



Food and Agriculture  
Organization of the  
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Strengthening the institutional linkages  
between national agricultural research  
systems actors and improving agricultural  
research for development in Egypt

# Policy brief





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Strengthening the institutional linkages  
between national agricultural research systems  
actors and improving agricultural research  
for development in Egypt

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Food and Agriculture Organization of the United Nations

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**POLICY BRIEF**



# INTRODUCTION

Agriculture in Egypt is the main source of food for domestic consumption. It also contributes to foreign trade and generates foreign currency earnings to support the national budgetary balance. The agriculture sector contributes 15 percent to Egypt's gross domestic product (GDP) and 25 percent to total employment. In terms of gender, agriculture employs around 45 percent of the female workforce. Most farming activities in Egypt are dominated by small-scale farmers who account for 25 million of those working in the agriculture sector, representing around 60 percent of the rural population (CAPMAS, 2019). As the agricultural sector plays a critical role in the country's economy, the Government of Egypt has recently started investing in agriculture through several presidential initiatives, such as the One and Half Million Faddan project, El-Reef El-Masry project, the New Delta project, among others. However, Egypt's agricultural sector has been facing several challenges in achieving food security, such as rapid population growth, soil salinization, water scarcity, land fragmentation, low adoption of new technologies and practices, lack of marketing information, inadequate support services, weak institutional coordination and lack of proper agricultural and rural development policies.

Agricultural research could provide appropriate solutions to address such challenges and achieve the UN's Sustainable Development Goals (SDGs). However, national agricultural research systems (NARS) and the agricultural extension and advisory services (AEAS) in Egypt have been facing several challenges that impede the potential contribution of agricultural research for development (AR4D) to overcome these challenges. Identifying ways to tackle these challenges is of paramount

importance, which in turn would strengthen the NARS and AEAS to implement their missions and achieve their mandates.

NARS include public and private research organizations and universities that play a critical role in advancing research on sustainable agricultural productivity in the country. For NARS to have a deeper understanding of the challenges both at farm and system levels, technical and financial support is needed to increase efficiency and functional capacity to sustainably enhance the impacts of AR4D projects and achieve national food and nutrition security.

Technical support in the form of national guidelines can provide NARS with essential tools to streamline their efforts on AR4D, increase efficiency, achieve better outcomes and ensure impacts. However, such support has either been lacking or insufficient. To strengthen the organizational development and enhance the effectiveness of NARS to achieve the SDGs, the assessment of AR4D implementation and the intuitional linkage among various actors is essential. This assessment is needed to identify the potential to enhance the capacity of NARS organizations, expand and strengthen their abilities to respond to growing dynamic challenges and achieve national food and nutrition security. The current study was a step toward supporting Egypt's NARS in AR4D.

Deep understanding of problems facing NARS and gaps in the agriculture sector is essential to identify lessons learned, guidelines for better implementation of AR4D, policy briefs and recommendations, which all lead to an enabling environment for achieving sizable impacts on the ground. To that end, a comprehensive assessment and analysis of a case study of NARS in Egypt was conducted to infer the lessons learned, draw

recommendations, develop guidelines and a policy brief to support research for development efforts. The assessment included the following outputs:

- (i)** clear understanding on the organizational and management of NARS in Egypt;
- (ii)** overview and review the previously implemented AR4D projects to explore gaps and opportunities and draw lessons learned;
- (iii)** develop guidelines and criteria that can be adopted to effectively help AR4D implementation;
- (iv)** assessment of the institutional linkages and collaboration within and among NARS and AES actors;
- (v)** strengthen the capacity of research staff on AR4D through training sessions on the necessary elements that ensure better implementation of AR4D to achieve the target impact; and
- (vi)** develop a policy brief that offers specific recommendations to ensure an enabling environment to better implement AR4D to achieve the target impact on small producers.



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# THE CONTEXT

Agricultural research is at the forefront of achieving sustainable agricultural development in Egypt. Impactful AR4D, such as new applied agronomic practices, high yielding varieties, improved animal breeds, proper modern machinery, improved soil and water management practices, etc., all contribute to support small-scale farmers to alleviate poverty, improve food systems and enhance the livelihoods and the income of resource-poor farmers. Adequate, stable and sustainable funding is critical for AR4D in Egypt as the current financial support to agriculture research centres and other NARS actors is still considered insufficient to conduct a large scale AR4D to create targeted, sizable impact on small producers. The Participatory discussions and literature analysis revealed that NARS in Egypt still needs proper financial, technical and administrative support to enhance their performance on implementing AR4D across the country.

This policy brief has been developed to offer specific key-recommendations and lessons learned that the Ministry of Agriculture and Land Reclamation in Egypt could consider for strengthening its support to the country's NARS. Ultimately, the recommendations are intended to ensure efficient adoption of the proposed methodologies for enhancing the impact of Egypt's NARS efforts on AR4D.



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**POLICY BRIEF**

## Key findings of the comprehensive case study

Linkage between agricultural research and rural development is a complex issue. In addition to technical aspects, social, political and economic aspects must be taken into consideration. This includes population growth, poverty and sustainable human development, which require an enabling environment for conducting successful research. Egypt's NARS are equipped with good human resource capacities. For example, more than 8,400 agricultural researchers were recorded as full time equivalents (FTEs) in 2012, employed by the Agricultural Research Center (ARC), which is the lead research institution in conducting AR4D in the country. The majority of these researchers (5,692) hold doctoral degrees (ASTI, 2015). However, AR4D in Egypt still faces several multiple challenges in achieving its targeted impacts. The main findings and lessons learned from the comprehensive analysis of the case study that need to be urgently addressed include but are not limited to:

- 1.** Lack of a monitoring and follow-up mechanism that ensures the implementation of strategic plans and performance of NARS.
- 2.** The AR4D programmes undertaken by most of the NARS actors in the country lacked proper organization and structure. They require an adequate governance structure to enable them to achieve the target impact for end users.
- 3.** Lack of coordination between and among scientific research institutions led to redundancy and overlapping of research topics, which leads to missed opportunities for financial support.

4. Linkages between and among the NARS organizations and the AEAS of the country were weak and inefficient and need further strengthening through adequate policies.
5. Researchers are not well-distributed either across the country or across disciplines.
6. Although Egypt's expenditure on research for development (as a percentage of GDP) increased from 0.43 in 2009 to 0.72 in 2018, it is still below the target 1 percent as per the Egyptian Constitution (ASRT, 2019) and far below the world average which was estimated at 1.17 percent (World Bank, 2018).
7. Weak linkage between scientific research and industry.
8. Most of the ARC's budget covers staff salaries and overheads to upgrade the research facilities. This resulted in lack of sufficient funds allocated for adaptive research programmes, which a mounted to a critical challenge to AR4D in the country.
9. Lack of coordination between different donors led to redundancy of research type and geographic focus.





- 10.** NARS lacked effective monitoring and evaluation (M&E) and documentation systems for implemented AR4D. NARS organizations should be supported to establish and institutionalize M&E for the AR4D programmes they implement. The M&E programme of the ARC should be prioritized and empowered to regularly document and report the progress and outcome of AR4D projects implemented by all AR4D actors in the country, as this should be essential for formulating policy and decisions at the national level.
- 11.** Accountability mechanisms to ensure value for money in AR4D implementation in Egypt need to be associated with all implemented programmes to ensure the benefits of implemented AR4D.
- 12.** Exit strategies and sustainability plans for AR4D were absent in most of the cases and need to be considered in all planned projects and programmes to ensure the sustainable adoption of research outputs by end users after the project is concluded.





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# Recommendations and way forward

Key recommendations drawn from the comprehensive analysis conducted through desk review and participatory discussions are listed below:

## **NARS organizational framework**

- **NARS organizations should streamline their research programmes in full alignment to** Egypt's Sustainable Agricultural Development Strategy (SADS 2030), which was developed based on national research priorities. This will **make them more responsive to the AR4D needs and priorities of the country.**
- **NARS organizations in Egypt should be encouraged and supported to properly structure their research programmes** and develop and publish comprehensive strategies for their research activities. This should help position each of them to contribute more effectively to the delivery of the AR4D needs of the country under the framework of SADS 2030.
- **A legal collaboration framework between NARS institutions in Egypt should be established** that includes a well-defined mechanism to strengthen collaboration between research organizations. This can be done by identifying and mapping all organizations that conduct agricultural research in Egypt to better understand the scope and mandate in agricultural research services that can be delivered by each organization. This would assist in identifying the areas for integration and collaboration.

■ **A mechanism to guide and coordinate the activities of NARS organizations in Egypt should be put in place.** An assessment study that looked at the structure of NARS in Egypt indicated that there are three main research for development centres in the country:

- 1) the Agricultural Research Centre (ARC) and the Desert Research Centre (DRC), both of which lead agricultural research in the country under the Ministry of Agricultural and Land reclamation (MALR);
  - 2) the National Water Research Center, which is the leading centre for water-related research in the country under the Ministry of Water Resources and Irrigation (MWRI) and
  - 3) the National Research Center (NRC) of the Academy of Scientific Research and Technology under the Ministry of Higher Education and Scientific Research, which covers the full spectrum of research for development in general.
- ARC is the official designated lead centre for agricultural research in Egypt with a unique capacity to conduct a wide range of agricultural research related to the national agricultural development strategy. The assessment of the linkage between the ARC and other national agricultural research institutions showed several venues for interaction through Egypt's Regional Council for Research and Extension (RCRE). This council was established to link NARS in Egypt, which still need improvement to effectively promote the coordination between various actors, including decision-makers, scientists, researchers, extension officers, private sector and farmers. Thus, exploring the possibilities to reform and enforce the current coordination frameworks and policies in a way that ensures efficient and effective coordination between ARC and other research institutions in AR4D through RCRE is critical.

- Based on mapping NARS in Egypt, ARC could take the necessary action to foster viable linkages with various national and international AR4D organizations in the country by:
  - Establishing and maintaining a database of all entities that are conducting agricultural research in the country.
  - Establishing a national database and roster that gather information on different research fields and research personnel that can be used to develop collaborative research projects. This database could also include documentation of previously conducted research projects across disciplines, including lessons learned, success stories, failure stories, staff capacities, expertise and interests. This database could better enhance decision-making when developing further projects on similar research areas and across other geographic areas, while avoiding redundancy and overlaps to better align with SADS 2030.
  - Organizing forums that will bring together various NARS actors on a regular basis to share experiences and review the progress on AR4D.
  - Leading efforts to develop joint proposals, seek collective funding and to jointly implement research activities by different NARS and international AR4D organizations in the country to help promote synergy and enable them to achieve more AR4D outcomes.
  - Establishing research alliances of disciplines and research themes across the country, the region and multidisciplinary research themes.
  - Setting key indicators to monitor the performance of effective flow of technology and scientific information among research, extension and farmers.

- Decentralization is recommended to widely adopt participatory approaches in the development, implementation and follow-up of strategic research plans. The establishment of partnerships and research alliances is also recommended to ensure access to available resources for better utilization and better alignment to SADS 2030.
- The visibility of NARS organizations in Egypt should be increased by raising awareness among NARS organizations and AR4D stakeholders (farmers/end-users, producer' organizations, AEAS and decision makers) and highlighting the potential of each NARS organization in Egypt to promote the relevance and contribution of each NARS actor to the national research strategy of the country.



## Research capacities and facilities

- Improve research arrangements and build the capacity of research staff to better implement AR4D by:
  - Enhancing their autonomy in determining their research topics at both organizational and national levels.
  - Promoting demand-driven AR4D at the national level through enhancing the adoption of participatory approaches and involving all stakeholders in the whole cycle of the project.
  - Setting an efficient follow-up mechanism to monitor the implementation of strategic plans and the performance of NARS research staff across the country.
  - Designing and conducting training programmes that target improving specific capacities and skills to enable the researchers to better design, implement and evaluate AR4D projects, including the applicability, adoptability, affordability, gender sensitivity and environmental impacts dimensions.
  - Raising staff awareness of existing strategies that strengthen linkages among research institutions and between research, extension, farmers and decision-making.
  - Introducing administrative reforms that aim at eliminating/reducing bureaucracy and unequal opportunities.
  - Establishing a national-wide database and roster for research expertise, facilities and capacities.
- **Provide adequate funding** to maintain existing research facilities and establish a programme aimed at periodically upgrading the AR4D programmes and facilities of ARC in particular and in the NARS in general.

- **Provide necessary regular maintenance** of research facilities and infrastructures, including research farms, laboratory equipment for soil, animal feed, irrigation water quality testing, and extension facilities and tools to facilitate and enhance the AR4D efforts of the various NARS and AES organizations in the country. Currently, most of the latest and advanced instruments and equipment are located at the ARC headquarters in Cairo, while sub-regional research stations lack the resources to conduct the quality research needed to support farmers. This divide significantly reduces the capacity of NARS organizations in the country to perform and deliver their mandates accordingly.





## Extension and advisory services (EAS)

Extension and advisory services are the vital link between researchers, farmers and decision makers. Identifying the main challenges affecting the performance of extension officers in order to keep that link efficiently active is of paramount importance. The literature analysis and participatory discussions revealed that weak means of communication is the real constraint to the delivery of extension services. Additionally, shortage in agricultural extension personnel, lack of financial support, lack of well-trained extension officers who are up to date with the latest in agricultural extension knowledge all contribute to limiting the function of extension and advisory service and its relationship to research and farmers.

■ **Empower the EAS:** Updating and empowering the existing extension system is essential as it plays a fundamental role in providing a range of services to farming communities, commercial producers and disadvantaged target groups. Extension officers can play a vital role in transforming the agricultural sector through active participation in the decision-making process related to agricultural development issues. They are key drivers of the successful achievement of the AR4D projects. The participatory discussions reflected the importance of the following:

- Reactivating the agricultural extension services to strengthen its role in communicating the results of agricultural research to all concerned stakeholders.
- Strengthening the existing linkage between agricultural extension, the advisory services system and other relevant stakeholders involved in the cycle of AR4D projects, as

well as establishing strong linkages to other heretofore unlinked actors.

■ **Improve coordination of EAS delivery in Egypt:** In order to improve efficiency in the utilization of the country's scarce extension resources, good communication channels must be established. Upgrading the existing extension facilities and extension officers' knowledge and information is also important. The participation of non-governmental organizations and the private sector – such as farming input suppliers – could be leveraged through a well-coordinated approach by the MALR to reduce the risk of confusion, overlapping and duplication of efforts and misallocation of resources. It would also enhance synergy to increase the output, impact, and performance of the EAS. Furthermore, the current sectoral coordination efforts by the ministry of agriculture should be expanded and focused further toward ensuring full compliance of all public and private EAS providers, aligned to both the national AR4D priorities and the EAS policies of the MALR. This can be facilitated by:

- Providing sufficient technical, administrative and financial support to agricultural extension bodies for proper and efficient performance in the delivery of extension services.
- Enhancing extension officers' autonomy in the choice of research topics in their organizations is essential, and will adequately reflect the community needs and problems that need research-based interventions.
- Establishing and strengthening linkages between extension officers, researchers and decision makers, especially when setting the research priorities at national level.
- Establishing an efficient mechanism that links project managers to both the agricultural research system and the agricultural extension system.

- Providing sufficient funds and equipping extension officers with appropriate tools, knowledge and skills to operate effectively and deliver the required services that farmers expect.
- Organizing regular research-extension-based forums to mitigate the urgent need to support the development and establishment of research-extension relationship that bring together both NARS and EAS actors on a regular basis to review AR4D progress, share experiences on emerging issues and adopt appropriate plans of action for the benefit of the smallholder farmers/end users.
- Establishing strong linkages between community development associations (CDAs) and the agricultural extension system as closely related partners in development, enabling them to support the role of extension services.



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## NARS performance in implementation of AR4D

- **Provide regular refresher training to enhance researchers' knowledge and skills to plan and implement AR4D.** Participatory discussions and key informant interviews (KIIs) indicated that researchers need to be supported to constantly improve and update the quality of their knowledge and skills on various aspects of AR4D planning and implementation, including project proposal writing, project management, risk management and monitoring and evaluation. This will be essential to not only facilitate their work, boost their confidence and develop their profile, but also to enable them to contribute more effectively to AR4D implementation in the country in order to achieve tangible impact on smallholder farmers and end-users.
  
- **Individual researchers/NARS organizations could improve their performance in implementation of AR4D by:**
  - Guaranteeing the participation of all stakeholders in decision making on AR4D gaps and topic identification and implementation.
  - Ensuring that the projects planned and implemented are linked to the national priorities of the country.
  - Fully considering the applicability, adoptability, affordability, gender sensitivity and environmental impact of every intervention during the planning, implementation and exit stages of the project.
  - Supporting the development and establishment of standard procedures for planning, organizing, implementing and documenting AR4D activities.

■ **Ensure famers' contributions to decision making on research topics:**

Given the fact that farmers are the direct beneficiaries and end users of any AR4D projects outputs, analysing the main challenges that affect their adoption of the introduced interventions as service recipients is a crucial step toward accelerating the adoption rate to achieve the targeted impact. The analysis of challenges facing farmers showed the importance of enhancing famers' contributions to decision making on research topics due to the fact that they are the ones who are aware of real problems on the ground. They can significantly contribute to identifying their needs to be addressed through AR4D interventions. Accordingly, when they act as vested participants, this often leads to the successful implementation of projects and ensures their ownership of the project outputs. This can be achieved by engaging influential lead farmers from the local community who can play a key role in linking farmers and project staff. This ultimately enhances the implementation of the project. Strengthening the role of CDAs as active actors in communicating the research results to farmers is also recommended.

■ **Adequate funding for AR4D:** The need for sufficient and stable funds for research institutions engaged in the field of AR4D is critical. Current lack and instability of funding for scaling out/up of AR4D project results remain the fundamental problems facing AR4D in Egypt. From the discussions with researchers and Klls, there is a need to explore ways to ensure the stability of funds required for investment in agricultural research and scaling out its outputs. This can be facilitated by:

- Mobilizing and increasing local funds allocated to sustainably implement AR4D activities and projects through self-reliance and reducing dependency on external funds.

- Encouraging/enhancing the contribution of the private sector and CDAs in AR4D where they can play a key role in this regard. The Government of Egypt can promote the contribution of the private sector by adopting tax incentives and regulatory reform programmes to ensure an enabling environment to stimulate private sector contribution to AR4D.
- Providing incentives in managing AR4D projects. This is needed to encourage and motivate researchers and project managers to take more responsibilities and to adequately manage their projects.

■ **Develop and implement robust monitoring, evaluation and learning (MEL) systems and a stakeholder feedback mechanism for AR4D projects in Egypt:**

- NARS organizations should institutionalize M&E to regularly assess the progress and impact of their programmes and activities.
- The MEL program/unit of ARC should be further strengthened to enhance its relevancy and effectiveness.
- Researchers should be trained and provided with the needed skills to effectively utilize stakeholders' feedback on implemented AR4D projects. Stakeholders should also be consulted when considering adjustments or adapting the workplan of introduced innovations and technologies, which will also assist in formulating better decisions on new projects.
- Researchers should be trained and provided with the needed support to document and publicize the outputs and lessons learned from their AR4D work to be considered for further projects.
- ARC could incorporate/reinforce mechanisms to ensure accountability for the deliverables expected of all AR4D projects implemented in the country, which ultimately ensures value for money.



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- **The ARC should put in place/reinforce sustainability mechanisms of all AR4D projects implemented in the country** to ensure that beneficiaries continue to benefit from the results of introduced AR4D interventions after project closure. Researchers should develop and integrate sustainability plans for projects they are implementing to ensure that the impact of their interventions are felt accordingly by the beneficiaries during and after the projects are concluded.
- **Mainstreaming innovation in AR4D activities** and enhancing the capacity to innovate. This can be achieved through establishing an AR4D unit at ARC that is responsible for the overall coordination of AR4D efforts in the country by linking the demands and feedback of communities with relevant specialized research institutes and divisions to provide appropriate solutions. The unit could also ensure accountability, M&E and feedback mechanisms to ensure the timely and qualitative delivery of outputs as well as the efficient use of resources.

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