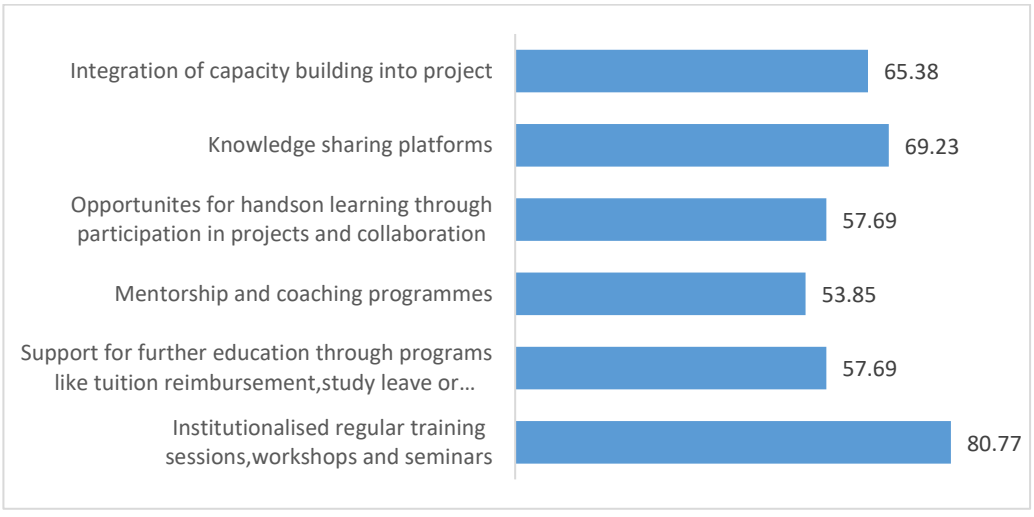

Figure 4. 5:: Initiatives taken to build capacities of policy institutions

Source: StEPPFoS Online survey

Other frequently mentioned initiatives include knowledge-sharing platforms, which facilitate the exchange of ideas and best practices among staff, and the integration of capacity-building into project activities, allowing employees to learn and grow while actively contributing to ongoing work. Hands-on learning and collaboration are also emphasized, providing practical experience that reinforces theoretical knowledge. Additionally, supporting further education in specific areas and offering mentorship opportunities are key strategies employed by these organizations to develop their staff's expertise.

For non-policy institutions, a particularly noteworthy initiative is cross-departmental collaboration, where staff from different departments work together to strengthen their capacities in various niches. This approach not only enhances individual skills but also fosters a collaborative and cohesive team culture within the institution, making it a laudable practice. Another significant initiative is the evaluation of training effectiveness, mentioned by 33% of research institutions (Figure 3.8). This practice involves assessing the impact of training sessions to redesign and improve future capacity-building initiatives, ensuring that they are as effective as possible in meeting the needs of staff.

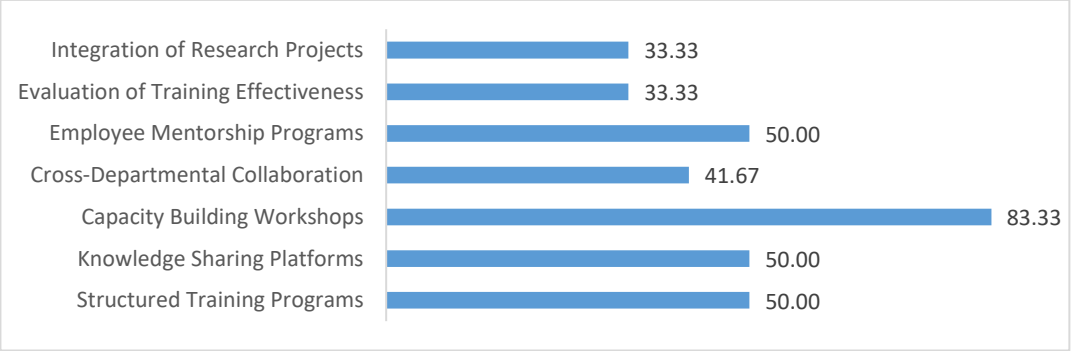

Figure 4. 6:Initiatives taken to build capacities in non-policy institutions

Source: StEPPFoS Online survey

Moreover, the integration of capacity-building models into program and project design stands out as a sustainable approach to consistently enhancing staff capabilities. By embedding these models into the framework of projects and programs, organizations ensure that employees are continuously exposed to new methodologies and emerging trends, which in turn strengthens their capacity to deliver on their mandates. This proactive approach not only builds the skills of current staff but also prepares them to adapt to future challenges and opportunities in their fields.

4.4 Core Elements of Capacity Building in Programs/Projects

If the institutional projects have capacity building elements, both policy and non-policy respondents note that the core element of the capacity enhancement services should focus mainly on building scientific research skills of the project host institution and building scientific research skills of other researchers in the project host country. Elements such as capacitating non-research support and management staff in other institutions of the project host country as well as government staff at higher office such as in ministries and agencies were moderately considered by responses. While capacitating non-research support and management staff in other institutions of the project host country and civic and non-civil organisations were among the least considered elements of capacity building services.

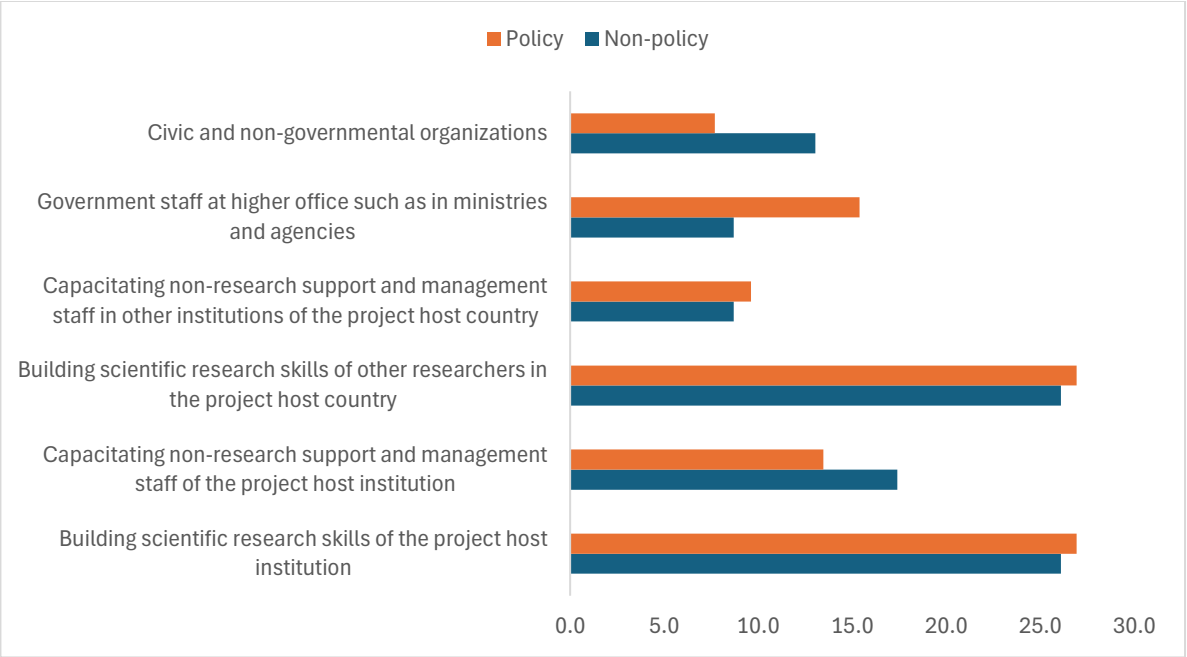

Figure 4. 7:Core element of the capacity building services (%)

Source: StEPPFoS Online survey

4.5 Capacity Building Resource Persons and Organizations Used

For **Policy institutions**, the primary element for capacity building is the use of their own research staff, which represents the largest share of responsibility. This is followed by their own non-research staff, indicating that internal personnel, regardless of their specific roles, play a significant part in capacity-building efforts. Next, non-research personnel in other institutions are utilized, reflecting a moderate reliance on external support. The least utilized element is scientific researchers in other institutions, suggesting a minimal engagement with external scientific experts.

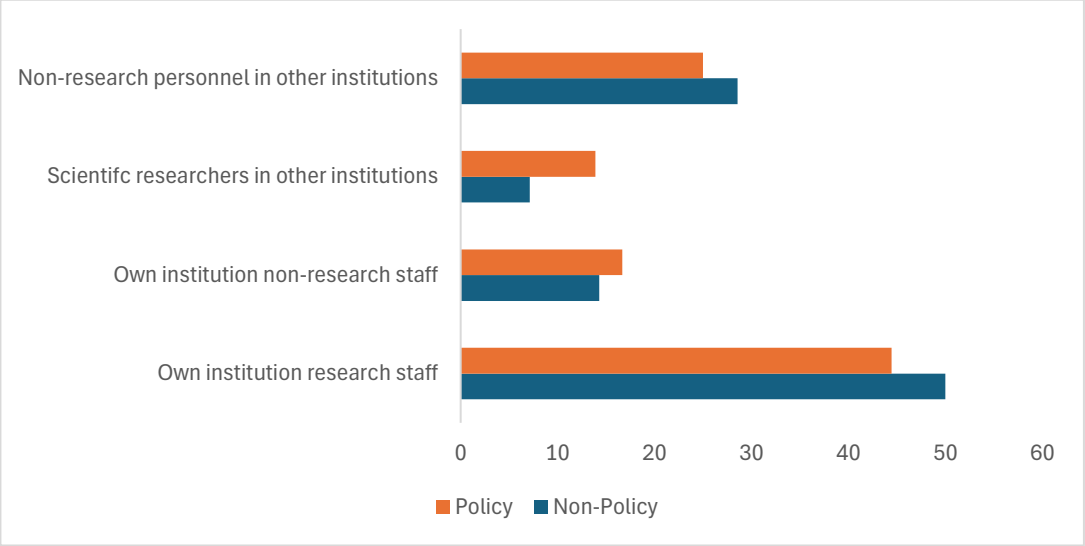

Figure 4. 8:Type of organizations used in capacity building

Source: StEPPFoS Online survey

The result further showed that, for **non-Policy** institutions, the largest capacity-building element is when the organizations provide those capacity building services to their own research staff, showing a strong preference for leveraging internal expertise. This is closely followed by non-research personnel in other institutions, indicating a greater openness to external support compared to policy institutions. The next most utilized element is their own non-research staff, which still plays a considerable role. The smallest element for non-policy institutions is scientific researchers in other institutions, such as policy institutions, highlighting a lesser reliance on external scientific researchers.

4.6 Target Beneficiaries of Capacity Building Programs

Policy institutions and non-policy institutions differ in their focus and target beneficiaries when implementing capacity-building projects. In **policy institutions**, the primary beneficiaries of these efforts are the institution's own research staff, comprising 41 % of the total, followed by scientific researchers from other institutions (32 %), as shown in Figure 3.11. Non-research personnel from both the institution itself (15%) and external organizations (6%) are lesser but notable beneficiaries, indicating a focus on fostering skills that support both internal policy research and wider scientific communities. There is also a small allocation for other actors such as farmers and consumer groups and local people at 6%, showing some inclusivity of diverse stakeholders.

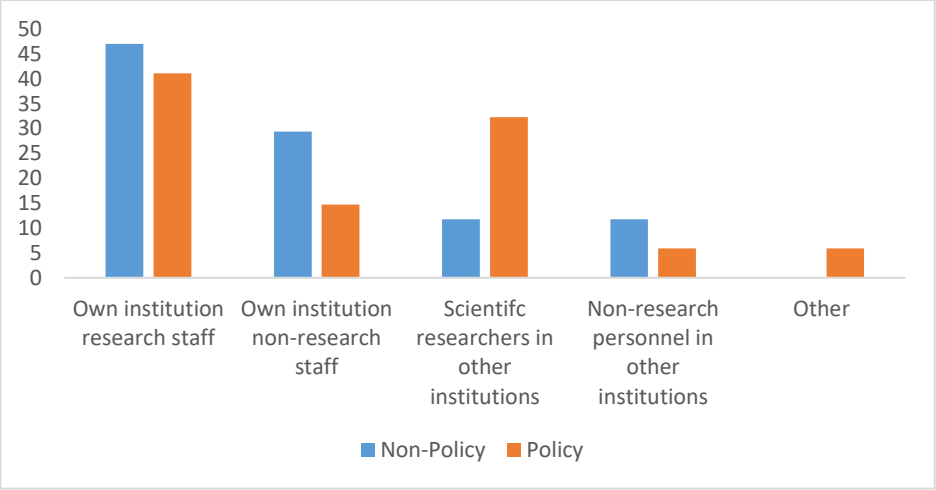

Figure 4. 9:Primary target beneficiaries of capacity building programs

Source: StEPPFoS Online survey

Non-policy institutions, however, prioritize their own research staff to an even greater extent, with 47.06% being primary beneficiaries. Non-research staff within the same institution also receive a significant portion of capacity-building efforts at 29.41%. By contrast, external scientific researchers and non-research personnel are much less prioritized, each representing 11.76% of the beneficiaries. This suggests that non-policy institutions are more inward-focused, emphasizing internal capacity-building over external collaborations.

In comparison, policy institutions allocate more resources to external scientific researchers, reflecting a broader scope of influence, while non-policy institutions concentrate more on internal staff development.

5. Institutional Capacities in Data Modelling, and Policy Analysis

5.1 Available capacities in evidence-based policy initiatives

From Figure 4.1, the results show that institutions need data and analytical skills the most for policy institutions. Other relatively less suggested but relevant skills include research proficiency, policy analysis expertise and stakeholder engagement analysis.

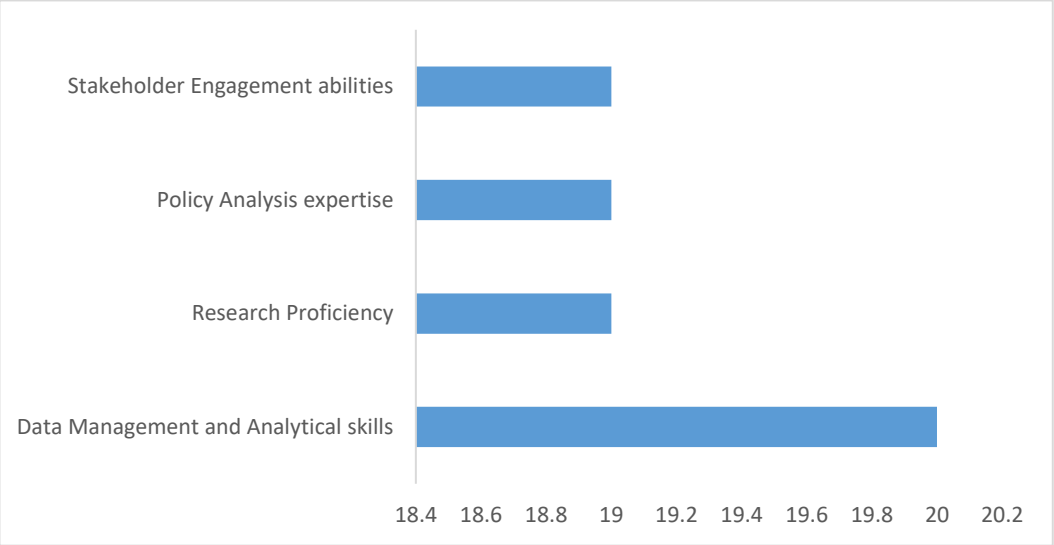

Figure 5. 1:Needed capacities for implementing evidence-based policy initiatives for policy institutions

Source: StEPPFoS Online survey

Moreover, more than half (54%) of non-policy related institutions, rely on quantitative economic methods to analyse agrifood issues, while a significant portion (39%) do not use these models, and a small fraction (7%) is uncertain about their institution's use of such methods. The most common programming tools however were Microsoft Excel, SPSS, Stata and R. The wide variety of the type of programming tools shows the diversity in analytical approaches.

Table 1:Programming tools for policy analysis

Programming tools	Percent
GAMS	5.13
R	12.82
STATA	15.38
SPSS	17.95

Excel	23.08
Python	5.13
QGIS	7.69
ArcGIS	10.26
Other (modelling systems)	2.56

5.2 Use of PANAP Economic Models

Additionally, less than half of the non-policy institutions note that some researchers at their institutions have received capacity building training on the use and application of economic models. These models were CGE models, Econometric models and Farm-level simulation methods. This was conducted mostly two (2) to three (3) times in a year. The remaining responses showed that such trainings occurred annually or more than three (3) times in a year.

However, only three (3) respondents (2 research, 1 non-research) have used the PANAP economic models before. They noted that their knowledge of the PANAP models are in DEMETRA model and FSSSIM-Dev.

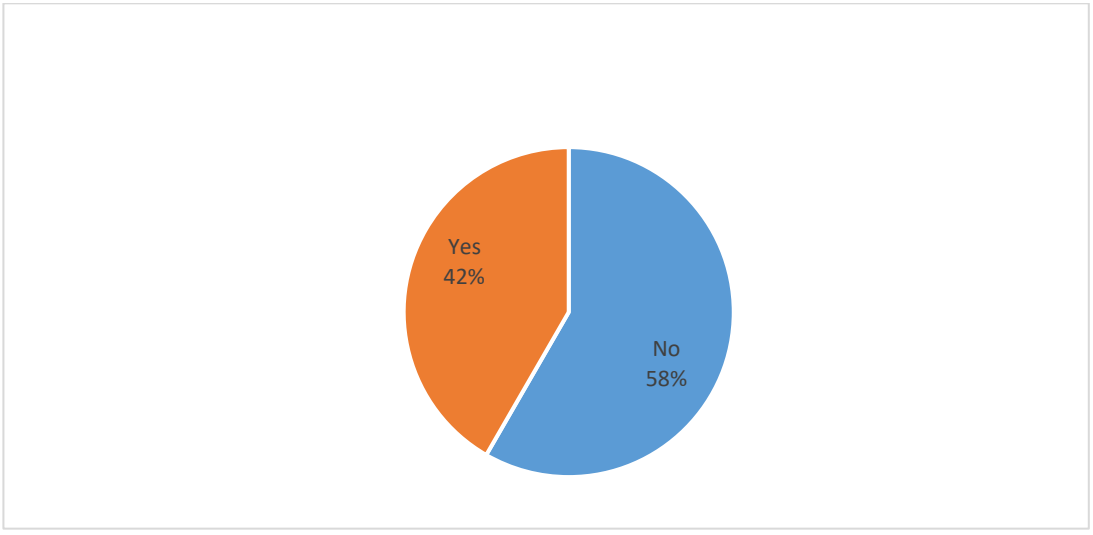

Figure 5. 2:Capacity building received in PANAP model application

Source: StEPPFoS Online survey

5.3 Capacity Rating in the Use of Economic Models

Non-policy institutions generally rate the capacity of their researchers for computable general equilibrium (CGE) modelling at a beginner level, with the majority (8 out of 16) indicating limited expertise in this area. A smaller number rate their researchers as having intermediate (3) or advanced

(1) skills, suggesting that while some capacity exists, it is not widespread. Additionally, one institution reported having no capacity for CGE modelling, while the remaining three (3) did not provide a rating. This distribution implies a need for targeted capacity-building initiatives to enhance the skills of researchers in CGE modelling within non-policy institutions.

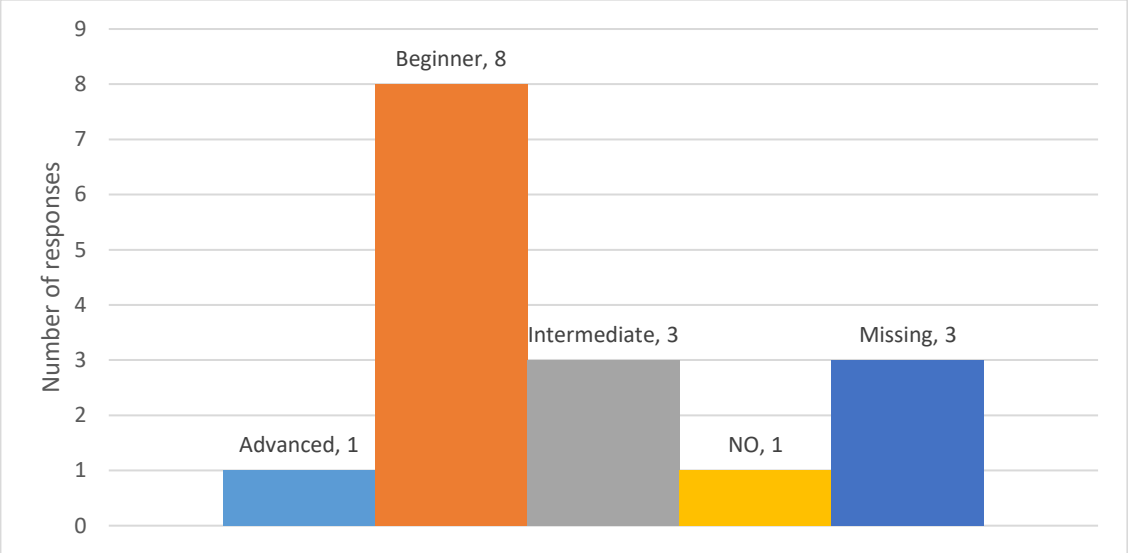

Figure 5. 3:: Capacity level of the researchers for computable general equilibrium (CGE) modelling

Source: StEPPFoS Online survey

5.4 Future capacity building in economic models needed and tools

Over half of the researchers in policy institutions surveyed reported that if there is a capacity-building opportunity in economic models in the future, they would love to participate in developing their skills and knowledge in economic models. It shows that researchers in policy institutions are anticipating future capacity-building programs to develop themselves and stay relevant in evidence-based policymaking. There is a need to invest in capacity-building for researchers. Interestingly, some researchers indicated that they are not interested in any economic model to build their capacity in the future. The survey revealed that the researchers are equally interested in different economic models. It is vital for future capacity building in economic models to focus on all the various economic models suggested in the graph.

Overall, the preference leans towards **computable general equilibrium (CGE) models** and **panel and cross-sectional econometrics** methods. **Partial equilibrium models** and **experimental/quasi-experimental impact evaluation methods** are also valued but appear less frequently. The responses suggest a strategic focus on comprehensive economic modelling and empirical research techniques,

highlighting an interest in both broad economic analysis and focused impact evaluations. A few responses are ambiguous or neutral, simply stating "no" or "yes" without further elaboration.

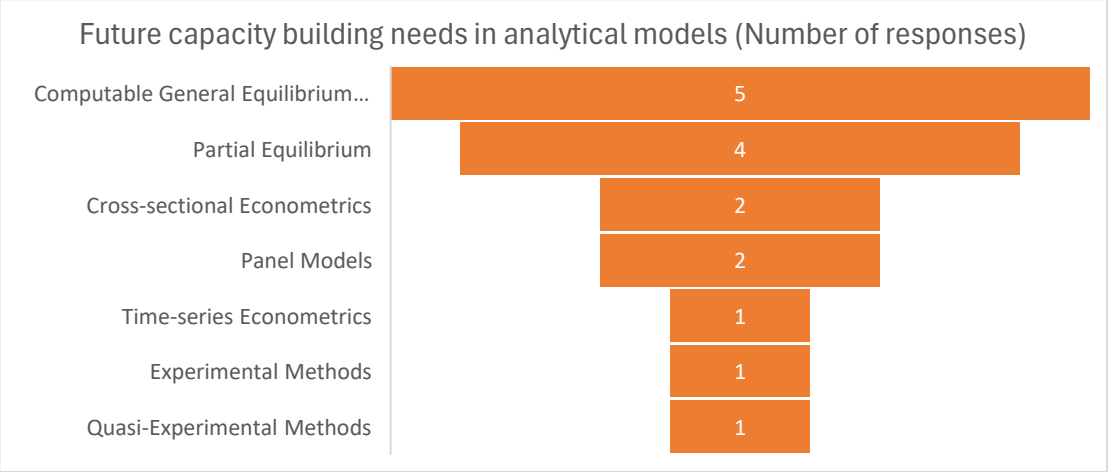

Figure 5. 4:: Capacity level of the researchers for computable general equilibrium (CGE) modelling

Source: StEPPFoS Online survey

Further, the preferred tools for capacity building revolve around software like **GAMS, STATA, R, SPSS, GIS, and Python**, demonstrating a blend of interests in economic modelling, statistical analysis, machine learning, and spatial data analysis. The emphasis on diverse data sources, including **field surveys, input-output tables, and national or international datasets**, highlights a holistic approach to economic research and policy analysis. There is also a recognition that all skills and tools may be necessary due to the institution's dynamic and evolving needs.

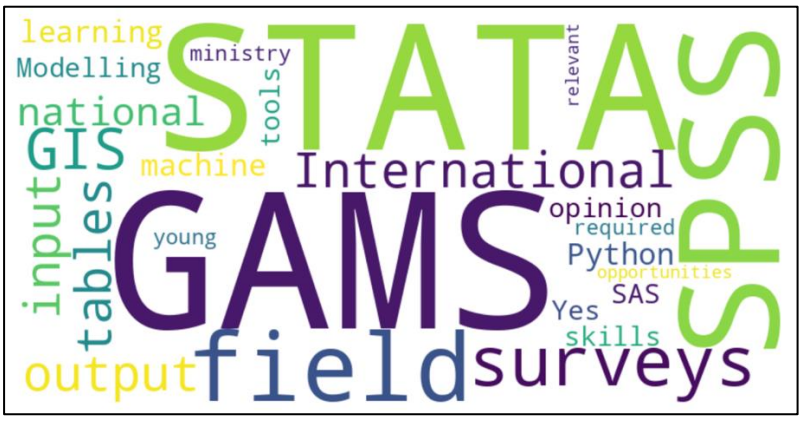

Figure 5. 5:Preferred tools for future capacity building

6. Organisational Structures to Supporting Data and Analysis for Evidence-Based Policymaking

6.1 Availability of data repositories

Data repositories are crucial for evidence-based research and policymaking as this allows researchers and policymakers to retrieve data efficiently thereby improving accessibility, transparency, collaboration, and the reproducibility of findings. However, while over a third of policy-related institutions note that they do not have a centralized repository for project documentation, a majority (77%) of non-policy related institutions do not have such repository. For non-policy institutions, the widespread absence of centralized data systems highlights a critical gap in data management that could undermine research quality and accessibility.

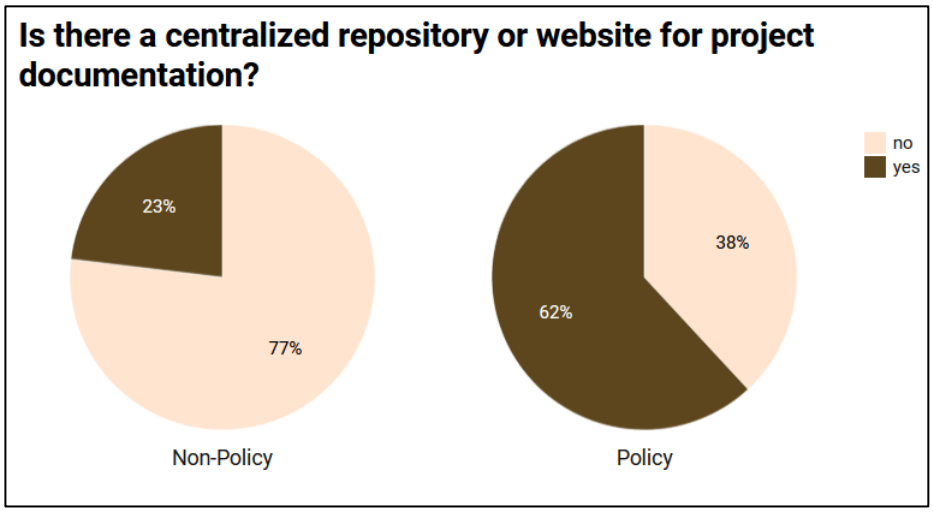

Figure 6. 1:Availability of data repositories

6.2 Reporting Structures and Systems for Projects and Programs

Sustaining efficient communication with stakeholders requires regular reporting from projects. Throughout the project lifespan, it guarantees responsibility, openness, and well-informed decisions. Progress monitoring, risk identification, and stakeholder expectation management are all made easier with effective project reporting. Figure 5.2 presents data on whether there is a system for regular project reporting to stakeholders, alongside examples of how these systems operate in various contexts. Below is a comprehensive breakdown and analysis of the findings.

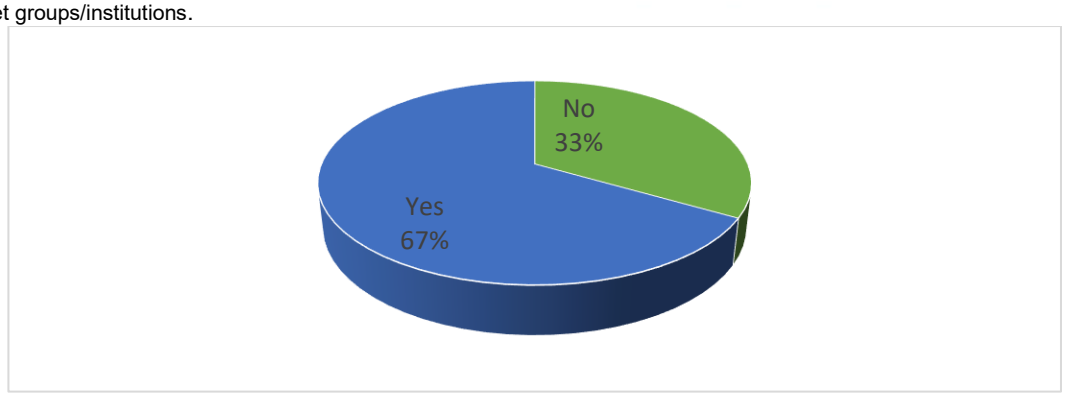

Figure 6. 2:Presence of a system for regular project reporting to stakeholders

Source: StEPPFoS Online survey

Majority of the respondents (66.67%) reported having a system in place for regular reporting to stakeholders. The fact that more than two-thirds of the respondents have systems in place suggests that most organizations or projects are aware of the importance of keeping stakeholders informed through structured reporting systems.

However, one-third of respondents (33.33%) do not have formal systems for reporting. The 33.33% of respondents who do not have such a system may reflect either a lack of capacity, resources or perhaps a less formalized project management structure in those organizations. This might represent an area for improvement or future development to ensure better accountability and stakeholder engagement. Respondents who indicated they have a regular reporting system in place gave instances of how their systems worked, showcasing a range of reporting systems as follows:

1. **Intermediate and Final Reporting:** Some organizations follow a reporting structure where they provide updates at specific milestones of the project, such as after certain phases are completed (interim reports) and at the end (final report). This method allows stakeholders to assess progress mid-project and review the outcomes, ensuring that adjustments can be made during implementation.
2. **Monthly, Quarterly, and Annual Reporting.** Some projects have more structured reporting systems, with reports submitted on a monthly, quarterly, and yearly basis to stakeholders. This system reflects a highly structured approach, with consistent reporting at defined intervals. This type of frequent and consistent reporting ensures that stakeholders are continuously informed about project progress, allowing for regular feedback and quick interventions if needed.
3. **Newsletters and Quarterly Reporting:** Some organizations utilize newsletters and quarterly reports to keep stakeholders updated on project developments. Sending newsletters is a

method to update stakeholders on a broader range of project activities and developments. On the other hand, a standard reporting timeline for many organizations is quarterly, aligning with most fiscal or operational quarters. Newsletters make reporting more engaging, while quarterly reports provide in-depth details about achievements, challenges, and forecasts.

4. **Regular Reporting Meetings:** Some organizational systems also focus on regular project briefing meetings to ensure ongoing communication between project teams and stakeholders. Holding regular meetings to brief stakeholders offers direct communication and immediate feedback loops. This method encourages real-time dialogue, problem-solving, and stakeholder engagement, beyond just written reports.
5. **Reporting through a Centralized Unit:** In other cases, project reporting is channelled through a Project Development and Administration Unit (PDAU), which manages the communication between different project components and stakeholders. In other words, PDAU is responsible for consolidating information and sharing it with stakeholders. This reflects a centralized and coordinated system where all information flows through a dedicated unit for reporting, ensuring consistency and thoroughness.
6. **Workshops and Presentations:** Workshops and presentations also serve as key avenues for reporting project outcomes and activities as well as a way to share progress and results to a broader audience. This method provides transparency and promotes stakeholder engagement through face-to-face interactions and broader dissemination of information.
7. **WhatsApp and Regular Information Sharing:** Other organizations mentioned the use of WhatsApp for regular information exchanges, reflecting the integration of digital tools to facilitate real-time reporting. Using WhatsApp to share project information also demonstrates the use of technology for informal communication. It is a practical, low-cost method, especially for smaller organizations or in regions with limited resources. However, it lacks the formal structure of other reporting systems.
8. **Quarterly Steering Committee Presentations:** Another common approach is presenting reports to steering committees every quarter, where the committee reviews and provides feedback. Steering committee presentations provide a platform for accountability and decision-making at critical stages of project development. This also allows for continual feedback and evaluation from stakeholders.

6.3 Structures for Communicating Project/Policy Milestones

Effective communication is a cornerstone of successful project management. Different communication methods play a crucial role in achieving project milestones by ensuring that information is shared efficiently, and stakeholders are engaged appropriately. The figure below presents the various communication methods used in communicating project milestones.

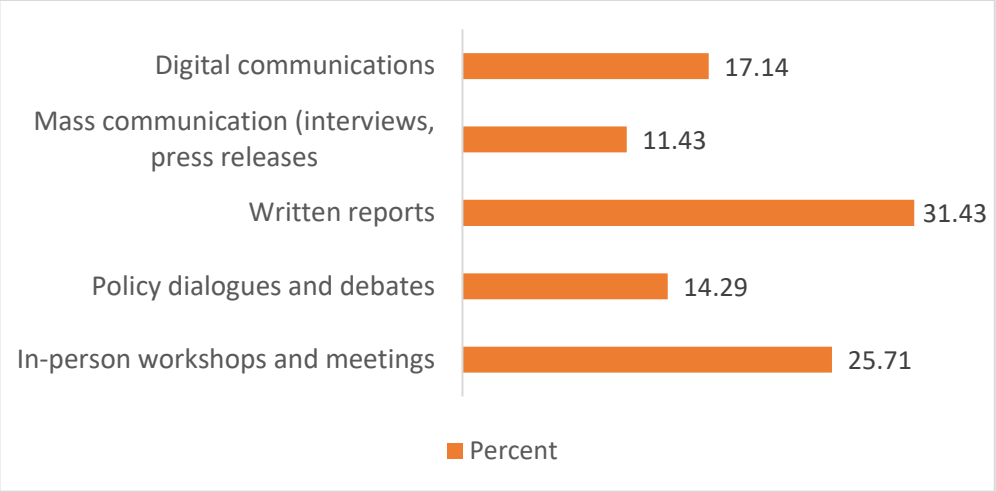

Figure 6. 3:How projects milestones are achieved

Written Reports: Written reports are the most frequently used communication method of project or policy milestones, making up 31.43% of the total. Written reports provide a detailed and structured way to document progress, challenges, and outcomes. They serve as a formal record that can be referenced for accountability and transparency as well as documenting progress, issues, achievements, and next steps at various stages of the project. These reports allow for detailed tracking of milestones and are usually mandatory in structured projects.

1. **In-person Workshops and Meetings:** In-person workshops and meetings are a popular method and a significant method for communicating milestone achievements, accounting for 25.71% of the communication methods used. These face-to-face interactions facilitate direct engagement, immediate feedback, knowledge sharing, and collaborative problem-solving, making them effective for complex discussions and decision-making processes. In other words, these in-person meetings and workshops offer a hands-on approach to problem-solving, strategic planning, and capacity building.
2. **Digital Communications:** Digital communications, which include emails, social media, and online platforms, make up 17.14% of the communication methods. These tools offer flexibility, speed, and a wide reach, making them suitable for regular updates, virtual meetings, and engaging with a dispersed audience. Digital communications are gaining popularity as

methods to track and achieve project milestones. In addition, digital tools enable remote teams to stay connected and share updates efficiently. This method is especially useful for international or multi-location projects, offering flexibility and cost savings.

3. **Policy Dialogues and Debates:** Policy dialogues and debates represent 14.29% of the communication methods. These forums are essential for discussing policy implications, stakeholder perspectives, and strategic directions. They help in aligning project goals with broader policy frameworks and ensuring stakeholder buy-in. Policy dialogues bring stakeholders together to discuss regulatory, legal, or policy-related milestones. These dialogues are critical when project goals involve changing laws or implementing new frameworks.
4. **Mass Communication:** Mass communication, including interviews and press releases, accounts for 11.43%. This method is effective for reaching a broad audience, raising awareness, and disseminating key messages to the public and media. It helps in building public support and visibility for the project. This method is vital for projects that aim to raise awareness, inform the public, or garner support from the general population or key stakeholders through media engagement.

6.4 Monitoring and Evaluation System

Figure 5.4 presents data on whether respondents' institutions have a monitoring and evaluation (M&E) system in place. Majority of survey respondents (77%) report that their institutions have a monitoring and evaluation (M&E) system in place. This indicates a strong commitment to tracking and assessing project progress, ensuring accountability, and improving project outcomes. A small percentage of respondents (28%) on the other hand do not have an M&E system in place. This could indicate a potential gap in organizational capacity, resources, or awareness of the importance of monitoring and evaluation. Others also describe their institution as a "beginner" in terms of implementing an M&E system. This suggests they are in the early stages of developing or adopting M&E practices, reflecting a possible area of growth or improvement for their institution.

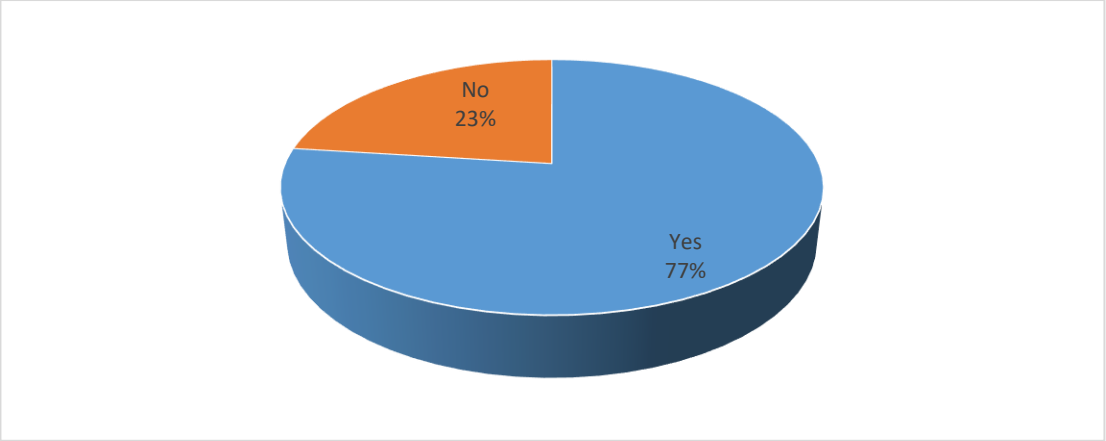

Figure 6. 4:Does your institution have a monitoring and evaluation system

Source: StEPPFoS Online survey

The high percentage of departments with an M&E system reflects the institution's dedication to continuous improvement and accountability. Institutions without M&E systems may need assistance such as targeted training and capacity-building initiatives to better track and evaluate their projects.

6.5 Policy Evaluation Systems in Institutions

Evaluating the effectiveness of policies within institutions is crucial for ensuring that these policies achieve their intended outcomes and contribute to the overall goals of the organization. Figure 5.5 offers insights into the prevalence of such evaluation systems across various institutions. More than half (53.85%) of the respondents report that their institutions have systems in place to evaluate the effectiveness of their policies. These systems include qualitative methods such as surveys and questionnaires, impact assessment models (cost benefit analysis; social return on investment, etc.), qualitative methods such as in-dept interviews focus group discussions, as well as monitoring and evaluation frameworks such as the theory of change (ToC). This suggests that these institutions have implemented mechanisms to regularly assess whether their policies are achieving their intended goals.

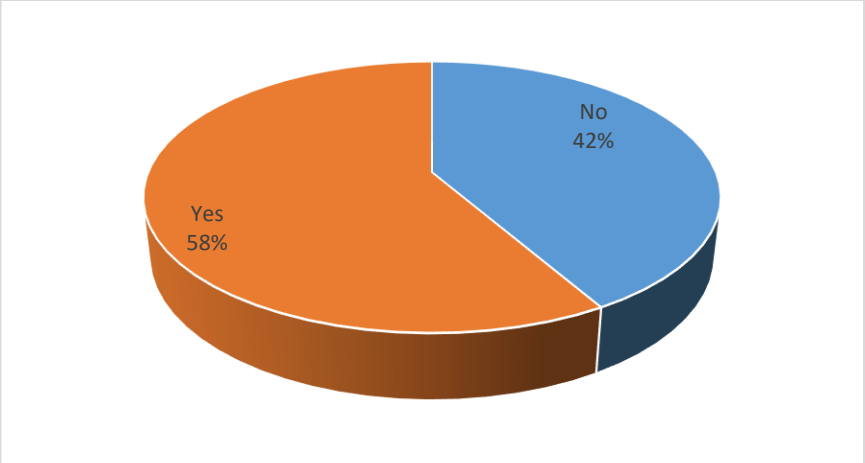

Figure 6. 5:Availability of a system for evaluating the effectiveness of policies in your institutions

Source: StEPPFoS Online survey

On the other hand, a considerable number of respondents (38.46%) indicated that their institutions do not have a system in place for evaluating policy effectiveness. This points to a potential weakness in their ability to assess whether policies are successfully meeting their objectives. Without such systems, these institutions may struggle to identify which policies are working and which need adjustment. This could result in ineffective or outdated policies remaining in place, negatively impacting institutional performance, resource allocation, and strategic direction.

7. Capacities and strategies to ensuring Gender Responsiveness in Institutional Projects

The study revealed that participating institutions demonstrate substantial capacity in adopting a multifaceted approach to gender inclusion. Their strategies encompass a range of activities, including the formulation of institutional gender policies, the integration of gender considerations into research and project design, the implementation of collaborative gender-focused projects and the overall application of Equity, Diversity, and Inclusion (EDI) lens to their works. These efforts reflect a commitment to addressing gender issues across various aspects of their operations, ensuring that gender inclusion is embedded throughout policy development, project planning, and research activities.

Institutional Gender Policies and Mainstreaming Efforts

Majority of the institutions have taken significant steps towards gender inclusion by devising and implementing dedicated gender policies. These policies serve as the foundation for ensuring that gender considerations are systematically integrated into institutional activities. For instance, some institutions have established key performance indicators (KPIs) related to gender and inclusion, ensuring that

progress in these areas is monitored and evaluated. Furthermore, there has been the embedding of gender mainstreaming policies across the operations of some institutions, ensuring that gender perspectives are considered at every level of decision-making and project execution.

Integration of Gender in Research and Project Design

All the participating institutions also indicate that gender inclusion is a priority, with a variety of strategies employed to ensure that all genders are meaningfully involved in their activities. From institutional policies and research design to community engagement and project execution, these institutions are making concerted efforts to promote gender equity. This approach is supported by the development of gender markers and systems of focal points that assist research staff in mainstreaming gender into their work. Such tools not only guide researchers but also reinforce the institution's commitment to gender equity in research outputs. These efforts also contribute to more inclusive research and policy outcomes but also set a precedent for the broader integration of gender considerations in the fields of science, technology, policy, and food systems.

Collaborative Projects and Community Impact

Many collaborative projects by the institutions are found to dedicate specific components to gender aspects, ensuring that gender is a central theme in both the process and outcomes of these initiatives. For example, one institution mentioned that it has a gender specialist who works closely with other teams in project development and implementation, ensuring that gender considerations are fully integrated. Additionally, the involvement of the concerned gender and diverse communities in planning and participating in workshops and discussions ensures that the voices of all genders are heard and considered in policy development.

Gender and EDI (Equity, Diversity, and Inclusion) Lens

Some institutions have adopted a broader Equity, Diversity, and Inclusion (EDI) lens, applying it to all projects carried out. This approach ensures that gender is not treated in isolation but as part of a comprehensive strategy that addresses multiple dimensions of inequality. By being specific about having a gender and EDI lens, these institutions are taking a proactive stance in promoting inclusion in all aspects of their work.

8. Challenges Faced by Institutions in Program Impact Analysis

8.1 Challenges in project and program impact analysis

The survey examined the challenges institutions face in project and program impact analysis based on four pillars: Budget limitations, time constraints, lack of specialized tools/resources, and limited staff expertise. Among the challenges, 42.31% of institutions reported that budget limitations were the most significant challenge in project and program impact analysis. It shows that institutions are, on average, budget constrained.

On the other hand, 21.15% of institutions reported having limited staff expertise in conducting project and program impact analysis. In addition, 19.23% of institutions reported they lack the specialized tools/resources to perform project and program impact analysis. Furthermore, time constraints are the less challenging issues institutions face in conducting project and program impact analysis.

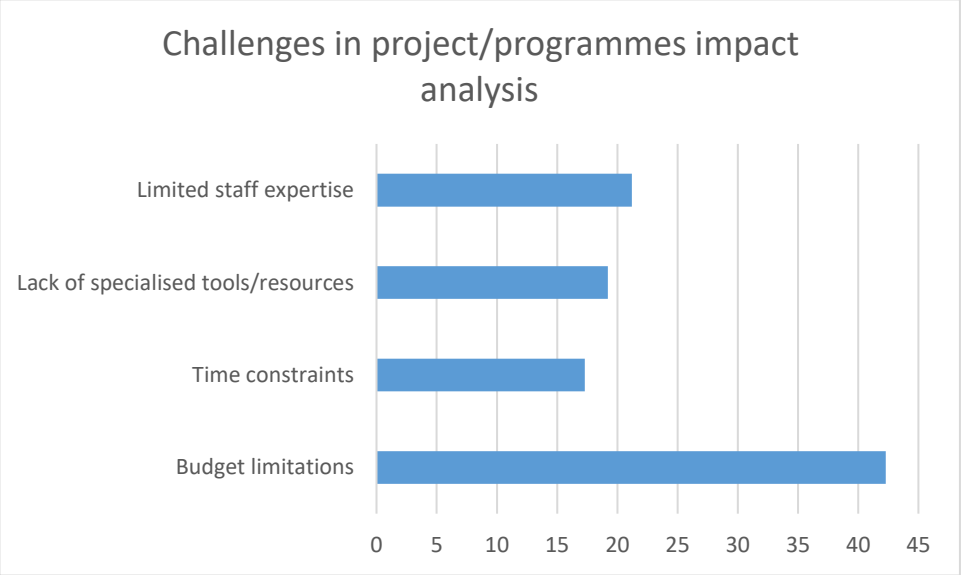

Figure 8. 1:Challenges in project and program impact analysis

Source: StEPPFoS Online survey

Therefore, institutions need to prioritize spending on the critical capacity needs of their researchers in project and program impact analysis. Overall, budget constraints, time constraints, lack of specialized tools/resources, and limited staff expertise are critical areas that institutions must address to become effective and efficient in conducting project and program impact analysis.

8.2 Underlying obstacles

Further analysis showed that some institutional structures or processes obstruct the translation of

research into the policy-making process. These underlying obstacles were bureaucratic hurdles, lack of communication channels, resistance to change, siloed departments, and others: an inability to communicate results and a poor ability to understand research results. Figure 7.2 below shows that all underlying obstacles affect the translation of research into the policy-making process. The survey revealed that the significant barriers are bureaucratic hurdles, a lack of communication channels, and soiled departments. Approximately 15% of policy institutions identified resistance to change as a barrier to translating research into the policy-making process, and only 2.13% of policy institutions identified an inability to communicate results/ poor ability to understand research results as a barrier to translating research into the policy-making process.

To begin with bureaucratic hurdles, policy institutions must evaluate and simplify research procedures to enable researchers to translate research into the policy-making process.

Subsequently, to address the lack of communication channels, policy institutions need to establish clear and structured communication channels to improve the translation of research into the policy-making process. In addition, to address resistance to change, policy institutions must communicate the benefits of using novel research methodologies and tools and provide training, development, and retraining to support researchers in understanding and implementing new research methodologies to help them translate their research into policies. Siloed departments are also an essential factor that obstructs the translation of research into the policy-making process. Policy institutions must foster collaboration among researchers to improve their ability to translate research into policymaking.

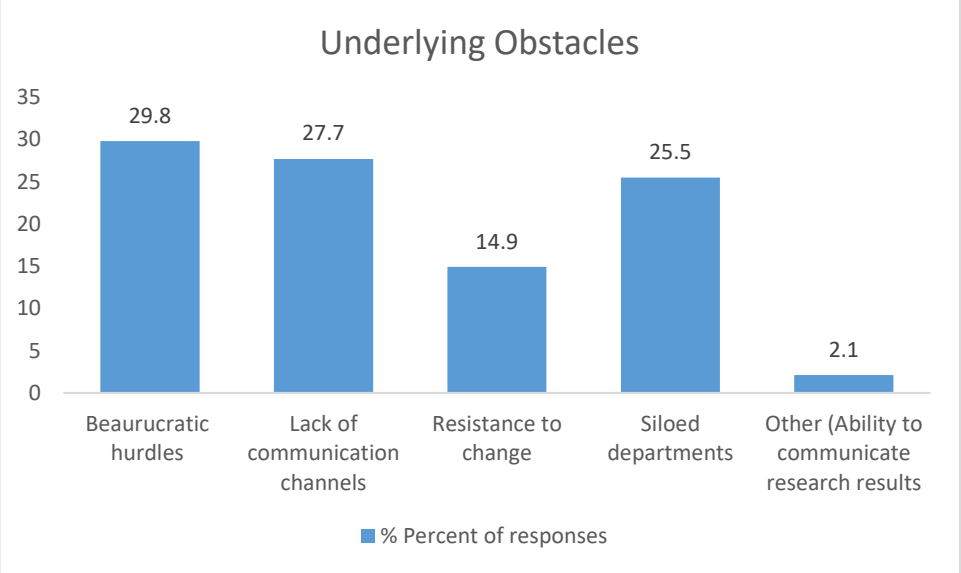

Figure 8. 2:Underlying obstacles

Overall, capacity building for researchers in policy institutions can adequately address the above hurdles

to improve the translation of research into the policy-making process.

8.3 Implementation challenges

The survey further identifies several implementation challenges institutions face in project and policy implementation. A word cloud was employed to identify the key themes of challenges based by institutions in implementing projects and policies. The main themes include;

- Financial challenges
- Technical capacity challenges
- Social challenges
- Economic and Geopolitical changes
- Changes in government, policy shifts, and bureaucratic red tape

Among the plausible challenges, the survey revealed that financial challenges were the most significant factor affecting policy institutions during project and policy implementation. Policy institutions experience delays in financial release from funding agencies and sometimes find it challenging to secure sustainable funding to implement projects and policies. Concerning technical capacity challenges, some policy institutions have researchers with insufficient knowledge, skills, and abilities in technical and specialized areas of the project and policy implementation.

In addition, social and geopolitical challenges were identified. Policy institutions face evolving cultural and social norms in communities where their projects and policies are implemented.

Figure 8. 3:Implementation challenges

Policy institutions must keep abreast of the changing culture and social norms of the areas where they carry out projects and policies. Moreover, policy institutions revealed that some researchers engage

only a few stakeholders (main stakeholders) involved in the project and policy implementation. Unexpected economic and geopolitical changes within and outside the country also potentially affect project and policy implementation.

9. Willingness to participate in StEPPFoS Project Activities

An overwhelming majority of survey respondents demonstrated a strong interest in participating in various StEPPFoS project activities, with enthusiasm spanning from virtual networking platforms to contributing to the development of a methodological guide for strengthening the science-policy-implementation interface. Specifically, between 81% and 95% of respondents indicated a willingness to engage in these initiatives, reflecting their recognition of the value and relevance of the project's goals and the EU-AU partnership for sustainable food systems transformation in Africa. In stark contrast, only a small fraction (2.7%) expresses disinterest in virtual platform participation and development of methodological guides. Though the 2.7% of the participating institutions do not show interest in these two specific activities, the overall interest across all the activities is impressive.

Table 2:Type of StEPPFoS activities Institutions are willing to partake in

Type of activity	Yes (% response)	Would need further information (% response)	No (% response)
Virtual Networking Platform: This web-based platform would be created to facilitate knowledge exchange and virtual dialogue among policy makers and researchers.	81.08	16.22	2.70
Science-Policy- Living Labs: As open innovation ecosystems that catalysers exchanges between food systems researchers, policymakers, and practitioners to find actionable solutions to Africa's food system	83.78	13.51	0.00
Research Seminars on different topics	91.89	8.11	0.00
Policy Workshops to discuss the development pathways and scenarios for food system transformation	94.59	5.41	0.00

Policy- researchers dialogue events	91.89	8.11	0.00
Support the development of a methodological guide on strengthening science-policy-implementation interface	89.19	8.11	2.70

Source: StEPPFoS Online survey

The findings are particularly encouraging, revealing a significant eagerness among the participating institutions to engage with StEPPFoS activities. This widespread interest highlights the alignment between the project's objectives and the institutions' priorities. Notably, 94.59% of respondents expressed their willingness to participate in policy workshops focused on discussing development pathways and scenarios for food system transformation. This high level of engagement underscores the importance of StEPPFoS' initiatives and suggests a strong foundation for collaborative efforts moving forward.

On the other hand, a notable proportion of respondents, ranging from 5.41% to 16.22%, indicated that they would need further information before deciding on their participation in specific StEPPFoS activities. This response highlights the fact that, while there is a generally strong interest in the project, some institutions may be hesitant to fully commit without a clearer understanding of what is required of them or the potential benefits of their involvement.

This need for additional information suggests that these institutions are cautious and want to ensure alignment between their capabilities and the project's objectives before engaging. It also points to the importance of clear and detailed communication from the StEPPFoS project team to address any uncertainties and provide comprehensive explanations of the activities, expectations, and potential outcomes. By offering more targeted information sessions or detailed documentation, the project could potentially increase participation rates and ensure that all institutions are fully informed and confident in their decision to engage.

Moreover, addressing these information gaps could help to build stronger, more committed partnerships, ensuring that all participating institutions are not only willing but also well-prepared to contribute effectively to the project's goals. This could ultimately enhance the overall success and impact of the StEPPFoS initiative by fostering a more inclusive and informed network of contributors.

However, it is important to acknowledge that not all institutions feel fully equipped to participate in some activities. For instance, one institution expressed a willingness to support the development of the methodological guide but cited a lack of capacity as a barrier. This underscores the importance of the capacity-building modules included in the StEPPFoS project, particularly under Work Package 2 (WP2),

which aims to address such gaps. The inclusion of these modules is vital for ensuring that all participating institutions fully engage with and benefit from the project's initiatives, thereby maximizing its overall impact.

10. Conclusions and Recommendations

Conclusions

Building on the result from the desk review as shown in Box 1 above, the analysis of capacity-building initiatives among policy and non-policy institutions reveals a strong commitment to staff development. Non-policy institutions emphasize regular training, with 85% conducting capacity development on a semi-annual or quarterly basis. Policy institutions, however, extend their focus to include external stakeholders, fostering collaboration. Both institution types align capacity-building efforts with strategic objectives, with 53.9% of policy institutions using employee feedback for assessments.

However, there are some remaining gaps, as 19.2% of institutions lack formal structures for assessing capacity needs. Key skills required include analytical capabilities, stakeholder engagement, and technical expertise, particularly for evidence-based policymaking. Non-policy institutions also report a need for improved economic modelling skills, with limited expertise in advanced techniques.

The study also underscores the need for enhanced capacity in economic modelling, particularly within non-policy institutions. Although some researchers have received training in the use of economic models such as CGE and econometric models, many institutions reported limited expertise in this area. The findings suggest a need for targeted capacity-building initiatives that focus on developing researchers' skills in advanced economic modelling techniques, which are crucial for conducting in-depth policy analysis and evaluating the impact of agricultural and economic policies.

Another significant area of focus is the development of skills for evidence-based policymaking, which is particularly crucial for policy institutions. These institutions reported a need for strong analytical skills in data interpretation, policy analysis, and decision-making, alongside competencies in research methodologies, science-policy communication, and the use of digital tools. Non-policy institutions, on the other hand, highlighted the importance of communication, stakeholder engagement, and technical knowledge in areas such as good agricultural practices and climate risk management, emphasizing the need to translate research into actionable policies.

A key lesson from the analysis is the importance of aligning capacity-building efforts with both individual staff needs and the broader strategic objectives of the institution. This staff-centered approach ensures that capacity-building initiatives are relevant and responsive to the specific developmental needs of employees. At the same time, institutions also employ organization-centered approaches, such as skills gap analyses and alignment with strategic plans, to ensure that capacity development contributes to the institution's long-term goals.

Preferred tools for capacity building include software like STATA, R, and Python, supporting economic research and data analysis. The findings highlight the importance of aligning capacity-building efforts with institutional goals while ensuring staff are equipped with the necessary skills to adapt to evolving challenges. Policy advocacy skills development should be a key consideration for further research. The willingness to participate in the StEPPFoS project activities by the respondent institutions is important for the implementation of activities under the project. These institutions would be prioritized in project activities such as capacity building, exchange programs, and networking. These are particularly important to the expansion drive for the PANAP network under work package 7 of the StEPPFoS Project.

Recommendations

The survey proposes the following actions to be taken as part of the StEPPFoS activities in filling the capacity gaps of policy and non-policy institutions:

Develop Formal Structures for Capacity Needs Assessment: StEPPFoS can encourage the participating institutions to develop formal structures for capacity needs assessment given that 19.2% of the institutions lack a formal structure for assessing capacity needs, it is crucial to establish systematic frameworks. These frameworks should integrate both staff-centered and institution-centered approaches, ensuring that staff development is aligned with both personal aspirations and organizational objectives. Regular performance evaluations and skills gap analyses should be standard practice for all institutions.

Tailor Capacity-Building to Specific Institutional Objectives: To build the capacities of institutions, StEPPFoS should align institutional capacity-building efforts to the strategic goals of the institutions. Non-policy institutions, which heavily rely on project-specific goals, should focus on aligning staff training with both immediate project requirements and broader long-term objectives. This ensures that training is not just project-specific but contributes to the institution's overall mission.

Expand Training on Economic Modelling and Analytical Tools: A key finding is the limited expertise in advanced economic modelling, especially computable general equilibrium (CGE) modelling. StEPPFoS can hence focus on building capacity in these models. Institutions should invest in targeted training programs that enhance skills in economic models and quantitative analysis. Encouraging participation in workshops and certification programs on advanced statistical and economic analysis tools like STATA, R, SPSS, and Python is crucial to building these skills.

Integrate capacity building into ongoing projects: Institutions should prioritize continuous learning by integrating capacity-building models into ongoing projects. Regular workshops and seminars are already

widely used, but mentorship programs could further enhance staff skills, offering guidance from experienced professionals. Cross-departmental collaborations and knowledge-sharing platforms should be expanded to promote learning across different disciplines.

Annex 1: 1st Desk Review to Identify and Analyze Existing Policy Capacity Gaps: A focus on PANAP Member Countries.

Strengthening Evidence-Based Policy and Practice for Sustainable Food Systems under the AU-EU Partnership

Task 1.1

Review and Analysis of Existing Capacity Gaps and Mapping Existing Policies/Projects/Programmes

Activity 1: 1st Desk Review to Identify and Analyze Existing Policy Capacity Gaps: A focus on PANAP Member Countries.

FARA
With support from Task members
V1.0

Executive Summary

This desk review, undertaken under Task 1.1 of the StEPPFoS Project, provides a foundational assessment of the policy capacity gaps that shapes the ability of PANAP member countries to design, implement, and communicate ex-ante economic impact analyses for agricultural and agrifood systems transformation. Through a structured analysis of national policies, institutional strategies, regional reports, peer-reviewed literature, and grey materials, the study offers a comparative and evidence-based understanding of the strengths, weaknesses, and emerging opportunities across twelve African countries. The review responds to the overarching objective of Work Package 1, which aims to synthesize existing knowledge and inform subsequent capacity-building interventions under WP2, as well as guide the design of the Task 1.1 survey instrument.

Overall, the findings highlight a strong political commitment among most countries to agricultural transformation through alignment with continental frameworks such as CAADP. However, persistent gaps in institutional, human, technical, and financial capacities continue to hinder the translation of these frameworks into actionable and evidence-driven policies. Many institutions lack enough economists, policy analysts, and modelling specialists capable of carrying out sophisticated ex-ante analyses. The reliance on external consultants, outdated academic curricula, and limited professional development pathways further weakens national ownership of analytical processes. At the technical level, agricultural data systems remain fragmented, incomplete, or outdated, with weak digital infrastructure and limited interoperability across institutions. These constraints undermine policymakers' ability to generate real-time insights, evaluate policy options, and conduct impact assessments grounded in credible evidence.

Institutional fragmentation and weak coordination further limit policy coherence and implementation effectiveness. Ministries responsible for agriculture, environment, planning, statistics, and finance often operate in silos, with minimal cross-sectoral engagement or shared accountability frameworks. This reduces the effectiveness of policy design, slows implementation, and limits governments' capacity to respond adaptively to emerging challenges such as climate shocks, market volatility, and demographic transitions. Financial constraints amplify these challenges, as most governments continue to underinvest in policy research and allocate inadequate domestic resources for evidence generation. Heavy reliance on donor-funded projects results in fragmented research agendas, limited institutional sustainability, and weak national ownership of policy knowledge systems.

The review also finds that Monitoring, Evaluation, and Learning (MEL) systems remain some of the weakest components of national agricultural policy frameworks. Indicators, baselines, and structured

feedback loops are often absent or insufficiently integrated, limiting opportunities for adaptive learning and evidence-based policy adjustment. At the broader governance level, political instability, frequent institutional restructuring, centralized decision-making, and weak data governance systems inhibit policy uptake and disrupt continuity in long-term development initiatives. These factors contribute to a persistent gap between policy ambition and implementation outcomes.

Comparative insights reveal considerable regional variation. East Africa exhibits relatively strong analytical and institutional capacity due to more established think-tank ecosystems and strong partnerships between government and academia. West and Central Africa face more significant gaps related to data systems, institutional coordination, and technical skills. Southern Africa has notable experience with planning and evaluation but struggles with MEL integration, while North Africa benefits from strong research infrastructure but faces challenges associated with centralized governance and limited stakeholder inclusion. These variations underscore the importance of differentiated and context-specific capacity-building pathways across regions.

Despite the challenges identified, the review notes several emerging opportunities that can be leveraged to strengthen policy analysis across the PANAP network. These include digital transformation initiatives under AU data governance frameworks, enhanced collaboration through regional networks such as FARA, FANRPAN, and RUFORUM, growing AU-EU partnership support for training and technical assistance, and the increasing policy demand for evidence due to climate pressures. Expanding youth-driven innovation ecosystems also presents opportunities for cultivating new analytical talent.

Introduction

1.1 Background and Context

The Strengthening Evidence-Based Policy and Practice for Sustainable Food Systems under the AU-EU Partnership (StEPPFoS) Project aims to offer an innovative approach to link the activities of the Pan-African Network for Economic Analysis of Policies (PANAP) to those of Food and Nutrition and Sustainable Agriculture (FNSSA) through capacity building and multi-stakeholder engagement. StEPPFoS is a four (4) year project which started on 1st January 2024 and will end on 31st December 2027. The project is being implemented through eight (8) work packages and will achieve four (4) specific objectives, which together are aimed at supporting the FNSSA 10-year roadmap and the global transition towards sustainable food systems transformation.

The persistent and systemic limitations observed across PANAP member countries continue to undermine their capacity to design, implement, and evaluate evidence-based agricultural and agrifood-systems policies. In many countries, policy processes are constrained by inadequate analytical skills, insufficient institutional infrastructure, weak coordination mechanisms, and inconsistent access to reliable data and modelling tools (Adom and Simatele, 2024). These capacity gaps hinder the production of robust ex-ante economic impact analyses that are essential for informed decision-making at national, regional, and continental levels, particularly in the context of shifting priorities related to agriculture, food security, environmental sustainability, and climate change (Agapitova, 2009; FAO, 2017; OECD, 2020; IPCC, 2019; AGRA, 2023).

In this context, Task 1.1 under the StEPPFoS project directly aligns with the first objective of Work Package (WP) 1. WP1's overarching goal is to synthesize and document evidence that will support the development of Consortium activities, laying a foundation for the entire project's success. The task is dedicated to reviewing, identifying, and analyzing existing capacity gaps while mapping ongoing policies across the targeted regions. Implemented over 18 months (M01–M18), Task 1.1 was led by the Forum for Agricultural Research in Africa (FARA) with the collaborative support of StEPPFoS partners, including the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), the Council for Scientific and Industrial Research (CSIR), the University of Venice (UNIVE), Université Félix Houphouët-Boigny (UFHB), and the Kenya Institute for Public Policy Research and Analysis (KIPPRA)

This desk review, therefore, provides the foundational evidence base required to guide the sequencing of StEPPFoS capacity-building activities. By mapping institutional and analytical gaps across the twelve

PANAP countries, the review generates insights that will inform WP2 training modules, shape the design of the Task 1.1 survey instrument, and ensure that subsequent project activities are aligned with real institutional needs and regional variations.

1.2 Objectives of the Desk Review

The primary objective of this desk review is to identify and analyze existing capacity gaps across PANAP member countries, with a particular emphasis on the research skills and institutional facilities required to develop, apply, and effectively communicate ex-ante economic impact analyses and modelling for African agrifood systems. The insights generated will directly inform the design of training modules under WP2. In addition, the findings from this desk review will serve as a foundational input for the comprehensive survey to be undertaken as part of Deliverable D1.1 of the StEPPFoS project.

The main guiding question for the desk review is ‘‘*what are the existing capacity gaps among PANAP member countries that affect their ability to design, implement, and evaluate effective agri food system policies*’’?

1.3 Scope and Coverage

This desk review, conducted under Task 1.1 across twelve PANAP member countries, assessed existing capacity gaps in conducting ex-ante economic impact analyses for African agrifood systems. Drawing on policy documents, institutional reports, academic literature and project outputs, it examined institutional infrastructure for quantitative policy analysis, the availability and use of modelling tools and datasets, competencies in economic modelling, and mechanisms for communicating evidence-based policy outputs. Using a mixed-methods synthesis (Creswell & Plano Clark (2018), the review identified cross-country variations and key gaps (Harden & Thomas (2010)), providing the foundational evidence for designing the survey instruments and methodological approaches for the next phases of the study (UNDP, 2020).

Methodology

Approach

A desk review is a structured form of secondary research that involves the systematic collection, analysis, and synthesis of existing literature, policy documents, institutional reports, and datasets to generate an informed understanding of a focal topic or to assess alignment and compliance with established frameworks. Within the PANAP initiative, this method is essential for evaluating institutional and research capacity gaps across member countries, particularly their ability to design, apply, and communicate ex-

ante economic impact analyses using quantitative methods.

The desk review applied a structured document analysis approach, combining thematic content analysis with comparative cross-country synthesis (Petticrew & Roberts, 2006). This method is appropriate for Task 1.1 because it enables systematic assessment of institutional capacity, policy frameworks, and analytical readiness using existing evidence where primary data is not yet available. The analysis focused on agricultural policy documents, national agricultural investment plans, institutional strategies, peer-reviewed literature, and outputs from regional bodies such as FARA, RUFORUM, FANRPAN, and AUDA-NEPAD. All materials were screened using predefined criteria: relevance to ex-ante policy analysis capacity, publication date (2010–2024), and geographical alignment with the twelve PANAP countries. Extracted information was coded against six capacity domains, generating a comparable, multi-country picture of policy and analytical capacity.

As Bowen (2009) explains, document analysis enables researchers to interpret and integrate information from diverse written sources to derive meaningful insights, identify patterns, and expose deficiencies within existing systems. O'Leary (2017) further observes that such systematic reviews ensure that new analyses are firmly grounded in prior empirical evidence and real-world policy contexts.

Using this methodological approach, the desk reviews map national and institutional capacities, assesses the availability and use of modelling tools, datasets, and analytical skills, and identifies barriers to effective policy research, communication, and uptake of evidence. It also provides insights that inform you about the design of targeted capacity-building interventions under the PANAP framework.

By synthesizing available evidence across countries, the desk review reveals cross-country variations, systemic constraints, and emerging trends. These findings form a critical foundation for understanding the broader institutional, technical, and capacity landscape within the PANAP network and directly support the development of training modules in Work Package 2 (WP2).

The PANAP initiative unites agricultural policy and research institutions from twelve African countries, including ministries, NARS, and policy or modelling units, responsible for generating evidence for agricultural decision-making. Representing West, East, Central, and Southern Africa, these institutions work together to strengthen national capacities to design, conduct, and communicate ex-ante economic impact analyses to support agrifood system transformation across the continent.

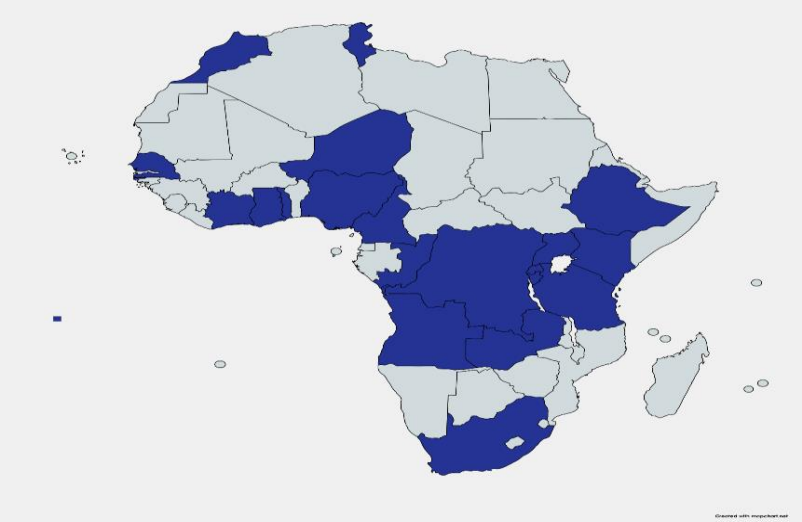

Figure 1: Map of PANAP member countries in Africa

In alignment with the Forum for Agricultural Research in Africa (FARA) and its Integrated Agricultural Research for Development (IAR4D) model, the review emphasized multi-actor engagement, recognizing that capacity building is not limited to individuals but extends to collective learning and institutional collaboration (Hawkins et al.,; Fatunbi et al., 2017). This was particularly relevant to the Policy Analysis and Advocacy Programme (PANAP), where effective policy formulation and implementation depend on the synergy between governments, research organizations, and regional bodies.

The selection of these documents and reviews were guided by well-defined inclusion and exclusion criteria to ensure proper and relevant selection of high-quality sources. The criteria selected were carefully designed and developed to align with the research questions of the review. These included: :

Keywords: Specific and highly relevant keywords were employed in the desk review to guide the search for documents and literature. This approach helped to refine the scope of the review, ensuring that only pertinent sources related to existing capacity gaps were identified and analyzed. The Keywords included: “capacity gaps, policy, agriculture, research, Africa, Analytical, Impact assessment, Ex-ante economic, Economic modelling, Quantitative methods, evidence-based, Agrifood systems.”

Publication date: The review only considered documents and literature published from 2006 to date because this period provided a relevant and broad temporal scope to capture trends and developments in the field.

Geographical focus: The documents were selected across twelve PANAP member countries. These countries were purposefully selected to represent Africa’s regional diversity and variations in policy readiness, thus South, East, West and Central Africa. The findings therefore offered a holistic

understanding of existing policy capacities and emerging opportunities to strengthen evidence-informed policymaking systems across the continent.

Relevance to the research questions: only the sources that directly addressed the research questions for this desk review and provided valuable context were considered.

The desk review process included;

Formulating a clear objective, research questions and scope.

Gathering relevant existing documents, reports, literature and data.

Evaluating completeness, consistency, and relevance of materials.

Synthesizing findings to inform future steps or provide a standalone analysis

2.2 Data Sources

The desk review draws on a diverse set of secondary data sources that provide insights into the institutional, technical, and analytical capacities of PANAP member countries to conduct ex-ante economic impact analyses for African agrifood systems. Key sources included:

National agricultural policy documents, research and innovation strategies, and institutional frameworks, from governmental portals and records or databases;

These sources gave key evidence for understanding each country's policy direction, institutional roles, and how they coordinate agricultural transformation. Documents like National Agricultural Investment Plans (NAIPs), National Research and Innovation Strategies, and Agricultural Sector Development Frameworks were reviewed to see how well they use evidence, coordinate across sectors, and include capacity building. They also helped explain how policies are developed, put into action, and how institutions learn over time.

Reports and evaluations from FARA, FANRPAN, RUFORUM, and AUDA-NEPAD;

These continental and regional organizations produce a lot of policy research, monitoring reports, and evaluation studies that document lessons on institutional capacity, links between research and policy, and challenges in connecting science and policy in Africa. FARA's evaluations point out major gaps in agricultural innovation, while FANRPAN and RUFORUM highlight the value of policy networks and developing skilled people. AUDA-NEPAD's evaluations help explain continental frameworks like CAADP and their implications for evidence-based policymaking. Together, these insights highlight the need for stronger coordination and better use of evidence to guide agricultural policy in Africa.

Peer-reviewed journals from Google scholar and Scopus, research gate such as Food Policy, World Development, and Agricultural Systems.

These journals were reviewed to gain practical and theoretical insight into how policies work, how governance operates, and how institutions function in agricultural systems. They also provided global comparative perspectives that enriched the regional analysis.

Grey literature, including policy briefs and donor evaluation reports from different organizational websites (e.g., FARA, FAO, IFPRI, OECD, AUDA-NEPAD, AU World Bank, FANRPAN and RUFORUM).

Grey literature offered up-to-date, practical evidence from donor-funded programs and international agencies. These materials added to the peer-reviewed sources by giving useful recommendations, case studies, and reviews of ongoing capacity-building and policy support efforts in Africa.

2.3 Analytical Methods

A qualitative content analysis approach was used to systematically interpret and synthesize evidence from the reviewed documents. The assessment was organized around six interrelated capacity domains human and institutional capacity, technical and analytical capacity, organizational and coordination capacity, financial and resource capacity, policy implementation and evaluation capacity, and the broader enabling environment adapted from the World Bank's Capacity Development Results Framework (World Bank, 2011) and refined using the UNDP Institutional Capacity Assessment methodology (UNDP, 2015). Each document was analyzed to identify recurring themes, institutional strengths, and capacity gaps relevant to policy analysis and evidence generation.

Extracted data were grouped under the six domains and synthesized through a comparative cross-country analysis of PANAP member institutions, enabling the identification of shared trends, regional disparities, and context-specific variations. By integrating these analytical lenses, the framework generated nuanced insights into the structural and functional determinants of policy capacity across the PANAP network, highlighting how differences in governance arrangements, resource allocation, analytical capabilities, and stakeholder coordination shape the effectiveness of policy formulation, implementation, and evidence-based decision-making within Africa's agricultural research and innovation systems.

2.4 Limitations

The desk review faced several methodological limitations that influenced the scope and depth of analysis. Key constraints included inconsistent data availability across PANAP member countries, with significant disparities in the accessibility and completeness of agricultural policy documents and institutional reports. Moreover, variability in the frequency and quality of policy publications, particularly among lower-

capacity institutions, posed challenges to cross-country comparability. Language barriers, especially in Francophone and Lusophone countries, further constrained access to relevant materials and limited the uniform interpretation of policy texts. Despite these constraints, data triangulation using secondary sources such as donor reports, academic literature, and regional policy evaluations helped to minimize potential bias and enhance analytical robustness. Importantly, these identified limitations underscore the need for complementary primary data collection, leading to the design and deployment of a structured survey targeting policy institutions, researchers, and regional networks to validate and enrich the findings of this desk review.

3. Overview of the Policy Landscape in PANAP Member Countries

3.1 Policy Architecture

Across the PANAP member countries, most governments have established NAIPs that are formally aligned with the CAADP principles and targets (African Union Commission & NEPAD, 2015). These frameworks demonstrate strong political commitment to agricultural transformation, food security, and rural livelihood improvement. AUDA-NEPAD has played a central role in providing technical guidance and monitoring progress through the CAADP Biennial Review mechanism (AUDA-NEPAD, 2023). Despite these advances, a recurrent finding of the desk review is that while many countries have developed comprehensive policy frameworks, the translation of these frameworks into implementable and evidence-based policy instruments remains limited. Implementation often faces institutional fragmentation, weak monitoring and evaluation (M&E) systems, and limited resource mobilization capacities, conditions that constrain the realization of intended policy outcomes (World Bank, 2021; UNDP, 2020).

In Ghana, Kenya, and Malawi, recent policy reforms have adopted more integrated and systems-oriented approaches, explicitly linking agricultural productivity goals with climate resilience, food systems transformation, and youth employment strategies (Adu et al., 2018; Antwi-Agyei et al., 2018; Rutting et al., 2024; Munthali et al., 2025; 27. Kadzamira & Kazembe, 2015). These countries have also benefited from relatively robust data ecosystems and active research–policy interfaces supported by national agricultural research institutions, universities, and continental initiatives such as FARA's Integrated Agricultural Research for Development (IAR4D) model (Adekunle et al., 2013; FARA, 2022). In contrast, countries such as Niger and Burkina Faso still operate under traditional agricultural growth frameworks that emphasize production expansion and input subsidies over sustainability, inclusivity, and

evidence-based learning (Rokka et al., 2025). These differences underscore the uneven evolution of policy capacity and institutional learning across the PANAP network, reflecting variations in governance quality, fiscal space, and stakeholder coordination.

Overall, while policy alignment with continental frameworks like CAADP is commendable, sustained investment in institutional capacity building, policy coherence, and adaptive management remains essential (Zimmermann et al., 2009). Strengthening evidence generation, cross-sectoral coordination, and accountability mechanisms will be critical for moving from policy formulation to effective implementation and transformative impact in Africa's agricultural systems (Chevallier, 2023).

3.2 Institutional Arrangements

The policy ecosystem across PANAP member countries is often fragmented and institutionally complex, characterized by multiple ministries and agencies overseeing interrelated mandates in agriculture, environment, trade, and national planning (Schoneveld, 2014). This institutional fragmentation frequently results in overlapping responsibilities, duplication of efforts, and coordination gaps, which undermine the efficiency and coherence of agricultural and food system policies (Cejudo & Michel, 2017). For instance, while ministries of agriculture focus primarily on production and extension, environmental agencies lead climate and land-use initiatives, and planning commissions manage overall development frameworks, often with limited mechanisms for inter-ministerial dialogue and harmonization (OECD, 2022). This lack of synergy weakens policy implementation and reduces the adaptive capacity of institutions to respond to emerging issues such as climate shocks, food insecurity, and market disruptions.

Within this fragmented landscape, national policy research institutions and Think Tanks such as the Kenya Institute for Public Policy Research and Analysis (KIPPRA) and the Institute of Statistical, Social and Economic Research (ISSER) in Ghana serve as crucial nodes for evidence generation and policy advice. They conduct empirical analyses, support ex-ante policy evaluations, and bridge the gap between research outputs and policymaking processes (KIPPRA, 2022; ISSER, 2023; Oduro-Kwarten & Onyango, 2025). However, despite their strategic positioning, these institutions often operate under limited financial resources and face capacity constraints, particularly in advanced econometric modelling, impact assessment, and systems analysis (Turnpenny et al., 2008; Pejovich, 2012). Such gaps constrain their ability to provide timely, data-driven evidence to inform policy reforms. Strengthening their technical and analytical capabilities through sustained investment, cross-institutional collaboration, and targeted training will therefore be critical to enhancing the overall effectiveness of the policy ecosystem and ensuring that national decisions are grounded in rigorous evidence and aligned with broader continental

frameworks such as CAADP and the AU's Science, Technology and Innovation Strategy for Africa (STISA-2024).

3.3 Stakeholder Roles

Civil society and private sector participation in agricultural policy formulation and implementation remains modest and episodic in most PANAP member countries. While both sectors are recognized as essential actors for inclusive and sustainable policy development, their engagement is often limited to consultative roles during stakeholder validation workshops rather than sustained participation in policy design, monitoring, and evaluation (Lemke & Harris-Wai, 2015). Civil society organizations (CSOs), farmers' associations, and producer cooperatives contribute valuable grassroots perspectives on livelihood realities, yet their influence on national policy outcomes is curtailed by weak institutional linkages and inadequate representation in decision-making structures (Rwelamira, 2015). Similarly, the private sector, particularly agribusiness and agri-input industries, plays a critical role in innovation diffusion and investment mobilization but is seldom integrated into formal policy dialogues, leading to missed opportunities for public–private synergy (Moragues-Faus & Battersby, 202).

At the regional level, networks such as the FARA, FANRPAN and RUFORUM have created structured avenues for research–policy engagement, emphasizing collaborative learning and multi-actor innovation systems. FARA's IAR4D model, FANRPAN'S Multistakeholder Policy Dialogue model and RUFORUM's policy advocacy initiatives exemplify continental efforts to bridge the divide between knowledge generation and policymaking (FARA, 2022; FANARPAN, 2024; RUFORUM, 2022). Nonetheless, as observed by Gluckman, (2016), the science–policy interface remains under-institutionalized, with few mechanisms that translate scientific evidence into concrete policy reforms. Strengthening these linkages requires formalized frameworks for evidence uptake, knowledge brokerage, and accountability, ensuring that policies are both participatory and empirically grounded

3.4 Policy Instruments and Mechanisms

Across many PANAP member countries, governments have adopted a range of policy instruments to stimulate agricultural growth, enhance food security, and promote innovation within national food systems. Commonly used tools include input subsidies, market stabilization schemes, credit guarantees, and research and innovation grants designed to improve productivity and reduce vulnerability to price fluctuations (Meyer, 2011; Liubkina et al., 2019). For example, fertilizer and seed subsidies in countries such as Ghana, Malawi, and Zambia have been central to agricultural policy for decades, often aimed at improving smallholder access to inputs and promoting food self-sufficiency (Druilhe & Barreiro-Hurlé,

2012; Nkhoma, 2018; Jayne et al., 2018; Obayelu et al., 2021; Benson et al., 2024). Similarly, market stabilization interventions, such as grain reserves and price support mechanisms, are frequently used to protect producers from market shocks and to ensure national food supply stability (Poulton et al., 2006; Gouel, 2014; Gurbanzade, 2024). In some cases, governments have also launched competitive research grant programs to strengthen agricultural innovation and technology dissemination, especially in collaboration with national agricultural research institutes and universities (Beintema & Stads, 2011; Ozor et al., 2025).

However, despite these policy efforts, the absence of comprehensive Monitoring, Evaluation, and Learning (MEL) frameworks remains a major constraint to adaptive policy management (Kuchenmüller et al., 2022). Many agricultural policies are implemented without systematic mechanisms for tracking performance indicators, assessing impact, or incorporating lessons into subsequent policy cycles (Brooks, 2023; Đurić et al., 2023). As a result, the feedback loop between evidence and decision-making remains weak, leading to repetitive policy interventions that often overlook past inefficiencies and evolving contextual realities (Malbon & Parkhurst, 2023). This situation undermines accountability, reduces transparency, and limits opportunities for continuous improvement in policy design (Lourenço, 2023).

Moreover, limited institutional capacity for data collection, analysis, and knowledge management further weakens the ability of governments to evaluate outcomes effectively (Ohemeng, 2025). In many countries, MEL functions are fragmented across ministries or donor-driven, leading to inconsistencies in reporting and limited national ownership of learning processes (Porter & Goldman, 2013). Embedding robust MEL systems within national agricultural policy frameworks would not only enhance evidence-based decision-making but also foster a culture of learning and adaptation within public institutions (Preskill & Boyle 2008, FAO. 2023). Strengthening these mechanisms through capacity building, cross-sectoral collaboration, and digital data systems will be critical for improving policy responsiveness and ensuring that public investments translate into measurable and sustainable agricultural transformation outcomes across Africa.

The policy landscape across all PANAP countries demonstrates strong alignment with continental frameworks such as CAADP and STISA-2024. However, this alignment does not consistently translate into implementable or evidence-driven policy instruments. Weak coordination, fragmented mandates, and underdeveloped monitoring frameworks reduce the ability of governments to operationalize their policy ambitions. These landscape characteristics form an important backdrop to the capacity gaps assessed in Section 4.

4. Analysis of Policy Capacity Gaps

The analysis of policy capacity gaps seeks to evaluate the extent to which institutions, systems, and individuals possess the knowledge, skills, and resources required to design, implement, and evaluate effective agricultural and food system policies (AfDB, 2016). Within the PANAP member countries, this analysis provides critical insights into the functional strengths and weaknesses that influence policy performance, coherence, and sustainability. According to (Wu et al., 2015; Buurman & Babovic, 2016), policy capacity is multidimensional, encompassing analytical, operational, and political competencies that enable evidence-based decision-making and adaptive governance. Assessing these capacities helps to identify systemic inefficiencies, institutional bottlenecks, and the absence of enabling environments that hinder the achievement of desired policy outcomes.

In the African agricultural context, where challenges such as fragmented governance, climate change, and limited financing prevail, analyzing policy capacity gaps is essential to ensuring that national agricultural investment plans (NAIPs) and related frameworks translate effectively into practice (AUDA-NEPAD, 2023). It also informs regional coordination under the Comprehensive Africa Agriculture Development Programme (CAADP) by highlighting where technical and institutional reinforcements are most needed.

Capacity Needs in Relation to the Study

Findings from the desk review underscore significant capacity needs across multiple dimensions. First, there is a strong demand for technical and analytical capacity to support data-driven policy formulation and monitoring (Mekonnen et al., 2024). Many policy institutions lack expertise in econometric modelling, impact assessment, and foresight analysis, which limits their ability to generate credible evidence for policy design (World Bank, 2021; Kar, 2023). Second, institutional and organizational capacity remains weak, with insufficient coordination mechanisms among ministries and limited use of Monitoring, Evaluation, and Learning (MEL) systems (FAO, 2021). Finally, functional and leadership capacities including negotiation, strategic planning, and stakeholder engagement require strengthening to enhance intersectoral collaboration and policy coherence (Andrews et al., 2017). Addressing these capacity gaps is vital for achieving the long-term objectives of PANAP and advancing Africa's agenda for evidence-informed and adaptive agricultural policymaking.

4.1 Human Institutional Capacity gaps identified though literature

A critical challenge within the agricultural policy landscape of many African nations participating in the PANAP framework lies in the limited availability of skilled policy analysts, economists, and modelling specialists capable of translating empirical evidence into actionable policy insights. This shortage of

technical expertise significantly undermines the capacity of governments and research institutions to design, evaluate, and adapt agricultural and food system policies in response to emerging challenges. As noted by Tambo et al. (2022), most ministries of agriculture and related agencies lack dedicated in-house teams competent in conducting ex-ante policy simulations, cost–benefit analyses, or econometric modelling. Consequently, these institutions often depend on external consultants or international organizations such as the International Food Policy Research Institute (IFPRI) and the Food and Agriculture Organization (FAO) to perform impact assessments and scenario analyses (IFPRI, 2023; FAO, 2021). While such collaborations have strengthened the evidence base for policymaking, they also highlight an enduring issue of limited national ownership and sustainability in analytical capacity.

This reliance on external expertise is further compounded by systemic gaps in academic and professional training. Curricula in agricultural economics and policy-related programs across African universities tend to emphasize theoretical instruction at the expense of practical, data-driven training (Frans, 2024). Graduates are often unfamiliar with the use of computable general equilibrium (CGE) or partial equilibrium models, which are essential for assessing policy trade-offs and macroeconomic linkages (World Bank, 2021). The limited integration of such applied tools into tertiary education results in a mismatch between the competencies of emerging professionals and the technical demands of modern policymaking environments.

Moreover, research institutions and think tanks, including those under national ministries, often operate with inadequate financial resources and minimal access to high-quality data, software, and technical mentorship (El Hajj et al., 2020). As a result, opportunities for hands-on learning, continuous professional development, and collaborative modelling exercises remain scarce. This constrains local researchers' ability to conduct independent policy analyses, thereby reinforcing dependency on donor-driven technical support. Strengthening analytical capacity, therefore, requires a dual approach: curriculum reform to align academic training with practical policy needs and institutional investment in building in-house modelling expertise. Such measures are vital to strengthening local ownership of evidence-based policymaking, fostering sustainability, and enabling African governments to design policies grounded in robust economic and scientific analysis.

In summary, the literature illustrates a persistent shortage of skilled policy analysts, modelers, and economists across most PANAP countries. Limited practical training, inadequate institutional resourcing, and high turnover have created a structural gap that constrains evidence-based policymaking and reinforces dependence on external expertise

4.2 Technical and Analytical Capacity

A major constraint to effective policy formulation and evidence-based decision-making in many PANAP member countries stems from a series of technical limitations that undermine the quality, consistency, and timeliness of agricultural data. These include inadequate access to reliable datasets, weak digital infrastructure, and outdated statistical systems that fail to capture the dynamic nature of agricultural production, trade, and environmental change. In several countries, agricultural data collection remains largely manual, fragmented across institutions, and infrequently updated, which limits the ability of policymakers to conduct real-time analysis or forecast sectoral trends (FAO, 2024). Only a few nations, notably Kenya and Ghana, have established functional integrated data platforms that align with global repositories such as FAOSTAT or link effectively with national statistical systems. Even in these cases, interoperability challenges and funding constraints often limit full integration and regular data validation (Geyman et al., 2025).

These limitations have significant implications for the monitoring and evaluation (M&E) of agricultural policies and programs. Without accurate and harmonized datasets, countries struggle to assess policy effectiveness, measure progress against regional targets such as the CAADP indicators or evaluate the economic impact of interventions on smallholder farmers (AUDA-NEPAD, 2023). Moreover, deficiencies in digital infrastructure, particularly in rural areas, restrict the potential for automated data collection and cloud-based analytics, reinforcing dependence on donor-funded surveys and periodic reports (FAO, 2024).

Despite these challenges, several emerging opportunities are beginning to transform the landscape of agricultural policy analysis. The rapid advancement of digital technologies, including remote-sensing applications, Geographic Information Systems (GIS), and machine-learning-based spatial analysis tools, offers innovative pathways for generating high-resolution data and improving policy targeting (Ehlers et al., 202). For example, GIS-based mapping allows for the visualization of agricultural productivity patterns, land-use changes, and climate vulnerabilities, thereby supporting more spatially explicit and evidence-driven decision-making. However, the uptake of such technologies remains limited, primarily due to inadequate technical expertise, high costs of equipment and software, and insufficient institutional coordination (FARA, 2022). Despite these constraints, regional initiatives such as those led by FARA, AUDA-NEPAD, and FANRPAN are beginning to promote digital innovation and data-driven policy collaboration across Africa.

To harness these digital opportunities, African governments and research institutions must invest in data governance systems, promote capacity building in digital analytics, and foster partnerships with

technology providers and regional data platforms. Enhanced collaboration between research networks, policymakers, and private sector actors will also be essential to scale innovations and ensure their policy relevance. Strengthening national statistical infrastructure and promoting open data sharing will be pivotal in closing the policy capacity gap and accelerating the transition toward data-informed agricultural transformation across the continent.

Overall, technical capacity gaps stem from data scarcity, weak digital infrastructure, and limited uptake of advanced analytical tools. Without significant investment in data governance and modelling capacity, PANAP institutions will struggle to generate credible ex-ante analysis

4.3 Organizational and Coordination Capacity

Institutional fragmentation remains one of the most persistent challenges undermining effective agricultural policymaking and implementation across many African countries participating in the PANAP framework. Ministries and agencies responsible for agriculture, finance, trade, environment, and planning often operate in silos, with limited mechanisms for cross-sectoral coordination and information sharing. This lack of integration leads to policy incoherence, duplication of mandates, and inefficiencies in resource allocation (AUDA-NEPAD, 2023). For instance, while ministries of agriculture typically focus on productivity and food security objectives, ministries of environment may prioritize natural resource conservation, and ministries of finance concentrate on macroeconomic stability. Without harmonized strategies, these competing priorities frequently result in fragmented policies that fail to address the complex, interconnected nature of food systems.

Although inter-ministerial task forces and coordination committees have been established in several countries to promote collaboration, their impact has often been limited. These bodies tend to function as ad hoc consultative platforms rather than legally empowered decision-making entities, lacking both budgetary autonomy and the authority to enforce inter-sectoral alignment (World Bank, 2021). Moreover, the frequent reshuffling of ministerial leadership and high staff turnover disrupts institutional continuity, while overlapping donor initiatives further complicate coordination at both national and regional levels (FAO, 2021). This fragmentation weakens policy coherence, delays implementation, and diminishes the effectiveness of government interventions aimed at achieving agricultural transformation and resilience.

In countries such as Kenya and Ghana, efforts to institutionalize coordination through sector working groups and joint planning frameworks have yielded some positive results, but these remain exceptions rather than the norm. Successful coordination requires not only institutional mechanisms but also shared

accountability frameworks, clear mandates, and incentive structures that promote collaboration among ministries and agencies. Furthermore, coordination must extend beyond government institutions to include research organizations, civil society, and the private sector, ensuring that diverse perspectives inform policy design and implementation (OECD, 2019).

Strengthening institutional coherence will therefore require both structural reforms and capacity development investments. This includes setting up legally empowered coordination bodies with adequate funding, integrating agricultural policies within broader national development and climate strategies, and enhancing monitoring and evaluation systems to track inter-sectoral outcomes. By addressing fragmentation, countries can build a more holistic and adaptive policy environment capable of advancing sustainable and inclusive agricultural transformation across Africa.

Taken together, evidence shows that institutional fragmentation and weak inter-ministerial coordination remain major bottlenecks to coherent agricultural policymaking. Siloed structures, overlapping mandates, and ad hoc coordination platforms limit alignment across ministries and between research and policy actors. These coordination gaps reduce policy coherence, delay implementation, and weaken accountability. Strengthening organizational systems, promoting stable coordination mechanisms, and fostering multi-actor collaboration are therefore essential for improving policy effectiveness and ensuring evidence flows across the policy ecosystem.

4.4 Financial and Resource Capacity

Financial constraints continue to pose a major challenge to effective policy research, formulation, and implementation across many PANAP member countries. Most governments allocate less than one percent of their total agricultural budgets to policy research and analysis, a level far below the investment required to sustain evidence-based decision-making (FAO, 2021). This chronic underfunding limits the ability of ministries and research institutions to conduct rigorous policy evaluations, maintain data systems, or recruit skilled analysts. As a result, the policy cycle from design to implementation and monitoring often proceeds with limited empirical grounding, reducing policy effectiveness and adaptability (World Bank, 2021).

A related challenge is the high dependence on donor funding, which, while instrumental in catalyzing research activities, undermines the sustainability and ownership of national policy research agendas. Donor-supported projects frequently dictate research priorities, methodologies, and timelines, sometimes misaligning with domestic policy objectives (OECD, 2019). When external funding ceases, many initiatives collapse due to the absence of institutional mechanisms or domestic financing to sustain

them (AUDA-NEPAD, 2023). This cyclical dependence has created a "projectized" research culture in which long-term capacity development is neglected in favor of short-term outputs.

Moreover, weak internal auditing and resource-tracking mechanisms exacerbate financial inefficiencies and limit accountability. In several ministries of agriculture, financial flows related to research, extension, and policy support are poorly documented, making it difficult to track expenditures or assess the cost-effectiveness of interventions. The lack of integrated financial management information systems and transparent reporting frameworks contributes to low fiscal transparency, constraining oversight from parliaments, civil society, and development partners.

Addressing these financial capacity gaps requires a two-pronged approach. First, national governments should institutionalize dedicated budget lines for agricultural policy research within their annual appropriations and ensure that these funds are protected from political fluctuations. Second, stronger collaboration between the ministries of agriculture, finance, and planning is needed to align policy research funding with national development priorities. Establishing public–private research financing models, expanding domestic resource mobilization, and integrating Monitoring, Evaluation, and Learning (MEL) frameworks into budget processes would promote financial accountability and sustainability (FANRPAN, 2022). Strengthening fiscal governance and transparency in research financing is therefore critical for fostering resilience, improving policy credibility, and reducing the dependency on external funding across Africa's agricultural policy ecosystem.

Overall, limited and inconsistent domestic financing for policy research severely restricts the ability of institutions to generate and use evidence. Heavy dependence on donor-funded projects undermines sustainability and creates fragmented research agendas misaligned with national priorities. Weak financial oversight and resource-tracking mechanisms further erode accountability. Addressing these gaps requires predictable public investment, stronger fiscal governance, and the institutionalization of dedicated budget lines for policy analysis to ensure long-term capacity strengthening.

4.5 Policy Implementation and Evaluation Capacity

Monitoring and Evaluation (M&E) remains one of the weakest components in the agricultural policy cycle across many PANAP member countries. Despite increasing emphasis on evidence-based decision-making, most policy frameworks still lack well-defined Monitoring, Evaluation, and Learning (MEL) systems that could guide adaptive management and accountability. According to UNECA (2021), fewer than 30 % of reviewed national agricultural policies include comprehensive MEL frameworks with clearly defined performance indicators, baselines, or measurable outcomes. Where such systems exist, they are often

limited to donor-funded projects rather than being institutionalized within government structures. This fragmented approach constrains the systematic collection, analysis, and utilization of data to inform ongoing policy adjustments and future programming.

Data collection for evaluation purposes is frequently ad hoc and reactive, typically conducted at the end of policy cycles or project implementation phases (FAO, 2021). As a result, opportunities for real-time learning and continuous improvement are lost. The absence of standardized data protocols and the reliance on manual reporting methods further undermine the credibility and comparability of results (World Bank, 2021). This situation reflects a broader institutional weakness in linking policy design, implementation, and feedback mechanisms, thereby reducing the potential for evidence-driven adaptation.

Moreover, the lack of technical and financial capacity within ministries and policies compounds the problem. In many countries, there are insufficient personnel trained in evaluation methodologies, impact assessment, or data analytics (UNDP, 2020). Where capacity does exist, it is often underutilized due to weak coordination between the ministries responsible for agriculture, planning, and statistics. The resulting disconnect means that evaluation findings rarely feed back into policy revisions or budgetary decisions, perpetuating inefficiencies in program implementation (AUDA-NEPAD, 2023).

Strengthening MEL capacity is therefore critical for fostering learning-oriented governance and ensuring that agricultural policies remain responsive to emerging challenges such as climate shocks, market volatility, and demographic transitions. Governments should institutionalize MEL frameworks within national agricultural strategies, allocate dedicated funding, and establish cross-sectoral data platforms to facilitate information sharing. Investing in capacity building, digital tools for real-time data capture, and regional learning networks will also enhance policy coherence and accountability. Embedding learning as a central pillar of policymaking is essential for sustaining progress toward the broader goals of agricultural transformation and food systems resilience in Africa.

In summary, Monitoring, Evaluation, and Learning (MEL) systems remain one of the weakest components of the agricultural policy cycle. Incomplete indicators, irregular data collection, and insufficient technical skills prevent governments from tracking outcomes or adapting policies based on evidence. Fragmented evaluation structures and limited integration between ministries further weaken learning loops. Strengthening MEL capacity through institutionalization, digital tools, and cross-sectoral data platforms is therefore crucial for fostering adaptive, evidence-informed governance.

4.6 Enabling Environment

Although many African countries within the PANAP network have adopted progressive national policies, including science, technology, and innovation (STI) strategies, agricultural modernization frameworks, and digital transformation agendas, the regulatory and governance environment necessary to facilitate effective policy uptake and implementation remains underdeveloped. These forward-looking policies demonstrate strong political commitment on paper, yet their translation into actionable programs is often hindered by weak institutional systems, fragmented oversight, and limited accountability mechanisms (World Bank, 2021). The result is a widening gap between policy design and execution, where ambitious strategies fail to yield measurable impact on productivity, innovation, and resilience.

A key factor undermining policy stability is political interference, which often disrupts the continuity of long-term development initiatives. As Owoo and Darkwah (2022) observe, frequent institutional restructuring, leadership changes, and politically motivated shifts in policy priorities create an unstable governance environment. These dynamics are particularly pronounced in ministries responsible for agriculture, science, and higher education, where recurrent reorganizations lead to loss of institutional memory and discontinuity in research and innovation programs. Similarly, inadequate decentralization prevents effective policy localization and reduces the capacity of subnational authorities to implement or monitor national strategies (UNECA, 2021). This centralization of decision-making power limits adaptive policymaking and constrains community-level innovation.

Another major challenge is the persistence of weak data governance systems. Many institutions lack clear protocols for data ownership, sharing, and interoperability, which limits cross-sectoral collaboration and reduces the potential for integrated evidence use (FAO, 2021). The absence of open-access data policies further constrains the dissemination of scientific knowledge and policy-relevant information among researchers, ministries, and private actors. Consequently, valuable datasets remain siloed within individual agencies or donor-funded projects, impeding collective learning and coordinated responses to emerging challenges such as climate change and food insecurity (AUDA-NEPAD, 2023).

To strengthen the regulatory and governance framework, governmental authorities should develop robust institutional structures supported by legal mandates that guarantee continuity throughout different political administrations. Investments in data governance, transparency, and open-access infrastructure will likewise be crucial to promote collaboration among the public sector, academic institutions, and industry. Furthermore, advancing decentralized governance structures and fortifying regional and local institutions can improve accountability and tailor policy execution to specific contexts.

Establishing an enabling environment that facilitates the adoption of innovation, mitigates political disturbances, and enhances the flow of evidence is consequently fundamental to furthering science-based agricultural transformation and the efficacy of policies throughout the continent.

Altogether, the evidence indicates that policy uptake and innovation are constrained by weak governance structures, political instability, and inadequate data governance systems. Frequent institutional restructuring disrupts continuity, while centralized decision-making limits local adaptation and stakeholder participation. Weak regulatory systems and fragmented data-sharing protocols further impede the flow of evidence. Building a stronger enabling environment will require stable governance, robust legal mandates, transparent data systems, and decentralized institutional capacities capable of sustaining long-term policy reforms.

5. Comparative Findings across PANAP Member Countries

Table 1 presents a comparative analysis highlighting regional variations among PANAP member countries.

Table 1: Comparative analysis revealing regional variations

Region	Representative Countries	Key Strengths	Major Capacity Gaps
West Africa	Ghana, Nigeria, Burkina Faso, Niger	-Strong regional policy frameworks under ECOWAS and alignment with CAADP- Active policy coordination through CORAF and FARA-affiliated research networks- Increasing adoption of digital agricultural platforms (e.g., Ghana's e-agriculture strategy) (Nwozor & Olanrewaju, 2020).	- Weak coordination between ministries and research institutions- Fragmented data systems and inconsistent MEL frameworks- Limited technical expertise in econometric modelling and impact analysis- High donor dependency and low domestic research funding (World Bank, 2021)
East Africa	Kenya, Uganda, Tanzania, Ethiopia	- Strong institutional base with think tanks such as KIPPRA (Kenya) and EPRC (Uganda)- Relatively robust national statistical systems and open data initiatives- Established policy learning platforms and university–government	- Funding volatility affecting policy continuity- Limited capacity in computable general equilibrium (CGE) and simulation modelling- Inadequate integration of climate and food systems foresight into policy analysis

		partnerships (Mwaniki & Wanjugu, W. 2021).	(Zurek, et al.,2020)
Southern Africa	Malawi, Zambia, Zimbabwe	- Long-standing experience with agricultural sector planning and policy evaluation under SADC frameworks- Existence of national agricultural investment plans (NAIPs) aligned with CAADP- Emerging interest in digital MEL tools (SADC, 2020)	- Weak implementation capacity and poor feedback loops between evidence and decision-making- Inadequate institutional support for policy research linkages- Frequent policy reversals due to political changes (Poulton et al., 2014)
North Africa	Tunisia, Egypt, Morocco	- Strong research institutions (e.g., ICARDA-linked centers) and integration with international research networks- Higher investment in science and innovation infrastructure- Relatively developed data ecosystems and analytical capacity (ICARDA, 2022).	- Over-centralized governance systems limiting participatory policymaking- Bureaucratic rigidity impeding policy innovation- Limited engagement of private sector and civil society in policy formulation (World Bank, 2021).
Central Africa	Cameroon, DRC, Chad	- Expanding engagement with continental agricultural frameworks (e.g., CAADP and AFSH-AP)- Ongoing institutional reforms supported by AUDA-NEPAD and FARA initiatives (AUDA-NEPAD, 2023).	- Severe resource constraints and weak policy coordination- Outdated statistical infrastructure and absence of MEL systems- Low institutional memory due to frequent restructuring and staff turnover (World Bank, 2021)

These regional contrasts highlight the need for differentiated capacity-building strategies under StEPPFoS. East Africa's more developed analytical ecosystem suggests readiness for advanced modelling training, while Central and West Africa require foundational support in data systems, coordination, and institutional strengthening. North Africa's strong analytical base could serve as a resource hub for South-South learning, while Southern Africa would benefit from strengthening MEL and evidence feedback

loops.

6. Key Challenges

The review identified several cross-cutting challenges that collectively constrain policy capacity, evidence use, and institutional performance within PANAP member countries. These challenges span financial, institutional, and human-resource dimensions and reflect systemic weaknesses in the policy ecosystem.

Limited domestic funding for policy research and reliance on donor programs

A major constraint across the region is the chronic underfunding of policy research and analytical institutions. Most governments allocate less than one percent of agricultural budgets to research and policy analysis, leaving ministries and think tanks heavily dependent on donor-funded programs (FAO, 2021; World Bank, 2021). This dependency creates short-term, project-driven cycles that undermine institutional sustainability and national ownership. When donor projects end, research programs and knowledge platforms often collapse, interrupting continuity and learning (AUDA-NEPAD, 2023).

Weak coordination between academia, government, and private sector actors

Collaboration across research, policy, and industry remains limited. Universities and policy research institutions often operate in isolation from government agencies, while the private sector and civil society organizations are seldom integrated into national policy dialogues (Pound & Dorward, 2020). This lack of coordination results in duplicative research efforts, inefficient resource use, and missed opportunities for innovation diffusion. Strengthening triple-helix collaboration between academia, government, and industry is essential for translating research into actionable policy solutions.

Brain drains of skilled economists and analysts to international organizations

A recurring issue identified in the review is the migration of skilled professionals, particularly economists, data scientists, and policy analysts, from national institutions to international organizations and development agencies (Owoo & Darkwah, 2022). This “brain drain” reflects disparities in remuneration, career development, and working conditions. Consequently, many ministries and think tanks are left with limited internal analytical capacity, forcing reliance on external consultants for complex policy modelling and evaluation. The absence of retention strategies and professional incentives exacerbates this talent gap.

Inconsistent data infrastructure for evidence generation

Reliable, harmonized, and up-to-date data remain scarce in most countries. National statistical systems are under-resourced, digitally fragmented, and often non-interoperable with regional and global platforms such as FAOSTAT (UNECA, 2021). Data collection for monitoring and evaluation tends to be ad

hoc, donor-driven, and poorly integrated into policy cycles (Juma & Tadesse, 2021). The lack of standardized data protocols and weak data governance significantly hampers the generation of credible evidence for decision-making and accountability.

Low institutional incentives for knowledge translation and policy uptake

Finally, weak incentives within public institutions discourage knowledge translation and the practical use of research in policymaking. Policy staff are rarely rewarded for innovation or evidence integration, and bureaucratic cultures tend to prioritize compliance over learning (UNDP, 2020). As a result, valuable research findings often remain underutilized, leading to policy inertia and limited adaptation. Institutionalizing Monitoring, Evaluation, and Learning (MEL) systems and creating performance-based incentives could strengthen evidence uptake and policy responsiveness.

Collectively, these challenges underscore the urgent need for systemic reforms to improve research financing, strengthen inter-institutional coordination, and foster enabling environments for knowledge-driven policymaking.

Despite these challenges, several opportunities exist, including the following:

Digital transformation initiatives under the AU Data Policy Framework.

Increased collaboration through regional networks like FARA, RUFORUM, FANRPAN, etc.

Capacity-building opportunities through EU-AU partnerships and open-access training platforms.

Growing policy demand for science-based evidence in agrifood systems due to climate shocks.

Youth engagement and innovation ecosystems emerging across Africa's research landscape (eg. YPARD, the CAFEYA project, YEFFA, led by AGRA, and related programs across the continent)

Addressing these challenges is essential for ensuring that PANAP institutions can produce high-quality ex-ante policy analysis. These systemic constraints directly shape the scope and design of WP2 training modules and highlight areas where future investments in MEL, data infrastructure, and institutional coordination will have the highest payoff.

7. Conclusions

This desk review has provided a foundational assessment of policy capacity gaps across PANAP member countries, drawing attention to the structural, institutional, and human resource limitations that constrain effective evidence-based policymaking in Africa's agricultural sector. The review has shown that while most countries have developed progressive agricultural and science-based policy frameworks aligned with continental priorities such as CAADP, substantial disparities persist in their implementation, coordination,

and learning mechanisms. Specifically, the analysis revealed systemic weaknesses in domestic financing for policy research, coordination between institutions, technical capacity for data-driven analysis, and institutional incentives for policy uptake and adaptation. These gaps collectively reduce the responsiveness and sustainability of agricultural policies in addressing the continent's food systems transformation agenda.

Across regions, East African countries tend to exhibit higher analytical and institutional capacity, largely due to stronger think tank ecosystems and government–research collaboration, while West and Central Africa continue to face challenges related to fragmented governance, inadequate resourcing, and dependence on donor-driven initiatives. North Africa, on the other hand, demonstrates solid research infrastructure but struggles with centralized governance that limits policy inclusiveness and innovation. The comparative analysis therefore underscores the importance of context-specific capacity development strategies that reflect each region's political economy, institutional maturity, and data readiness.

Despite the robustness of this review, it is important to acknowledge that desk-based analyses have inherent limitations. The availability, consistency, and quality of publicly accessible documents varied significantly across countries, with some key policy reports and evaluation studies unavailable or outdated. Language barriers also limited the inclusion of materials from Francophone and Lusophone countries, while gaps in national data repositories constrained cross-country comparability. These limitations inevitably restricted the depth of the analysis and point to the need for primary data collection to validate and expand upon the findings presented here.

Furthermore, the desk review identifies capacity gaps only at an aggregated level and does not capture the detailed, institution-specific or individual-level needs required to design targeted and demand-driven training interventions for capacity strengthening across PANAP member countries.

To address these gaps, a complementary research survey will be conducted as a follow-up to this desk review. The survey will focus on PANAP member institutions to gather further evidence. This mixed-method approach will enable triangulation of the desk review findings, providing a richer and more accurate picture of policy capacity across the PANAP network.

In conclusion, this review has laid the groundwork for a deeper, evidence-informed inquiry into the determinants of policy capacity in Africa's agricultural and food systems. By combining desk-based analysis with survey data, the next phase of the study aims to generate actionable insights that will inform targeted interventions under the StEPPFoS Project, ultimately strengthening Africa's ability to design, implement, and sustain transformative, evidence-based agricultural policies.

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Table 1: Policy Capacity Gap Analysis (Based on Desk Review)

Type	Description	Data Sources	Replicability & Scalability	Strengths	Limitations	Case Use References
Human & Institutional Capacity	Assesses availability of skilled economists, policy analysts, and modelling specialists; evaluates institutional staffing and training systems within ministries, think tanks, and universities.	National policies, institutional reports, academic literature, think-tank assessments (KIPPRA, ISSER), FAO, IFPRI.	Replicable across countries through standardized competency assessments; scalable through regional training and long-term institutional partnerships.	Highlights capacity shortages; identifies opportunities for curriculum reform; supports design of WP2 training.	Severe skill shortages, dependency on external consultants, outdated university curricula, limited continuous professional development.	Tambo & Matimelo (2022); World Bank (2021); FAO (2021); Frans (2024).
Technical & Analytical Capacity	Examines availability of datasets,	FAOSTAT, National Statistics	Highly replicable through harmonized data	Clear identification of data gaps;	Fragmented, outdated data systems; limited	FAO (2024); Geyman et al. (2025);

	modelling tools, digital infrastructure, and capacity for conducting ex-ante economic impact analyses.	Offices, FAO (2024), regional databases, academic journal evidence, GIS/remote-sensing tools.	protocols; scalable using digital platforms and regional data hubs.	highlights emerging digital tools (GIS, remote sensing); supports evidence-driven policy.	interoperability; high cost of software; weak digital literacy.	Ehlers et al. (2021).
Organizational & Coordination Capacity	Reviews cross-ministerial coordination, policy coherence, stakeholder engagement, and inter-agency communication.	Governmental frameworks, AUDA-NEPAD documents, sector coordination reports, FARA/FANRPAN materials.	Replicable via institutional mapping and coordination audits; scalable through creation of national coordination platforms.	Identifies structural causes of fragmentation; highlights role of triple-helix partnerships.	Persistent siloed mandates; weak coordination bodies; high staff turnover; limited research–policy linkages.	Cejudo & Michel (2017); OECD (2019); FAO (2021).

Financial & Resource Capacity	Evaluates domestic financing for policy research, donor dependency, resource-tracking mechanisms, and funding predictability.	National budget reports, donor evaluations, AUDA-NEPAD CAADP Biennial Reviews, World Bank financing assessments.	Replicable via financial audits; scalable through institutionalization of budget lines for policy research.	Highlights fiscal governance needs; exposes gaps in sustainability of policy research.	Low domestic funding, donor dependency, weak financial reporting and auditing systems.	FAO (2021); World Bank (2021); AUDA-NEPAD (2023).
Policy Implementation & Evaluation Capacity (MEL)	Measures existence and quality of Monitoring, Evaluation & Learning (MEL) systems, indicators, data utilization, and feedback loops.	Evaluation reports (FAO, UNECA, AUDA-NEPAD), policy documents, ministry M&E frameworks.	Replicable through MEL diagnostics; scalable via digital MEL platforms and harmonized indicators.	Shows weak policy feedback systems; identifies training needs for MEL specialists; supports evidence-based governance.	Lack of indicators; absence of standardized protocols; limited technical skills; fragmented data systems.	UNECA (2021); Đurić et al. (2023); World Bank (2021).

Enabling Environment	Reviews governance structures, data governance, political stability, legal frameworks, decentralization, and institutional continuity.	National STI policies, governance assessments, AU/NEPAD frameworks, FAO governance datasets.	Replicable via governance scorecards; scalable via regional harmonization (AU policies).	Identifies systemic governance constraints; highlights importance of stability, decentralization, and data governance.	Political interference; institutional restructuring; centralized decision-making; weak regulatory frameworks.	Owoo & Darkwah (2022); World Bank (2021); AUDA-NEPAD (2023).
Comparative Regional Capacity Profiles	Cross-country synthesis showing variations in capacity readiness across West, East, Southern, Central, and North Africa.	Regional analyses (ECOWAS, SADC, AUDA-NEPAD), national reports, think tank publications.	Replicable using region-by-region benchmarking tools; scalable to new countries joining PANAP.	Enables tailored capacity-building strategies; highlights regional strengths such as East Africa's analytical base.	Data inconsistency across countries; gaps in Francophone and Lusophone coverage; limited comparability.	Table 1 in the review; Nwozor & Olanrewaju (2020); Zurek et al. (2020); ICARDA (2022).

Overall Capacity Gap Assessment Framework	Six-domain framework adapted from the World Bank CDRF and UNDP Institutional Capacity Assessment for evaluating policy capacity.	World Bank CDRF, UNDP Capacity Assessment, literature, policy documents.	Fully replicable across countries; scalable across institutions and regional networks.	Robust, structured, multi-dimensional framework; integrates analytical, organizational, and governance aspects.	Relies heavily on available documents (desk review constraint); gaps in countries with poor documentation.	World Bank (2011); UNDP (2015); Petticrew & Roberts (2006).

Category	Data Source / Platform	Scope & Content	Geographic Coverage	Use Cases	Relevance to StEPPFoS
1. National Policy & Strategy Documents	National Agricultural Investment Plans (NAIPs), Agricultural Sector Development Frameworks, National Research & Innovation Strategies	Provide national policy priorities; institutional roles; coordination structures; investment frameworks; evidence use; governance arrangements;	Covers all 12 PANAP countries as reviewed (West, East, Central, Southern Africa).	•Mapping institutional and policy architectures	

		M&E systems; strategic planning for agriculture and food systems.			
• Assessing how evidence is used in policymaking					
• Identifying gaps in modelling tools, datasets, capacity					
• Understanding coordination mechanisms	Forms the baseline policy architecture informing WP1 Task 1.1. Helps align StEPPFoS interventions (WP2, WP3) with national demand for capacity building, foresight, and evidence-based decision-making.				

2. Continental & Regional Institutional Reports	FARA, AUDA-NEPAD (CAADP BRs), FANRPAN, RUFORUM, SADC/ECOWAS frameworks	Produce analyses of policy processes, institutional capacities, implementation bottlenecks, CAADP alignment, regional integration, and cross-country governance assessments.	Africa-wide; regional economic communities (ECOWAS, EAC, SADC); continental level.	• Benchmarking regional capacity differences	
• Identifying cross-country trends and systemic constraints					
• Understanding continental policy coherence	Supports *continental alignment* of StEPPFoS by linking PANAP work with FNSSA Roadmap, CAADP, and regional policy harmonisation. Essential for				

	WP1 synthesis & WP7 policy dialogues.				
3. Peer-Reviewed Journals & Academic Literature	Food Policy, World Development, Agricultural Systems, climate/agriculture journals, Google Scholar, Scopus	Provide empirical research on governance, policy effectiveness, modelling tools, institutional capacity, MEL systems, and analytical capabilities. Include global comparative cases.	Global but applied to African context in review.	• Strengthening evidence base for capacity gaps	
• Identifying theoretical frameworks					
• Informing survey tool and analytical approaches	Helps ensure StEPPFoS uses rigorous analytical foundations. Supports methodological framing of WP1 and design of WP2 training curricula.				

4. Global Statistical & Data Platforms	FAOSTAT, National Statistics Offices, regional datasets, GIS/remote sensing, digital agriculture systems	Agricultural production data, trade, prices, environmental indicators, geospatial data, modelling-ready datasets. Enables trend analysis, forecasting, scenario building.	Global + country-level datasets for all PANAP countries.	• Quantitative analysis	
• Designing ex-ante economic analysis	Critical for strengthening analytical capacity, a core goal of StEPPFoS WP2. Directly supports modelling, forecasting, and digital data training modules.				
5. Grey Literature (Donor & Development Reports)	FAO reports, World Bank, OECD, IFPRI, AGRA, AUDA-NEPAD evaluations, project briefs	Provide timely and practical insights into institutional performance, policy implementation, capacity-building efforts, donor program lessons, and M&E findings.	Africa-wide, global, and country-specific.	• Triangulating evidence	

• Filling gaps where academic or government data is limited					
• Understanding donor-driven research agendas	Strengthens understanding of implementation realities, donor influence, and sustainability constraints—essential for WP1 diagnostics and WP6 gender/youth integration.				
6. Think Tank & Research Institute Outputs	KIPPRA (Kenya), ISSER (Ghana), EPRC (Uganda), CSIR, ICARDA	Produce policy briefs, analytical reports, economic modelling studies, impact evaluations, agricultural foresight studies.	Country-level & regional hubs in East, West & North Africa.	• Informing modelling readiness	
• Identifying skill gaps					

• Understanding national research-policy interface	Supports identification of country-specific analytical readiness, informing WP2 targeted capacity-building and selection of trainees.				
7. Digital & Geospatial Data Tools	GIS platforms, remote-sensing tools, machine learning datasets, digital agriculture platforms	Spatial agricultural productivity patterns, land-use mapping, climate exposure, agro-ecological zoning, real-time monitoring.	Global with national-level adaptations in some PANAP countries (e.g., Kenya, Ghana).	• Spatial analysis	
• Climate vulnerability assessment					
• Evidence-based targeting of policies					
• Data-driven decision support	Aligns with StEPPFoS goals on digital innovation, foresight, and modelling under WP2				

	and WP3. Provides data for scenario analysis and food system transformation planning.				
8. Monitoring, Evaluation & Learning (MEL) Systems	National MEL frameworks, donor MEL systems, FAO/UNECA MEL guidance, AU CAADP indicators	Provide indicators, baseline data, reporting frameworks, evaluation guidelines, implementation tracking.	Varies by country; some PANAP countries have limited MEL systems.	• Understanding policy feedback loops	
• Identifying gaps in evaluation					
• Designing adaptive policy tools	Essential for StEPPFoS evidence-to-policy workflows, strengthening institutional learning in WP4, WP7.				
9. Stakeholder & Multi-Actor Platforms	FARA IAR4D, FANRPAN policy dialogues, RUFORUM networks, farmer associations	Provide insights on stakeholder engagement, participatory policy processes, governance	Regional + national level institutions in all PANAP regions.	• Mapping actor networks	

		arrangements, and policy learning platforms.			
• Understanding coordination gaps					
• Strengthening science–policy interface	Directly supports StEPPFoS multi-stakeholder engagement activities in WP5 & WP7 and strengthens PANAP–FNSSA linkage.				

Annex 2: 2nd Desk Review- Identification of Relevant Data Sources to Support Quantitative Analysis.

Task 1.1

Review and Analysis of Existing Capacity Gaps and Mapping Existing Policies/Projects/Programmes

Activity 2: 2nd Desk Review

Identification of Relevant Data Sources to Support Quantitative Analysis.

1. Introduction

This methodological and data review represents a core component of Task 1.1 and it is central to strengthening the project's overarching capacity-building agenda. The review seeks to systematically identify relevant data sources for ex-ante quantitative analysis and to examine the qualitative and quantitative methodologies currently used for economic impact and policy assessment in African agrifood systems. By assessing the accessibility, usability, and methodological robustness of existing datasets and tools, this work aims to determine which approaches can be effectively leveraged, adapted, or scaled across diverse country contexts.

A major focus of the review is evaluating the replicability and scalability of existing PANAP models and other widely used analytical frameworks. Many African national and regional institutions continue to face challenges relating to limited modelling expertise, insufficient data infrastructure, and fragmented methodological application (Asenso-Okyere et al., 2008; Nin-Pratt et al., 2015). Consequently, understanding the transferability of models across contexts—and the conditions required for them to function effectively is essential for designing capacity-building interventions that are realistic, context-sensitive, and aligned with institutional needs.

Strengthening capacity in economic modelling, ex-ante impact evaluation, and evidence-based policy analysis is widely recognised as a cornerstone of effective agricultural transformation. The OECD (2012) and FAO (2017) emphasise that global development outcomes rely on countries' ability to generate credible evidence, assess policy trade-offs, and forecast system-level impacts using rigorous analytical tools. Similarly, the World Bank (2020) highlights that investments in national analytical capacity yield long-term gains in policy coherence, resource allocation, and programme effectiveness. In Africa's agrifood systems, characterised by climate vulnerability, rapid population growth, and dynamic food markets, ex-ante modelling capacity is especially critical for anticipating shocks, guiding reforms, and aligning agricultural strategies with broader economic goals (Hazell & Wing, 2020).

The review is in two parts:

1. Review of data for economic analysis within the agrifood system.
2. Review of methodologies (quantitative and qualitative) for economic impact analysis.

By generating a clear picture of methodological gaps, data limitations, and opportunities for model scaling, this review will directly inform the design of targeted training modules and mentorship programs under the project's capacity-building work package (WP2). The insights generated will ensure that capacity development efforts are grounded in a realistic understanding of current trends and that future training equips researchers and institutions with the analytical tools needed to support robust, evidence-driven policymaking particularly across PANAP member countries.

2. Review Approach

This review adopted a systematic and structured approach to map, assess, and synthesise data sources and methodological tools relevant for food and nutrition policy impact analysis in Africa. The methodology was organised into five interconnected stages designed to ensure comprehensive coverage of national and international evidence ecosystems while maintaining transparency, rigour, and replicability and to keep the analysis closely aligned with the objectives of Task 1.1 and the wider capacity-building agenda of the project.

2.1 Stage 1: Scoping and Protocol Development

The review began with a scoping phase to clarify its purpose, boundaries, and analytical focus. During this stage, the core objectives were defined, namely: to identify key datasets that support food and nutrition policy impact analysis; to review quantitative, qualitative and modelling methodologies used in these domains; and to assess the replicability and scalability of these methods across PANAP member states. The thematic and sectoral coverage was also specified, with the review focusing on agriculture, food systems, nutrition, markets, household welfare and economy-wide modelling.

On this basis, a methodological protocol was developed to guide the review process. The protocol set out the main information sources to be consulted, the search terms and combinations to be used, and the criteria for inclusion and exclusion of materials. It also specified the quality parameters and data extraction templates that would be applied in subsequent stages. This protocol helped ensure that the review remained systematic and consistent, and that all team members shared a common understanding of the methodological standards and the scope of the work.

2.2 Stage 2: Systematic Literature and Data Source Identification

In the second stage, a systematic search was conducted to identify relevant literature and data sources. This search covered peer-reviewed academic publications, institutional and policy reports, and major statistical and modelling repositories. Academic databases such as Scopus, Web of Science, Google Scholar, EconLit and PubMed were consulted for empirical and methodological studies on food systems, nutrition, agricultural policy, econometric analysis, impact evaluation, and economy-wide modelling. In parallel, institutional databases including FAOSTAT, World Bank Open Data, WHO's Global Health Observatory, UNICEF-MICS, ReSAKSS and the AfDB Africa Information Highway were reviewed to map the main international datasets that support agricultural and nutrition analysis. National statistical offices, agriculture and health ministries, and sector information systems (such as DHIS2-based platforms and market information systems) were also examined to capture country-level data infrastructures.

Search terms were constructed using combinations of keywords related to food systems, nutrition policy, agricultural impact assessment, econometric and quasi-experimental methods, CGE and input-output modelling, qualitative analysis, and routine administrative data. These terms were applied iteratively to refine the search as the team gained a clearer picture of existing evidence. Materials were included if they referred to African contexts or to global data systems directly applicable to African food and nutrition policy analysis, documented analytic methods in sufficient detail, and contributed to understanding data structures, accessibility, use cases, or methodological limitations. Items that did not pertain to food, agriculture, nutrition or economic modelling, or that lacked methodological clarity, were excluded. This process ensured that the review was focused on sources that could meaningfully inform the subsequent analysis.

Grey literature, country-level reports, and unpublished evaluations were also screened to reduce selection bias and ensure representation of lower-resourced contexts

2.3 Stage 3: Data Extraction and Classification

The third stage involved systematic extraction of information from all included materials using a structured template. For data sources, the extraction focused on the type of dataset, its geographic coverage, frequency of collection, level of disaggregation, and primary analytical purpose, such as ex-ante modelling, ex-post evaluation, market monitoring or nutrition surveillance. Attention was also paid to the variables

and indicators captured, including demographic, agricultural, nutritional, price and macroeconomic measures, and to the degree of documentation and metadata available.

In addition, the review examined the accessibility and usability of each source, noting file formats, the presence or absence of APIs, licensing arrangements, and the extent of user guidance offered by the custodial institution. Institutional ownership and governance were documented to understand which agencies maintain the data, how often updates occur, and under what conditions the data can be accessed by researchers and policymakers. For methodological studies, information was extracted on the type of analytical approach used, its data requirements, identification strategy, and policy application. All data sources and methods were then classified into categories that mirror the structure of the report: national datasets, international repositories, sectoral and thematic platforms, econometric methods, non-econometric and modelling approaches, and qualitative methods and tools. This classification created a coherent framework for the detailed discussion in Sections 3 and 4.

2.4 Stage 4: Methodological Appraisal

Once the key data sources and methods had been identified and classified, the review proceeded to a methodological appraisal stage. Here, each analytical approach was assessed against a set of criteria adapted from established methodological guidelines. The appraisal examined the data demands of each method, considering the minimum data structures, sample sizes, time dimensions and variable coverage required for credible analysis. Internal validity was evaluated by examining identification strategies, such as randomisation, quasi-experimental designs or instrumental variables, and by reviewing how each method addresses selection bias, confounding and measurement error.

The review also considered external validity and transferability, assessing the extent to which findings obtained in one context or sector can be applied to other settings within the African region. Technical complexity and required expertise were examined in terms of skills, software, computational resources and training needs. Finally, the appraisal explored the feasibility of implementing each method within typical African institutional environments, taking account of existing MEL systems, data infrastructures, staffing, and budget constraints. This appraisal provided the evidence base for later judgements about replicability and scalability, as presented in Section 5 and summarised in the matrix in Table 1.

2.5 Stage 5: Synthesis, Cross-Comparison and Integration

In the fifth stage, the findings from the previous steps were brought together into an integrated analytical narrative. The synthesis examined how data availability and quality shape the choice and feasibility of different methodological approaches in practice. It mapped the linkages between specific data sources—such as nationally representative surveys, routine health information systems, market information systems, social accounting matrices, and international repositories—and the econometric, quasi-experimental, qualitative and economy-wide models that rely on them.

The synthesis paid particular attention to gaps and misalignments, for example where advanced methods such as CGE modelling or quasi-experimental impact evaluation are theoretically relevant but constrained by outdated SAMs, infrequent surveys, or weak administrative data. It also examined how qualitative approaches can be used to complement quantitative analysis by explaining mechanisms, implementation bottlenecks and behavioural responses that are not captured in numeric indicators. This integrative process informed the identification of cross-cutting patterns in data and methodological capacity across sectors and countries, and allowed the review to highlight which families of methods are most suitable for replication and scaling within the PANAP network. The synthesis therefore underpins both the discussion of replicability and scalability in Section 5 and the recommendations presented in Section 6.

2.6 Ethical and Quality Assurance Considerations

Although this review is based entirely on secondary data and published materials, ethical and quality assurance considerations were taken into account. The review only used publicly available documents or sources that can be legitimately accessed under the terms specified by their custodians. No confidential or personally identifiable information was handled. Quality assurance was promoted through the use of standardised extraction templates, internal cross-checking of extracted entries, and triangulation of evidence across multiple data sources wherever possible.

2.7 Limitations of the Review Approach

The methodology adopted for this review also has limitations, which are important for interpreting its findings. First, despite extensive searching, it is possible that some relevant datasets or methodological applications were not captured, particularly where institutional reports or country-level evaluations are not publicly archived or are only available in print or restricted formats.

Second, access to many administrative and programme datasets and certain national market information systems, was limited to aggregated reports or summary publications. This restricted the level of detail with which data structures and quality could be assessed.

Third, the diversity of country contexts, data systems and institutional capacities in Africa means that the comparability of methods across settings is imperfect. Some studies report detailed methodological procedures and diagnostics, while others provide only high-level descriptions, making it difficult to draw fully consistent conclusions.

Finally, because the review is not itself an empirical impact evaluation, it relies on the quality of reporting in the underlying literature. These limitations were mitigated by prioritising well-documented and methodologically robust sources and by triangulating information across multiple references. Nonetheless, they point to the need for continued improvements in data documentation, open access, and methodological reporting to strengthen future reviews of this kind.

3. Review of Relevant Data Sources for Food and Nutrition Policy Impact Analysis

In this section, we review the key data sources available for assessing policy impacts within food and nutrition security systems. Beyond identifying relevant datasets, we assess their accessibility, quality, and usability for conducting rigorous economic and policy impact analyses. Reliable and well-structured data are critical for both ex-ante simulations and ex-post evaluations, enabling researchers and policymakers to understand the potential and actual effects of interventions across multiple scales, from households to national systems. Furthermore, data availability shapes the choice of analytical methods, including econometric, computable general equilibrium (CGE), and cost-effectiveness models, as well as qualitative assessments that explain underlying mechanisms and contextual factors.

3.1 Identification of Key Data Sources

This section reviews key quantitative data sources, with a focus on enhancing their relevance for policy analysis in African contexts. A summary of this has been provided in Annex 1.

3.1.1 National datasets

National datasets serve as the primary foundation for localized, country level agriculture, food and nutrition policy analysis. In most African countries, the Demographic and Health Surveys (DHS) and the Living Standards Measurement Study (LSMS) are the most widely used nationally representative sources.

The DHS provides detailed information on nutrition, child and maternal health, infant and young-child feeding, and household demographics. While the LSMS offers granular data on income, consumption, and agricultural practices. (World Bank, 2025). Other national sources, such as Integrated Household Surveys (IHS), Agricultural Sample Surveys, provide complementary insights into food production, market prices, and household welfare. These datasets are typically collected through nationally representative surveys by National Statistical Bureaus and Offices and are instrumental in tracking trends and evaluating the impact of policy interventions (Carletto et al., 2021). Additionally, the National Statistical Bureaus complement these data sources with open indicator portals and bulletin series that supply the official denominators and macro controls used in food-systems work. For example, the Ghana Statistical Service (GSS) StatsBank provides analysts with routinely merge to survey microdata and market series (Ghana Statistical Service, 2025).

In recent years, several African countries including Uganda, Ethiopia, Tanzania, Nigeria, Malawi, Rwanda, Senegal, and Zambia, have made significant strides in institutionalizing routine nutrition data collection through Health Management Information Systems (HMIS), particularly using platforms like DHIS2 (District Health Information Software 2). These systems aggregate monthly facility-level reports on key nutrition service indicators such as growth monitoring, admissions for severe and moderate acute malnutrition (SAM/MAM), micronutrient supplementation, and nutrition counselling. This shift toward routine data capture has enhanced the granularity and timeliness of nutrition information, enabling more responsive program monitoring and evaluation (Gimbel et al., 2017; Bhattacharya et al., 2019). WHO and the Health Information Systems Programme (HISP) network have supported countries with nutrition metadata packages and data quality toolkits, helping institutionalize indicator definitions and improve reporting standards (WHO, 2020).

Agriculture sector ministries also generate and collate data crucial for monitoring often using standardized metadata packages and toolkits. These data sources capture information monthly nutrition-service indicators including the market information systems (MIS), commodity exchanges, agricultural trade and food price series. For example, the RATIN is a Market Information System (MIS), which provides the latest commodity prices in East Africa. The Ghana Commodity Exchange and customs platforms such as the UNCTAD Automated System for Customs Data (ASYCUDA) generate transaction-level trade data that support analyses of price transmission and import policy (Ghana Commodity Exchange, n.d.; UNICEF, 2021; UNCTAD, 2021).

In addition to household surveys and administrative datasets, Social Accounting Matrices (SAMs) represent a critical yet often underutilized national data source for economic impact and policy assessment. SAMs are comprehensive, economy-wide data frameworks that capture the flow of all economic transactions between sectors, institutions, and households within a country over a given period. They are foundational for computable general equilibrium (CGE) models, which are widely used to simulate the distributional and macroeconomic impacts of food, nutrition, and agricultural policies (Bolarinwa, 2024). Many African countries have developed national and subnational SAMs, often with support from institutions like the International Food Policy Research Institute (IFPRI), UNU-WIDER, and national planning commissions. Their structure also supports replicability across countries and scalability to sub-national levels, making them a valuable tool for comparative policy analysis (IFPRI, 2024)

Beyond these national statistical offices, research, and academic databases also play a pivotal role in enriching the national data landscape. Universities, think tanks and research consortia frequently generate high-resolution, thematically focused datasets through longitudinal studies, pilot interventions, and community-based research. For instance, institutions like the University of Ghana's Institute of Statistical, Social and Economic Research (ISSER) and the African Population and Health Research Center (APHRC) in Kenya maintain proprietary datasets on food security, nutrition, and household economics. DataFirst at the University of Cape Town provides curated access to African survey and administrative microdata. The Ethiopian Development Research Institute (EDRI), now part of the Policy Studies Institute (PSI), collaborates with the Central Statistical Agency (CSA) and international partners to produce datasets on agricultural productivity, food prices, and household welfare. In Uganda, Makerere University's School of Public Health and the Economic Policy Research Centre (EPRC) generate data on nutrition, food access, and policy impact. In Tanzania, the Ifakara Health Institute (IHI) and the Tanzania Food and Nutrition Centre (TFNC) maintain datasets on child nutrition, dietary patterns, and health outcomes. These institutions often collaborate with regional networks such as ReNAPRI, FANRPAN, and the African Economic Research Consortium (AERC), which facilitate data harmonization and policy dialogue across countries. Their datasets though sometimes restricted in accessibility than national surveys are rich in thematic depth and responsive to emerging policy questions (Munialo et al., 2023).

3.1.2 International data repositories

International data repositories play a pivotal role in supporting food and nutrition policy analysis across Africa by offering harmonized, cross-country datasets that complement national sources. These

repositories are particularly valuable for comparative studies, regional benchmarking, and modeling policy impacts across diverse socioeconomic and ecological contexts (Cassimon et al., 2022).

FAOSTAT remains the core source for comprehensive data on agricultural production, trade, food balance sheets, and nutrition indicators across more than 245 countries and territories (FAO, 2023). FAOSTAT's structured datasets enable users to analyze trends in food availability, dietary energy supply, and crop yields, which are essential for assessing food system performance and policy effectiveness (Thar et al., 2020).

The World Bank's World Development Indicators (WDI) databank also provides harmonized macro and sector indicators commonly used as controls and denominators in agriculture and nutrition economic models and relevant to agricultural value-added metrics (World Bank, 2023). Similarly, the Global Health Observatory (GHO) and Global Dietary Database (GDD) provide nutrition-related health and standardized dietary intake data across countries (Imamura et al., 2015). UNICEF's Multiple Indicator Cluster Surveys (MICS) synthesize survey evidence into annually updated prevalence series. Offering household-level data on child nutrition, education, water and sanitation, and maternal health (UNICEF, 2021).

The Food and Nutrition Security and Analysis (FNNSA) database, aggregates country-level data on food security indicators, nutrition outcomes, and policy commitments. It supports tracking progress toward the Malabo Declaration and evaluating national nutrition strategies (AUDA-NEPAD, 2023). As well, the Cost of a Healthy Diet Dashboard (FAO) assesses affordability and accessibility of nutritious diets using price and consumption data (FAO, 2023b). Global Nutrition Report (GNR) Data Platform curates indicators on nutrition financing, governance, and outcomes (GNR, 2023). Africa Information Highway (AfDB) hosts national statistics including food and agriculture indicators, with open data access. The ReSAKSS (Regional Strategic Analysis and Knowledge Support System) tracks agricultural growth, investment, and policy performance aligned with CAADP targets (Makombe, Tefera and Ulimwengu, 2020). While the Global Open Data for Agriculture and Nutrition (GODAN) promotes open access and interoperability for agriculture and nutrition datasets (GODAN, 2022)..

These repositories are increasingly being integrated into national evidence ecosystems and support replicable policy simulations (Dean et. al., 2024).

3.1.3 Sectoral and thematic databases

Sectoral and thematic databases provide targeted insights into specific dimensions of food systems, nutrition, and policy implementation. These platforms are particularly valuable for modeling interventions, evaluating program effectiveness, and identifying sector-specific bottlenecks.

The Food Security Portal, developed by IFPRI, offers tools for price monitoring, policy simulation, and early warning systems. It supports scenario modeling in response to shocks such as climate events or market disruptions. Complementing this, IFPRI's SPEED (Statistics on Public Expenditures for Economic Development) database compiles detailed data on public spending in agriculture, nutrition, and rural development across African countries, enabling fiscal policy analysis and expenditure tracking (IFPRI, 2023).

In the domain of food crisis monitoring, the Famine Early Warning Systems Network (FEWS NET) provides near-real-time data on food prices, climate hazards, livelihoods, and analyst reports. It is widely used for anticipatory action and humanitarian response planning. The Integrated Food Security Phase Classification (IPC) and its regional counterpart, Cadre Harmonisé, offer standardized classifications of acute food insecurity and malnutrition. IPC's technical manuals formalize a convergence-of-evidence approach, integrating diverse data sources to produce consensus-based severity maps (IPC Global Partners, 2023).

The World Food Programme's HungerMap LIVE and mVAM (mobile Vulnerability Analysis and Mapping) platforms provide high-frequency, near-real-time data on food consumption, coping strategies, and market access. These systems blend phone surveys, satellite imagery, and predictive analytics to fill information gaps where traditional surveys are delayed or infeasible (WFP, 2023).

For nutrition-specific monitoring, the Global Nutrition Report (GNR) country profiles synthesize data from DHS, STATcompiler, the Joint Malnutrition Estimates (JME), and administrative sources to produce standardized dashboards. These profiles often serve as entry points for policymakers and donors, while researchers return to microdata for causal inference and modeling (GNR, 2023).

FANRPAN's policy databases archive national and regional food and nutrition policy documents, strategies, and legislative frameworks. The Food and Agriculture Policy Decision Analysis (FAPDA) by FAO also hosts over 18,000 national policy decisions and frameworks, supporting policy trend analysis and institutional diagnostics (FAO, 2023c). Nutrition Surveillance Systems such as SMART and REACH provide high-frequency anthropometric and service delivery data in humanitarian and development contexts. Platforms like CGIAR's AReNA, AgTrials, and HarvestPlus, and GAIN's Data Hub offer datasets on agricultural innovations, climate-smart practices, and nutrient-focused interventions respectively (GAIN, 2023; CGIAR, 2023).

These databases are increasingly interoperable with national HMIS and statistical systems, enabling scalable integration into policy analysis frameworks. However, challenges remain in data discoverability, access restrictions, and harmonization of indicators across platforms (Cassimon et al., 2022).

3.2 Assessment of Data Accessibility and Usability

This section therefore critically examines the usability of the identified data sources, paying particular attention to structural barriers, institutional access constraints, and opportunities for improving data transparency, interoperability, and integration in support of more timely and food and nutrition policy-relevant analysis**.**

3.2.1 Availability, completeness, and formats

Across Africa, the availability of food and nutrition data has improved markedly, driven by investments in digital infrastructure, open data initiatives and statistical capacity building (Choudhury et al., 2025; AUDA-NEPAD, 2024).

Nationally representative surveys such as DHS and LSMS-ISA remain the most accessible and well-documented sources, offering standardized questionnaires and metadata. Studies such as Annan et al., (2022) show that panel data designs, integrated agricultural modules and strong documentation have raised the quality and usability of microdata in participating African countries. These datasets form the backbone of impact evaluation, productivity analysis, and baseline diagnostics. However, their multi-year periodicity limits their usefulness for tracking short-run policy shifts or seasonal conditions (Choudhury et al., 2025)

Market and trade datasets show the greatest heterogeneity in formats. Some MIS platforms publish structured CSV or Excel files, while others rely heavily on narrative reports, static bulletins, or PDFs (Annan et al., 2022). Administrative systems, particularly DHIS2-based nutrition data, provide monthly information and standardized indicators. While this makes them potentially powerful for routine policy monitoring, access is often restricted by national data-governance rules. Completeness varies across facilities and regions, and the absence of consistent quality audits or historical versions reduces reliability for modelling. The evidence on routine health information systems, particularly those based on DHIS2, reinforces this trade-off between temporal resolution and data quality. Case studies from sub-Saharan Africa show that DHIS2 can provide high-frequency facility data on service delivery (Bhattacharya et al.,

2019; Owino et al., 2022). Farnham et al. (2023) find that DHIS2 captures many indicators relevant to the Sustainable Development Goals

International repositories offer the most structured and transparent formats. FAOSTAT, CoAHD, WDI, WHO-GHO, and ReSAKSS provide stable access points, APIs and clear documentation. Thar et al. (2020) reviewed 119 studies using FBS in health research and conclude that these data are particularly useful for analysing medium- to long-term trends and for cross-country comparisons. In the nutrition domain, food-composition work highlights the importance of high-quality nutrient tables but notes that many African region–specific tables have historically been released as static reports. Although, the aggregated nature of these data series make microsector analysis with microdata difficult (Gimbel et. Al., 2017).

3.2.2 Opportunities for improving access

The review identifies several concrete opportunities to enhance accessibility and usability. For national statistical systems, transitioning key publications from PDF to machine-readable formats (CSV, JSON, SDMX) would significantly reduce preparation time and allow more rigorous modelling. This shift aligns with broader open data principles and supports reproducible research workflows (World Bank, 2025).

Survey programmes such as DHS and LSMS-ISA can increase harmonisation across rounds, including consistent agricultural modules, geocoding, and standardised codebooks. Such improvements would directly address the replicability and portability challenges highlighted earlier in the review. Himelein (2014) and subsequent methodological syntheses argue that harmonised questionnaires, panel re-interviews and links to microdata libraries substantially reduce entry costs for analysts and enhance the policy relevance of survey data. Carletto (2021) similarly calls for expanding geospatial integration, better measurement of diversified livelihoods and more systematic dissemination of code and metadata as preconditions for “data-fit-for-purpose” agricultural research

Also, administrative data can be better structured and designed around standardized indicators. Extending this indicator of agricultural administrative datasets to include standardized indicators would expand the evidence base for dynamic policy monitoring. Gimbel et al. (2017) identify that a set of core intervention components such as feedback loops, supervision, and standardised data-quality assessments, would significantly improved completeness and accuracy in three African countries. Ciambra et al. (2023) recommend prioritizing a subset of high-value indicators, standardizing definitions and institutionalizing regular reviews to make datasets more reliable and actionable for SDG monitoring. Similarly, sectoral and

thematic datasets could be strengthened by adopting common metadata standards, unified naming conventions, and machine-readable formats for food composition, R&D indicators, and spatial datasets. Such improvements would directly support the integrated modelling needs.

However, although most international repositories offer strong accessibility, transparency, interoperability, opportunities exist for more disaggregated national levels. This limits their utility for subnational analysis or for evaluating localized interventions (Headey, 2024).

3.3 Data Gaps and Limitations

Despite growing investments in data infrastructure, significant gaps persist in the availability, granularity, and thematic scope of food and nutrition data in Africa. These limitations constrain the ability of researchers and policymakers to conduct timely, disaggregated, and policy-relevant analyses.

One of the most persistent challenges is the temporal infrequency of core household surveys. Nationally representative surveys such as the Demographic and Health Surveys (DHS) and Living Standards Measurement Study (LSMS) are typically conducted every three to five years, creating substantial lags in data availability. This limits their utility for monitoring short-term shocks, seasonal variability, or the effects of rapidly evolving policy environments (Krasovskaia & Just, 2024). Spatial resolution is similarly constrained, with most international repositories and national surveys reporting indicators at national or regional levels. This masks critical subnational disparities in food insecurity, service delivery, and market access, particularly in countries with high geographic heterogeneity (Munialo et al., 2023).

Access to data remains uneven across platforms and institutions. Academic and institutional datasets such as those generated by universities, think tanks, and research consortia, are often gated behind paywalls, lack persistent identifiers, or are governed by ad hoc licensing arrangements (AUDA-NEPAD, 2024). Even when data are technically available, they may be poorly documented, inconsistently formatted, or difficult to locate due to fragmented hosting and limited metadata. These barriers disproportionately affect local researchers and policymakers, who may lack the resources or technical capacity to navigate complex data ecosystems. The usability of data is closely tied to the quality of its metadata and documentation. While platforms like DHS and LSMS provide detailed technical documentation, many administrative datasets lack standardized metadata across countries. WHO's nutrition metadata packages and FAO's SDMX protocols aim to address this gap, but adoption remains uneven (WHO, 2020; FAO, 2023).

Further, while international repositories such as FAOSTAT and the World Bank's World Development Indicators provide harmonized national-level data, they often lack subnational disaggregation. Even administrative systems like DHIS2, which offer facility-level reporting, often suffer from inconsistent coverage and unreliable denominators, especially in rural and underserved areas. Project-based surveys generate valuable microdata but are rarely harmonized or archived in accessible repositories, limiting their reuse and comparability. Data access is frequently governed by ad hoc arrangements rather than formal data-governance policies, which constrains transparency, replication, and cumulative learning across countries and studies (Munialo et al., 2023).

The literature also highlights thematic blind spots in existing data systems. While staple crops and basic nutrition indicators are well represented, data on nutrient-specific consumption, food contamination, and intra-household food allocation are either missing or inconsistently measured (de Jager et al., 2018; Headey, 2024). For instance, de Jager et al. (2018) found that food-based dietary guidelines in rural Ghana were poorly aligned with actual household production and consumption patterns, due in part to the absence of detailed nutrient-level data. Similarly, food safety indicators—such as hygiene practices and exposure to foodborne pathogens—are rarely included in national surveys, despite their growing relevance for public health and trade policy (Cafiero & Neufeld, 2023).

Finally, access and discoverability barriers remain a major constraint. Many institutional and academic datasets are not publicly archived, lack persistent identifiers, or are gated behind restrictive licensing agreements. Even when data are technically available, they may be poorly documented or difficult to locate due to fragmented hosting and limited metadata (Munialo et al., 2023). These barriers disproportionately affect local researchers and policymakers, who may lack the resources or technical capacity to navigate complex data ecosystems.

4. Review of Methodological Approaches for Food and Nutrition Policy Impact Analysis

Robust methodological approaches are essential for analysing food and nutrition policies, especially within the African context, where systemic constraints and institutional weaknesses shape policy outcomes. The methodologies when applied allow for entities such as PANAP to harmonise analytical capacity across member states and strengthen the policy evidence base for FNSSA objectives. Developments in econometrics (Gujarati & Porter, 2009), causal inference (Angrist & Pischke, 2009; Pearl, 2009), CGE modelling (Dervis, de Melo & Robinson, 1982), cost–benefit analysis (Boardman et al., 2018), input–output methods (Samuelson & Nordhaus, 2010), qualitative research (Yin, 2017; Patton, 2014), and

systems thinking frameworks (Foran et al., 2014; Jones, Hoey & Blesh, 2021) provide a broad foundation for evidence-based policymaking. However, persistent capacity gaps in data systems, analytical skills, MEL frameworks, and cross-institutional coordination continue to limit the quality and uptake of policy analysis in PANAP member institutions and across Africa as whole. A summary of the various methods is presented in Annex 2 and each of them briefly discussed in the proceeding sections.

4.1 Quantitative Methodologies

4.1.1 Econometric Models

Econometric models constitute the backbone of quantitative policy analysis across PANAP member countries, particularly for assessing agricultural productivity, market integration, demand elasticities, and household welfare dynamics. Their widespread adoption stems from their relative flexibility and modest data demands compared to more complex economy-wide models (Gujarati & Porter, 2009). In this section, we explore both experimental and non-experimental methods for impact analysis within agri-food systems.

4.1.1.2 Experimental Impact Evaluation Techniques

Experimental impact evaluation, particularly **Randomised Controlled Trials (RCTs)**, has become central and gold standard to advancing rigorous evidence in agricultural development, social protection, financial inclusion, extension delivery, and nutrition interventions. RCTs eliminate selection bias through random assignment, allowing evaluators to isolate causal effects with high internal validity (Gertler et al., 2016; Glennerster & Takavarasha, 2013). Over the past two decades, their application has expanded significantly across low- and middle-income countries, driven by the need for robust evidence to inform agricultural technology adoption strategies, market interventions, behavioural change programmes, and household nutrition improvements.

The agricultural economics and development literature documents numerous RCT applications, ranging from evaluations of input use and production technologies (Duflo, et al., 2011), digital and behavioural extension strategies (BenYishay & Mobarak, 2019), to interventions targeting nutrition, dietary practices, and early childhood outcomes (Banerjee et al., 2015). Similarly, RCTs have been widely used to assess the impacts of social protection and resilience programmes on food security, consumption smoothing, and welfare dynamics (Hoddinott et al., 2018). These studies illustrate the versatility of experimental methods

for examining both household-level behavioural responses and complex system-level interventions that shape agrifood outcomes.

Despite their methodological strength, several challenges constrain the widespread institutionalization of RCTs. Their implementation requires substantial financial, operational, and human-resource capacity, including multi-year data collection, sophisticated sampling frames, and high-quality monitoring systems; conditions often limited in public-sector institutions (Glennerster & Takavarasha, 2013). Additionally, many agricultural and nutrition programmes lack integrated monitoring and evaluation structures or longitudinal administrative data, reducing the feasibility of tracking outcomes over time (Patton, 2014). A further limitation arises from the fact that experimental evaluations are frequently donor-driven or externally initiated, which can weaken national ownership and restrict the integration of findings into policy planning and programme design processes (White, 2019).

Consequently, while RCTs remain the gold standard for causal inference, their practical adoption rests heavily on funding, institutional capacity, and strong partnerships between governments, research institutions, and development organisations. Their diffusion within agricultural and nutrition policy spaces continues to expand, but the pace remains uneven across contexts, reflecting both methodological promise and implementation realities.

4.1.1.3 Quasi-experimental Impact Evaluation Techniques

Across Africa, and particularly within countries participating in the Pan African Network for Economic Analysis of Policies (PANAP), rigorous evaluation of food security, agriculture, nutrition, and social development policies is increasingly necessary for evidence-based policymaking. While randomized controlled trials remain the gold standard for causal inference, most real-world policy reforms and public programmes are not amenable to random assignment. Consequently, quasi-experimental methods, designed to identify causal impacts without randomization, have become central to policy analysis on the continent. These methods differ in their underlying assumptions, data requirements, robustness, and technical capacity burdens. Some techniques including, Difference-in-Differences, Propensity Score Matching, Regression Discontinuity Design, Instrumental Variables, Endogenous treatment models, Synthetic Control Method, Panel Data/Fixed Effects models, Interrupted Time Series, Dose–Response frameworks, are highlighted below.

Difference-in-Differences (DiD)

Difference-in-Differences (DiD) is one of the most widely used quasi-experimental approaches in African policy evaluation. DiD measures how outcomes change over time in a treatment group relative to a comparison group, attributing the differential change after programme rollout to the intervention under the parallel trends' assumption (Angrist & Pischke, 2009; Gertler et al., 2016). Its appeal lies in its ability to exploit staggered policy rollouts, regional variations in programme introduction, or administrative implementation delays.

In PANAP countries such as Ghana, Ethiopia, and Kenya, DiD has been applied in evaluations of agricultural input subsidy schemes, farmer extension programmes, and nutrition interventions, where pre- and post-intervention data exist. Its relative simplicity and compatibility with existing cross-sectional or panel datasets make it practical for ministries and statistical agencies that lack complex modelling infrastructure. However, the method is highly sensitive to violations of the parallel trend's assumption. In many African settings, climate shocks, regional insecurity, market disruptions, or disparities in economic growth can cause treatment and control regions to trend differently even in the absence of policy intervention. In addition, baseline measurements are often irregular, and administrative data may not be systematically collected, limiting the availability of long pre-intervention time series. Despite these challenges, DiD remains an accessible method when supported by careful diagnostics such as placebo testing and pre-trend checking.

Propensity Score Matching (PSM)

Propensity Score Matching (PSM) provides a means of constructing a comparison group statistically similar to programme participants using observable characteristics (Becker & Ichino, 2002). PSM rests on the selection-on-observables assumption, meaning that once observable covariates are controlled for, treatment assignment is as good as random. This makes the quality and completeness of covariate data crucial.

In African policy evaluation, PSM has been widely used in the assessment of agricultural technology adoption, nutrition programs, and smallholder livelihood improvements where randomized evaluations are impractical and treatment uptake is voluntary (Gertler et al., 2016). Ministries and research institutions value PSM because it can be implemented using cross-sectional survey data without the need for complex longitudinal tracking. However, the method struggles when important determinants of participation,

motivation, leadership influence, social positioning, are unobserved, creating residual bias. Therefore, while PSM is flexible and widely used, over-dependence on it can lead to false confidence in causal attribution if data limitations are not addressed.

Regression Discontinuity Design (RDD)

Regression Discontinuity Design (RDD) compares units just above and below a cutoff that determines program eligibility, generating a locally credible causal estimate under the assumption that potential outcomes evolve smoothly around the threshold (Angrist & Pischke, 2009). RDD is rigorous but relies on clear eligibility rules and accurate measurement of the assignment variable.

RDD is less applied compared to DiD or PSM because many programmes lack strict quantitative admission thresholds. Where RDD has been used, often donor-implemented or academically supported nutritional interventions, bursary mandate allocations, or targeted subsidy schemes—analyses demonstrate strong internal validity but narrow generalisability due to the local nature of the estimate. Capacity constraints further limit usage: high-frequency pre-intervention data, precise administrative registers, and advanced econometric skills for bandwidth selection and manipulation testing are not consistently available across PANAP member countries.

Endogenous Treatment Models

Endogenous treatment models have become central to empirical work on food and nutrition systems, particularly because participation in agricultural, health, and nutrition programmes is rarely random. Households self-select into interventions based on factors such as motivation, resource endowments, social networks, or physical access, making standard regression approaches inadequate. To address these challenges, evaluators increasingly rely on econometric approaches that correct for selection bias and identify causal effects under non-experimental conditions.

One of the most widely used frameworks is the **Endogenous Switching Regression (ESR)** model, which combines a probit-based selection equation with separate outcome equations for treatment and non-treatment groups (Lokshin & Sajaia, 2004). The ESR approach allows impacts to differ across regimes and accounts for unobserved heterogeneity that jointly influences treatment participation and outcomes. It has been extensively applied in food and nutrition contexts—for example, in assessing the nutritional benefits of adopting biofortified crops such as orange-fleshed sweet potato (de Brauw et al., 2015), evaluating adoption of improved seeds on food security and dietary quality (Manda et al., 2018), and examining how participation in nutrition education programmes affects household dietary diversity

(Aweke et al., 2020). The strength of ESR lies in its ability to generate counterfactual predictions for both adopters and non-adopters, offering a more nuanced understanding of behavioural heterogeneity.

A second commonly used family of models is the **Endogenous Treatment Effects Model (ETEM)**, sometimes implemented as treatment-effects probit, Poisson, or continuous-outcome models. These models assume a single structural outcome equation estimated jointly with a treatment selection equation, typically identified through an instrumental variable. ETEMs are particularly useful when outcomes such as dietary diversity scores, food consumption, or anthropometric measures require specific distributional assumptions. Their application in nutrition research includes evaluating the effect of nutrition counselling on child growth outcomes (Leroy et al., 2010), assessing the impact of agricultural training or extension on dietary diversity (Kassie et al., 2017), and analyzing behavioural factors influencing adoption of nutrition-sensitive agricultural practices.

A third approach involves **Instrumental Variable (IV) treatment effects models**, which rely on plausible external instruments that influence treatment participation but not outcomes directly. Instruments such as distance to extension offices, programme eligibility thresholds, and staggered rollout schedules have been used to correct for endogeneity in agricultural-nutrition linkages (Sibhatu & Qaim, 2017). IV models are especially appropriate when switching-regression assumptions do not hold or when the treatment selection mechanism is strongly influenced by observable external factors.

Finally, the **Control Function Approach (CFA)** represents a flexible econometric alternative that incorporates first-stage residuals directly into the outcome equation to correct for endogeneity. This method has been effectively applied in studies modelling dietary diversity, food expenditure, and calorie availability, particularly where adoption or participation decisions are influenced by latent behavioural characteristics (Bellemare et al., 2013). The CFA allows researchers to maintain familiar regression structures while addressing selection bias, making it attractive for a wide range of food and nutrition indicators.

Together, these endogenous treatment models provide a robust methodological foundation for evaluating food and nutrition interventions in contexts where randomised experiments are not feasible. Their widespread adoption across agricultural development, health, and nutrition economics underscores the continued need for capacity building in econometric impact evaluation across Africa, where complex systems and heterogeneous populations require rigorous analytical tools.

Fixed Effects and Panel Data Models

Panel data methods, including fixed-effects estimators, control for unobserved time-invariant heterogeneity, making them valuable when multiple observations per unit are available (Gujarati & Porter, 2009). These methods are widely used in studies of agricultural productivity, technology adoption, food consumption patterns, and labour market dynamics where panel datasets exist.

The uptake of panel methods in Africa has grown alongside increased use of multi-round household surveys. Nonetheless, creation and maintenance of high-quality panel datasets remain expensive, and attrition is a significant challenge. In many African countries, administrative systems are not yet digitised sufficiently to support the routine generation of linked longitudinal microdata. Capacity for dynamic panel modelling (e.g., system GMM, instrumental panels) is also uneven across PANAP institutions.

Interrupted Time Series (ITS)

Interrupted Time Series (ITS) evaluates programme impacts by comparing long-run outcome trends before and after a policy introduction (Gertler et al., 2016). ITS is valuable when suitable comparison groups are unavailable and rich time-series administrative data exist (e.g., monthly commodity prices, health service utilisation rates).

ITS has been used in Africa to evaluate the effects of national price interventions, market regulations, or food subsidy adjustments. However, many African monitoring systems do not generate long, uninterrupted pre-intervention time series. High-frequency administrative data collection is inconsistent, and time-series modelling capability, including seasonality correction and autocorrelation modelling, is still developing in many policy units.

4.1.2 Non-Econometric Approaches

4.1.2.1 Cost–Benefit and Cost-Effectiveness Analysis (CBA/CEA)

CBA and CEA are critical tools for comparing policy and investment options, particularly when governments must allocate limited resources across competing agricultural, social protection, and nutrition programmes (Boardman et al., 2018). These approaches are central to policymaking within FNSSA because they allow governments to quantify economic returns on agricultural technologies, biofortification, extension services, and climate-smart agriculture.

The primary capacity gaps revolve around technical valuation skills and data availability. Monetising long-term benefits, such as improvements in child cognitive development, soil fertility, or labour productivity, requires specialised expertise. Furthermore, many ministries struggle to generate local value parameters, relying instead on international estimates that may not reflect local realities. The absence of trained public-sector economists limits the integration of CBA/CEA into budgeting, leading to policy choices that are insufficiently grounded in economic evidence.

4.1.2.2 Input-Output (I-O)

Input–Output (I–O) analysis, originally developed by Leontief (1936), is an economy-wide modelling tool used to trace how shocks to one sector, such as agricultural investment, food price changes, or nutrition interventions cascade through the broader food system via inter-industry linkages. In food and nutrition security studies, I-O models help quantify how policies affect food supply, poverty, employment, household incomes, and the affordability of nutritious diets by estimating sectoral multipliers (Dorosh & Thurlow, 2018). They have been widely used to assess the economy-wide impacts of agricultural productivity changes, food fortification strategies, and supply chain disruptions, including recent applications to analyse COVID-19 impacts on food systems (Arndt et al., 2020; McKibbin & Fernando, 2020). While powerful for short- to medium-term scenario analysis, I–O methods rely on fixed coefficients and updated I–O or SAM tables, which can limit their flexibility in rapidly changing food system contexts.

4.1.2.3 Computable General Equilibrium (CGE) Models

CGE models simulate economy-wide impacts of policy reforms, climate shocks, and trade changes (Dervis, de Melo & Robinson, 1982; Robinson, Cattaneo & El-Said, 2001). PANAP has long recognised CGE as an advanced tool for capturing the multidimensional nature of food systems, spanning production, trade, consumption, labour markets, and macroeconomic adjustments. Such models include DEMETRA which is being popularised among FNSSA and PANAP institutions. However, the implementation of these models is severely limited by data and human-capital constraints. Most African countries lack updated Social Accounting Matrices (SAMs), which are essential for CGE modelling (Jorgenson, 1984). Where SAMs do exist, they are often produced externally and updated infrequently. The complexity of CGE software and the specialized programming skills required further constrain adoption.

4.2 Qualitative Methods and Analytic Tools in Food and Nutrition Policy Impact Analysis

Qualitative methods are indispensable for understanding the social, cultural, institutional and behavioural drivers that determine how food and nutrition policies operate on the ground. In PANAP member countries, where data limitations, diverse social norms, and institutional fragmentation frequently complicate quantitative policy assessments, qualitative tools provide critical insights that guide interpretation of econometric and impact-evaluation results and that surface policy-relevant mechanisms (Patton, 2014).

4.2.1 Analytical methods

The various analytical approaches in qualitative economic analysis are discussed in the proceeding section.

Thematic Analysis

Thematic Analysis (TA) identifies patterned meanings across qualitative data and is widely used in food and nutrition security (FNS) research. Its strengths include flexibility, clarity of procedures, and suitability for capturing cultural and contextual influences on diet. However, TA may oversimplify complex social dynamics if themes are not deeply interpreted, and researcher bias can influence coding (Braun & Clarke, 2006). In northern Ghana, TA was used to analyse focus-group discussions on maternal and child nutrition, revealing culturally-rooted food taboos, such as avoidance of eggs or certain meats during pregnancy, which constrained dietary diversity (Dabala et al., 2021). These findings directly informed culturally sensitive maternal nutrition policy recommendations. Similarly, a Photovoice study in Kenya and Ghana applied TA to examine how affordability, vendor hygiene, social influence, and food safety shape urban dietary practices, providing evidence for food-environment policies and urban nutrition planning (Wanjohi et al., 2023).

Content Analysis and Discourse Analysis.

Content analysis is used for systematic review of policy documents and media narratives. Discourse analysis is less commonly used but extremely valuable for unpacking how food-policy frames (e.g., “food security” vs. “nutrition-sensitive agriculture”) shape stakeholder priorities; studies of national food-safety debates and front-of-pack labelling use content analysis to map stakeholder positions. Kirui et al. (2024) FOPL research, for instance, analysed participants’ textual explanations and labelled attributes to identify framing preferences relevant for regulatory design.

Participatory & Interpretive Methods (e.g., Photovoice)

Participatory and interpretive methods such as Photovoice enable participants to visually document, describe, and interpret their own food environments. These methods elevate marginalized voices, produce context-rich insights, and strengthen community engagement. Their limitations include smaller samples, potential selection bias, and challenges with generalization (Wang & Burris, 1997). A Photovoice study among pregnant adolescents in Cape Coast, Ghana found that over 64% experienced food insecurity and identified barriers such as income instability and limited social support. The findings inform adolescent-responsive nutrition and social protection policies (Posey et al., 2024). Another Photovoice study in urban Kenya and Ghana highlighted how physical food environments (hygiene, vendor safety, affordability) influence dietary choices. Researchers recommended integrating food-safety regulation, affordability measures, and community food-environment improvements into local nutrition policy (Wanjohi et al., 2023).

Narrative / Grounded-Theory–Inspired Approaches

Narrative analysis and grounded-theory approaches use inductive, iterative coding to build conceptual explanations of food-related behaviours and institutional processes. They are powerful for uncovering complex socio-structural drivers of food insecurity, though they require intensive data collection, reflexivity, and careful sampling; generalizability can be limited (Charmaz, 2014). A qualitative study in sub-Saharan Africa used inductive narrative analysis to show how food-insecure pregnant women often prioritised securing food over seeking maternal health services, illustrating how food insecurity undermines nutrition and health outcomes and pointing to the need for integrated food–health policy strategies (Kota et al., 2025).
In the Democratic Republic of Congo, grounded-theory–inspired qualitative work demonstrated how household structures, communal labour, and local institutions influence child nutrition outcomes-evidence supporting policies that strengthen community cooperation, labour-sharing systems, and equitable food access (Kismul et al., 2015).

4.2.2 Analytical tools/softwares

Qualitative impact assessment in food, agriculture, and nutrition policy research increasingly relies on dedicated analytical tools that enhance the rigour, transparency, and reproducibility of textual and observational data analysis. Central to this advancement is the use of Computer-Assisted Qualitative Data

Analysis Software (CAQDAS)**.** These platforms support systematic coding, memoing, data retrieval, triangulation, and audit trails, features that are essential for high-quality qualitative research (Paulus & Lester, 2016; Silver & Lewins, 2014).

NVivo

NVivo is among the most widely used CAQDAS tools in applied social science and policy research. Its strength lies in enabling structured thematic coding, hierarchical codebook development, and mixed-method integration through text queries, node matrices, and visualization tools. NVivo supports a range of data types, interviews, focus groups, policy documents, videos, and digital observations, making it suitable for nutrition and food system studies that involve diverse evidence sources. Studies note that NVivo improves inter-coder reliability and enhances transparency through systematic audit trails (Zamawe, 2015; Woods et al., 2016).

Dedoose

Dedoose is a web-based platform designed for collaborative qualitative and mixed-method analysis. Its interface facilitates team-based coding, inductive and deductive code-tree development, and integration of qualitative data with quantitative variables, an essential feature when linking household survey indicators to narrative findings. Scholars highlight Dedoose's utility for handling multilingual transcripts, cross-site datasets, and iterative coding processes (Azungah, 2018; Namey et al., 2016).

ATLAS.ti

ATLAS.ti provides advanced capabilities for managing large qualitative datasets and supports network visualisation, co-occurrence mapping, and conceptual modelling. It is particularly valuable for analysing complex social processes and system interactions, such as food safety behaviours, nutrition knowledge pathways, or governance dynamics. Research emphasises the software's strong query tools and its suitability for in-depth grounded theory and phenomenological analysis (Friese, 2019; Konopásek, 2008).

MAXQDA

MAXQDA is another widely recognised CAQDAS platform known for its user-friendly design and strong mixed-method features, including quantification of codes, crosstabulation, and joint displays. Its visual analytic tools make it appropriate for qualitative assessments embedded within monitoring and

evaluation frameworks. Scholars highlight its value in multidisciplinary research teams and in bridging qualitative insights with statistical summaries (Kuckartz & Rädiker, 2019).

Other Tools (Quirkos, QDA Miner, Transana)

Emerging and lightweight tools such as Quirkos offer accessible entry points for smaller teams, while QDA Miner provides strong content-analysis capabilities, enabling researchers to perform lexical frequency analysis alongside traditional thematic coding. Transana supports detailed audiovisual analysis, useful for studies involving ethnographic observation or video-based documentation of food environments or extension interactions.

4.3 Sectoral Context and Gaps in Application of the Methodologies

4.3.1 Sectoral context

Across PANAP member states, the methodological choices used for food and nutrition policy analysis follow clear sectoral logic but are heavily conditioned by institutional-level capacity and data availability.

In agriculture, econometric and quasi-experimental approaches are the dominant tools used to analyse input adoption, yield responses, technology uptake, and climate impacts (Gertler et al., 2016; Gujarati & Porter, 2009). For example, national studies in Ghana and Kenya have used panel and cross-section econometric models to estimate fertilizer and seed adoption responses, and to model how price and access constraints shape market participation. In Kenya, a mixed methods study on front-of-pack labelling combined econometric analysis of purchasing patterns with FGDs and KIIs to understand consumer comprehension and likely behavioural change; the qualitative work was critical to interpret heterogeneity in demand elasticities across urban and peri-urban consumers (Kirui et al., 2024). Such sectoral work often feeds directly into national agricultural investment priorities, where Ministries seek simple, actionable elasticity estimates.

In nutrition, programs commonly rely on rigorous impact evaluations (experimental) and CEA/CBA to justify investments. Studies of behaviour-change and maternal/child nutrition programs in Rwanda and Kenya have combined KIIs, FGDs and impact evaluation designs: Albin et al. (2024) used in-depth interviews and FGDs to understand caregiver practices and service delivery constraints that explained why measured impacts on child diets were smaller than expected. Anohter study by Musyoka et al. (2023) also

used KIIs and FGDs to reveal cultural proscriptions around animal-source foods that blunt the nutrition effects of livestock promotion. These qualitative insights explain mechanisms behind quantitative effect estimates and point to complementary interventions (e.g., social-norms work) that a CEA alone would miss.

At the food-system / value-chain level, system modelling and CGE or partial equilibrium approaches are increasingly used to evaluate economy-wide reforms, trade policy, and shocks (Foran et al., 2014; Jones, Hoey & Blesh, 2021). IFPRI's Nexus SAM work in Ghana provided a concrete platform to couple CGE simulations with household microdata, enabling distributional analysis of policy shocks (IFPRI, 2019/2022). However, only a handful of PANAP countries have similarly complete SAMs and the capacity to run, interpret, and translate CGE results for ministries.

4.3.2 Gaps in the Use of Qualitative and Quantitative Methods for Food and Nutrition Policy Impact Analysis

Impact analysis in food and nutrition policy increasingly relies on a blend of econometrics, non-econometrics quant methods and the seldom use of qualitative inquiry. Yet, empirical studies across Africa and other low and middle-income regions highlight some methodological and institutional gaps that limit the robustness, interpretability, and policy relevance of findings. These gaps stem from data limitations, capacity constraints, weak monitoring systems, and challenges in integrating qualitative and quantitative approaches.

A major limitation is the *lack of suitable and timely data*. Many evaluations struggle with the absence of panel datasets (with baseline and endline data), irregular household surveys, and incomplete programme registers. These conditions make it difficult to apply quasi-experimental designs such as difference-in-differences or matching. Studies note that without baseline and follow-up data, evaluators risk drawing biased inferences about programme impact (Beegle et al., 2020). Similarly, macroeconomic tools such as Social Accounting Matrix (SAM) based Computable General Equilibrium (CGE) models are constrained by outdated national accounts and missing behavioural parameters, leading to fragile simulation outcomes (Robinson, Cattaneo & El-Said, 2001; Laborde et al., 2018).

Cross-cutting reviews also emphasise *weak integration of qualitative methods*, despite their critical role in uncovering mechanisms behind nutrition and food system outcomes. Research shows that quantitative indicators often fail to reflect intra-household food allocation, cultural norms, implementation

bottlenecks, and perceptions of food safety. These insights only emerge through key informant interviews, focus groups, or observational methods (Fletcher et al., 2021; Maxwell et al., 2022). However, qualitative studies themselves face challenges: small samples, limited use of CAQDAS tools, and insufficient training undermine reliability and auditability (Namey & Trotter, 2015). Without structured integration frameworks, mixed-methods studies struggle to reconcile divergent datasets, leading to partial explanations of policy effects.

Human capacity constraints remain another widely documented bottleneck. Advanced causal inference, RCT implementation, and CGE modelling often depend on external consultants or research partners, weakening national ownership and hindering continuity of analysis (Gertler et al., 2016; Beintema & Stads, 2017). Limited local expertise in qualitative analysis further reduces the depth of process evaluation, implementation research, and behavioural insights.

Institutional weaknesses compound these methodological gaps. Food, agriculture, health, and trade ministries frequently operate in silos, making it difficult to evaluate nutrition-sensitive interventions that span multiple sectors (FAO, 2022). Monitoring, evaluation, and learning (MEL) systems are often donor-driven, with limited integration into national statistical and policy-planning structures. As a result, policy impact studies tend to be episodic rather than embedded in long-term programme cycles. Most institutions also lack data repositories that make the documentation of data difficult for such impact analyses.

Finally, a consistent gap across the literature is *limited transparency and replicability*. Many quantitative studies do not conduct sensitivity analyses, provide elasticity documentation, or share code and datasets, reducing the credibility and reproducibility of findings (Clemens, 2017; IFPRI, 2019). At the same time, qualitative studies often lack well-documented protocols, making triangulation difficult. However, some journals are increasingly emphasizing the need for authors to submit their data and codes when submitting manuscripts for publication. This significantly improves transparency and replicability of findings.

These gaps, though not exhaustive, underscore the urgent need for stronger MEL systems, harmonised data collection protocols, investment in CAQDAS and quantitative training, updated national accounts for modelling, improved institutional data repositories and arrangements that support integrated food

systems evaluations. Without such reforms, the evidence base for food and nutrition policy will continue to face challenges in delivering credible, actionable, and contextually relevant insights.

5. Replicability and Scalability Assessment of the Methods

This section assesses the replicability and scalability of major methodological models used in food and nutrition policy analysis. The assessment follows the criteria: data needs, methodological robustness, transferability, and resource, institutional, and adaptability requirements.

5.1 Criteria for Replicability

5.1.1 Data needs

The replicability of methodological models across PANAP countries depends on the availability, quality, and frequency of national datasets. Econometric models generally require lower data complexity, often relying on cross-sectional household surveys, which makes them highly replicable even in low-capacity environments (Gujarati & Porter, 2009). In contrast, quasi-experimental designs (e.g., DID, RDD, PSM), although replicable in theory, require baseline data and functional MEL systems, which remain weak across many African countries (Gertler et al., 2016; Patton, 2014).

Highly data-intensive models, such as I–O and CGE models, require updated Social Accounting Matrices (SAMs), national accounts, production tables, and trade statistics (Dervis, de Melo & Robinson, 1982). When countries lack regularly updated SAMs (Robinson, Cattaneo & El-Said, 2001), the replicability of these models is limited. Capacity gaps in national statistical systems reduce the feasibility of replicating economy-wide modelling exercises consistently across the continent.

5.1.2 Methodological robustness

Models with rigorous, established methodological foundations, such as quasi experimental and experimental impact evaluations, exhibit high methodological robustness and can be replicated with fidelity if technical capacity exists (Angrist & Pischke, 2009; Becker & Ichino, 2002). However, in practice, African institutions struggle with issues such as small sample sizes, weak randomisation protocols, and measurement errors, which compromise robustness.

CGE models, though methodologically robust, require complex calibration and econometric validation steps, and minor data inconsistencies can significantly affect results (Jorgenson, 1984). Narrative and

thematic analyses also present robustness challenges due to subjective interpretation and inconsistent coding practices (Braun & Clarke, 2006).

Because robustness depends on both technical mastery and institutional quality, the lack of skilled analysts and weak research governance structures in any PANAP member country will directly undermine replicability.

5.1.3 Transferability across contexts

Econometric and cost-effectiveness models tend to be more transferable across different country contexts, provided similar survey instruments exist (Boardman et al., 2018). Impact evaluations, however, are context-sensitive, designs that work in one region may not transfer easily due to cultural, environmental, or implementation differences (Gertler et al., 2016). CGE and I–O models are theoretically highly transferable, but differences in economic structure, informal sector size, and institutional arrangements limit practical transferability across African economies (Dervis et al., 1982). Qualitative methods such as case studies and FGDs are highly transferable, but lack of standardisation reduces consistency and makes cross-country comparison difficult (Yin, 2017; Patton, 2014).

5.2 Criteria for Scalability

5.2.1 Resource requirements

Econometric analysis and basic CBA/CEA have relatively low financial and computational requirements, making them highly scalable across PANAP member countries (Boardman et al., 2018). Impact evaluations, particularly RCTs, are not easily scalable due to high costs for sampling, field implementation, and long-term tracking (Gertler et al., 2016). CGE modelling is resource-intensive, requiring extensive datasets, skilled modellers, and access to specialised software. Scaling CGE across PANAP would require regional modelling hubs, sustained funding, and long-term capacity development. Qualitative methods are less costly but require trained facilitators, transcription tools, and analytical software, resources that are still lacking in many national research systems.

5.2.2 Institutional capacities

Scalability depends significantly on national institutional structures. Econometric and CBA/CEA tools are easily integrated into existing policy units within ministries of agriculture, finance, and planning, requiring

modest institutional change. In contrast, MEL systems for quasi-experimental evaluations require robust institutional frameworks, long-term programme monitoring, and coordinated data management, capacities still weak across the continent (Patton, 2014). Qualitative methods require institutional procedures for stakeholder engagement, ethical review, and data protection, areas where many countries still face regulatory gaps.

5.3 Adaptability of Methods to Different Contexts

In practice, econometric analysis, cost–benefit and cost-effectiveness analysis (CBA/CEA), and qualitative approaches demonstrate strong adaptability across key African development sectors, including agriculture, nutrition, climate resilience, social protection, and food system transformation. These methods have been successfully applied to value chain performance, household welfare, market systems, and behavioural interventions with only modest contextual adjustments. For example, econometric models have assessed determinants of agricultural technology adoption in Ghana, Kenya, and Ethiopia (Kirui et al., 2024), while CEA has been used to evaluate the cost-effectiveness of institutional nutrition services and community-level interventions in Rwanda and Malawi (Albin et al., 2024). Qualitative approaches have similarly shown cross-sector transferability; studies in Kenya and Nigeria used KIIs, FGDs, and market observation to understand consumer food safety perceptions and market dynamics in informal settlements, evidence that informed regulatory and behavioural response recommendations (Bukachi et al., 2021).

Impact evaluation designs, particularly experimental and quasi-experimental approaches, are also adaptable but less universally transferable. As indicated earlier, their feasibility depends on the structure of the programme being evaluated, as robust causal inference requires either controlled implementation roll-out, well-defined eligibility thresholds, or clear timing variations. For instance, extensions of agricultural advisory programmes have been evaluated in multiple countries because the intervention design easily supports staged roll-out and comparison groups. By contrast, conditional cash transfers, school feeding, and targeted nutrition programmes in countries such as Kenya, Rwanda, and Togo have demonstrated that context-specific eligibility rules and delivery systems complicate replication of impact evaluation frameworks without redesigning the evaluation strategy (Gertler et al., 2016; Albin et al., 2024).

Computable General Equilibrium (CGE) and related economy-wide models are theoretically transferable across African contexts, but their practical adaptability is constrained by the need for substantial structural adjustment to reflect sectoral complexity and high levels of informality characteristic of African economies

(Dervis, de Melo & Robinson, 1982). Recent IFPRI-supported work in Ghana and Ethiopia illustrates that adapting CGE frameworks requires updated social accounting matrices, detailed trade and sector elasticities, and explicit treatment of informal markets and subsistence production (IFPRI, 2019/2022). Countries without routinely updated national accounts or SAMs often struggle to implement CGE analysis without external modelling support.

Scalability and replicability is therefore highest for methodologies that rely on manageable data requirements and are flexible across policy contexts, such as econometrics, CBA/CEA, and structured qualitative analysis. These approaches can be rapidly deployed, do not require full economy-wide datasets, and can be sustained with in-country analytical capacity. Conversely, methods demanding complex, economy-wide databases, such as CGE modelling, remain more difficult to scale across the African Union unless investments are made in data systems, modelling training, and sustained institutional support.

A guiding matrix for assessing best suited methods for replication and scaling is provided in Table 1.

Table 3: Matrix of recommended models best suited for replication and scaling

Method	Adaptability Across Sectors	Data Requirements	Technical Complexity	Key Limitations Identified
Econometric Analysis	Highly adaptable across agriculture, nutrition, climate, market analysis, food systems	Moderate – requires surveys or administrative datasets	Moderate	Limited by survey frequency, measurement errors, and dataset comparability
Cost–Benefit / Cost-Effectiveness Analysis (CBA/CEA)	Widely adaptable in agriculture, nutrition, social protection and education	Moderate – requires cost tracking and outcome measurement	Low to moderate	MEL systems often lack full cost data; decisions not always aligned with economic evidence

				(Boardman et al., 2018)
Impact Evaluations (Experimental / Quasi-Experimental)	Moderately adaptable depending on programme structure and roll-out	High – needs baselines, treatment variation, and follow-up	High	High cost, political risks, and dependency on external technical partners
Qualitative Methods (KIIs, FGDs, Case Studies, Observation)	Highly adaptable across all sectors, contexts and governance levels	Low – requires standardised guides and trained facilitators	Low to moderate	Uneven analysis rigour and limited access to CAQDAS tools (Braun & Clarke, 2006; Patton, 2014)
CGE & Input–Output Models	Adaptable in theory but requires major modification for African economy structures	Very high – needs updated SAMs, input–output tables and elasticities	Very high	Outdated SAMs and shortage of trained CGE modellers (Dervis, de Melo & Robinson, 1982)

6. Conclusion and Recommendation

6.1 Conclusion

This review has highlighted critical methodological, data, and institutional gaps that limit the ability of PANAP member countries to conduct rigorous food and nutrition policy impact analysis. While a range of qualitative, quantitative, and economy-wide tools exist, their effective application is constrained by inadequate data infrastructures, limited technical capacity, fragmented institutional arrangements, and insufficient integration between qualitative and quantitative approaches. The analysis reveals that

although many countries have pockets of excellence in survey implementation, modelling, and qualitative inquiry, these strengths remain uneven and dependent on external support. The lack of updated Social Accounting Matrices (SAMs), incomplete administrative datasets, and low-frequency household surveys further undermine the feasibility of advanced analytical methods such as CGE modelling, quasi-experimental evaluation, and mixed-methods impact assessments.

Equally, qualitative methods, while increasingly used, suffer from small sample sizes, weak documentation, limited use of CAQDAS, and insufficient alignment with quantitative findings. These constraints impede the generation of actionable evidence on behavioural drivers, programme bottlenecks, equity concerns, and system-level mechanisms within food and nutrition security. Collectively, these gaps demonstrate the need for a coherent, system-wide capacity strengthening effort to position PANAP institutions to lead high-quality, contextually relevant, and scalable impact analysis across Africa's agrifood systems.

A key insight from the review is that scalability and replicability remain severely constrained by systemic weaknesses across data, skills, and institutions. The absence of harmonised, high-frequency, and interoperable datasets limits the ability to apply advanced modelling approaches—whether quasi-experimental methods, CGE simulations, or mixed-methods impact evaluations—consistently across contexts. Many countries still operate with outdated SAMs, irregular household surveys, and incomplete administrative or programme records, making results difficult to compare or reproduce. At the same time, analytical capacity for both quantitative and qualitative methods is uneven, with sophisticated econometric and modelling work concentrated among a small pool of experts and qualitative analysis hindered by limited CAQDAS skills and inconsistent documentation standards. These challenges are compounded by institutional fragmentation, in which responsibilities for food and nutrition analysis remain siloed across sectors, preventing sustained, system-level evaluation practice. Together, these factors undermine the replicability of findings and make it difficult to scale evidence-based approaches across countries or regions. Addressing these gaps will require coordinated investments in data systems, human capacity, and institutional integration to ensure that policy insights generated in one setting can be reliably adapted, replicated, and used to inform continental food system transformation.

6.2 Recommendations

Strengthen data foundations for policy modelling

Strengthening data foundations is essential for enabling robust and scalable policy modelling across food and nutrition security systems. Countries need routine and harmonized data collection systems, including household surveys, nutrition monitoring platforms, and integrated programme registries, to support longitudinal analysis and quasi-experimental evaluation. Equally critical is the regular updating and institutionalization of Social Accounting Matrices (SAMs) and Input–Output tables, which form the backbone of CGE and other economy-wide modelling tools. Improving data governance through clear metadata standards, anonymization procedures, and shared repositories will enhance reproducibility and comparability across countries. Taken together, these investments lay the groundwork for evidence-based policymaking that can be scaled across regions and sustained over time.

Build technical capacity for quantitative and qualitative methods

To reduce dependence on external expertise and strengthen national ownership of policy analytics, countries must significantly expand technical capacity for both quantitative and qualitative methods. This includes developing regional training hubs that build skills in CGE modelling, econometrics, causal inference, and mixed-methods evaluation. At the same time, qualitative research capabilities must be enhanced through systematic training in CAQDAS tools such as NVivo, ATLAS.ti, MAXQDA, and Dedoose to improve rigour and transparency in coding and analysis. Cross-institutional mentorship programmes are also needed to cultivate a pipeline of analysts capable of working across sectors and methodologies. Investing in these capabilities will enable PANAP institutions to generate high-quality, contextually grounded evidence that can inform complex food and nutrition policy debates.

Strengthen Monitoring, Evaluation, and Learning (MEL) systems

Robust MEL systems are a cornerstone of credible policy impact analysis. Embedding evaluation design at the onset of programmes, complete with baseline data, clear theories of change, and pre-analysis plans, ensures methodological integrity and enhances learning throughout implementation. MEL systems must incorporate standardized qualitative modules to systematically capture behavioural drivers, implementation bottlenecks, and equity considerations. Moreover, adopting mixed-methods evaluation

frameworks will foster a stronger link between quantitative outcomes and qualitative explanations, making impact assessments more comprehensive and policy-relevant. Strengthening MEL systems in this way enables continuous learning, greater accountability, and more adaptive programme management across food and nutrition interventions.

Secure sustainable funding

Sustainable financing remains a precondition for building and maintaining national analytical capacity. Governments should allocate predictable budgetary resources for data systems, modelling units, and MEL structures to avoid reliance on short-term donor funding. At the same time, leveraging partnerships with continental organisations, development banks, and philanthropic actors can provide additional, longer-term support for training, data improvements, and methodological innovation. Promoting the use of open-source analytical tools or shared software licences will further reduce costs, widen access, and ensure continuity of key analytical functions. A diversified and sustainable funding base is essential for institutionalising high-quality policy analysis and ensuring long-term resilience of national evidence systems.

With all these said, strengthening the capacity for impact analysis within PANAP countries is a strategic investment in evidence-driven policymaking. By improving data systems, expanding analytical capabilities, enhancing institutional coherence, and ensuring sustainable financing, PANAP can establish itself as a continental leader in generating high-quality, actionable evidence for food and nutrition security transformation. The insights generated through this review provide a foundation for targeted training under Work Package 2 and for a long-term capacity development agenda that empowers African institutions to lead their own policy analytics with confidence and rigor.

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Summary of Data Sources, Scope, Use case and Relevance to StEPPFoS

Category	Data Source / Platform	Scope & Content	Geographic Coverage	Use Cases	Relevance to StEPPFoS
National datasets	Demographic and Health Surveys (DHS)	Nationally representative household surveys on nutrition, child & maternal health, IYCF, WASH, and demographics; indicators	>90 countries with multiple African rounds	Baselines; trend & equity analysis; triangulation with HMIS	Baseline indicators; disaggregated analysis; monitoring & evaluation.
	LSMS–ISA (harmonized household–plot panels)	Multi-wave household–plot data on agriculture, incomes, shocks; reproducibility package and harmonized panel for cross-country work.	Selected SSA (e.g., Ethiopia, Malawi, Nigeria, Tanzania, Uganda)	Micro-causal designs (DiD, event-study); productivity & welfare modelling	Disaggregated analysis; programme evaluation; model calibration.
	National Statistical Bureaus and Offices open-data portals (eg: Ghana Statistical Service—StatsBank & CPI bulletins)	Official time series on CPI (incl. Food CPI), national accounts, agriculture indicators; downloadable bulletins/tables.	Country-specific	Deflators; macro controls; affordability series for diet-costing	Baselines; triangulation with microdata; price analyses.
	DHIS2 Nutrition (UNICEF/WHO standard packages)	Monthly facility data on SAM/MAM, growth monitoring, supplementation; standardized metadata and DQA guidance.	Country HMIS implementations	Interrupted time-series; coverage monitoring; programme readiness	High frequency monitoring; local programme tracking.

Category	Data Source / Platform	Scope & Content	Geographic Coverage	Use Cases	Relevance to StEPPFoS
	RATIN (regional MIS)	Grain market price intelligence and cross-border signals published by the regional MIS.	East Africa (regional)	Price pass-through; market integration; shock tracking	Price inputs for food-cost and welfare analysis. (EAGC)
	National Commodity Exchange platforms	Weekly/higher-frequency quotes for staples (e.g., maize, soybean); CSV/Excel downloads.	Country (exchange-listed commodities)	Parity pricing; surveillance; policy-timing checks	High-frequency price series for models/dashboards.
	ASYCUDA customs system (trade microdata via customs)	Transaction-level import/export declarations (HS codes, values, partners); customs automation platform.	Broad deployment across African customs	Trade policy analysis; import parity; exposure mapping	Trade channels in impact modelling; programme exposure. (ASYCUDA)
International data repositories	FAOSTAT—Food Balance Sheets (FBS, 2010–2023)	Supply-Utilization Accounts and Food Balance Sheets; kcal/protein availability; bulk/API access with new 2010–2023 series.	~178–189 countries	Food availability benchmarking; structural models; diet-cost joins	Model calibration; cross-country comparators (vintage-aware). (FAOHome)
	Cost & Affordability of a Healthy Diet (CoAHD)	Cost/affordability indicators using price data and dietary guidelines; methods brief and SOFI chapters.	Global with African coverage	Diet affordability assessment; price-shock scenarios	Baseline affordability metrics; scenario design; targeting. (FAO Stat Files)
	World Development Indicators (WDI) API	Programmatic access to macro indicators (GDP, CPI, population, ag value-added, etc.).	Global	Model covariates; denominators; trend context	Model covariates; triangulation across sources.

Category	Data Source / Platform	Scope & Content	Geographic Coverage	Use Cases	Relevance to StEPPFoS
	WHO Global Health Observatory (GHO) OData API	Health & nutrition outcome/coverage indicators via OData endpoints; metadata and download options.	Global (WHO Member States)	Health covariates; service coverage trends	Health covariates for ag-nutrition models; harmonized indicators.
	ReSAKSS / CAADP BR & AATS (eBR portal)	CAADP indicator dashboards, BR briefs; eBR online submission/validation system improving timeliness and documentation.	Africa-wide	Benchmarking commitments; accountability analysis; cross-country panels	Policy tracking; continental comparators for synthesis.
	IPC / Cadre Harmonisé (CH) API & dashboards	Acute food-insecurity phases with population tables, maps; open API and protocols.	>45 crisis-affected countries; strong West Africa/Sahel focus	Hotspot targeting; crisis trend analysis;	Risk monitoring; programme targeting and prioritization.
	FEWS NET (markets, trade, outlooks)	Price and trade monitoring; monthly/seasonal food-security outlooks for decision-makers.	FEWS NET focus countries in Africa	Nowcasting; triangulation with surveys/admin data	Monitoring inputs; scenario context for models
	FAO GIEWS – FPMA Tool (Domestic & International Prices)	Interactive database of domestic food prices (retail/wholesale) and international commodity prices;	120+ countries incl. most of Africa	High-frequency price inputs; affordability/diet-cost joins; shock monitoring	Timely price layer for modelling and dashboards; complements FBS/CoAHD.

Category	Data Source / Platform	Scope & Content	Geographic Coverage	Use Cases	Relevance to StEPPFoS
		bulletins, warnings, regional roundups; API-style downloads			
Sectoral & thematic databases	IFPRI SPEED (public expenditures)	Cross-country public expenditures incl. agriculture; downloadable time series for fiscal analysis.	160+ countries (historic series)	Fiscal incidence; spending–outcome links; policy benchmarking	Economic impact modelling; CGE/CBA spending channels. (IFPRI Research Data Management)
	ASTI (agricultural R&D indicators)	National ag R&D investments, human resources, institutions; policy briefs and downloads.	>90 LMICs	Innovation capacity; productivity studies; readiness metrics	Structural parameters; research-capacity baselines. (ASTI)
	FAO/INFOODS—West African Food Composition Table (WAFCT 2019)	Nutrients per 100g for regional foods; expanded items/components vs. 2012 edition.	West Africa	Convert foods→nutrients; diet-costing; nutrition modelling	Nutrient mapping for diet-cost models; recipe mapping. (Open Knowledge FAO)
	CGIAR GARDIAN (and centre portals)	Cross-CGIAR discovery of datasets/publications; links to ILRI/IITA; some APIs.	Global (Africa-rich)	Thematic datasets (livestock, agronomy, socio-econ); joins to official stats	Topic depth; micro-to-meso integration in pipelines. (GARDIAN)
	DataFirst (UCT)	Curated access to African survey & administrative microdata; secure remote enclave for sensitive data.	Africa (multi-country; strong South Africa coverage)	Access to scarce microdata; training; reproducibility	Disaggregated analysis; reproducibility support; data stewardship. (re3data)

Category	Data Source / Platform	Scope & Content	Geographic Coverage	Use Cases	Relevance to StEPPFoS
	ILRI & IITA data portals	Livestock, agronomy, pests, and socio-economics; machine-readable datasets; CKAN back-ends and metadata.	Africa (multi-country)	Sector-specific modelling; ground data for validation	Sectoral inputs; calibration/validation for models.
	LEAP4FNSSA – FNSSA Project Database (WUR WebQuery) – FNSSA Knowledge Platform	Curated registry of ongoing/completed projects aligned to the AU–EU FNSSA Roadmap; rich project metadata (funders, themes, countries, outputs) with search/browse	Africa–Europe (bi-continental)	Mapping interventions; clustering initiatives; identifying evidence or partners; Portfolio analysis; policy coherence tracking; discovery of datasets/publications	Landscape scans; partnership mapping; contextual "exposure" layer to join with outcomes. Knowledge backbone for synthesis; (CORDIS)

Quantitative and Qualitative Methodologies for Economic Impact and Policy Assessment in agri-food systems

Type	Description	Data Sources	Replicability and Scalability	Strengths	Limitations	Case use References
Computable General Equilibrium (CGE) Model	Stimulate the effect of policy shock such as subsidy, tax and trade reforms on production, consumption, income distribution and trade flows among others in the entire economy. Example is the	GTAP II database Social Accounting Matrix (Kenya, Ghana	Adaptable to different country contexts Has been used successfully in Ethiopia to assess welfare impacts of agricultural policies	Captures nation-wide effects, cross sector linkages and trade effects. Also very good for policy scenarios modeling	Scalability may be constrained by data availability because high quality data is required, Specialized skills and software required for its application. Calibration and validation may be	Changing Profile of Indian Trade Relations by Somesh KMathur, Archana Srivastava, Mustajab Khatir, Abhimanyu Singh Rana (2025) indicating the inherent challenges with CGE Models including data inconsistencies, parameter specification and

	DEMETRA Model developed by JRC.				time-intensive	complexity of calibration Zhang et al (2025) elaborate on main modules and equations of the Chinese environmental CGE Model
Integrated Assessment Models (IAMs) Examples Dynamic Integrated Model of Climate and Economy (DICE) and the Regional Integrated Model of Climate and the Economy (RICE)	Frameworks that integrates knowledge from multiple domains largely focusing on interactions between economy, society and	Scenario databases such as Zenodo IAMC platform IAMC Github Emission databases	Adaptable to different countries contexts	Captures nation-wide effects at global scale	Over-reliance on technology and specialized skills required	Rising 2020 use IAMs to investigate trade-offs in water-energy-food systems and highlights the complementarity role of IAMs to intertemporal decision-making and economic valuation accounting for

	environment					trade-offs between possible users of investment in water resources
Input-Output (I-O)	Demonstrate inter-industry flows showing how output of one sector becomes input to another	I-O table for country/region National Bureau of statistics	The models are easy to implement than full CGE if data exist and scalable across contexts	Simple structure, fewer data requirements compared to full CGE	Static, no price/quantity substitution effects	Kenya Institute for Pulic Policy Research and Analysis elaborates on the utility of I-O tables generated by the Kenya national Bureau of Statistics and the multiplier analysis methodology used to analyzed structural change and growth options (Wanjala 2017)

Social Accounting Matrix (SAM) and Multiplier Models	SAMs extends I-O to include households, factors and institutions to estimate multiplier effects showing how a change in one sector ripples through the economy	National level Statistical Services/Open Sources example Ghana Statistical Services, Kenya National Bureau of statistics IFFPRI Data Sources SAM Data for country/region including supply and use tables, National Accounts, Agricultural Census, Quaterly labour force survey among others	Ease to implement if data exist, scalable across contexts and less demanding Commonly used in value-chain development programmes	Simple structure, fewer data requirements compared to full CGE and good for regional and sectoral impact assessment	Captures short term static effects and less suitable for dynamic feedbacks and structural changes	Pfunzo et al (2024) applied SAM in South Africa and reported inconsistent and incomplete data for sub-matrix disaggregation

Partial Equilibrium/Sector Specific Models Sector specific models like LINKAGE and ENVISAGE	Focus on specific commodity or market modelling supply, demand or price responses to one sector while others sectors are held constant	National Agricultural statistics, trade data sources/FAOSTATS	More replicable and scalable in different countries for different commodities Commonly used in trade policy analysis for specific commodities	Fewer data requirement and simple structure to follow through Can embed detailed technology or production functions	Ignores feedback to other sectors and bias policy impact estimates if there are strong inter economy-wide linkages	Zhoa et al (2015) estimates the linkages of CO2emissions involved in industrial sectors and carbon effects of inter-sectors linkages in South Africa. Practical support for formulation of national policies favorable to energy consumption and environmental protection Dorosh and Thurlow (2018) applied

						CGE/LINKAGE Model to decompose sectoral growth-poverty linkages in five African Countries including Malawi, Uganda, Mozambique, Zambia and Tanzania
Cost-Benefit Analysis (CBA)	Quantifies both costs and benefits of a policy or project in monetary terms. For example investments in	Costs/benefits data Field data sources	Highly replicable and scalable	Intuitive for policy makers, easily communicated and directly links to project/intervention/investment decisions	May ignore general equilibrium effects, distributional impacts and indirect effects. Has limited scope for system-	Following PRISMA guidelines, a systematic review was conducted by Osifowora et al 2024. Specifically to identify application of CBA of

Cost-Effectiveness Analysis (CEA)	irrigation or input subsidy and compute net present value or benefit-cost ratio CEA compares costs per unit of benefit				wide modelling	intervention in the food environment and evaluate the methodological challenges in 28 studies eligible for inclusion in the review. Several of the studies evaluated CBA of fortification of staple foods and reported high economic returns. The authors suggested adherence to standardized methodological frameworks in

						evaluating CBA of interventions.
Econometric/Statistical Impact Evaluation	Use of regression methods, panel data, difference-in-differences, instrumental variables, randomized controlled trails (RCT) to estimate causal effects of policy interventions on outcomes such as	Household Surveys and Panel Data Sources at national/regional level Field Data collection	Highly replicable if data exist but for scalability across different contexts depends on quality of data, design of intervention and attribution of causal effects and may have to be complement	Strong for casual inference at micro-level and good for policy effectiveness (ex-post) Has been used extensively for agricultural policy evaluation	Context specific and may suffer from external validity issues and results may not be generalise	Utility application in assessing effectiveness of interventions and adoption studies in agri-food systems in Africa (Johnstone et al 2023, Verschoor et all 2025)

	yield, income, employment and consumption		ed with other models			
Simulation/Scenario/Mixed System Dynamics modelling/foresight modelling	These methods simulate alternative futures under different policy/regime or shock assumptions	Farm/national/regional level data sources	Highly scalable for different contexts and scales regarding farm, region and national level data for modelling. Replicability depends on how transparent assumptions or data are	Can be used to explain uncertainties, risks management, long-term projections, cross-dimensional trade-offs considering economic, environmental and social impact assessment. Use cases for future transition of food systems under climate change, trade policy shifts and technology adoption	Often high complexity, heavy assumptions and results may be uncertain depending heavily on assumptions	Aboah et al 2024 A meta-network analysis of methodological specifications for system dynamics modelling and point out the challenge in internal consistency while ensuring objectivity within formulated scenarios system dynamics modelling

						amidst stakeholder participation
Stakeholder interviews, focus group discussions, key informant interviews	Semi structured or structured interviews with farmers, policy makers, private sector actors, value – chain actors. Focus group discussions to elicit perceptions of policy,	Qualitative Surveys Field Data collection, content analysis	Highly replicable in different contexts across countries using standardized interview protocols. Scaling may require cultural adaptation and effective translation tools	Rich contextual insight and capturing the unmeasurable to deepen understanding for example of how policies are implemented, perceived, enablers and barriers	Subjectivity, harder to generalize and aggregate	Burgaz et al. (2025) used semi-structured stakeholder interviews to capture perceptions in identifying institutional, financial and political barriers and facilitators for food-systems policy development and implementation. Queenan et al. (2022) used semi-structured

	barriers and enabling conditions among others					interviews and stakeholder engagement to develop and validate a qualitative system-dynamics model of the broiler chicken system.
Participatory Rural Appraisal (PRA)and participatory methods	Involving local stakeholders directly in analysis, mapping value chains, ranking, timeline analysis and community workshops	Co-generation of data at the field or community level	Replicable and scalable for example using standard PRA toolkits	Empowers local voices, captures local knowledge and support ownership of assessment process and helps identify context-specific barriers and enablers	Requires local facilitation skills and results may not be easily comparable across contexts, time - intensive	Prajapati et al.,(2025) used participatory approaches to involve farmers, extension agents and researchers in co-creating context-specific farming practices and knowledge exchange

						Fischer, (2022) used Participatory Rural Appraisal (PRA) methods including mapping, ranking and discussion tools to engage local actors and access their perspectives on heterogeneous livelihood strategies
Case Studies and Governance/Political Economy/Institutional Analysis	In-depth Analysis of policy intervention (or system analysis) and could	Case Studies could benefit from both primary and secondary data sources	Methods can be replicated in different contexts but not very scalable since this is context-	Rich insight into why policies succeed or fail and could be used in political economy analysis	Not easily generalizable and could be time-intensive	In implementing nutrition and sustainability policy into government food procurement, Heenan et al.,

	be with both qualitative and quantitative data		specific and embedded			(2022) used a case-study design to map stakeholders, governance structures, bargaining processes and incentives influencing implementation of healthy/sustainable procurement policies.
Mixed-methods/Integrated Approaches	Both qualitative and quantitative data sources	Ensures richness, robustness and context-sensitivity drawing on economic/biophysical modelling and stakeholder analysis	Well-designed will ensure replicability and scalability Used in analyzing	Balance between quantitative depth and qualitative context to support policy relevance and effectiveness, stakeholder buy-in and improved interpretation	Requires diverse skills and resource intensive	Wayessa, (2023) used a mixed-methods approach combining quantitative analysis of access to livelihood

			cash transfer policy for small-holder farmers in Ghana and Kenya			resources in state-sponsored resettlement and qualitative analysis of the resettlers' and hosts' experiences and perceptions, to capture both magnitude and meaning of development intervention outcomes.

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Funded by the European Union

This project has received funding from the European Union's Horizon Europe Research and Innovation programme under Grant Agreement No. 101136770