



Food and Agriculture
Organization of the
United Nations

GUIDELINES TO SUPPORT THE NATIONAL AGRICULTURAL RESEARCH STRATEGY OF LIBERIA



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Required citation:

Mulbah, Q., Swelam A., Ramasamy, S., Liu, Z. 2023. *Guidelines to support the national agricultural research strategy of Liberia*. Rome, FAO. <https://doi.org/10.4060/cc6052en>

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ACKNOWLEDGEMENTS

This document is a result driven from the comprehensive assessment of national agricultural research and extension systems with a special focus on institutional linkages between various actors in Liberia which received great support from numerous stakeholders, including research organizations, farmers, extensionists, researchers and individual experts working in the agricultural research for development (AR4D) system in the Republic of Liberia. The authors are particularly grateful to all the key informants, researchers, farmers, and extension officers for sharing their knowledge and insight to address the research questions examined during the assessment study. The authors are particularly grateful to Dr James S. Dolo, Head of the Crops Programme at CARI. Special thanks to Madam Mariatou Njie, the FAO Representative in Liberia and her team for assisting in the organization and implementation of the study.



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CHAPTER 1: INTRODUCTION



The agriculture sector is a strategic and key pillar of the economy of Liberia, as it is the most viable, sustainable, and renewable source of national income. Approximately 70 percent of the population depends on agriculture for their livelihood and over the past 10 years, the sector has contributed at least 24 percent of real GDP annually to the Liberian economy (CBL, 2012; 2014; 2016; 2018; 2019; 2020). In 2018 and 2019, the agriculture sector employed around 43 percent of the working age population, making it the second most important job market in the country (World Bank, 2021). Despite the importance of the sector the level of investments in research, which is critical to driving its growth and development, has been very low over the years (MFDP, 2017; 2019; IFPRI 2014; 2021).

In Liberia, agricultural research is carried out by both public and private sector organizations, including the Central Agricultural Research Institute (CARI), agriculture departments at various institutions of higher education, private agriculture companies, and some non-governmental, civil society and some international AR4D organizations. Together, these organizations form the National Agriculture Research System (NARS) of the country. The NARS organizations have a deeper understanding of the challenges both at farm and system levels and they need technical and financial support to increase their efficiency to sustainably enhance the impacts of research for development projects (R4D) and achieve national food and nutrition security. Building the capacities of these institutions and expanding and strengthening their abilities to respond to the growing challenges facing the country is critically important for achieving national food and nutrition security for the country.

Technical support, in the form of national guidelines can provide NARS with essential tools to streamline their efforts, increase their efficiency, and achieve better outcomes and impacts. Additionally, it has been observed that agricultural research is normally supported by government institutions such as the Ministry of Agriculture. In addition to these core institutions, NARS collaborate with various other national and international research and development-based organizations. The assessment of NARS performance and the institutional linkages between them and other relevant institutions is essential for identifying potentials for collaboration to strengthen their capacities, and to expand and strengthen their abilities to respond to growing challenges. A good understanding of the systemic problems and gaps is also key to the development of guidelines and methodologies that can be used to enhance their performance and overall impact on the ground.

As part of the efforts of Food and Agriculture Organization of the United Nations to strengthen the research impact of the NARS and their links to the extension service system in Liberia, OIN conducted a comprehensive assessment of both systems with a special focus on institutional linkages among the various actors in the country to establish a deeper insight into the existing challenges and opportunities. Direct outputs of the assessment included:

- clear understanding on the organizational & management of NARS in Liberia;
- developed guidelines that can be followed to effectively help AR4D implement strategies such as assessing problem identification, research needs, demonstration and out-scaling of proven agricultural technologies;
- assessment of the institutional linkages and collaborations within and between NARS actors and extension systems;
- a policy brief that offers specific recommendations to ensure efficient adoption of proposed methodologies for enhanced impact of NARS R4D efforts.

The deliverables of the assessment were:

1. a guideline for assessment of impacts of AR4D projects based on literature reviews and participatory discussions;
2. a case study report based on the comprehensive analysis of AR4D projects in Liberia;
3. a policy brief to support the NARS for better implementation of AR4D projects through engagement of various actors including beneficiaries/farmers;
4. a comprehensive analysis of the institutional linkages among the NARS organizations in Liberia, including universities and relevant stakeholders with particular focus on the research-extension-farmers nexus pathways and linkages;
5. a compendium of criteria and check lists to ensure better research and development linkages for sustainable agriculture and food security;
6. a training programme at country level focusing on AR4D with emphasis on participatory approaches;
7. a documentation of lessons learned with key recommendations for further improvement of AR4D in Liberia.

In short, the results of the assessment study helped to draw lessons learned that enabled the development of the present guidelines to support the NARS to improve AR4D efforts in Liberia. The lessons learned and details of the guidelines are presented in the following chapters.



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CHAPTER 2: LESSONS LEARNED



1. Organizational set-up and linkage between the NARS organizations

The NARS consists of both public and private-sector entities that conduct research in various fields of agriculture. Presently, there are at least 19 NARS organizations in Liberia, about 80 percent of which are post-secondary and higher education institutions. These organizations function independently of each other and CARI is the only publicly dedicated center for agricultural research in the country. The results of the participatory discussions with various AR4D actors and experts revealed that the set-up of the various NARS institutions in the country may not be adequate to enable them to fully fulfil the AR4D needs within the country. As an example, there are no sub-research stations for regional testing of agricultural technologies around the country. This suggests that there is a need to expand the reach of the NARS by creating regional research stations in other parts of the country to widely serve rural communities.

CARI was established with the objective of guiding, coordinating, and providing general oversight to all aspects of agricultural research in the country. However, it does not seem that CARI has been fulfilling these roles effectively, as most of the NARS organizations have been operating independently of each other with little or no coordinated approaches to collectively address the strategic agricultural research and development needs of the country. CARI should do more to foster common linkages with the various national and international AR4D organizations. The institute should organize forums that will bring together the various AR4D actors on a regular basis to share experiences and it should lead the effort to develop joint proposals, seek collective funding, and implement research activities with other NARS and international AR4D organizations. This could help to foster and promote synergies that would enable them to achieve more AR4D outcomes for the country.

2. Institutional capacity for research

Notes analyzed from the desk review indicated that the institutional capacities of AR4D in Liberia have dramatically increased over the past 10 years. Research facilities and infrastructure destroyed during the devastating 1990 civil wars have been considerably rebuilt and the national number of AR4D researchers have more than doubled over the last 10 years. The participation of female researchers having increased from 25 percent in 2011 to

at least 40 percent in 2020. This demonstrates that the country has become more prepared in terms of human capacity to pursue the AR4D needs of its farmers and agribusinesses. It was noted that several critical research facilities, such as equipped laboratories for soil, animal feed and irrigation water quality analysis, are still lacking. The GOL and donors should make it a top priority to increase funding allocations for the upgrading and maintenance of the research facilities, as limitations of critical infrastructure and facilities for NARS organizations reduces their capacity to perform and properly deliver their mandates.

3. The extension and advisory services (EAS)

Farm enterprises and smallholder farmers require regular and sustained access to technology and knowledge to enable them to improve the production and productivity of their crops and livestock. The extension and advisory services (EAS) are critical for facilitating such access by serving as a bridge between farmers and producer organizations to research and knowledge generation services and agribusiness.

Agriculture extension and advisory services (AEAS) have been delivered in Liberia by an array of public sector entities including several ministries and agencies of the Government of Liberia (GOL), non-profit NGOs and civil society organizations, and private business, such as agro-input dealers and sellers of various farm products. Interviews with representatives of various stakeholders, including farmers, researchers, extension workers and key experts, suggested that the EAS in Liberia has not been working for all farmers and have therefore been ineffective.

Before the 1990 civil war in Liberia, government extension agents were active in every administrative district across the country. Presently, the coverage is far less, as several districts lack the presence of government extension staff. The main provider of extension services in the country, the Liberia Ministry of Agriculture (MOA), has less than 100 extension workers to cover the estimated 1.6 million farmers in the country. The few extension workers in the system appeared handicapped by poor logistics for mobility, poor road networks, and a shortage of critical supplies and equipment for on-farm demonstration of promoted technologies. In addition, extension officers often lacked access to new knowledge and information support systems.

National budgetary constraints were cited as the main limiting factor contributing to the low performance of the EAS in Liberia. One way to improve the performance of the national extension programme would therefore be for the GOL to mobilize and provide the requisite funding allocations to the MOA. Additionally, such funding should be used to recruit, deploy and support the work of more extension officers. In addition, the participation of NGOs and private-sector organizations and businesses could be leveraged through a well-coordinated approach by the MOA to reduce duplication of efforts and enhance synergies to increase the output, impact, and performance of the EAS. Furthermore, the current sectorial coordination efforts by the MOA should be expanded and focused towards ensuring full compliance of all private and other public EAS providers with both the national AR4D priorities and the EAS policies of the GOL.

Working towards these goals, the MOA has developed a national EAS policy, which has been in place since 2012 (Heritage, 2012; MOA, 2012a, 2012b). The policy is intended to provide guidance to all AEAS stakeholders and envisions a pluralistic, decentralized, demand-driven, and market-oriented AEAS that is flexible enough to address priority-crosscutting issues such as gender, nutrition, climate change and natural resource management. When fully implemented, this noble intent and vision could yield high dividends for farmers, agribusiness, and the economy.

4. Linkage between research and extension and advisory services (EAS)

As mentioned earlier, the EAS is responsible for bridging the gap between research and farmers and in order to achieve this there must be a strong liaison between research stations and the EAS. Participatory discussions results showed that the researchers and experts in Liberia believed that the official linkages between the EAS and NARS organizations were weak and ineffective, as they overwhelmingly flagged these issues as one of the main challenges facing AR4D. Majority of the extension workers indicated that, because of the weak linkage between the EAS and research stations, farmers could not fully benefit from AR4D efforts. To address these challenges, it will be important to strengthen the linkage between research and the EAS. A Research- Extension forum could be established and supported to 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. The research system should also be encouraged to communicate frequently with the EAS and the farming community through appropriate mass media avenues to increase their visibility and enhance contact with the EAS, farmers and other end-users.

5. Linkage between extension and advisory services and farmers

Like the linkage between the NARS and the EAS, participatory discussions revealed that the agriculture extension delivery system was ineffective because it was reportedly not working for all farmers, since only a few farmers tend to benefit from services. Reasons for these disparities were related to not only the limitation of extension workers and logistics to service farmers in remote localities, but also to the duplication of extension services delivered in certain localities.

As discussed above (in Section 3), increasing budgetary allocation to the national extension services by MOA and National Government should be used to support the recruitment, deployment and functions of additional extension workers needed to serve in every district and clan across Liberia. Also, effective coordination of the entire EAS apparatus, including both public and private sector organizations and agribusinesses will be needed to improve the utilization of the already scarce EAS resources in the country.

6. Implementation of agricultural research for development (AR4D)

6.1. Institutional framework and arrangements for research

The quality of the formal organizational structures, rules, and norms in place at the various NARS institutions can vastly influence the success of AR4D implementation in the country. Opportunities for constant improvements of the knowledge, skills and functional capacity of the research staff are critical for the improved performance of the system.

Participatory discussions revealed that the institutional frameworks for the operations and functions of CARI and many of the other NARS organizations in Liberia were adequate, but not functioning well. They suggested that these were due to the limitation of resources, even though the foremost AR4D organization in the country (CARI) presently lacks regional research hubs for fine-tuning and scaling out of agricultural technologies around the country. This suggests that there is a need to expand the reach of the NARS by creating sub-research stations across the country.

National coverage by higher education institutions has significantly increased over the past 10 years, with at least one higher education level agricultural programme in nine of the fifteen counties and each of the agro-ecological zones of the country. This arrangement provides an excellent opportunity for partnership to enhance multi- environment testing of technologies, which has become increasingly relevant due to climate change. Collaborative efforts between CARI and the institutions providing higher education in agriculture around the country could be harnessed to enable some of these institutions to serve as sub-stations for CARI which would encourage efficient utilization of already scarce scientific resources within the country.

There is also a need for the enhancement of several knowledge and skill-related changes related to AR4D among the researchers at CARI. These include, but are not limited to, project proposal writing, project management, risk management, and monitoring and evaluation of knowledge and skills. Opportunities should be provided for the NARS researchers to upgrade their knowledge and skills in those areas, as this will not only facilitate their work and develop their profile, but also it should enable them to contribute more effectively to AR4D implementation in the country for a sizeable impact on the smallholder farmers and end-users.

6.2. Research planning and implementation guidelines

The mode of planning and implementation are critical for the generation of outcomes and impacts from projects. Participatory discussions held with researchers revealed that farmers and end-users were not included regularly in the process of research gap identification. Some beneficiaries were given the opportunity to participate in the implementation of some, but not all AR4D projects. Furthermore, procedures used to design research projects at the

research institute varied among several of the researchers, and it appeared that most of the researchers did little or nothing to consider the issue of gender in their planning and implementation of AR4D.

These observed deficiencies in uniformity in the various procedures and practices could be the result of the absence of effective institutional guidelines and limited opportunities for on-the-job training of researchers to update their knowledge and skills. These findings suggest that there is a strong need for the establishment and adoption of standard procedures for planning and executing research projects by researchers of the NARS. In-service workshops should also be organized regularly to facilitate knowledge and skill improvement among the research staff of the NARS. Even though most of the researchers indicated that they considered a range of salient criteria, such as the relevancy of research topics to the national priorities of the country and to food security, when planning and implementing AR4D, training should be emphasized to help all the researchers understand the significance of these requirements.

6.3. Technical, administrative, and financial support to CARI

Currently CARI is the only nationally owned institution in Liberia that is wholly dedicated to agricultural research. CARI is expected to attract considerable attention and support from stakeholders, since it was established by the government to function as the agency responsible for pursuing and delivering the AR4D objectives and needs of the country. Findings from the stakeholder's participatory discussions indicate that researchers and other key AR4D actors in the country were not happy with current state of the technical, administrative, and financial support from the government. They described assistance as limited and poor to the extent that many of the researchers have been compelled to routinely utilize their personal resources to support their institutional duties. The desk review analysis similarly revealed that financial support extended to CARI directly by the GOL over the last five years has been extremely low.

Despite the present situation it is important to mention that since 2010 the GOL had provided immense technical and administrative support for the revitalization of the NARS of the country. Those efforts contributed greatly towards the rehabilitation of the physical facilities of CARI and other NARS organizations, led to the restructuring of CARI and its research programmes, and helped improve the national human resource capacity for AR4D in the country.

In recent years, international donors, such as the European Union have been observed to channel funding assistance for AR4D activities in Liberia through international organizations such as the FAO, AfricaRice, and others. These organizations have often applied the funding to finance their own programmes, with very little benefit to the national system. Any funding assistance intended to help the national system in Liberia should be provided directly to the national organizations, instead of channeling it through an intermediary organization.

6.4. Contribution of stakeholders to decision-making and implementation of AR4D

The primary focus of the national agricultural research institute in Liberia has been to carry out adaptive research. The participation of all stakeholders in AR4D activities, ranging from the decision-making process, the implementation of activities and the evaluation of project outcomes is important to ensure that stakeholders' needs and concerns are thoroughly addressed to ensure a positive impact of projects and interventions. The results of the participatory discussions suggest that unlike the researchers and most of the extension officers, farmers were completely excluded from the decisions regarding the formulation and selection of research topics.

Additionally, the results suggest that several farmers, researchers, and extension officers have not been able to participate in the implementation of AR4D activities in the country. This may be due to not only the limitations of funding and scarcity of projects, but also to the partiality of some decisions makers that lead to the exclusion of others.

The exclusion of farmers and some stakeholders from the critical process of research gap identification could be the result of the lack of awareness and education on the significance and benefits of participatory approaches in AR4D programmes. The lack of awareness and training on ethical considerations for implementation could also be responsible for the occurrence of personal bias that have sometimes led to the intentional exclusion of more deserving stakeholders in AR4D programmes in Liberia. It will be important to initiate and/or intensify awareness and trainings for both researchers and project leaders to enhance their knowledge and skills on participatory research approaches. The institutional rules and norms for organizing and implementing R4D within the various NARS institutions should be expanded to emphasize participatory approaches and ethics in the planning and implementation of their research.

6.5. Challenges in implementing AR4D

The challenges in implementing AR4D in Liberia consisted of a combination of factors that have the propensity to limit the performance and output of its organizational, planning, and implementation mechanisms. The participatory discussions revealed that the limitation of financial resources, tools and equipment, low staff capacity, weak institutional coordination and weak linkage between research and extension, were the main challenges facing AR4D within the NARS and the EAS. The performances of various key players (decision makers, researchers, project managers, farmers, and extension officers) were limited by several unique or related problems that negatively affected the implementation and/or impact of AR4D. In addition to funding constraints, the lack of equipped laboratories, equipment, logistics, and supplies for field research activities, and low salaries and incentives were the main challenges reportedly faced by researchers. It was further revealed that government extension workers did not have the requisite logistics to enhance their ability to work with farmers and farmers could not fully benefit from AR4D because they lacked access to basic inputs and implements.

The various challenges highlighted in the current study should not be dismissed; however, there is a need for the GOL and its development partners to find sustainable ways for addressing these problems. The NARS, together with the EAS, should ensure, as part of their standard operating procedures, that all stakeholders are properly consulted when decisions are considered for initiating AR4D projects. Programmes such as meetings and regular research and extension review conferences should be used to enhance the linkage between research and extension. These efforts should be incorporated in guidelines that would be developed to support the functions of the NARS and the EAS in the field of AR4D.

7. Monitoring, evaluation and learning (MEL) of AR4D

Monitoring and evaluation (M&E) are an essential activity to measure the progress and impacts of any programme. It is important for AR4D projects to have a good and reliable monitoring and evaluation system that ensures the proper implementation of activities. The MOA and CARI should be largely responsible for monitoring AR4D in the country. The results of the participatory discussions showed that there has been no properly established MEL mechanism in place at the level of the MOA, even though some “pockets” of data collection activities have been carried out occasionally by the ministry. Discussions with researchers suggest that the research institutes lacked the requisite institutional and technical mechanisms to gather feedback from farmers or stakeholders before, during and after implementation of their AR4D projects.

The limitation of MEL activities, even at CARI, could be one factor that has limited the opportunities for the growth and development of the NARS in the country. Ideally, the MOA or the central government, and every other NARS organization should develop and maintain effective MEL systems to ensure that their programmes and projects are constantly updated and remain responsive to the dynamic needs of end-users. The NARS must be supported in every way possible to establish and implement a culture of regular monitoring and evaluation of impacts of their programmes and activities in the country. Training for researchers should emphasize instructions and procedures for gathering and analyzing stakeholders’ feedback on AR4D programmes organized by the NARS.

8. Project sustainability and accountability for AR4D deliverables

A proper sustainability plan for AR4D projects is highly important to ensure that stakeholders continue to benefit from the services delivered by the project following its completion. Results from the participatory discussions suggested that some of the AR4D projects conducted over the last 10 years did not seem to have any sustainability plan. The services or results delivered by the projects could not continue to be felt following the end of the projects. This may have resulted from poor execution of projects, as most of AR4D projects

delivered to farmers are usually funded by international donor agencies that normally aim to promote the sustainability of the programmes they fund. The discussions also indicated that mechanisms to ensure accountability for AR4D deliverables were not as strong as the needed to be.

To ensure sustainability, technologies that could be easily reproduced by farmers are the types of interventions that should be targeted by AR4D projects. This is important because such technologies could easily be scaled and advanced for commercialization by local entrepreneurs and small-scale businesses. Additionally, the GOL should ensure that all AR4D projects should provide viable sustainability plans and exist strategies. Additionally, proper accountability for deliverables and financial accountability in AR4D programmes could be enforced if the capacities of the relevant anti-graft and integrity institutions strengthened to support and enhance their independence and avoid personal conflicts.

9. Impact of AR4D

Developmental research involves the promotion of scientific interventions aimed at reducing poverty and improving human welfare through innovations that lead to increased productivity, which is essentially an overarching goal of many developing country governments. To achieve these desired outcomes, it is important to ensure that AR4D projects are properly aligned with the national priorities of the government and the technologies promoted must be applicable for use by the end-users, affordable and easy to adopt, and responsive to gender issues, with no or limited adverse impact on the environment.

Overall, the responses gathered from the participatory discussions implied that the impact of AR4D projects in Liberia over the past 10 years can be rated as medium. Despite the positive assessment, a majority of Liberian farmers have not benefited from the impacts of AR4D activities in the country. Though the NARS have been doing their best to test, promote and disseminate improved technologies, the overall performance of AR4D cannot be regarded as satisfactory until the farmers in all parts of the country are well served. The EAS needs to be fully supported and empowered to accomplish this task.

The participatory discussions also revealed that many of the stakeholder believed that AR4D projects were largely linked to the national priorities of the country, and in many cases, were able to address critical issues such as the applicability, adoptability, affordability, gender sensitivity and environmental impact of the implemented programmes. These results indicate that despite the positive assessments given by many of the stakeholders, there is much room for improvement. Going forward, it will be important for the stakeholders to ensure that AR4D programmes implemented in the country are fully aligned with the policy priorities of the government and are able to address the relevant critical issues that should enhance sustainability and impact.



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CHAPTER 3: GUIDELINES FOR IMPROVED AGRICULTURAL RESEARCH FOR DEVELOPMENT



1. The need for AR4D guidelines

In many developing countries, including Liberia, the connection between research and agricultural development is weak and needs improvement. Agricultural research for development is designed to improve the resilience, livelihoods, and food security of small-scale farmers in rural communities. The National Agricultural Research System is comprised of universities and public and private research organizations and plays a very important role in advancing research for agricultural productivity. Although NARSs have a deeper understanding of the challenges both at farm and system levels, they need the technical and financial support to increase their efficiency to sustainably enhance the impact of AR4D projects to achieve national food and nutrition security. Technical support, in the form of national guidelines, can provide NARS with the essential tools needed to streamline their efforts, increase their efficiency, and achieve better outcomes and impacts.

Based on the lessons drawn from the implemented AR4D-assessment methodology, including desk review analysis and participatory discussions held with various actors and experts familiar with the NARS of Liberia, the following guidelines are proposed to strengthen the knowledge and skills of researchers and AR4D project managers within the various NARS organizations in the country. The guidelines include recommendations that should be considered by the GOL, its development partners, NARS organizations and other stakeholders to help improve the performance of the NARS in Liberia. It is expected that the guidelines, when applied accordingly, will enhance collaboration among the main research organizations of the NARS and improve the sustainable impact of AR4D in the country.

The guidelines are necessary to enhance the appropriateness of practice and to improve the quality of work in NARS organizations by providing a practical framework for decision-making and maintaining a sense of responsibility and accountability within AR4D programmes. Additionally, the guidelines will provide the boundaries that allow researchers and other AR4D actors to make decisions for the benefit of the stakeholders and the AR4D organization. Adherence to the guidelines can improve the consistency of implementation, help avoid inefficiencies and optimize the value of AR4D expenditures by identifying practices that are unnecessary or unduly expensive.

2. Human resources

Human resources are an indispensable factor for the production of goods and services. The individuals that make up human resources should have the necessary talents to contribute effectively to the organization. However, the pressure to provide and maintain jobs in society have sometimes led many actors and decision makers in agricultural research to not fully consider the necessity of the actual talents needed to drive production and productivity in organizations and workplaces. Franca et. al (2012) observed that by considering human talents as a necessary resource, an organization can strengthen itself by hiring and developing talented people and consequently synergizing their contributions within its range of other existing resources.

Agricultural research organizations are critical for improving and sustaining food security, nutrition and livelihoods in rural communities which drives the real growth and development in developing economies. There is a need for a reassessment of attitudes towards job creation and personnel placement in research organizations in Liberia, if the potential and impact of AR4D is to be realized fully in the country.

■ Agricultural education

Even though universities are expected to conduct research to support their teaching portfolio and to ensure their contribution to agricultural knowledge creation and diffusion, the primary function of agriculture colleges in an AR4D system is to train the next generation of agricultural specialists, including researchers and extensionists. The type of knowledge and skills required of agricultural graduates have been observed to change over time; hence, there is a need for institutions of higher education to review and update their curricula regularly. As Eicher (2004) indicated, within the context of AR4D, agriculture colleges should sufficiently equip students with problem-solving skills in agriculture. Efforts in agriculture education programmes in Liberia should work to attract more students and to increase the share of female students within agricultural sciences.

■ Recruitment process

Attracting and maintaining skilled and effective employees is critical to the success and sustainability of every professional organization, including AR4D institutions. AR4D should be more result-driven to ensure that research results, outcomes and impact all lead to tangible improvements in the wellbeing of smallholder farmers and their households. Guiding and aligning human resources with the goals and objectives of the organization should be the overarching effort in the recruitment and deployment of employees.

To enhance the selection and deployment of staffing within NARS organizations, employees should not be seen as individuals that need a job, but more as “human talents” with relevant experiences that should be empowered to contribute effectively to the achievement of the

development goals, objectives, and deliverables of the organization. The following best practices in the hiring of employees are suggested to be supported and facilitated by the decision makers and supporters of AR4D in Liberia:

- an independent and impartial recruitment process;
- standard procedures for the recruitment and deployment of employees could be adopted and supported by the relevant administrative structure and decision makers to ensure transparency and promote accountability;
 - Comprehensive assessment of the staffing portfolio of the organization should be undertaken regularly to identify and address any gaps in knowledge, attitudes and skills of the staff;
 - implementation, monitoring, and documentation of staff performance evaluation;
 - implementation and documentation of comprehensive personnel improvement programmes for relevant employees;
 - Recruitment of new employees should follow a guided procurement process;
 - publicize (advertise) the vacancy;
 - evaluate applications and shortlist candidates for interview;
 - notify shortlisted applicants and conduct an interview to assess their competency;
 - analyze, review, and report the data collected from the interview;
 - select the best candidate for hiring based on the result and recommendation from the interview data;
 - declare the results of the interview to all parties, including the interviewees and interviewers;
- The necessary personnel action notice should be implemented.

■ Staff motivation

Proper recruitment and deployment of staff should not be an end to addressing the staffing needs of the AR4D organization. Maintaining the necessary corps of competent staff should be thoroughly considered for ensuring the sustainability and success of AR4D organizations. Franca et. al. (2012) defined “talents” as aptitudes that human beings are born with, and because such aptitudes are affected by the environment, they can be either strengthened or weakened if the environment is supportive or unsupportive. Hence, the aim of the administrative organization in AR4D should be to provide a supportive environment that encourages and strengthens the talents of its staff to achieve the desired levels of performance. Some effective ways to motivate staff to sustain their effectiveness and contribution to the organization would be to:

- provide constant opportunities for the improvement and upgrading of their job knowledge and skills;
- provide competitive salaries, incentives, benefits and social security.

3. Functions of the NARS in AR4D

The NARSs are the linchpin of an agricultural innovation system. They serve as a critical input towards achieving long-term food security. The NARS is responsible for generating and evaluating new agricultural technology and innovations. The functions of the NARS are:

- to enhance development and support advisory services;
- provide training programmes (short or long-term) for extension workers and farmers;
- support information communications;
- deliver the AR4D needs of the country;
- support the national development agenda of the country;
- advocate and facilitate policy options for demand-driven agricultural product value chains in the country.

3.1. Structure and collective functions of the NARS

The NARS is a collection of public and private research and education agricultural organizations involved in agricultural research. Generally, agricultural research organizations have traditionally focused mainly on the biological and physical sciences, seeking to explain biophysical constraints to agricultural production. The typical model of the research system generated technological options for varying agroecological conditions on the understanding that public extension systems would gather the research results and technological packages to deliver them to the farmers.

The primary function of agriculture colleges in AR4D systems is to train the next generation of agricultural specialists, including researchers and extensionists. In addition, agriculture colleges are expected to conduct research to support their teaching portfolio and to ensure their contribution to agricultural knowledge creation and diffusion.

Presently, the NARS of Liberia are composed of CARI, the various agriculture colleges, and other public and private sector entities that conduct research on agriculture-related issues in the country. The NARS organizations could continue to exist as independent entities but would better serve the country if they collectively functioned as a connected system of the various integral organizations linked by a common collaborative framework.

3.2. Enhancing skills for administrative leadership

The NARS require a critical mass of expertise and skills to support the functions of the various AR4D institutions in the country and to facilitate inter-agency collaboration within the NARS. The researchers and key experts should be highly qualified with a set of minimum qualifications that would enable them to deliver their mandates and achieve their missions. The NARS and the GOL should therefore continue to facilitate and support advanced trainings and education to constantly improve and upgrade the quality of the research personnel. They should also provide incentives to attract and maintain the requisite staff required to effectively deliver the mandates of the NARS.

3.3. Enhancing researchers' key-knowledge and skill-related in AR4D

The key processes described in this part of the guidelines are intended to help researchers improve their understanding of:

1. the roles and responsibilities of the National Agricultural Research System:
 - All researchers and leaders of NARS organizations should be fully aware and familiar with the structure and collective roles and responsibilities of the NARS.
 - NARS administrators and researchers should have the ability to establish and strengthening partnerships and collaborations to enhance interactions that maximize output at minimum costs.
2. how to properly design AR4D projects that have all the elements for a smooth implementation of programmes and research that ensure successful outcomes;
3. how to effectively implement AR4D projects that achieve a sizeable impact;
4. how to monitor the implementation and evaluate the progress and outcomes of AR4D projects.

4. Institutional linkage

Linkage between various parts of a system are important for enhancing its function. The key function of the NARS in Liberia is to address the AR4D needs and deliver the necessary results. Collaboration between the various NARS organizations is important to avoid overlap and duplication of research and to facilitate cooperation to more effectively utilize scarce scientific resources within the country. This cannot be achieved easily without an effective coordination mechanism to guide the efforts of the various players and stakeholders. Establishing this mechanism involves not only identifying and appointing a coordinating agent, but also outlining and supporting ways and means by which the coordination and collaborations can be achieved.

4.1. Partnership and collaboration framework

A community of partners in research who commit to a cause will achieve more together, than individual members of that community standing alone. Partnerships can compel stakeholders to focus more on a joint purpose. Donors are becoming increasingly apt at funding AR4D initiatives that involve multiple partners from diverse backgrounds. Through networks, institutions have been able to harness and align their comparative advantages to produce more results with wider impacts.

Partnerships in research provides an opportunity for shared learning, resource pooling and ultimately increase the potential for innovation. Further to the NARS successfully forging networks within, they should actively seek and embrace partnerships from outside their typical spheres of collaboration, including private and public corporations, civil society, donor agencies and non-governmental organizations who in some way share similar visions.

4.1.1. Developing and growing partnerships

Networking is the exchange of information and ideas among people with a common profession or special interests, usually in an informal social setting. Networking often begins with a single point of common ground. Professionals use networking to expand their circles of acquaintances, find out about job opportunities in their fields, and increase their awareness of news and trends in their fields or the greater world (Investopedia, 2021). A partnership is an arrangement where two or more people or entities agree to cooperate to advance their mutual interests. In the Liberian NARS network, partnership should advance along the continuum from networking to collaboration. This will be important for increasing the impact in AR4D and will help better inform policy. Collaboration is that type of partnership involving not only the exchange of information, activities and sharing resources, but also a willingness to increase the capacity of another organization for a common purpose and mutual benefit. To promote the evolution of partnerships for impact in AR4D, the Apex NARS organization or a NARS coordination committee could:

- Take the lead in attracting partnerships and facilitating negotiations with interested partners. Establishing a dedicated Focal Point Committee and Chair, whose sole responsibility should be to coordinate the NARS and maintain and enhance every partnership. The committee could help facilitate negotiations between NARS members and other international partners such as NGOs, private companies, research organizations, and others.
- Encourage and promote inter-disciplinary collaboration, which research has been found to be critical for moving science and society forward. Researchers and NARS organizations should not only rely on the talent they have. They need to reach out to find counterparts with complementary knowledge and skillsets that are willing to help.
- Enhance communication and promote the sharing of information. A wide range of ICT tools and platforms are currently available to facilitate sharing of vital information, even as global interconnectivity has become more commonplace.
- Increase public engagement by highlighting the nature and extent of the programmes and research undertakings of the NARS, and by ensuring effective dissemination of research findings and other results derived and delivered by the NARS. This can also be important for raising awareness.

Additionally, to promote the growth of partnerships for informing policy, the NARS must:

- Work closely with people and would-be beneficiaries in target communities, through innovative outreach programmes. They should constantly receive essential and timely feedback that could help in the refinement and fine-tuning of relevant policy options.
- Increase and sustain partnership between NARS organizations and CARI and between policy makers and institutions, as partnerships can better influence policy makers. Through partnership with policy makers, they can become more actively connected with the problems and the solutions developed by researchers and NARS.

4.2. NARS coordination framework

Coordination is the process of ensuring smooth interplay of the functions of management to achieve common objectives with minimum effort and resources (Narang, 2021). Through effective coordination mechanisms, the NARS can develop robust systems, standards, tools and codes that are relevant to the needs of its members and other AR4D players, and reduce reliance on foreign models that may not always fit into the existing context of the NARS in Liberia.

The guiding principles of the coordination framework should be:

- adherent to the national goals, and the objectives of the NARS;
- scientific integrity and professional excellence;
- productive engagement with stakeholders;
- including accountability;
- aimed for tangible results and impact on the ground;
- decentralized of research services;
- assuring the quality of agricultural research services.

4.2.1. Coordination body and points of contact

CARI should undertake the responsibility for coordinating the NARS in the country. However, if this is not possible, representatives of the various NARS organizations in the country could agree upon the establishment of a national agricultural research coordination committee (NARCC), which should convene as regularly as possible.

The coordinating body should consist of Focal Points or Liaison Officers, one appointed by each NARS organizations, and a corps of officers to lead its functions. The scope of the coordination efforts should be purely internal, i.e., it should exist only between the member institutions of the NARS, as the coordinating body should not be expected to serve as a liaison between any NARS organization or group of the NARS organizations and any third party. It is further proposed that a National Agricultural Research Policy is developed to guide AR4D implementation and actors in the country, along with a statutory coordinating body that could also have the responsibility to mobilize and streamline funding, in addition to working with relevant stakeholders to set the directions for AR4D in the country.

4.2.2. Programming tools for effective coordination of the NARS organizations

Some initiatives that should be undertaken to enhance collaboration and linkage between the NARS organizations should be, though not limited to:

1. joint programming;
 - undertaking activities in a common work plan and related budget;
 - collective effort of partners working together to plan, implement, monitor, and evaluate activities to achieve agreed development goals effectively and efficiently;
 - through joint programming and common results, the modalities for supporting programme implementation can be identified.

2. regular (perhaps, quarterly) NARS coordination meetings;
3. annual science congress;
4. establishment of a NARS publication to promote national local content.

4.2.3. Enhancing linkage between research and EAS

1. Enhancing the complete research cycle:
 - get all the key stakeholders together regularly to put into perspective and prioritize the research needs of the country and together set the research agenda for a given period;
 - develop, discuss, and agree upon strategies for addressing the relevant needs;
 - brainstorm, develop and agree upon action plans for implementation;
 - assign responsibilities for implementation; adjourn and return subsequently to review implementation progress.
2. Regular AR4D/EAS meeting.

5. Organizational scope for the NARS efforts in AR4D

The AR4D concept, also known as action research development (ARD), is based on the realization that research designed and implemented by multi-disciplinary teams from different institutions and stakeholder groups can solve complex problems better, meet multiple objectives, and is more likely to result in the development of a full range of technological, policy and institutional options that are needed to benefit and support a broader set of end-users (Daane and Booth, 2004). The concept of the NARS in developing countries has largely evolved in response to the growing interest in linking agricultural research more directly with regional and national development objectives. The link between research and development objectives essentially involves transforming development objectives into system objectives, system objectives into organizational strategic objectives, and strategic objectives into programme and project priorities (Mbabu and Ochieng, 2006).

In Liberia, the development objectives of the country are articulated in medium-term development strategies, covering multisectoral interests and objectives (such as economic growth, job creation and poverty eradication), which are dissected into more specific strategic objectives for each sector, based on their niches and expected contributions to the overall national objectives. The MOA, for example, has been given the responsibility to pursue increased agricultural production and enhance natural resource management that should contribute to economic growth, job creation and poverty eradication.

Within this context, the research system would need to focus on its unique contribution. Each NARS organization would then need to identify and define their respective areas by defining their own strategic objectives, depending on their core competencies and interests. Once clear objectives are established, the respective NARS organizations will be well positioned to

address other dimensions of scope in the AR4D agenda, including the type of research, area of focus and methodological approaches (Lynam and Elliott 2004).

Before developing any AR4D project, the following comprehensive criteria and check list to ensure better Research and Development linkages are important to ensure successful implementation of the project:

- The project must be aligned with the national research priorities and strategies.
- The project should be community-based and demand driven.
- There should be community consultation prior to implementation phases.
- Introduced technologies and innovations should be benchmarked appropriately.
- The introduced interventions should be practical, affordable, cost-effective, and gender-sensitive.
- The project must have an effective monitoring, evaluation and learning system.
- The project must have a continuous feedback mechanism.
- The project must have an exit strategy and a sustainability plan.
- Lessons learned from the project should be documented.
- Stakeholders' ownership of project outputs and outcomes should be ensured.

6. Designing AR4D projects

6.1. Identification and analysis of AR4D stakeholders

The process of stakeholder engagement begins with the identification and analysis of the relevant stakeholders. Basically, stakeholders are those who may be affected by or influence a project or an effort. Stakeholder identification is the process of determining who the stakeholders of a project are, and their key groupings and sub-groupings. Stakeholder analysis is a technique used by projects to identify and assess the importance of key people, groups of people, and institutions that may influence the success of the project activities.

Stakeholder identification and analysis should always be done at the beginning of a project, as it can be used as a basis for formulating a good stakeholder engagement geared towards winning their support. The key steps in stakeholder analysis include:

- identifying the stakeholders of the project;
- prioritizing the stakeholders;
- understanding the key stakeholders.

Identification of stakeholders begins with brainstorming and listing all the people who would be affected by the project, people who have influence or power over it, or people who have an interest in its successful or unsuccessful conclusion. Certain stakeholder groups might be pre-determined through regulatory requirements (IFC, 2007; MindTools, 2021). Depending on the level of power and/or interest, the different individuals or groups may have over and/or in the project, the researcher can prioritize them by deciding what actions that need to be taken with them:

- Those found to have high power and to be highly interested in the project should be managed closely, i.e., the project must fully engage these people, and make the greatest efforts to satisfy them.
- Those found to have high power, and to be less interested should be kept satisfied, i.e., the project must put enough work in with these people to keep them satisfied, but not so much that they become bored with the message.
- Those found to have low power, and to be highly interested must be kept Informed, i.e., the project must adequately inform these people, and talk to them to ensure that no major issues are arising. People in this category can often be very helpful with the project details.
- Those found to have low power, and to be less interested must be monitored, i.e., the project must monitor these people, but take care not to bore them with excessive communication.
- Finally, understanding the stakeholders will mean discovering how the key stakeholders feel about the project. The project will also need to work out how best to engage them, and how to communicate with them.

6.2. Identification of research gaps and community needs

Bring representatives of all the relevant stakeholders together and collectively:

1. define the desired or expected level of output/quality of AR4D, with specific targets for each indicator;
2. assess actual/present level of output and quality;
3. compare the two levels to identify the gap.

The outcomes considered should be specific, observable, and measurable and should be relevant to the goals of the sector. It is critical to find the underlying reasons for the gaps so that interventions can target the root causes to enhance effectiveness and impact. Researchers should conduct root cause analysis by using common methods such as the Five Whys (or Why Tree) process or the Fishbone (or Cause and Effect) Diagram proposed by Murphy and Sebikali (2014):

1. Five Whys or Why Tree process:
 - state the problem/gap as accurately and succinctly as possible;
 - below it, list the possible causes of the problem/gap by asking the question;
 - “why?” or “why is that true?” or “why is that happening?”;
 - for each of the causes, again ask the question “why?”, and list the responses below;
 - continue this process at least 5 times or until you have reached the source of the problem, the lowest level cause stakeholders can do something about, or the response;
 - “that is just the way it is, or that is just what happened”.

2. Fishbone or cause and effect diagram:
 - agree on a problem statement (effect);
 - write it at the center right of the flipchart. Draw a box around it and draw a horizontal arrow running to it;
 - brainstorm the major categories of causes of the problem;
 - write the categories of causes as branches from the main arrow;
 - brainstorm all the possible causes of the problem. Ask: “Why does this happen?” As each idea is given, the facilitator should write it as a branch from the appropriate category. Causes can be written in several places if they relate to several categories;
 - again ask “why does this happen?” about each cause. Write sub-causes branching off the causes. Continue to ask “Why?” and generate deeper levels of causes. Layers of branches indicate causal relationships.

6.3. Basic criteria and considerations for determining/selecting AR4D topics

Good and acceptable AR4D projects should:

- be more demand driven;
- be well aligned with country’s research priority;
- be fully participatory, involving the major stakeholders from the planning to implementation and evaluation stages;
- have a good sustainability plan and exit strategies;
- have well documented outcomes;
- be adoptable, cost-effective, scalable, and affordable;
- be responsive to gender and environmental sensitivities.

Research scientists should ensure that the AR4D projects they design and implement are capable of meeting the above minimum criteria.

6.4. Selection and design of the interventions

Following the identification of the root causes of the gaps, stakeholders can then select and design interventions that will address these gaps. The process of selecting the intervention involves the stakeholders brainstorming and proposing possible solutions and ultimately selecting the priority interventions, based on agreed selection criteria. These criteria may be things such as response to root cause(s) of problems, practicality, affordability, feasibility, appropriateness/acceptability and benefits.

Once the interventions are selected, the stakeholders can now develop a design plan, test and optimize it, and produce a final version. The design plan should include the process or steps to be used to develop the interventions, the people responsible for each step, and the timeframe. The testing process should include reviews with end-users/clients and subject-matter experts, or actual trials with members of the target audience in the environment in

which the intervention will be implemented. Feedback from the process should be used to revise the workplan accordingly.

7. AR4D project implementation

In general, there are four stages in implementing AR4D. The Center for Effective Services (2021) identified these stages as:

1. exploring and preparing;
2. planning and resourcing;
3. implementing and operationalizing;
4. full implementation.

The first stage, exploring and preparing, is a key decision-making phase in implementation. The research team will need to spend quality time assessing the needs of those affected by the intervention, consulting with stakeholders to secure buy-in, building a supportive climate and identifying champions who will drive the change, and assessing readiness and capacity for implementation. During the second stage, planning and resourcing, the foundation is laid for effective implementation. A team is identified and a clear plan put in place for implementation, outlining the tasks required, people responsible, timelines for delivery, and arranging funding and other necessary resources.

During stage three, the intervention is initially implemented for the first time, usually on a pilot basis before later being rolled out fully, using the implementation plan developed in stage 2 to guide the activities. During this stage, the plan can be reviewed and updated, if necessary, to reflect changing contexts and circumstances. The project finally becomes fully operational and integrated into the setting during the full implementation stage (stage 4). By this time, the outcomes of the intervention are ready to be evaluated, and this provides an opportunity to show impact and progress the intervention through continuous cycles of improvement.

7.1. The key activities during the exploration and preparation stage are:

- identifying community needs and gaps or assessing needs and the evidence base for the intervention;
- assessing fit, feasibility and appropriateness, including alignment with country's research priority;
- assessing implementation readiness;
- developing leadership for implementation;
- stakeholder engagement planning;
- selecting or designing the intervention;
- identifying outcomes;
- developing a theory of change and logic model.

7.2. The key activities during the planning and resourcing stage are:

- assessing enablers and barriers for implementation;
- developing an implementation plan;
- establishing implementation team(s) and other structures to support implementation;
- securing resources;
- identifying champions to support implementation;
- designing monitoring, evaluation, and feedback systems;
- determining and delivering staff training, capacity building and support requirements;
- planning for sustainability.

7.3. The key activities during the implementing and operationalizing stage are:

- maintaining ongoing communication with key stakeholders, explaining why the intervention is necessary and securing continued buy in;
- providing ongoing professional development opportunities, coaching and mentoring for stakeholders implementing and delivering the intervention;
- monitoring implementation, service, and client outcomes;
- using data and feedback to inform ongoing improvements;
- adapting for local context where appropriate.

7.4. The key activities during the full implementation stage are:

- maintaining skillful practice;
- developing more efficient and effective structures;
- evaluating implementation, service, and client outcomes;
- engaging in continuous improvement cycles.

The key broad steps in the implementation of AR4D projects involve:

Step 1: Structuring the implementation team. The role of the implementation team should be to:

- develop an implementation/action plan;
- identify persons/organizations with appropriate expertise/experience to implement the interventions;
- assure team members know roles and responsibilities, expectations for interventions;
- identify and mobilize resources;
- carry out and manage interventions.

Step 2: Developing a detailed implementation action plan. The plan should include:

- planned activities;
- person responsible for each activity;
- required resources;
- date by which each activity will be accomplished;
- expected result and how it will be measured.

Step 3: Conducting and monitoring the project activities:

- at milestone points, assess milestone goals, provide feedback, and use monitoring data to make decisions;
- monitor actual costs or expenses against amounts budgeted, in an integrated manner with other monitoring activities;
- key-stakeholders should check regularly to ensure that the team is successfully integrating the changes that should be occurring as part of the implementation process.

8. Monitoring and evaluating AR4D projects

The progress and performance of AR4D projects should be monitored, documented, and evaluated to measure any changes in the performance gaps or to capture the expansion of high performing areas arising from the implementation process. Monitoring refers to the routine tracking of data that measure progress toward achieving objectives of a programme or intervention. The purpose of monitoring should be:

- to ensure that the project activities are implemented according to plan and timeline;
- to identify activities or resource allocation that may need to be adjusted or improved to achieve desired results;
- to provide information for decision-making and programme evaluation;
- to support reporting requirements;
- to facilitate advocacy.

Evaluation is the process of collecting and analyzing data to measure how well a programme or intervention has met expected objectives and/or the extent to which changes in outcomes can be attributed to the programme or intervention, or to other factors. The purpose of evaluation is to confirm that adopted strategies and funding available produced the desired results, and to assist stakeholders in decision-making about future programme improvement and implementation by:

- providing an objective and reliable assessment of the activities;
- providing feedback to local organizers and other stakeholders about:
 - the outcomes of the activities;
 - strengths and weaknesses;
 - other influencing factors;
 - suggested measures for improvement.

8.1. Monitoring and evaluation system could include:

- developing the M&E plan;
- monitoring routinely and recommending changes for adjustment;
- repeating the baseline data collection process using the same indicators and instruments;
- comparing results with baseline;
- reporting and communicating evaluation results.

9. Stakeholders' feedback mechanism

Stakeholders are those who are affected by a project and/or those who have the power to influence the outcome of the project. Effective feedback and response mechanisms are critical to project success and accountability. According to MEAL DPRO (2019) feedback-and-response mechanisms are two-way communications systems designed specifically to gather and respond to feedback from project participants and other community stakeholders. The Project Management Alliance (2021) indicated that stakeholders' feedback is important because it:

- facilitates the free-flow of information during project implementation;
- enables the project team to address problems more quickly;
- encourages stakeholder engagement;
- is critical for ongoing improvement in project implementation.

For project managers to ensure that they get the right levels of input from the right stakeholders they need to apply good strategies to gather feedback and reactions from relevant stakeholders. To effectively gather and analyze stakeholders' feedback, the project manager should:

- schedule and hold regular stakeholder team meetings;
 - apply active listening and consider all stakeholder conversations and discussions;
 - apply effective and continuous meeting facilitation strategies (i.e., planning and sticking to an agenda);
- constructively handle the reactions of the stakeholders by creating action plans that specify roles and responsibilities for resolving project issues raised by stakeholders and consider them in the adjusted workplan.

10. Exit strategy and sustainability plan

The aim of every development programme is to deliver sustainable positive changes. This means the changes introduced by projects should not depend on external support once the project ends. Changes should provide the beneficiaries to have the capacity to continue with the changes. Studies have shown that for lasting changes to take place, a well-managed termination of the project needs to be planned in advance (Gardner et. al, 2005). The project

termination should always be considered in its exit strategy to ensure that the project results will continue to benefit its beneficiaries or right-holders even after it is completed. An Exit Strategy is therefore a contingency plan that is executed by a project in an expeditious manner once the predetermined criteria for ending the project have been met or exceeded. The goal of an Exit Strategy is to ensure the sustainability of impacts after a project ends. An exit strategy can, therefore, contain a project sustainability plan. Lee (2017) explained that the exit strategy is a process that follows through all stages of the project cycle:

1. The preliminary exit plan is drafted together with all partners during the project planning stage.
2. The plan is clearly defined during the project implementation.
3. The necessary modifications to the exit plan are made with the help of the follow-up data.
4. During the project implementation, monitoring and evaluation process, the exit strategy puts emphasis on learning together with the stakeholder and documenting the lessons learned.

Rogers et. al (2016) also indicated that incorporating the lessons for sustainability into project design may improve the likelihood that development projects continue to offer benefits after project completion.

10.1. Importance of exit strategies

Exit strategies, when planned with communities in advance of close-out, have been proven to contribute to better programme outcomes and encourage commitment of beneficiaries to commit to programme sustainability. According to Gardner et. al (2005), good exit strategies can:

1. help resolve or reduce the tension that may arise between the withdrawal of assistance and commitment to achieve programme outcomes;
2. help clarify and define the donor's role to support communities, reducing the potential misunderstandings and future dependency;
3. be critical to developmental relief programming as they inform a programme's sustainability plan or planning for its next phase or implementing similar activities in other areas.

Conversely, without exit strategies, programme transitions and exits are likely to be more haphazard which reduce the potential benefits of achieved results.

10.2. Universal approaches to exit strategies

The three basic approaches to exit strategies are:

1. Phasing down

Phasing down is a gradual reduction of programme activities, utilizing local communities/beneficiaries to sustain programme benefits while the original sponsor (or implementing agency or donor) deploys fewer resources. Phasing down is often a preliminary stage to phasing over and/or phasing out.

2. Phasing out

This refers to a sponsor's withdrawal of involvement in a programme without turning it over to another institution for continued implementation. Ideally a programme is phased out after permanent or self-sustaining changes are realized, thus eliminating the need for additional external inputs.

3. Phasing over

In the phasing over approach, a sponsor transfers programme activities to local institutions or communities. During programme design and implementation, emphasis should be placed on community capacity building so that the services provided can continue through local structures.

10.3. Criteria to be used to determine when to exit a project

Criteria used to determine when to exit programmes vary. However, they can be grouped into three general categories.

1. Time limit

Exit time limits are normally dictated by funding cycles. Time limits may increase a programme's focus in establishing systems of sustainability or they may impose artificial timing constraints.

2. Achievement of programme impacts

Although achieving the intended programme impact is often difficult within a given timeframe, indicators of programme impact can sometimes be used as exit criteria. These can be used to focus programme graduation efforts on the more self-reliant communities or the effective programme components. Thus, impact indicators can help inform and guide the Exit Strategy timeline.

3. Achievement of benchmarks

Benchmarks are defined as the measurable indicators of identified steps in the graduation process of an exit strategy. They are parts of the monitoring and evaluation planning matrix from the onset. Benchmarks should be linked to the graduation process and to the programme components to be phased out or terminated.

4. Setting the timeframe for project exit

There are several considerations to be noted when establishing the timeframe for programme exit strategies. Establishing an exit timeline that is linked to the programme funding cycle, and clearly communicated to the community is essential. Since programme implementation will influence exit strategy activities, it is important that the exit plan remains flexible with the expectation that some of the exit criteria and benchmarks may need to be modified during the programme cycle.

Further, implementing exit plans in a gradual, phased manner is recommended, as the staggered graduation of project sites can contribute to sustained outcomes by applying lessons learned from earlier sites to those that come later. Lastly, after phase over or programme phase out is complete, continued contact with communities will help to support sustainability of outcomes.

11. Documentation and lessons learned

Lessons learned are the documented information that reflects both the positive and negative experiences of a project; they are basically knowledge and understanding acquired via experience (Keefe, 2021). Lessons learned represent the organization's commitment to project management excellence and the project manager's opportunity to learn from the actual experiences of others. Documenting the lessons learned is important to:

- understand what went wrong and why;
- identify what can be done differently in the future;
- understand what went well and why;
- possibly duplicate the appropriate steps across all teams and yield positive results with other projects.

Documenting lessons learned includes:

1. *soliciting information;*
2. *publishing a report.* Once all information is collected, examined, and revised as needed, it should be distributed so that everyone involved, from the team to upper management, is aware of and understands all lessons learned;
3. *store the report in a central location.* A lessons learned document is meant to guide future projects, which is impossible if it is not made readily available. All reports should be kept in a central location so that other project managers can adopt successful routines and avoid pitfalls from previous projects;
4. *naming the scope of the lesson;*
5. *a description of the problem or success;*
6. *the impact on the project;*
7. *the process improvement recommendations (lessons learned).*



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Although National Agricultural Research Systems (NARS) have a deeper understanding of the challenges at both farm and system levels, they need the technical and financial support to increase their efficiency to sustainably enhance the impact of AR4D projects to achieve national food and nutrition security. Technical support, in the form of national guidelines, can provide NARS with the essential tools needed to streamline their efforts, increase their efficiency, and achieve better outcomes and impacts. Based on the lessons drawn from the implemented AR4D-assessment methodology, including desk review analysis and participatory discussions held with various actors and experts familiar with the NARS of Liberia, the guidelines are proposed to strengthen the knowledge and skills of researchers and AR4D project managers within the various NARS organizations in the country. The guidelines include recommendations that should be considered by the Government of Liberia and its development partners, NARS organizations and other stakeholders to help improve the performance of the NARS in Liberia. It is expected that the guidelines, when applied accordingly, will enhance collaboration among the main research organizations of the NARS and improve the sustainable impact of AR4D in the country.

The guidelines aim to enhance the appropriateness of practice and to improve the quality of work in NARS organizations by providing a practical framework for decision-making and maintaining a sense of responsibility and accountability within AR4D programmes. Additionally, the guidelines also aim to provide the boundaries that allow researchers and other AR4D actors to make decisions for the benefit of the stakeholders and the AR4D organization. Adherence to the guidelines can improve the consistency of implementation, help avoid inefficiencies and optimize the value of AR4D expenditures by identifying practices that are unnecessary or unduly expensive.

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