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The project consortium is composed of:

BELGIUM	European Alliance on Agricultural Knowledge for Development (**Agrinatura**) **AGRICORD**
BURKINA FASO	Fonds National de la Recherche et de l'Innovation pour le Developpement (**FONRID**)
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Abstract	The transition to a climate-sensitive, integrated agrifood system is critical for achieving the UN Sustainable Development Goal 2, which aims to end hunger and promote sustainable agriculture. To address these challenges, the African Union (AU) and European Union (EU) formed the Food and Nutrition Security and Sustainable Agriculture (FNSSA) Research and Innovation (R&I) Partnership as part of the Joint AU-EU Strategy. The 2016-2026 FNSSA Roadmap which guides the partnership emphasized the need to coordinate R&I policies, a food systems approach, with joint resource management and crosscutting themes like entrepreneurship and capacity development. As the 2016-2026 FNSSA Roadmap winds up, the process of developing a new R&I Roadmap for 2027-2037 has been initiated and will guide future AU-EU investments. This is supported by the AU-EU partnership, through the CEA-FIRST (Consortium Europe-Africa on Research and Innovation for Food Systems Transformation) project. The review of the 2016-2026 FNSSA Roadmap, identified emerging issues, assessed past performance and made recommendations for the next 10-year phase. A structured online survey was developed and submitted to CIRAD for review, then validated by the CEA FIRST Task 2.4 members. It was then distributed across RUFORUM, FARA and AGRINATURA networks and the overall CEA-FIRST Consortium, to collect data from implementers and beneficiaries across Africa and Europe. Both quantitative and qualitative data were collected and analysis analyses run to evaluate project outcomes, stakeholder engagement and areas for improvement. Key findings indicate that the FNSSA projects positively impacted sustainable farming practices, capacity building, research collaboration and food security. The LEAP4FNSSA initiative played a critical role in fostering collaboration, supporting research and building capacity. However, the initiative also faced several challenges including but not limited to coordination issues, resource constraints and funding delays. African partners faced additional difficulties due to currency depreciation and inflation. The need for more balanced participation between and within Africa and Europe and publicity on the FNSSA Roadmap were also noted as a setback in this context.
Keywords	FNSSA implementation, Roadmap review, e survey, stakeholder engagement events

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Abbreviations

AFA	Africa Foresight Academy
AfCFTA	African Continental Free Trade Area
AGRINATURA	European Alliance on Agricultural Knowledge for Development
AI	Artificial Intelligence
AKIS	Agricultural Knowledge and Innovation System
ARC	Agricultural Research Council
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
AU	African Union
AUC	Association of Commonwealth Universities
AUDA-NEPAD	African Union Development Agency New Partnership for Africa's Development
AU-EU	African Union-European Union
AURG	African Union Research Grants
CAADP	Comprehensive Africa Agriculture Development Programme
CAASTNET	Coordination and Advancement of sub-Saharan Africa-EU Science & Technology Cooperation Network
CCSE	Climate Change and Sustainable Energy
CEA-FIRST	Consortium Europe-Africa on Research and Innovation for Food Systems Transformation
CEMAC	Economic and Monetary Community of Central African
CIRAD	Centre de coopération Internationale en Recherche Agronomique pour le Développement (French Agricultural Research Centre for International Development)
CORAF/ WECARD	West and Central African Council for Agricultural Research
CSA	Climate Smart Agriculture
DESIRA	Development Smart Innovation through Research in Agriculture
DG-RTD	Directorate-General for Research and Innovation
DG-AGRI	Directorate General for Agriculture and Rural Development
EAC	East African Community
EC	European Commission
ECOWAS	Economic Community of West African States
ERA ARD	European Research Area on Agricultural Research for Development
ERAFRICA	European Research Area Network for Africa
ERANET	European Research Area Network
EU	European Union
FAO	Food and Agriculture Organisation
FARA	Forum for Agricultural Research in Africa
FNSSA	Food and Nutrition Security and Sustainable Agriculture
FOSC	Food Systems and Climate
H2020	Horizon 2020 Research and Innovation Programme
HEIs	Higher Education Institutions
HLPD	High-Level Policy Dialogue

IOR	Impact Oriented Review
IRC	International Research Consortium
ISS AFRICA	Institute for Security Studies Africa
KC-FNS	Knowledge Centre for Global Food and Nutrition Security
LEAP4FNSSA	Long-term Europe-Africa Partnership for Food and Nutrition Security and Sustainable Agriculture
LEAP-Agri	Long-term Europe-Africa Partnership for Research and Innovation in Food and Nutrition Security and Sustainable Agriculture
MAPLE	Maputo Annual Planning and Learning Event
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation, and Learning
NGO	Non-Governmental Organization
PAEPARD	Platform for African-European Partnership on Agricultural Research for Development
PRIMA	Partnership for Research and Innovation Solutions in the Mediterranean region
PPP	Public-Private Partnership
PROIntensAfrica	IntensAfrica Project for Sustainable Intensification of Agriculture in Africa
R&I	Research and Innovation
RECs	Regional Economic Communities
RINEA	Research and Innovation Network for Europe and Africa
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SADC	Southern African Development Community
SCAR	Standing Committee on Agricultural Research
SDG	Sustainable Development Goal
SLM	Sustainable Land Management
SLU	SVERIGES LANTBRUKSUNIVERSITET
ToC	Theory of Change
ToR	Terms of Reference
UK	United Kingdom
UN	United Nations
US$	United States Dollars
WUR	Wageningen University & Research

List of Annexes

Annex 1: A desk synthesis review report of the FNSSA R&I emerging challenges and prospects

Annex 2: A desk impact-oriented review Report of the outputs and outcomes of the eight years of implementing the 2016-2026 Roadmap.

Annex 3: A document report of the e-surveys on the outputs and outcomes of the eight years of implementing the 2016-2026 Roadmap.

Annex 4: Multi-stakeholder consultation events' report of the Review Report

Annex 5: Draft recommendations of the Research and Innovation priorities for inclusion in the 2027-2037 R&I on FNSSA Roadmap.

I. Context and Background

Food systems transformation is high on the policy agenda both in Africa and in Europe. Food systems actors and the Agricultural Knowledge and Innovation System (AKIS) stakeholders in both Africa and Europe need knowledge and tools to play a pro-active role. This transformation process is seriously hampered by factors including the multiplicity of actors, fragmentation of interventions, peace-meal and projectized nature of the AKIS investments. Agriculture transformation is also challenged by the changes in current drivers of the Agrifood system such as climate change and population growth. Both drivers heighten the need for an accelerated transformation of the food system from a production-dominated one to an integrated climate sensitive food system (agrifood system).

Recognizing the importance of these challenges, the first Joint African Union – EU Partnership Strategy (2007), integrated agriculture and food and nutrition security, environmental sustainability and climate change, and development of knowledge-based societies. Recognizing the increasing commonalities of priorities between the AU and the EU and to operationalize the strategy in a more structured way, a ten-year (2016-2026) Roadmap for a jointly funded EU-AU Research & Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture (FNSSA Roadmap) was developed. Four research and innovation priorities were funded under the FNSSA Roadmap for Research and Innovation (R&I); i) Sustainable Intensification; ii) Agriculture and food systems for nutrition; iii) Expansion and improvement of agricultural markets and trade and iv) Crosscutting issues (improved coordination between European and African FNSSA R&I projects, supporting innovation processes, strengthening collaborative capacities of R&I communities, and social and cultural contexts of FNSSA production systems). These priorities were largely funded through the African Union Research Grants, EU R&I Framework Programme 7, Horizon 2020, and Horizon Europe, but also joint funding schemes with EU and AU Member States such as ERAFRICA, LEAP-AGRI and FOSC and funding tools such as DeSIRA . The 2016-2026 FNSSA Roadmap comes to an end in 2026 and the AU-EU partnership approved through the CEA-FIRST project financing, the development of a new R&I Roadmap on FNSSA for the period 2027-2037.

To effectively engage all the stakeholders in the FNSSA domain in Africa and Europe, the AU/EU International Research Consortium (IRC) Platform on FNSSA was launched in September 2022 as part of the Long-term Europe-Africa Research and Innovation Partnership for FNSSA (LEAP4FNSSA).

The purpose of the IRC is to bring together all the relevant stakeholders in the FNSSA domain to jointly define and implement interventions that strengthen food systems and AKIS to address the complex issues surrounding fragmentation and incoherence in actions due to large knowledge gaps. The European Commission through the Horizon Europe R&I Programme (Cluster 6) provided additional financing to operationalize the IRC under a Coordination Support Action called '***Consortium Europe-Africa on Research and Innovation for Food Systems Transformation (CEA-FIRST)***'. CEA-FIRST specific objectives are to:

- Operationalize the IRC on FNSSA; including its governance bodies, its liaison with the HLPD process, working groups and funding mechanism
- Operationalize the new AU-EU partnership modality through a learning environment and a large knowledge base, including monitoring, evaluation and learning (MEL), creating communication and links between different initiatives to improve cooperation in science, technology and innovation (STI)

- Develop a sound method for the analysis of the results of R&I activities and for identifying research gaps, thus, providing basis for the updating of the EU AU FNSSA Roadmap and
- Increase the synergies and coherence between actors, research and innovation projects, initiatives and funding programmes, through the development of institutional alliances and clusters of projects and expertise.

CEA-FIRST Project officially started on December 01, 2023. It will be delivered through the implementation of seven work packages (WP) as follows:

Work Package 1	CEA-FIRST Project and IRC Start-up
Work Package 2	Consolidation of Knowledge Management & Monitoring, Evaluation and Learning tools and support to the FNSSA Roadmap update
Work Package 3	Strengthening Networking and Stakeholder Engagement
Work Package 4	Knowledge and learning facilitation using information generated from the Knowledge Management Platform and the MEL
Work Package 5	Implementing IRC Functions Through Stakeholder Engagement
Work Package 6	Coordination of CEA-FIRST and IRC Pilots. CEA-FIRST activities will be conducted under the control and guidance of the EC REA Project Officer
Work Package 7	Ethics Requirements

As part of the activities under WP2 - ***Consolidation of Knowledge Management and Monitoring, Evaluation and Learning tools to support the FNSSA Roadmap update***", Task 2.4 co-led by RUFORUM and CIRAD and working with AGRINATURA, SLU, WUR, FARA, ARC, and UH will support the process of updating of the 2016-2026 FNSSA Roadmap. The priorities of the new Roadmap will guide the AU-EU R&I investments for the period 2027-2037. Task 2.4 of the CEA-FIRST project focuses on evaluating the progress of the initiatives of the current FNSSA Roadmap in the context of emerging priorities and setting the stage for the next Roadmap phase (2027-2037). In line with this, RUFORUM sub-contracted two independent consultants, Alex Percy-Smith and Prof Adipala Ekwamu, originating from Europe and Africa, respectively to carry out an independent evaluation of the implementation of the FNSSA Roadmap, and contributed to the logistical, technical, and strategic orientation of the review process. CIRAD appointed Bernard Mallet to support the consultants.

II. Objectives of the review of the FNSSA Roadmap 2016-2026

The review of the FNSSA R&I 2016-2026 Roadmap was guided by three primary objectives:

a) **To Identify FNSSA R&I challenges and prospects:** The review sought to uncover emerging challenges and opportunities within the current FNSSA R&I Roadmap, provided insights into areas that required attention and innovation.
b) **To assess past performance:** An independent evaluation assessed the effectiveness of the Roadmap's implementation, focused on its impact in achieving the objectives of the AU-EU Research and Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture.
c) **To formulate recommendations:** Based on findings, the review made recommendations for the next phase of the FNSSA R&I Roadmap (2027-2037), aimed at refining and enhancing the strategic direction and implementation of future initiatives.

III. Methodological approach

To undertake the review of the eight years implementation of the 2016 – 2026 FNSSA Roadmap, three different and complementary methodological approaches were applied.

3.1. Desk review

The approach to the desk review involved two parts.

Part 1 or 'desk synthesis review' was a critical review of existing literature to come up to a synthesis of FNSSA R&I challenges and future prospects. Strategic documents from Africa and Europe that target the FNSSA Roadmap were consulted. These included documents on **Policies, Partnerships, Funding mechanisms and Foresight studies.** The main sources of literature were various policy documents, LEAP4FNSSA studies and in Foresight4Food documents. The outputs of such review were used to make recommendations to inform decision making in updating the roadmap.

Part 2 was an 'impact-oriented review' of the outputs and outcomes of the eight years of implementing the 2016-2026 Roadmap. An assessment has been made of whether the Roadmap has achieved impact with a view to drawing outcomes, conclusions and lessons learnt for impacts of innovations. Information for the assessment has been derived from reviewing the work to date of the Monitoring, Evaluation and Learning (MEL) Framework; consideration of the 11 M&E criteria in the Roadmap and the effectiveness of the four research and innovation themes (Sustainable Intensification, Agriculture & Food Systems for Nutrition, Market expansion & improvement, Cross-cutting issues).

The 'impact-oriented review' focused on the reports of programmes rather than individual projects funded under the four themes. This was complemented by (i) the analysis by CIRAD of projects and programmes implemented under the "EU-AU FNSSA Roadmap 2016-2026" umbrella as part of the CEA-FIRST project which will result in a project deliverable D2.2; and (ii) the online survey results, (iii) implemented as part of task2.4 and (iv) the multi-stakeholders consultation events.

3.2. Online surveys

As part of the review process, an online survey was carried-out to consider the input of many stakeholders as possible in the African Union and the European Union. This study used a cross-sectional research design, employing both qualitative and quantitative approaches to evaluate the outcomes of FNSSA projects. A structured online survey tool was developed as a primary data collection instrument. This tool was rigorously validated by members of the Task 2.4 of the CEA-FIRST project. To cater for a broader demography, the questionnaire was subsequently translated into French. This translated instrument was piloted by RUFORUM to assess its effectiveness in terms of content accuracy, validity and reliability before full-scale distribution.

The survey leveraged on the established networks of RUFORUM, the Forum for Agricultural Research in Africa (FARA) and AGRINATURA for distribution to achieve extensive dissemination of the questionnaire in both Africa and Europe. Additionally, individual and collective emails were sent to target respondents and networks of respondents, as well as through the RUFORUM weekly newsletters and physically during the various stakeholder consultation workshops held under this review assignment. RUFORUM and FARA were instrumental in reaching out to respondents in Africa while AGRINATURA and CIRAD supported outreach in Europe. The survey targeted both implementers and beneficiaries of FNSSA projects across these continents. To increase response rates, comprehensive instructions were provided, emphasizing

the voluntary nature of participation. Measures to ensure respondent anonymity and confidentiality were implemented to augment the integrity of the data collected.

After the data collection process, the responses were downloaded, cleaned and entered in SPSS software (version 24) for analysis. Both qualitative and quantitative primary research methodologies were applied in combination to triangulate information in order to provide a more comprehensive understanding of the outcomes of the FNSSA programme.

The survey solicited feedback from all stakeholders in the FNSSA domain and input on the suggestions for the 2027-2037 FNSSA Roadmap. Input from stakeholders was useful in enriching the desk study with key successes, level of achievement of expected outcomes of the R&I programmes in the 2016-2026 Roadmap priority areas.

3.3. Multi stakeholders consultation events

A series of multi-stakeholder consultation workshops were designed and implemented either as webinar or in-person workshops sometimes delivered in hybrid format in both Europe and Africa. The aim was first to include the voices of the various stakeholders in Europe and Africa on the outputs and outcomes of the eight years implementation of the roadmap; challenges and emerging issues and secondly to validate findings from the various activities implemented as part of the review process (desk synthesis and impact – oriented reviews and the online survey). To account for the language diversity prevailing in both Africa and Europe, concept notes and flyers were developed in French and English. Likewise, interpretation services were provided during the events in the four RUFORUM languages. These stakeholder consultation workshops offered a platform for dynamic discussions and the generation of actionable recommendations for the new FNSSA Roadmap (2027-2037). The consultations were held at national, regional, and continental levels (for Africa) and at National and Continental levels (for Europe) to account for the specific context of each continent and to ensure inclusive engagement with diverse actors across different contexts. These events were pivotal not only in gathering feedback but also in advancing the operationalization of the IRC. This platform is envisioned to foster collaboration, knowledge sharing, and innovation across Africa and Europe, reinforcing the long-term goals of the FNSSA partnership.

IV. Key findings

4.1. FNSSA R&I challenges identified and future prospects

4.1.1. Policies

a. Global - SDGs

A study[1] carried out under the LEAP4FNSSA project, was published in September 2020. This study found that the Roadmap 2016 – 2026 is aligned with the SDGs. There is no indication in the reports and literature published since that the Roadmap 2027-2037 should not continue to be aligned with SDG2.

[1] Implications of the content of recent European Union and African Union policy documents on the Food Nutrition Security and Sustainable Agriculture (FNSSA) Roadmap. LEAP4FNSSA September 2020 53pp

b. CAADP

The Comprehensive Africa Agriculture Development Programme (CAADP) is Africa's policy framework on agricultural transformation, wealth creation, food security and nutrition, economic growth, and prosperity for all. CAADP goal is an agriculture led development that eliminates hunger, reduces poverty and food insecurity, enabling expansion for exports and higher economic growth path based on sustainable development and natural resources preservation principles. The 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods constitutes a recommitment to the CAADP principles and values through seven commitments.

Stakeholder validation of the Post Malabo Agenda will be held during the 2024 CAADP Partnership Platform and Maputo Annual Planning and Learning Event (MAPLE) in October 2024. The objective will be to facilitate awareness, dialogue, learning and reflection on the content of the agenda, so there are opportunities for IRC to promote the Roadmap.

c. Africa - AU Agenda 2063

The new 10-year plan of the AU 2063[2], covering the period 2024 to 2033, does not specifically mention FNSSA or the Roadmap. The AU Agenda 2063 presents Africa's seven aspirations with a total of 20 goals for the future and identifies key Flagship Programmes which can boost Africa's economic growth and development and lead to the rapid transformation of the continent.

d. Africa/Europe – AU-EU Innovation Agenda

Strengthening R&I cooperation between the AU and the EU is a key priority. In July 2020 ministers agreed to focus cooperation efforts on four priority areas, namely: Public Health, Green transition, Innovation & Technology, and Capacities for Science. The AU-EU Innovation Agenda[3] was adopted in 2023 and aims to enhance cooperation in science, technology and innovation. It aims to foster the translation of R&I into tangible positive impact on the ground. It also highlights issues like climate change, entrepreneurship and job creation among others which should be taken into account in the FNSSA Roadmap.

When the AU-EU IRC on FNSSA was launched in September 2022, the EU declared that the Roadmap probably lives up to the four objectives of the Joint AU-EU Innovation Agenda (*Make it real; Generate Impact by design; Strengthen people, communities and institutions; Learn, monitor and scale it up*). Activities need to accelerate.

e. Europe - Green Deal and Farm-to-Fork

The European Green Deal policy[4] was approved in 2020 as a set of policy initiatives which aim at making the EU climate neutral in 2050. The policy has implications for Africa. As part of its "Farm to Fork" policy[5] package, the EU aims to become a leader in setting sustainable global food standards and aims to make food systems fair, healthy and environmentally friendly. Compliance with these standards as a condition for accessing the European market could constitute additional nontariff barriers for African agriculture exports

[2] DECADE OF ACCELERATED IMPLEMENTATION: A 10-year strategy for Agenda 2063 pp52
[3] Roadmap of the AU-EU Innovation Agenda 4 May 2023, 47pp
[4] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/story-von-der-leyen-commission/european-green-deal_en
[5] https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

to the EU. The AU-EU partnership can help address these challenges. This indicates a need to intensify efforts within theme 3 "Expansion and improvement of agricultural trade and markets".

4.1.2. Partnerships

A LEAP4FNSSA study[6] published in 2020 concluded that projects contribute towards fulfilment of the Roadmap goals and are in line with the FNSSA partnership values. The study observed that a wide range of partners were involved in the projects including universities, research organisations/agencies, government bodies, private sector partners and expert networks. Universities and research organisations were involved in the largest number of projects, and expert networks and the private sector being were least involved in terms of numbers.

4.1.3. Funding mechanisms

CIRAD carried-out an in-depth analysis of FNSSA research activities and detailed results (including the funding mechanisms) can be found in CEA FIRST deliverable D2.2. Here are some highlights.

a. Africa - African Union Research Grants (AURG)

The AURG programme[7] has provided competitive funding for grants and direct funding for Pan-African Science and Technology (S&T) for sustainable development, building and strengthening Africa's S&T capacities. The calls provide funding for projects with a budget of between US$ 500.000 and US$ 1.000.000. The second call (2024) is closing, and the future of this mechanism is currently uncertain. The areas of Climate & Development and Science, Education and Culture are areas of relevance for the FNSSA Roadmap. The EU provides funding for the AURGs. 32 projects have supported FNSSA R&I in 30 African countries.

b. Intra-Africa Academic Mobility Scheme

The Intra-Africa Academic Mobility Scheme (2022-2027)[8] is the EU's programme to encourage international learning mobility across the African continent. Whilst not targeting FNSSA as such this is a useful source of much sought after funds. It aims to support learning opportunities, exchanges, and cooperation ultimately to promote Africa as an attractive study destination.

c. Europe - DeSIRA

The Development Smart Innovation through Research in Agriculture (DeSIRA) programme[9] focuses on climate but does not solely focus on Africa. The first phase is from 2019 to 2026. The EU funded programme aims at strengthening research capacities and research governance. FNSSA is specifically mentioned by the DeSIRA programme. Some 335.000.000 euro have been invested in 68 projects. The new FNSSA Roadmap must monitor possibilities of funding of projects in possible new DeSIRA calls.

[6] "Study on the projects funded to support the FNSSA Partnership"
[7] https://au.int/en/aurg
[8] https://www.eacea.ec.europa.eu/news-events/news/new-publications-intra-africa-academic-mobility-scheme-2022-2027-2024-05-30_en
[9] https://capacity4dev.europa.eu/projects/desira_en

d. Europe - LEAPAgri

The LEAP-Agri project[10] (A Long-term EU-Africa research and innovation Partnership on Food and Nutrition Security and Sustainable Agriculture) was a joint Europe and Africa R&I initiative in FNSSA under the EU H2020 programme. A total of 18 European and African countries co-funded 27 joint R&I projects with a total budget of 22,7 m. euro to target FNSSA. The EC funded 33% of this amount. The projects mainly focussed on the Roadmaps' crosscutting theme. LEAP-Agri highlighted that the ending of the ERA funds would make it more difficult for EU-AU researchers to attract funding for joint programs. The Partnerships in Horizon Europe (that have replaced the ERA nets) focus mainly on Europe. An important outcome of this project for the FNSSA Partnership was the establishment of the AU-EU Funder's Network.

e. Europe – FOSC

The European Research Area Network Cofund Food Systems and Climate (FOSC)[11] was started in 2019 and will run with an extension period until 2025. The Co-fund receives funds from the H2020 and builds on earlier experience including LEAP-Agri. A range of activities are implemented under this project. This project also focuses on Latin America and the Caribbean apart from Africa and Europe. 18 European and African countries have co-funded 22 joint R&I projects on Agriculture and Climate change.

f. PRIMA

The Partnership for Research and Innovation solutions in the Mediterranean region (PRIMA) has co-funded 238 joint projects (2018-2023) in 20 European and African countries. A total budget of about 350m euro has been used in the Mediterranean region within the agricultural sector. PRIMA is supported by the EU.

4.1.4. Emerging issues and future prospects

a. Megatrends in Africa

The Ministry of Foreign Affairs, Finland commissioned a study of Megatrends in Africa[12] which was published in 2019. Six major trends in Africa are identified: population growth, climate change, urbanisation, migration, technological development and democracy. However, there are regional differences, e.g. fertility rate. The trends are interlinked; however, population and climate are more central than others. The report emphasises the role of land use and land cover change to agriculture in Africa, and the ecosystem service impacts and the importance of remote sensing. It does mention both resilience and sustainable intensification as well. It concludes that mitigation and adaptation is needed for example to address land coverage change and thereby climate change, and development of climate-smart agriculture is needed.

b. Foresight studies

The Foresight Africa 2024 report[13] stressed-out the rapidly changing global and regional environment, which requires focusing on five thematic areas: development financing, climate change, digital economy,

[10] https://leap-agri.com/?page_id=234
[11] https://www.foscera.net/en/foscera/projects.htm
[12] Megatrends in Africa
[13] https://www.brookings.edu/wp-content/uploads/2024/01/ForesightAfrica2024.pdf

entrepreneurship, and trade and regional integration. The report also highlighted three crosscutting themes: governance, gender, and youth that are underscoring these five key pillars.

c. ISS African Futures

ISS African Futures with AUDA-NEPAD conduct independent research on Africa's development prospects using a dynamic, and continually updated forecasting platform to understand the potential progress of the African continent. This can be found at https://futures.issafrica.org/. The site offers in-depth scenarios and trajectories modelled for each African country, aligned with the African Union's Agenda 2063 vision, to illuminate the continent's progress. The country-level forecasts and impacts are integrated and presented at the regional level for various geographic and economic communities, such as North Africa or ECOWAS. Continent level analyses are also offered. The separate scenarios modelled include agriculture.

4.1.5. Disseminating and accessing FNSSA information

The approach of information dissemination regarding the call for innovative proposals for FNSSA is central to the reach and spread of FNSSA work and goals. **Figure 1** shows that majority of organisations received information on FNSSA from colleagues (52%) followed by website (25%) and RUFORUM networking information (12%) and others (11%). This underscores the current key information pathways to make partners aware of the FNSSA opportunities especially for the pipeline Roadmap. Based on the results, the findings indicate the primary channels for disseminating information about FNSSA opportunities to potential partners through personal networks and online platforms. This suggests that a targeted approach focusing on leveraging existing relationships, as well as utilising digital resources, is crucial for effectively reaching and engaging potential partners, going forward.

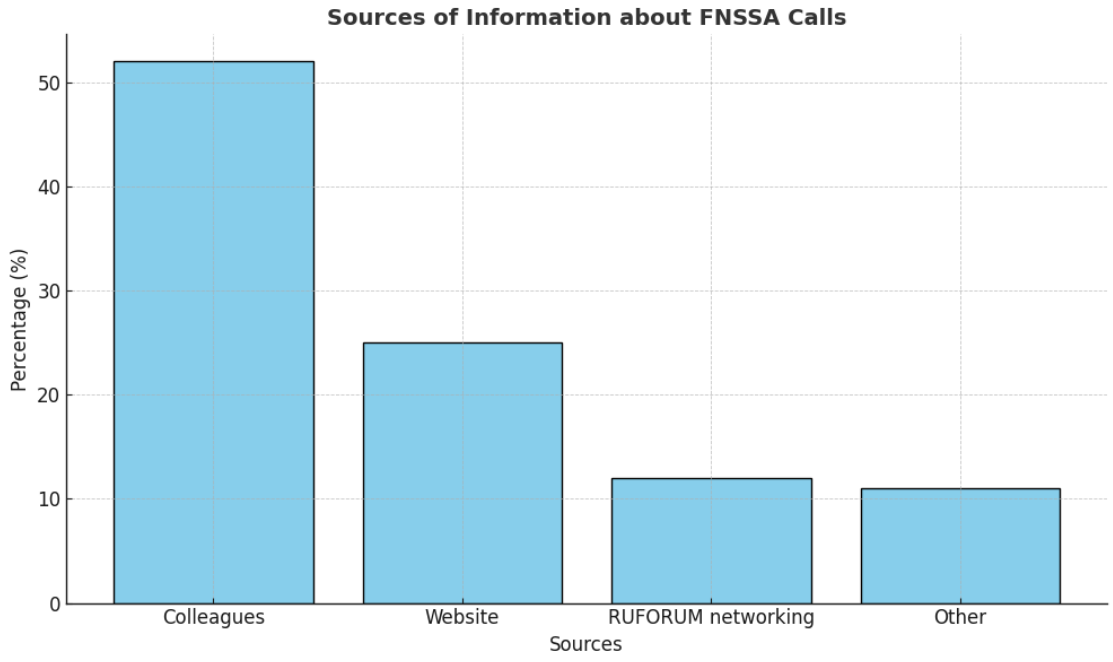

Figure 1: Channels through which respondents were informed about FNSSA initiatives

4.2. Performance assessment of the past eight-year's implementation of the Roadmap 2016-2026

4.2.1. Objectives

This objective of the review seeks to identify achievements, challenges, and opportunities for improvement, for guiding the strategic direction of future FNSSA activities. To do so, an independent evaluation assessed the effectiveness of the 2016 – 2026 Roadmap's implementation, focusing on its impact in achieving the objectives of the AU-EU Research and Innovation Partnership on Food and Nutrition Security and Sustainable Agriculture.

It is worth recalling here that the African Union (AU) and the European Union (EU) Food and Nutrition Security and Sustainable Agriculture (FNSSA) Research and Innovation (R&I) Partnership aims at transforming agriculture from a production-centric to a climate-responsive, integrated agrifood system in order to address the pressing challenges laid out in Sustainable Development Goal (SDG) 2. This goal seeks to eradicate hunger, achieve food security, enhance nutrition, and promote sustainable agriculture in an increasing complexity of these global challenges—ranging from climate change impacts to shifting socio-economic landscapes. The 2016 – 2026 Roadmap was launched as a joint endeavour designed to foster innovative research and policy solutions to the above challenges across Africa and Europe.

4.2.2. Key Outputs

a) The number of projects implemented during the eight years of the Roadmap

The FNSSA project database[14] contains 547 entries (31.07.2024). Of the 547 projects about two-thirds have been completed, the remaining are ongoing.

b) Performance of the Roadmap per priority theme

The projects are identified as addressing one or more of the four priority themes. Table 1 highlights project distribution per priority theme.

Table 1. FNSSA database project distribution per priority theme.

Themes	No. of projects	% of total
Sustainable intensification	403	74
Agriculture and food systems for nutrition	167	31
Expansion and improvement of agricultural trade and markets	86	16
A group of cross-cutting topics	116	21
Total	547	

It is clear from the data above that Sustainable Intensification is the theme addressed by the largest number of projects (74%), but there is no measure of whether this is a well justified thematic focus. It is likely that most projects addressed agricultural practices and technologies and their adoption which leads to them being included under this theme and would not fall under the other themes. They might have focused on increasing biodiversity, household food security, income diversity, resilience to climate change etc. but would fall under this theme. Sustainable intensification covers a broad area and classification of projects has limitations. A LEAP4FNSSA study[15] published in 2020 concluded that the Roadmap is rather

[14] FNSSA project database (wur.nl)
[15] "Study on the projects funded to support the FNSSA Partnership"

unbalanced in terms of themes and recommended more focus on “Trade and markets”. A deeper analysis is needed to provide more useful data and justification for the choice of this (and other) themes.

The Online survey also showed that activities under the FNSSA 2016-2026 Roadmap made substantial progress in addressing key challenges related to food and nutrition security and sustainable agriculture. A notable focus was innovations within the agriculture and food systems in the nutrition sector. **Figure 2** illustrates that 64% of the respondents who indicated that their organisation/institution was involved in at least one FNSSA R&I project, indicated agricultural and food systems as a focus for their innovation projects under the FNSSA initiative. Considering the two regions, Africa and EU, still the key priority area was Agriculture and food systems and followed by aspects targeting priority theme 4, namely, crosscutting issues such as improved AU-EU R&I project coordination, enhanced innovation processes, strengthened R&I community collaborations and consideration of social and cultural contexts within FNSSA production systems. Among the crosscutting issues, improved European-African R&I project coordination stood out as the main area considered by participants in the FNSSA initiative.

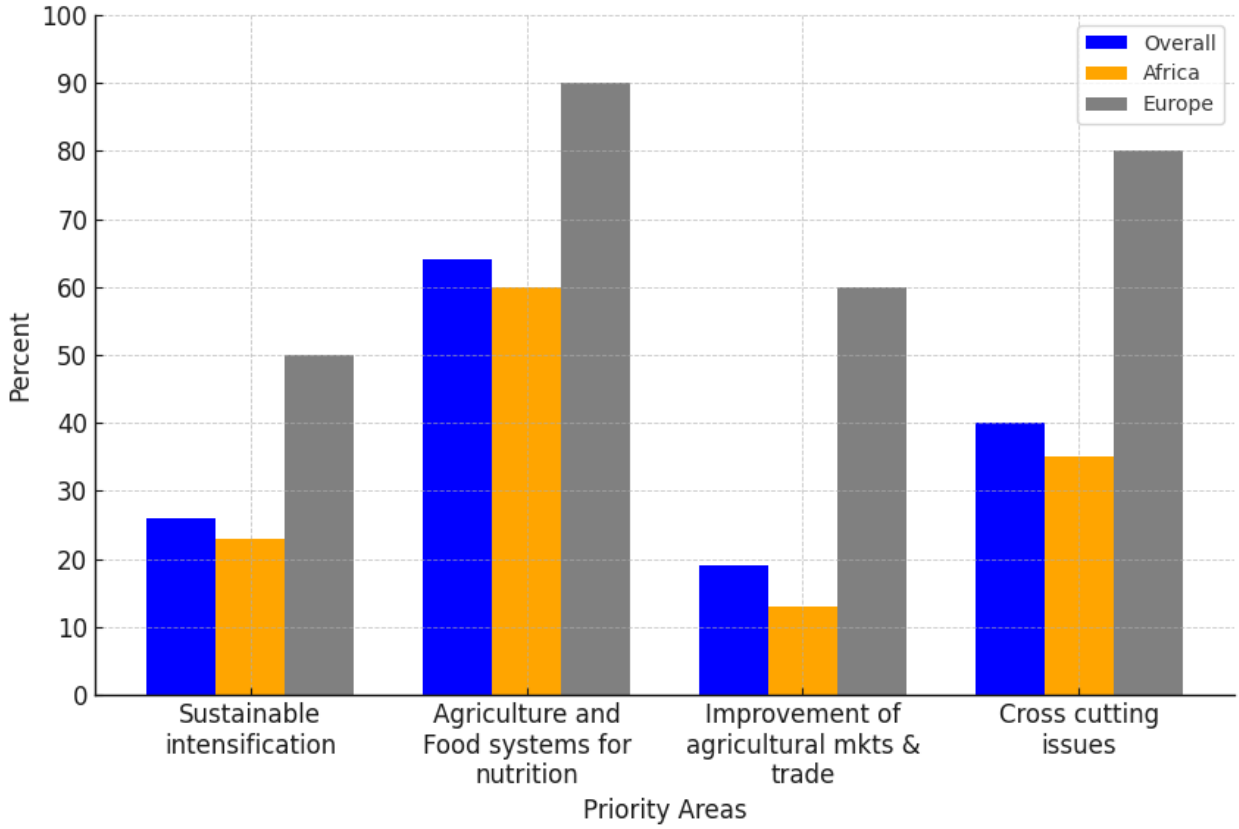

Figure 2: Choice of priority areas by FNSSA participating institutions/organizations

c) Types of project

The projects are divided into one or more of six project types as indicated in Table 2 below. Some projects are more than one type.

Table 2. FNSSA database projects' distribution per type

Type of project	No. of projects	% of total
Development and innovation-oriented (research) projects	292	39
Applied research projects	250	33
Institutional capacity building projects	118	16
Strengthening partnerships and alignment projects	40	5
Personal capacity building projects	28	4
Fundamental research projects	20	3
To be determined	5	1
Overall	753	100

Statistics from the LEAP4FNSSA projects database point to the lack of balance in the themes addressed; the lack of investment in strengthening partnerships and personal capacity building and imbalance in participation of the various stakeholder groups. A very small percentage of the projects fall into the categories strengthening partnerships and personal capacity building. However, outcomes of other projects are likely to include elements of capacity building. Justification of the balance between the various types of projects should be considered. The LEAP4FNSSA study from 2020 recommended that improved capacities and infrastructure for better data collection and analysis should be included probably as a crosscutting theme.

d) Location of projects in the FNSSA database

The database includes a section on "Location". It appears that a country is included if the project includes a partner from this country. A quick search provided data, which gave some insights. The location of projects is firstly divided between Africa and Europe with a larger number of countries from Africa (67%) being represented. This may partly be explained by the number of countries and partly by the larger population in the two continents. According to the UN there are 44 countries in Europe and 54 in Africa and the population of the two continents are registered as 746 million in Europe in 2018 and 1.216 million in Africa in 2016. Within the continents, there is a large diversity in the sub-regions covered. In the database, Europe is divided into four regions Northern, Southern, Eastern and Western, whilst Africa is divided into five regions namely Central, Eastern, Northern, Southern and Western. The number of projects in each continent and each of their respective regions is provided in Figure 3.

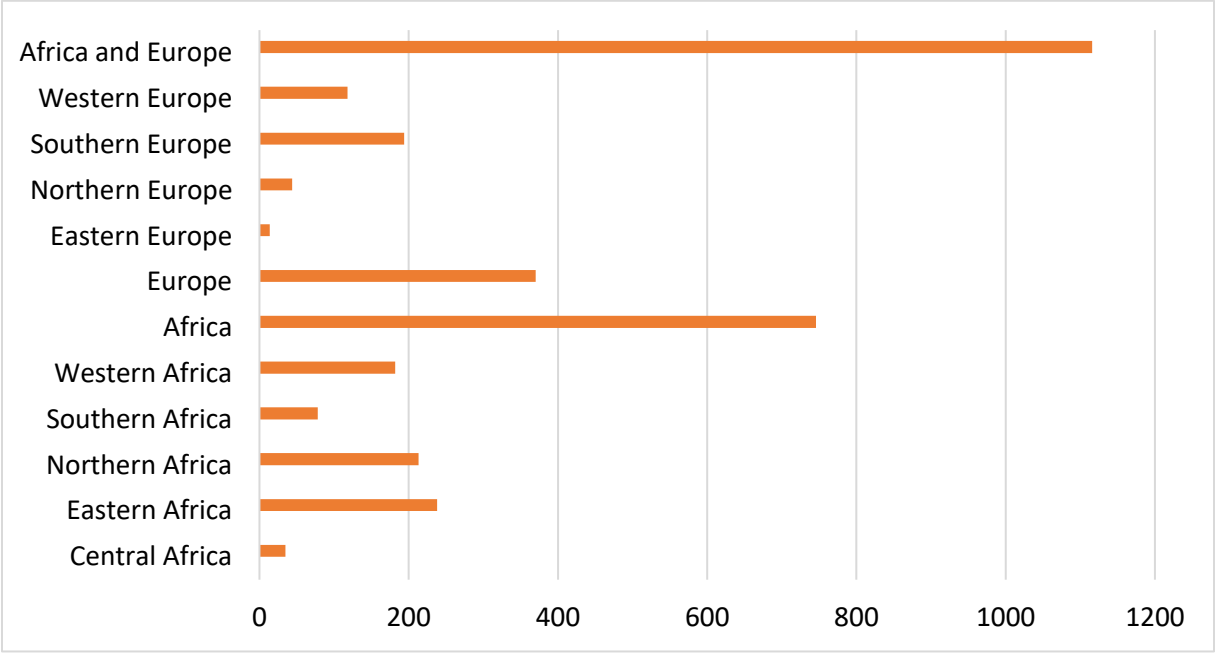

Figure 3. The distribution of projects in Africa and Europe in the FNSSA database

There are about twice the number of projects focussing on Africa compared with Europe. This is clearly not balanced and could be questioned in an "equal" partnership between Europe and Africa. In Africa the greatest number of countries are to be found in the Eastern and Northern regions whilst in Europe the greatest number is in the Southern and Western regions. There may be explanations for this imbalance including links between European countries and former colonies as well as traditional ties of collaboration, etc. However, it is not the purpose of this assignment to make judgement on these aspects.

e) FNSSA database projects' distribution by type of organization

A broad range of type of organisations participate in FNSSA projects, as illustrated in Figure 4 below. There is a considerable imbalance in involvement of the full range of stakeholder groups in FNSSA projects with the dominance of universities and research organisations and the notable low involvement of farmers but also of agri-businesses and NGOs. It should be noted that the EC's, DG-Agri has emphasised the need for increased inclusion of farmers in the FNSSA initiatives.

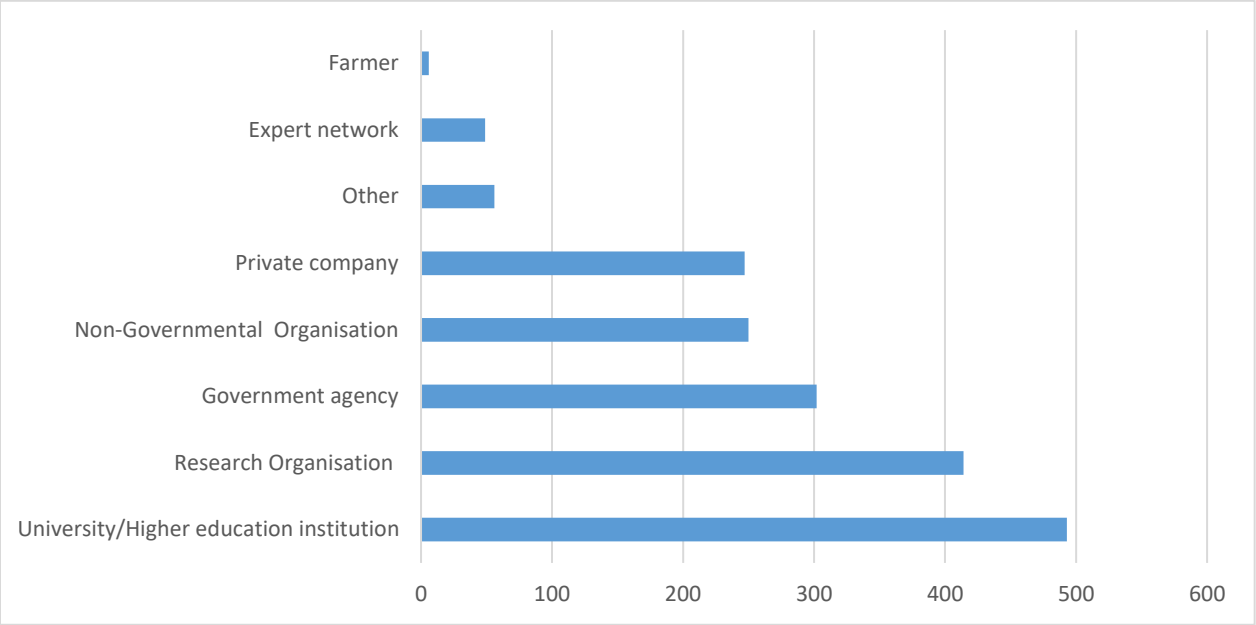

Figure 4. Project distribution in the FNSSA data by type of organization

f) Special topics coverage in the FNSSA database

The ToRs request review of subjects such as environment, one health, biodiversity, food security and nutrition in the face of climate change and conflicts. A rapid search in the Leap4FNSSA database for these topics and other relevant topics yields the following information (Table 3).

Table 3. The number of projects per special topic in the FNSSA database

Topics	No. of projects	% of total
Climate change	**223**	**40,8**
Environment	**134**	**24,5**
Biodiversity	**95**	**17,4**
Food and Nutrition Security	**78**	**14,3**
Food security and nutrition in the face of climate change and conflicts	**1**	**0,2**
One health	**41**	**7,5**
Marketing	**42**	**7,7**
Markets and Trade	**16**	**2,9**
Youth	35	6,4
Gender	39	7,1
Gender opportunities	5	0,9
Digitisation	1	0,2

From this Table it appears that a reasonable number of projects have addressed Climate change, environment and biodiversity. It is surprising that less than a fifth of the project address Food Security and Nutrition. The topics which are addressed by very few projects indicate that these need a greater focus of attention, i.e., gender, youth, digitisation, FNSSA and conflicts, links to health, markets and trade.

4.2.3. Key outcomes

a) Fulfillment of the roadmap goals

The 2016 – 2026 Roadmap was launched as a joint endeavour designed to foster innovative research and policy solutions to SDG2 - to eradicate hunger, achieve food security, enhance nutrition, and promote sustainable agriculture in an increasing context of complex and global challenges—ranging from climate change impacts to shifting socio-economic landscapes across Africa and Europe. The baseline study report by the LEAP4FNSSA Baseline carried out in 2020[16], with 105 selected FNSSA R&I projects funded under the Partnership's constituent supporting programmes (H2020, LEAP-Agri and AURG) found that broadly speaking, FNSSA R&I projects funded under different schemes have contributed towards fulfilment of the Roadmap goals and are in line with the FNSSA partnership values. Similar results were found by the online survey of the current study (Figure 5).

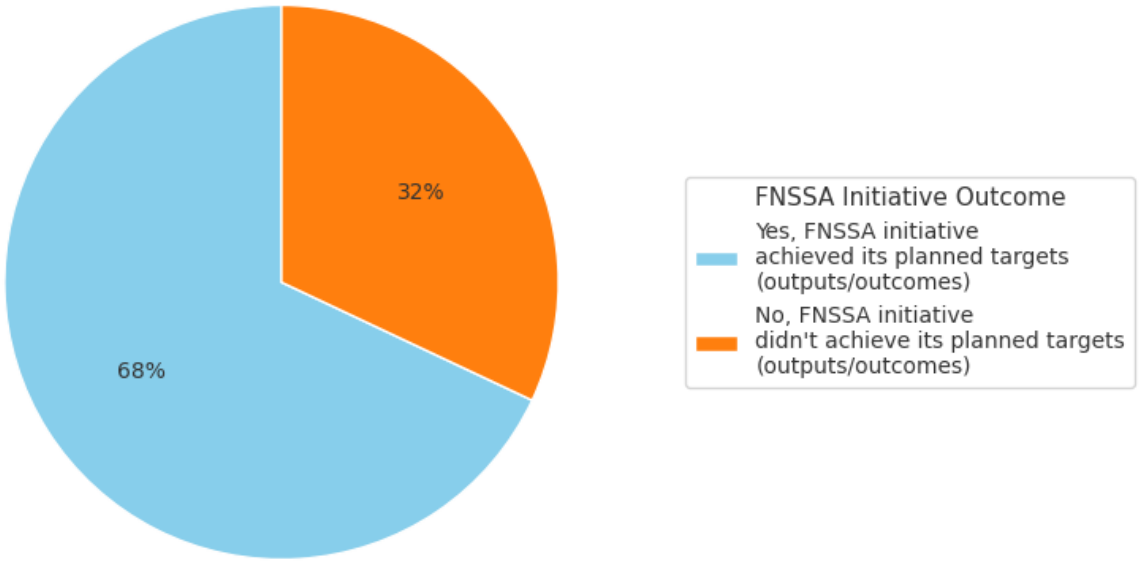

Figure 5: Sentiment of respondent stakeholders to the online survey in achievement of FNSSA target goals

b) Coverage of the four priority themes

Among the four priority themes of the roadmap, the same baseline study reported that most of the 105 projects studied address the theme "Sustainable intensification", whilst the theme "Expansion and improvement of agricultural markets and trade" has the least number of projects.

[16] LEAP4FNSSA - Deliverable N.: D1.4. Title: LEAP4FNSSA Baseline Study and Progress Update – Working Draft 2 November 2019, 97pp

c) FNSSA partnership and projects coordination

The LEAP4FNSSA baseline study also reported that there was a wide range of partners involved in the projects and these include universities, research organisations/agencies, government bodies, private sector partners and expert networks. Staff at universities and research institutions drive the design and implementation of the Partnership's research and innovation activities but activities are based on pre-identified shared priorities. Funding challenges exist, but partnerships have remained resilient to these challenges, value add of the Partnership of continued facilitation and building of bi-continental R&I partnerships. Capacity has been built across the Partnership. Other key findings were that there was insufficient private sector involvement and project coordination was mainly from Europe partners.

4.2.4. Highlights from stakeholders' consultation events

This assignment implemented five stakeholders' consultation events for Africa and Europe stakeholders. The key highlights are summarized below.

a) Human Resources and Infrastructure Development

The FNSSA Roadmap significantly advanced the development of human capital and research infrastructure across Africa and Europe, particularly within the agricultural sector. By prioritizing capacity-building initiatives, FNSSA empowered researchers, agronomists, policymakers, and other key stakeholders to drive agricultural innovation and respond effectively to emerging challenges.

The establishment of state-of-the-art research facilities, particularly in biotechnology, plant breeding, and climate-smart agriculture, underscored FNSSA's commitment to building institutional capacity. These facilities have enabled the development of new crop varieties, improved pest and disease management strategies, and advanced techniques in soil health management.

One notable achievement was the development of enhanced sweet potato varieties, which exemplifies FNSSA's success in translating research into actionable agricultural solutions. These varieties contributed to improved productivity and nutritional security, especially in regions grappling with malnutrition and food insecurity. This success illustrates the broader potential of targeted research to deliver sustainable agricultural systems that bridge the gap between scientific innovation and real-world application.

Moreover, FNSSA facilitated the formation of cross-continental research networks, including Intra-Africa Academic Mobility grants, which fostered collaboration among previously uncoordinated research institutions. This multidisciplinary ecosystem promoted knowledge exchange, shared learning, and technology transfer between African and European stakeholders. The resulting alignment of research goals and methods contributed to a cohesive agricultural research framework that supports the global objectives of food and nutrition security and sustainability.

b) Policy Engagement

FNSSA's influence on agricultural policy has been profound, driving significant reforms at both national and continental levels. A key achievement was the African Union summit on soil health and fertilizers, where FNSSA's evidence-based advocacy led to the adoption of improved soil management practices. These reforms have not only enhanced soil fertility but also contributed to more sustainable farming practices, demonstrating the roadmap's capacity to translate scientific research into impactful policies.

FNSSA's commitment to evidence-based policymaking has set it apart as a catalyst for agricultural governance. By grounding policy recommendations in rigorous research, FNSSA has advanced the development of adaptive policies that are responsive to new challenges, including climate change and market dynamics. This alignment of empirical research with policy formulation has ensured that FNSSA's initiatives are not only scientifically robust but also politically viable, providing a strong foundation for long-term agricultural reform.

The roadmap has also strengthened the science-policy interface, ensuring that research findings directly inform decision-making processes. This interface has been instrumental in advancing sustainable agricultural practices, enabling governments to integrate scientific insights into national and regional strategies aimed at tackling food and nutrition insecurity, climate change, and socio-economic disparities. FNSSA's ability to shape responsive policies has been one of its defining achievements, enhancing the relevance and impact of its research outputs.

c) Collaboration and Trade

FNSSA has been highly effective in promoting cross-border collaborations between higher education institutions (HEIs), research organisations, and private sector stakeholders across Africa and Europe. These partnerships facilitated the transfer of agricultural technologies, knowledge, and best practices, accelerating the adoption of sustainable agricultural innovations. Through these collaborative efforts, FNSSA created a more integrated agricultural network that enhances resilience to market disruptions and environmental shocks.

By breaking down trade and regulatory barriers, FNSSA enabled the free flow of goods and technologies that support the modernization of agricultural sectors in both continents. The roadmap encouraged countries to share best practices and technological innovations, addressing common challenges such as food and nutrition security and climate change. This collaborative approach fostered a sense of regional integration, strengthening the agricultural sector's capacity to respond to global market demands and contribute to resilient food systems.

FNSSA's approach to collaboration extended beyond traditional research partnerships to include trade facilitation, creating a more efficient agricultural trade network that benefits both African and European economies. By promoting cross-border collaboration, FNSSA laid the groundwork for sustainable agricultural trade that supports economic growth, poverty reduction, and food security.

d) Increased EU Support

One of FNSSA's key successes has been its ability to mobilise increased financial and institutional support from the European Union. This support was instrumental in scaling up agricultural innovations and sustaining long-term projects that align with broader development agendas such as the European Green Deal and the Sustainable Development Goals (SDGs). FNSSA's strategic positioning within these global frameworks attracted significant EU investment, enabling the expansion of its initiatives across multiple regions.

The funding secured through FNSSA facilitated the implementation of projects focused on sustainable intensification, nutrition-sensitive agriculture, and climate resilience. This financial backing allowed FNSSA to scale successful innovations, ensuring that research outputs reached marginalized communities that are most vulnerable to the impacts of climate change. By demonstrating measurable positive outcomes in agricultural research, FNSSA strengthened its capacity to attract ongoing EU investment, enhancing the roadmap's sustainability and impact.

V. Challenges in Implementation

5.1. Scaling and Regulatory Barriers

Despite FNSSA's achievements in developing innovative technologies, scaling these innovations remains a significant challenge. Many technologies that proved successful in research settings have struggled to gain traction due to complex regulatory environments. Fragmented and inconsistent regulatory processes across regions have hindered the adoption of new technologies aimed at addressing critical issues such as deforestation, biodiversity loss, and food and nutrition insecurity.

To overcome these barriers, there is a pressing need for more streamlined and harmonized regulatory frameworks that facilitate cross-border collaboration and technology adoption. Simplifying regulatory processes would not only accelerate the scaling of innovative solutions but also enable broader regional cooperation in addressing shared agricultural challenges. Harmonized regulations could support the widespread implementation of climate-smart and regenerative agricultural practices that are essential for building resilient food systems.

5.2. Awareness and Inclusivity

Another critical challenge identified was the limited awareness of FNSSA's platforms and partnerships, particularly among grassroots organisations, universities, and local research institutions. This lack of visibility has constrained the adoption of FNSSA initiatives, particularly in regions where these innovations could have the most significant impact. The Roadmap's programs have sometimes struggled to engage vulnerable populations and rural communities, reducing the overall effectiveness of its interventions.

The uneven distribution of resources across regions further exacerbates these challenges, as countries with less established research infrastructure often lack the capacity to fully participate in FNSSA initiatives. Enhancing outreach, inclusivity, and resource allocation is essential for ensuring that FNSSA's benefits are equitably distributed and reach those who need them most.

5.3. Climate Resilience and Environmental Shocks

Climate change poses a severe threat to agricultural systems, and FNSSA has faced criticism for not sufficiently integrating climate resilience strategies into its core initiatives. As environmental shocks such as droughts, floods, and extreme weather events become more frequent and severe, there is an urgent need to strengthen the resilience of agricultural practices.

FNSSA must prioritise the promotion of climate-smart and regenerative agricultural practices, including agroecology, agroforestry, and water conservation techniques. These strategies can help farms recover from climate-related disasters while enhancing long-term sustainability. Embedding climate resilience

into the FNSSA framework will ensure that agricultural communities are better prepared to cope with environmental challenges and secure their food systems for the future.

As part of the above, focus needs to be put on biodiversity conservation and ecosystem management.

5.4. Areas for Improvement

a) Digitisation and Data Analytics Utilization

To enhance its impact, FNSSA must improve its approaches to digitisation and data analytics. Currently, data collection and dissemination are often confined within individual projects, limiting their broader application and reducing the potential for real-time insights that could inform policy decisions. Establishing digital communities of practice and encouraging the use of advanced digital tools would create a more interconnected research environment that supports collaborative innovation.

The adoption of technologies such as artificial intelligence (AI), big data analytics, and precision agriculture is crucial for enabling data-driven decision-making. These tools offer predictive insights into crop yields, climate trends, and soil health, allowing farmers, researchers, and policymakers to respond to challenges more effectively. By building a robust digital infrastructure, FNSSA can support its long-term goals of sustainable intensification and food security.

b) Strengthening National Policies

The success of FNSSA Roadmap activities in areas such as soil management provides a foundation for expanding its influence into other key areas, such as seed systems, input quality, and post-harvest management. Strengthening national agricultural policies will be essential for sustaining the advancements achieved through FNSSA initiatives. Effective policy frameworks can support the broader adoption of research outputs, ensuring that FNSSA's impact is sustained over time.

c) Inclusivity and Cross-Sectoral Collaboration

FNSSA Roadmap activities have created more inclusive platforms that engage a diverse spectrum of FNSSA stakeholders, including grassroots organisations, smallholder farmers, private sector actors, and policymakers. Inclusivity is vital not only for equitable distribution of FNSSA's benefits but also for fostering ownership among stakeholders and ensuring that the roadmap addresses the needs of vulnerable communities.

Cross-sectoral collaboration is crucial for tackling the complex and interconnected challenges facing global agriculture. By integrating expertise from climate science, biotechnology, economics, and social sciences, FNSSA can drive holistic solutions that address both technical challenges and socio-economic issues in the agricultural sector.

5.5. Emerging Trends and Future Priorities for 2027-2037

a) Demographic and Socio-Economic Trends

Africa's rapidly expanding youth demographic presents both a challenge and a significant opportunity for agricultural transformation. The growing number of young people in both urban and rural settings, coupled with high rates of unemployment, necessitates targeted interventions to engage youth in

productive agricultural activities. FNSSA's future roadmap should capitalize on this demographic dividend by promoting agribusiness, value-added activities, and youth-led innovations in the agricultural sector.

Engaging youth in agripreneurship—ranging from technological innovations in food production and processing to digital solutions for market access—will help diversify income sources and address youth unemployment. Furthermore, it will foster a new generation of agricultural leaders capable of driving sustainable development across the continent.

Urban farming represents a unique opportunity to engage youth in urban environments where traditional farming is limited. Technologies such as hydroponics, aquaponics, and vertical farming can help maximize food production in urban areas, contributing to food security, reducing waste, and creating economic opportunities for urban youth. By encouraging the integration of food production into urban settings, FNSSA can contribute to resilient, sustainable urban food systems.

To support these efforts, FNSSA must invest in education and capacity-building programs tailored to young people. Both formal and informal training programs should focus on building digital literacy, entrepreneurship skills, and expertise in applying new technologies to agriculture. This will ensure that Africa's youth are fully prepared to take on leadership roles in transforming the continent's agricultural landscape and advancing sustainable food systems.

b) Climate Change and Environmental Challenges

The escalating impacts of climate change represent one of the most pressing challenges facing global agriculture. Both Africa and Europe are increasingly experiencing climate-related shocks, including droughts, floods, erratic weather patterns, and soil degradation. These environmental shocks disproportionately affect smallholder farmers and rural communities, who are already vulnerable to poverty and food insecurity. If not adequately addressed, these challenges could significantly reduce agricultural productivity and push millions into deeper poverty.

The FNSSA Roadmap (2027-2037) must prioritise climate change adaptation and mitigation strategies to enhance the resilience of agricultural systems. Promoting climate-smart agriculture (CSA), which integrates sustainable practices with climate resilience, is essential for increasing agricultural productivity while reducing the carbon footprint of farming activities. CSA practices, such as conservation agriculture, water-efficient irrigation systems, and drought-resistant crop varieties, can help farming communities adapt to climate variability and protect their livelihoods. In addition to climate-smart agriculture, FNSSA should emphasize regenerative agricultural strategies that restore soil health, enhance biodiversity, and strengthen ecosystem resilience. Agroecological practices, agroforestry, and organic farming can improve the long-term sustainability of agriculture by utilizing natural processes to enhance farm resilience to environmental stresses. These methods also reduce reliance on chemical inputs, such as synthetic fertilizers and pesticides, which are known to harm the environment.

Circular farming systems, which promote resource efficiency by creating closed-loop systems where waste products from one process are used as inputs for another, also offer a sustainable path forward. Integrated crop-livestock systems, for example, can enhance nutrient cycling, reduce greenhouse gas emissions, and improve farm profitability. By adopting these approaches, FNSSA can promote agricultural systems that are not only productive but also environmentally sustainable.

Governments and policymakers must collaborate to develop policies that incentivize the adoption of CSA and regenerative practices. FNSSA can advocate for the development of climate-resilient infrastructure and policy frameworks that support adaptation efforts at both the national and regional levels. Financial support for smallholder farmers, alongside the promotion of climate-resilient value chains, will ensure that agricultural systems are better equipped to withstand environmental shocks while promoting sustainability.

c) Technological Advancements

The rapid pace of technological innovation offers transformative opportunities for improving agricultural productivity, efficiency, and sustainability. FNSSA must fully embrace digitisation, biotechnology, and artificial intelligence (AI) to lead the next wave of agricultural transformation. These cutting-edge technologies have the potential to significantly boost yields, optimize resource use, and enhance sustainability throughout the agricultural value chain.

Digitisation, in particular, has the power to revolutionize how farmers access information and manage their operations. Through mobile platforms, farmers can receive real-time data on weather patterns, soil conditions, pest outbreaks, and market prices, allowing them to make informed decisions that optimize productivity and reduce risk. Precision agriculture technologies, including drones, GPS-guided machinery, and remote sensing tools, enable the targeted application of inputs such as water, fertilizers, and pesticides, improving efficiency and minimizing environmental impacts.

AI and machine learning can further enhance decision-making in agriculture by offering predictive insights into crop yields, soil health, and climate trends. These technologies can support supply chain optimization, reducing food waste and improving the efficiency of food production from farm to market. Robotics and automation also have the potential to reduce labour costs, increase efficiency, and address labour shortages in rural areas. In addition, biotechnology, particularly advances in genetic engineering and CRISPR technology, represents another key area where FNSSA can make a substantial impact. Climate-resilient crops, such as drought-tolerant and pest-resistant varieties, will be essential for maintaining productivity in regions vulnerable to the impacts of climate change. Innovations in biofortification and nutrient-rich crop varieties can also contribute to improving food security and nutrition, especially in regions facing chronic malnutrition.

However, the successful deployment of these technologies depends on the development of robust digital infrastructure and capacity-building efforts. FNSSA must invest in expanding access to broadband internet in rural farming communities, fostering digital literacy, and ensuring that smallholder farmers can fully benefit from these innovations. Closing the digital divide is critical to ensuring that technological advancements are equitably distributed and that their benefits reach even the most marginalized farming populations.

d) Strengthening human and research capacity

Further advances including effective implementation of the FNSSA Roadmap will require building and strengthening research capacity at all levels while giving attention to inclusivity and building capacities of

less endowed countries. Thus, investment in human capital and research will be needed. This should be done in such a way to foster AU-EU partnership and regional collaboration.

e) Political and Policy Considerations

To maximize the impact of the FNSSA Roadmap (2027-2037), it is essential to align the Roadmap's initiatives with existing regional and continental policy frameworks. These frameworks include the Comprehensive Africa Agriculture Development Programme (CAADP), the African Continental Free Trade Area (AfCFTA), and the European Union's Green Deal. By aligning with these overarching frameworks, FNSSA can ensure coherence with broader development agendas and leverage synergies with agricultural, economic, and environmental policies.

Strong science-policy connections will be necessary to ensure that research findings are translated into actionable policies that drive agricultural innovation. FNSSA must prioritise collaboration with national governments and regional bodies to influence policy frameworks that support sustainable food systems and resilient agricultural practices. By embedding its research outputs into national and regional strategies, FNSSA can enhance the long-term sustainability of its initiatives and contribute to lasting transformations in food and nutrition security.

VI. Discussions

The synthesis of main messages from the literature review are briefly discussed in this chapter.

a. Policy

The Partnership addresses the challenges set out in **UN Sustainable Development Goal 2** on ending hunger, achieving food security and improved nutrition and promoting sustainable agriculture by 2030. The Roadmap aligns well with the SDG2. This should continue, but it also recommended that it should be mandatory in project proposals to describe how projects intend to address global policies such as SDGs as well as addressed them in project activities and their reports.

Bridging the gap between **science and policy** and integrating concerns from different areas is necessary to establish sustainable and equitable policies addressing diets, health, livelihoods, jobs, the environment. This will also require harmonisation between countries and between the two continents. A link to the Knowledge Centre for Global Food and Nutrition Security (KC-FNS)[17] could be strengthened with a view to reinforcing the science-policy interface and fostering inter-policy dialogue.
The new FNSSA Roadmap should completely embrace the seven core aspirations and their respective goals as described in the new 10-year plan of the AU 2063. Notably Aspiration 1 goals 5 (Modern Agriculture for increased productivity and production) and 7 (Environmentally sustainable climate resilient economies and communities) as well as Aspiration 6, goals 17 (Full Gender Equality in All Spheres of Life) and 18 (Engaged and Empowered Youth and Children) are of most importance for the FNSSA Roadmap to address.

[17] About the Knowledge Centre for Global Food and Nutrition Security (KC-FNS) | Knowledge for policy (europa.eu)

b. Priority themes

The FNSSA partnership is built on key issues and has identified four priority themes. As these themes are aggregated into a rather broad area, it does not seem relevant to change them in the forthcoming Roadmap.

Africa contributes less than 4% of global greenhouse gas emissions; however, the continent is one of the most vulnerable regions to climate change. It is recommended that **Climate Change Adaptation and Mitigation in FNSSA** is also included to address volatile climate, health and social economic challenges. This should align with the Roadmap of the Climate Change and Sustainable Energy (CCSE) Partnership of the HLPD. LEAP-RE is a Long-Term Joint Research and Innovation Partnership on Renewable Energy between the European Union and the African Union and has funded more than 10 research projects under H2020 related to the food-climate-energy nexus. Water, biodiversity and environment are also relevant aspects of climate change which should be considered with special focus on specific regions.

The **conceptual design of FNSSA** needs to be revisited to ensure that current thinking is captured in overall concerns. This is essential to ensure a focussed and directed use of resources. At the same time concepts of and principles for building **resilience** should be considered when transforming agriculture. The role of resilience in projects should be carefully considered[18].

Some **cross-cutting issues** may be more policy issues rather than R&I initiatives, although R&I projects can potentially document effects of the policies. Activities addressing some of Cross-cutting issues (current theme 4) should be accelerated. One of the most important cross-cutting issues is to address a **more inclusive involvement of youth** in Africa. In order to reverse the increasing average age of farmers in Africa, innovative strategies must be developed to involve youth as a major group across stakeholder groups. These are likely to be of greater interest if they are directly connected to issues which are closer to youth – entrepreneurship, start-ups, digitisation etc.

LEAP4FNSSA M&E work concluded that there should be an increased focus on **gender** transformative research beyond the confines of the status quo, including embedding-gender responsive and transformative research design within funding programme architecture.

Another cross-cutting issue is increased focus on **digitisation and digitalisation** which is paramount for more effective and relevant R&I. Much information from R&I data should be digitised. Digital technologies can unlock new value from data that has been aggregated through digitisation, drive changes, by creating new models. Fostering digital applications and green technologies for agro-ecological production, healthy and sustainable food processing and consumption would be a valuable contribution to Green transition in Africa and Europe. This could involve increased mobility of academics to Europe and Africa as well.

c. Funding

Funding of R&I projects within the FNSSA domain is inadequate. Many projects have been completed in recent years and the outlook for further funding is uncertain.

[18] Food system resilience – a new research area for the AU-EU Partnership, LEAP4FNSSA Policy Brief 2021, 4pp

The number of grants awarded under the two AURG calls is inadequate to cover FNSSA issues across the continent. It does not appear that there will be a third call. This is unfortunate. Similarly, the Intra-Africa Academic Mobility Scheme runs until 2027. They are both very useful funding source which should be continued, and funding of more calls and opportunities are recommended.

Through the HLPD, African Governments and the AU should define funding sources to promote ownership. This may also be in the private sector.

The next Horizon Europe programming cycle will be starting towards the end of 2024 and inputs should be provided to promote topics related to FNSSA.

Real commitment to long-term funding is notoriously difficult due to changing pollical situations and relatively short-term strategies of funding organisations. However, continued efforts are needed to get long-term commitment to stable funding.

d. Emerging issues and future prospects

Megatrends such as Climate change and increasing Urbanisation must be considered in the new Roadmap.

A link to the work of the Foresight4Food initiative and their regular events and seminars could be forged especially with work focussing on Africa and with the Africa Foresight Academy (AFA) on building foresight capabilities in Africa. The international initiative offers foresight expertise to synthesise foresight work targeting agri-food and linking food systems. This might support policy work of the future Roadmap.

In addition, the ISS African Futures and Innovation platform[19], provides decision makers and others with forward-thinking policy analysis to plan key development pathways. They carry out independent research on Africa's development prospects using a dynamic, and continually updated forecasting platform to understand the potential progress of the African continent. The IRC should consider linking up with the platform or at least participating in the upcoming African Futures Conference 2024, Forecasting Development Trends and Opportunities on 29th October 2024.

e. Partnerships

In general, it is important to harness the potential of the private sector by involving them in project partnerships during the whole project process. This is especially, but not only, important in the third priory theme. To this end, farmers may also be considered as representatives of the private sector and their involvement in the whole project chain is equally important. This will improve relevance of R&I projects and create greater ownership of projects. Farmers' organisations and cooperatives may be a point of entry for involving farmers.

There should be an increased translation of outputs and outcomes into useable knowledge. Indeed, the EU-Africa Innovation Agenda points to the need for systematic interaction between researchers, policymakers, business and civil society representatives, and other stakeholders in view of the uptake of research findings for commercialisation to be increased and for better use by the civil society and policy makers. It also points to the need to improve relationships between Technology Transfer

[19] ISS African Futures | Home

Organisations/Technology Hubs and project coordinators. This is necessary to exchange at all levels to translate outcomes and outputs into useable knowledge to be harnessed by the private sector. This includes providing funds for scaling-up R&I results by entrepreneurial ventures such as start-ups.

Countries in both Africa and Europe have diverse traditions for partnerships in R&I projects. Nevertheless, in both continents all countries are working towards the SDGs and other policy issues. The concentration of projects in some countries in Europe and Africa should be addressed with a view to developing a more relevant distribution of projects between the continents and between countries within each continent. This could be partly achieved by joint actions of increased mobility in both directions.

Regional differentiation in relation to partnerships in priority themes should be made for some aspects of some themes e.g. North Africa and the Mediterranean area is a very high-risk water stress area, and projects must be focussed on water in this region.

Dominance of European coordination of projects has previously been reported. Until recently EU Regulations have dictated that only EU organisations could coordinate EU funded projects. More recent assessments are difficult to find, but it is likely that there has been an increase in African-led projects, thus improving the balance between Europe and Africa. However, continued capacity development is also required. In addition, EU countries often have forehand knowledge about calls, about a year before they are published. Clearly this provides an advantage as they can build a consortium before the call is announced. This can be addressed by improved and open sharing information.

f. Implementation

A further shift towards demand led research, as opposed to supply driven problem definition, is imperative for increased relevance and ownership. Experience in this area is to be found with key actors having a role in defining research needs and solutions.

Very few projects appear in a search in the LEAP4FNSSA project database for social science. Increased integration of the social sciences with FNSSA R&I making research more inter and multi-disciplinary is necessary is necessary. R&I projects should have co-design and co-creation elements also from social applicability and research ethics perspectives.

There should be an increased translation of outputs and outcomes into useable knowledge, including improved scalability of results. Indeed, the EU-Africa Innovation Agenda points to the need for systematic interaction between researchers, policymakers, business and civil society representatives, and other stakeholders in view of the uptake of research findings for commercialisation to be increased and for better use by the civil society and policy makers. It also points to the need to improve relationships between Technology Transfer Organisations/Technology Hubs and project coordinators. This is necessary to exchange at all levels to translate outcomes and outputs into useable knowledge to be harnessed by the private sector. This includes providing funds for scaling-up R&I results by entrepreneurial ventures such as start-ups.

g. Follow-up to LEAP4FNSSA

The lack of the follow-up actions recommended in a number of the reports produced as outputs from the LEAP4FNSSA project, especially the three studies referred to in the ToRs, can be considered an emerging issue to be addressed. The completion of the project period of the LEAP4FNSSA project and, thereby, funding has undoubtedly limited the possibility of further activities needed to follow up on recommendation made in these studies. No evidence has been found, for follow-ups being systematically made to the recommendations made in LEAP4FNSSA studies from 2020 and indeed other projects. A list of recommendations from the three LEAP4FNSSA studies is to be found in Annex 2.

When a project comes to an end, and follow up actions are necessary, resources are needed for them to be implemented. These are non-research issues and innovative funding solutions are required. Follow-ups will improve impact of the project results.

h. Specific new issues

The FAO Report from 2022[20] demonstrated that the implications of big data, their dynamics and concentration for economic growth, reduction of poverty and income inequality have not yet been fully explored. This would be a new issue under the Cross-cutting theme. The emerging issue of Artificial Intelligence, and machine learning should also be studied in terms of R&I and benefits in Africa and Europe. As yet little can be found about this in terms of FNSSA R&I.

VII. Conclusion and Recommendations

Based on findings, the review made recommendations for the next phase of the FNSSA R&I Roadmap (2027-2037), aimed at refining and enhancing the strategic direction and implementation of future initiatives. Inputs to the drafting of the new Roadmap are provided in the document report titled recommendations. It is a collection of conclusions from the various activities report undertaken in this assignment and provide recommendations for the crafting/drafting team which will prepare the new FNSSA Roadmap.

The Key Emerging Recommendations for consideration in the Drafting of the 2027-2037 Roadmap include:

1. Strengthen Partnership between and within Africa and Europe, and among all institutions of the CEA FIRST consortium
2. Operationalize and strengthen the AU-EU IRC (International Research Consortium) on FNSSA by expanding IRC membership and improving coordination of FNSSA projects
3. Address Demographic Shifts such as rural-urban migration, changing diets and the evolution of food systems
4. Prioritize Climate-Smart Agriculture (climate change adaptation and mitigation) in future FNSSA strategies and activities
5. Prioritize Biodiversity Conservation and Enhancement for Environment Health and Climate Change resilience in future FNSSA Strategies and activities
6. Strengthen and Expand African Union Research Grants and Intra-Africa Academic Mobility Schemes

[20] The future of food and agriculture Drivers and triggers for transformation, FAO, 2022, 444pp

7. Prioritise putting Research Into Use by transitioning research findings from academic and research institutions to application at end-user levels
8. Strengthen Capacity for Coordination, Implementation, and scaling up of R&I across FNSSA countries
9. Strengthen Farmers Institutions and their Engagement in Future FNSSA R&I activities
10. Enhance Resource Mobilization by securing long-term funding through diverse streams to sustain research and innovation initiatives

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