



**Agricultural Research Delivery in Africa:  
An Assessment of the Requirements for Efficient, Effective  
and Productive National Agricultural Research Systems in  
Africa**

**Main Report and Strategic Recommendations**

**6 March 2006**

## Contents

List of Tables	iv
List of Figures	iv
<b>Abbreviations and Acronyms</b>	<b>v</b>
<b>1. Introduction</b>	<b>1</b>
1.1. Background this NARS assessment	1
1.2. Expected outputs of the NARS assessment	1
1.3. Terms of reference	1
1.4. Acknowledgements	2
<b>2. Methodology</b>	<b>2</b>
2.1. Definition of national agricultural research systems and national agricultural research institutes	2
2.2. The process adopted	3
<b>3. Results of the assessment</b>	<b>3</b>
3.1. Governance and management	3
3.1.1. Research strategic and implementation plans	3
3.1.2. Vision and mission statement	4
3.1.3. Management boards and committees	4
3.1.4. Management manuals	6
3.1.5. Research institute staff evaluation	6
3.1.6. Stability of management staff	6
3.1.7. Restructuring and sizing of institutes	7
3.1.8. Management reviews	7
3.1.9. Priority-setting, programme planning, monitoring and evaluation	7
3.1.10. Discussion	7
3.2. Financial status and management	8
3.2.1. Research budgets – sources of funding	8
3.2.2. Funding modalities	10
3.2.3. Financial management and oversight	10
3.2.4. Discussion	11
<b>3.3. Scientific capacity and management</b>	<b>12</b>
3.3.1. Research personnel	12
3.3.2. Terms and conditions of service	13
3.3.3. Training programmes for research staff	14
3.3.4. Research competences – Biotechnology & research programme design	15
3.3.5. Scientific publishing – institutional and research staff	15
3.3.6. Technology generation and dissemination	17
3.3.7. Connectivity (information and communication technology, ICT)	18
3.3.8. Library and documentation facilities	21
3.3.9. Laboratory facilities	21
3.3.10. Research partners	21
3.3.11. Research programme management	21

3.3.12. Monitoring and evaluation of research programmes	21
3.3.13. Discussion	22
<b>3.4. Collaboration</b>	<b>24</b>
3.4.1. Introduction to collaboration, partnerships and linkages	24
3.4.2. Awareness of FARA	24
3.4.3. Establishing partnerships	25
3.4.4. Linkages with universities and other research institutes	25
3.4.5. Linkages with NGOs	27
3.4.6. Linkages with farmer- and community-based organizations	28
3.4.7. Linkages with policy-makers in ministries	28
3.4.8. Linkages with sub-regional organizations	28
3.4.9. Discussion	32
<b>4. General conclusions</b>	<b>33</b>
4.1. Introduction: Some concepts of innovation systems for integrated agricultural research for development (IAR4D)	33
4.2. Governance and management	35
4.3. Financial status and management	35
4.4. Scientific capacities and management	36
4.5. Collaboration	37
4.6. Categorizing sub-regional NARS and NARIs	37
4.7. Options for strengthening African NARS	38
<b>5. Strategic recommendations</b>	<b>39</b>
5.1. Introduction	39
5.2. Implementation process	40
5.3. Grouping of recommendations	40
A. General recommendations	41
B. Specific recommendations	42
<b>6. Documents consulted</b>	<b>47</b>
<b>Annexes</b>	<b>48</b>
1. The 21 conditions for creating strong African NARS	48
2. Concept note: Strengthening NARS in Africa: A pan-African training capacity building programme	50

## List of Tables

Table 1	Frequency of change in key management staff of NARIs	6
Table 2	Funding patterns for the eight best-funded African NARIs (after South Africa)	10
Table 3	Age distribution of research scientists in African NARIs	13
Table 4	Distribution of research scientists in research disciplines in African NARIs	13
Table 5	Incentives available to NARI staff	14
Table 6	Training needs for key aspects of agricultural research performance, management and delivery	15
Table 7	Research competences of NARIs	15
Table 8	Institutional publishing patterns of African NARIs	16
Table 9	Accessibility of external information to NARI scientists	20
Table 10	NARI staff proficiency in Internet searching for information	20
Table 11	Research partnership patterns in African NARIs	25
Table 12	Linkage patterns of African NARIs with universities, other research institutes, SROs and NGOs	26
Table 13	ASARECA budget and funding by donor source, 2005	31

## List of Figures

Figure 1	Representations in Boards of Management of NARIs	5
Figure 2	Funding patterns for the Agricultural Research Council (ARC), the NARI of South Africa	9
Figure 3	Software used in financial management by NARIs	11
Figure 4	The numbers of scientists in African NARIs	12
Figure 5	Publication performances (numbers of articles in refereed journals in 5 years) of agricultural scientists in African NARIs	17
Figure 6	Generation and transfer of agricultural technologies by agricultural research scientists in African NARIs	18
Figure 7	Availability of connectivity facilities in African NARIs	20
Figure 8	Monitoring and evaluation for research outputs, outcomes, impacts and institutional issues by NARIs	22
Figure 9	Assessment of NARS awareness of FARA	25
Figure 10	Joint research projects implemented collaboratively by African NARIs and other institutions, NGOs and FBOs	27

## Abbreviations and Acronyms

AARSF	African Agricultural Research Services Facility (FARA proposal)
AATF	African Agricultural Technology Foundation
ACP	Africa, Caribbean and Pacific region
ARC	Agricultural Research Council (Nigeria, South Africa)
ARD	agricultural research for development
AREU	Agricultural Research and Extension Unit (Mauritius)
ARI	advanced research institution
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
BASIC	Building African Scientific and Institutional Capacity (FARA programme)
CAADP	Comprehensive African Agricultural Development Programme (NEPAD)
CARE	Cooperative for Assistance and Relief Everywhere
CBO	community-based organization
CD-ROM	compact disk – read-only memory
CEAR	centre of excellence for agricultural research
CERAAS	<i>Centre d'Etudes Régional pour l'Amélioration à l'Adaptation à la Sécheresse</i> (Senegal)
CFM	competitive funding mechanism
CGIAR	Consultative Group on International Agricultural Research
CILSS	<i>Comité Permanent Inter Etats de Lutte Contre la Sécheresse dans le Sahel</i>
CIRDES	<i>Centre International de Recherche-Développement sur l'Élevage en zone Subhumide</i> (Burkina Faso)
COMESA	Common Market for Eastern and Southern Africa
CORAF	<i>Conseil Ouest et Centre Africain pour la recherche et le développement agricole</i> (French of WECARD)
COSADER	Network of Cameroonian NGOs on Food Security and Rural Development
CSIR	Council for Scientific and Industrial Research (Ghana)
CTA	Technical Centre for Agricultural and Rural Co-operation (The Netherlands)
DANIDA	Danish International Development Agency
DFID	Department for International Development (UK)
DONATA	Dissemination of New Agricultural Technologies in Africa (NEPAD–FARA programme)
EAC	East African Community
ECA	Economic Commission for Africa
ECOWAS	Economic Community of West African States
etc.	etcetera
EU	European Union
FAAP	Framework for African Agricultural Productivity (NEPAD–FARA, <i>formerly MAPP</i> )
FANR	Directorate for Food, Agriculture and Natural Resources (SADC)
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
FBO	farmer-based organization
FOFIFA	<i>Centre National de Recherche Appliquée au Développement Rural</i> (Madagascar)
GDP	gross domestic product
GFAR	Global Forum on Agricultural Research
GTZ	<i>Gesellschaft für Technische Zusammenarbeit</i> (Germany)
i.e.	that is
IAC	InterAcademy Council
IAR	Institute of Agricultural Research (Sierra Leone)
IAR4D	integrated agricultural research for development
IARC	international agricultural research centre
ICSU	International Council for Science
ICT	information and communication technology

IFPRI	International Food Policy Research Institute
IFS	International Foundation for Science
IGADD	Inter-Governmental Agency for Desertification and Development
IIAM	<i>Instituto de Investigacao Agraria de Mocambique</i> (Mozambique)
INASP	International Network for the Availability of Scientific Publications (UK)
INERA	<i>Institut de l'environnement et des recherches agricoles</i> (Burkina Faso)
INPA	<i>Instituto Nacional de Pesquisa Agraria</i> (Guinea Bissau)
INRAB	<i>Institut national des recherches agricole du Bénin</i> (Benin)
ISAR	<i>Institut des Sciences Agronomiques du Rwanda</i>
ISNAR	International Service for National Agricultural Research ( <i>now part of IFPRI</i> )
ISTS	Initiative on Science and Technology for Sustainability
ITC	International Trypanotolerance Centre (The Gambia)
KARI	Kenya Agricultural Research Institute
KKM	Kano–Katsina–Maradi (pilot learning sites of the SSA CP)
M&E	monitoring and evaluation
MAPP	Multi-country Agricultural Productivity Program (FARA, <i>now FAAP</i> )
MIS	management information system
MoU	Memorandum of Understanding
NARI	national agricultural research institute
NARO	National Agricultural Research Organization (Uganda)
NARS	national agricultural research system(s)
NCRI	National Cereals Research Institute (Nigeria)
NEPAD	New Partnership for Africa's Development
NGO	non-governmental organization
NPP	networks, programme and projects (ASARECA)
NRI	Natural Resources Institute (UK)
OBEPAB	<i>Organisation Béninoise pour le Promotion de l'Agriculture Biologie</i> (NGO)
PhD	Doctor of Philosophy (doctorate)
PLS	pilot learning site
PRASAC	<i>Pôle regional de recherché appliquée au développement des savanes d'Afrique centrale</i>
PTD	participatory technology development
RAILS	Regional Agricultural Information and Learning System (FARA programme, <i>formerly RAIS</i> )
RAIN	Regional Agricultural Information Network (ASARECA)
RAIS	Regional Agricultural Information System (FARA, <i>now RAILS</i> )
RISDP	Regional Indicative Strategic Development Plan
SACCAR	Southern African Centre for Cooperation in Agricultural and Natural Resources Research and Training (former SRO for Southern Africa, <i>now replaced by SADC-FANR</i> )
SADC	Southern African Development Community
SADC-FANR	SADC's Directorate for Food, Agriculture and Natural Resources
SIDA	Swedish International Development Agency
SRO	sub-regional (research) organization
SSA CP	Sub-Saharan Africa Challenge Programme
STI	science and technology information
ToRs	terms of reference
TWAS	Academy of Sciences of the Developing World (Italy)
UEMOA	<i>Union Economique et Monétaire Ouest Africaine</i>
UK	United Kingdom
US	United States [of America]
USAID	United States Agency for International Development
WECARD	West and Central African Council for Research and Development (English of CORAF)

## 1. Introduction

### 1.1. Background to this NARS assessment

In August 2003, the Forum for Agricultural Research in Africa (FARA) organized the first Sub-Regional Organizations (SRO–FARA) retreat involving representatives of the three SROs, namely the West and Central African Council for Research and Development (CORAF/WECARD), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the Southern African Development Community's Directorate for Food, Agriculture and Natural Resources (SADC-FANR), and key FARA staff to identify mechanisms through which FARA could add value to the work of national agricultural research systems (NARS) and the SROs.

The specific objective of this retreat was to forge a common sense of mission between FARA and the SROs, and to develop a framework of action which will enable FARA Secretariat to add value to the work of the SROs in strengthening NARS for the purpose of achieving the African Vision for Agricultural Research and Development.

To initiate the process of strengthening NARS, the retreat decided that FARA should commission an assessment of NARS to identify what could be done to strengthen SROs and NARS on the basis of 21 conditions (*see* Annex 1) elaborated in the presentations of the Chair and Vice-Chair of the FARA Board. These conditions were aggregated into four major potential areas of intervention for NARS support, namely:

- Improving governance and management
- Improving financial status and management
- Strengthening scientific capacity and management
- Strengthening collaboration.

### 1.2. Expected outputs of the NARS assessment

The expected outputs of this exercise are the identification and understanding of the strengths and weaknesses of NARS in these four areas, forming the basis for recommendations on the ways in which FARA could provide support for NARS and SROs to improve African agricultural research performance and delivery.

This report presents the findings and recommendations of this NARS assessment, which was conducted from May to November 2005.

### 1.3. Terms of reference

The terms of reference for this assignment were as follows:

- To assist the FARA Secretariat in implementing the NARS assessment based on the 21 conditions endorsed during the first SRO–FARA retreat. This could include desktop studies on each of the 21 conditions before conducting the NARS assessment for each sub-region.

- To suggest innovative ideas to revitalize NARS in Africa—ideas that are aligned to FARA’s objectives and functions and four region-wide programmes and framework. This would include the rationale, principles, implementation process, budget and any other category that the consultants suggest to ensure the successful endorsement of the proposal by investors and stakeholders.

#### 1.4. Acknowledgements

The consultants are deeply grateful to Dr Monty Jones, the Executive Secretary of FARA, for the opportunity to undertake this assignment and to Mr Victor Keraro, FARA’s Head of Administration and Finance, and his staff for technical assistance in organizing our travels and other logistics needed for this assignment.

We are also pleased to acknowledge the collaboration received from our NARS partners and from the Secretariats of the SROs—we thank them for their time given to hosting us and providing very useful information during the country missions.

Professor Niels Roling and Prof. Janice Jiggins of Wageningen Agricultural University, the Netherlands, both of whom have considerable experience in African agricultural research, made useful comments on our draft report, gave time to discuss with us key issues relating to agricultural research in Africa, and made valuable suggestions that helped us to improve this report.

We are also grateful to Dr Sylvester Baguma of the National Agricultural Research Organization (NARO, Entebbe, Uganda) for advice on the appropriate analysis of the data collected, coding the questionnaire responses, performing the analysis and commenting on our interpretation of the analysis. Sylvester also read the draft report and made many valuable suggestions for improvement.

## 2. Methodology

### 2.1. Definition of national agricultural research systems and national agricultural research institutes

It is essential to clarify and distinguish between two important terminologies used in this report: these are *national agricultural research systems* (NARS) and *national agricultural research institutes* (NARIs). We adopted the general definition of NARS of Engel (1997), i.e. a network of actors capable of constituting a “theatre of innovation”. These actors can also be regarded as stakeholders, which include agricultural research institutes, agricultural education and training organizations, NGOs, farmer-based organizations (FBOs), policy-makers, the private/business sector (processors, marketers, transporters, etc.) and any other groups that are active in the agricultural development arena. NARIs are the entities established by national governments primarily to undertake the task of conducting agricultural research for development in country. NARIs are therefore regarded as one of the major actors in the NARS.



## *2.2. The process adopted*

In this study, we considered NARS as consisting of the NARIs, the universities (which implement agricultural education and research programmes), NGOs and FBOs. These components of NARS are independent elements, which are poorly coordinated and, in many countries, have very limited contact and collaboration with each other.

The exercise concentrated on the NARIs; but, where feasible, contacts were made with universities, NGOs and a few FBOs. Two kinds of questionnaires were designed for this exercise, one specifically for the NARIs one for NGOs and universities, since different kinds of data were expected from these organizations. The questionnaires were distributed electronically, and supplemented by country missions to interact directly with the heads of research institutions, key NGOs and farmer organizations, and to assist them to complete the questionnaires. During the country visits, we sought additional information on key issues of agricultural research management, funding, scientific capacity and collaboration. These missions proved very useful in explaining aspects of the questionnaires that were poorly understood, as well as for collecting additional information and seeking the views of research directors on strengthening agricultural research delivery in Africa. In some instances, the consultants actually assisted in completing the questionnaires.

Responses to the questions were coded and analysed using the Likert scale on the SPSS package, which is appropriate for analysing the kind of data collected.

## **3. Results of the NARS assessment**

Questionnaires were sent electronically to 56 NARS in Sub-Saharan Africa, and responses were received from 50 NARIs in 26 countries. This represents a response rate of 73%. We also received responses from 12 universities, 5 NGOs and 4 FBOs. Not all respondents answered all of the questions (thus, percentages in the analysis do not always sum to 100%).

Our report covers detailed analysis of the responses obtained from NARIs, NGOs and FBOs in 26 countries from which we received fully completed questionnaires. The analysis provided an insight into the current status of research management competence and delivery in African NARS. The results of the analysis led to conclusions and strategic recommendations which will hopefully help FARA to explore, in collaboration with the three SROs and relevant regional and international development partners, appropriate mechanisms to provide support to African NARS in their efforts to be more efficient in agricultural research performance and delivery.

### *3.1. Governance and management*

Issues of governance covered included the development of research strategic and implementation plans, memberships of management boards and committees, management manuals, staff evaluation as well as institutional restructuring and management reviews.

#### **3.1.1. Research strategic and implementation plans**

Surprisingly, over half (54%) of the NARIs surveyed had not developed a research strategic plan, while the others (46%) had. Of the institutes that had a strategic plan, 39% had

developed a 5-year medium-term implementation plan, while 19% had a 3-year medium-term implementation plan; 23% had no medium-term research implementation plans.

The capacities of the institutes in priority-setting, programme planning, and monitoring and evaluation were rated as very adequate (15%), adequate (62%) and inadequate (23%). These figures suggest serious weaknesses in planning and monitoring of research performance in a significant number of African NARIs.

### **3.1.2. Vision and mission statement**

Institutional visions, mission statements and organizational objectives are vital for providing proper guidance in the execution of the mandates of research institutes. Vision and mission statements have been developed in 77% and 89% of the institutes, respectively. Over 92% of the institutes that responded have clearly defined research goals, objectives and outputs, which suggests that the scientists and other personnel of these institutes have milestones to which they aspire in their efforts to achieve efficiency in the performance of their duties. The activities of research institutes are specifically time-bound in 81% of institutes.

### **3.1.3. Management boards and committees**

All government-owned agricultural research institutes are managed by Boards of Directors or, in the francophone countries, the *Conseil d'administration*, appointed by governments. A variety of models of agricultural research management arrangements exist in government-owned NARIs in Africa. For example, in Malawi and Zambia, individual agricultural research institutes are not managed by boards but by the parent government ministries, which is normally the Ministry of Agriculture. Another model is found in Tanzania, where all the NARIs are under the Department of Training and Development of the Ministry of Agriculture and do not have individual Boards of Directors, but each institute has a programme committee that is responsible for research-programme management. In Nigeria, the 14 NARIs have individual Boards of Directors and the institutes are supervised by the Department of Agricultural Sciences of the Federal Ministry of Agriculture and Rural Development. However, a recent institutional change will involve the transfer these NARIs to a newly created Agricultural Research Council (ARC), which will be responsible for agricultural research and post-secondary non-university agricultural education and training. The ARC will have a Board of Directors, while the institutes will retain individual Boards of Directors. The work of the NARIs in Ghana is supervised by a Council for Scientific and Industrial Research (CSIR) with a Board of Directors, while individual NARIs have their own Boards. The Kenya Agricultural Research Institute (KARI) has a national Board of Directors, but the individual institutes of KARI do not have Boards of Directors.

It would be useful for FARA to collect detailed information on the various models of institutional arrangements that exist for the governance and management in African NARIs, in order to assess which models promote efficiency and effectiveness in agricultural research performance and delivery.

Where Boards of Directors exist for NARIs, their compositions vary considerably, including policy-makers, scientists, academics, farmers, representatives of NGOs and processors (manufacturers). The total membership of the Boards averaged 10 members in 15% of the institutes sampled and ranged from 11 to 20 members in 39% of institutes.

Representation of various categories of membership on the Boards is given in Figure 1. The data shows that membership of the Boards of research institutes is dominated by scientists,

policy-makers and academics, while FBOs, NGOs and processors are poorly represented. This suggests that these important stakeholders are not given adequate opportunities to contribute to policy decisions affecting national agricultural research. In Nigeria, current membership of the Boards of Directors of agricultural research institutes is dominated by active politicians, members of Senate or the House of Representatives, most of whom have no vested interest whatsoever in agricultural research or have limited knowledge or experience of agricultural research.

We consider these patterns of NARI Board membership a serious weakness for effective governance and management of African agricultural research institutes, because such Board memberships exclude the participation of important stakeholders. It would be desirable for national governments to achieve not only a better stakeholder balance in NARI Boards, but also seriously consider the interest, experience and agricultural research and development relevance of individuals selected for appointment to the boards of NARIs.

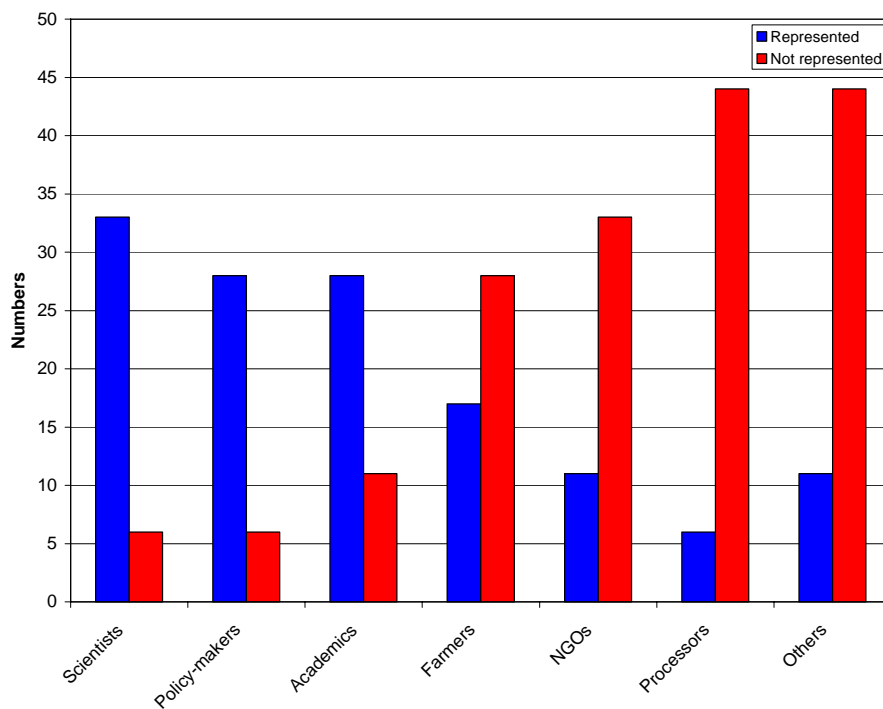


Figure 1. Representations on Boards of Management of NARIs.

The frequency of board meetings averaged two per year in 39% of institutes and four per year in 23% of institutes. Executive or Management Committees have been established in 77% of the NARIs; this pattern has existed for over 5 years in 31% of institutes and for over 10 years in 19% of institutes. Executive committees consist of 1–5 members in 28% of the boards and 6–10 members in 33% of the boards. Each year, executive committee meetings are held an average of 1–5 times in 54% of the institutes. In a few cases, the executive committee meets irregularly. Sixty per cent of the research institutions have programme committees, which meet at least four times a year. However, wide stakeholder representation on programme committees is minimal.

### 3.1.4. Management manuals

A variety of management manuals is in use in African NARIs, including:

- Human-resources management manual
- Assets management manual
- Financial management manual.

The development and use of human-resources manuals is recent: 27 % of NARIs sampled introduced this manual within the previous 1–5 years. While 54% of NARIs sampled have a human-resources management manual, 42% have not developed one and therefore do not use such a manual. Assets management manuals are in use in 54% of NARIs sampled, while 42% do not have such a manual. The introduction and use of assets management manuals occurred between 6 and 10 years ago in 15% of the NARIs. The assets management manual is computerized in 65% of the NARIs that have such a manual. Administrative (23%) rather than management information (6%) is provided by the assets management manuals (71% did not respond to this question!).

### 3.1.5. Research institute staff evaluation

Annual staff performance evaluation is an important management exercise conducted by 46% of the institutes, but 46% of institutes record that this exercise is not conducted.

### 3.1.6. Stability of management staff

Key management staff assessed in this exercise were Chief Executive Officers, Directors, Program Managers, Human Resources Managers and Finance Managers. We assessed the frequency of change of these management staff every 5 and 10 years.

The results are presented in Table 1, which shows that:

- i. The Chief Executive Officers and Directors of institutes change every 10 years in 31% and 35%, respectively, of institutes and every 5 years in 23% and 38%, respectively.
- ii. The Program Managers, Human Resources Managers and the Finance Managers tend to be changed every 5 years in 39%, 27% and 31% of institutes, respectively.

These results suggest that changes in the top management of research institutes are less frequent than in the lower cadres of management; this reflects greater stability in the top management of agricultural research institutes in Africa.

Table 1. Frequency of change in key management staff of NARIs

Management position	Frequency of change	Percentage of respondents
Chief Executive Officer	5 years	23
	10 years	31
Director	5 years	38
	10 years	35
Program manager	5 years	39
	10 years	8
Human resources manager	5 years	27
	10 years	12
Finance manager	5 years	31
	10 years	15

### **3.1.7. Restructuring and sizing of institutes**

The questionnaire sought information on restructuring and sizing of research institutes in order to assess the frequency with which these organizations take actions regarding improving institutional efficiency. Over 25% of institutes did not respond to this question. During a 20-year period, 27% of the institutes had been restructured once every 5 to 10 years, while 33% had been restructured once every 10 years. Eight per cent of the NARIs indicated that they were restructured every year—this is difficult to understand, because it does not seem practicable to undertake institute restructuring every year.

A significant number of institutes (69%) indicated that they required appropriate sizing to improve efficiency, and the major reasons given for requiring right-sizing included:

- to achieve research goals (8%)
- to rationalize resources (19%)
- to accommodate needs (12%).

The main ways in which institutes may be right-sized are given as through balancing the research staff (12%) and institutional reforms (12%).

### **3.1.8. Management reviews**

Internal and external management reviews form a major part of NARIs' activities. A significant number (69%) of NARIs had carried out internal reviews over the previous 5 years. External reviews are conducted less frequently, mainly every 11–15 years; 62% of institutes undertake external reviews, while 27% do not conduct external reviews. Heads of NARIs suggested that external reviews are normally not conducted mainly because of the high cost of organizing and managing them, a cost that the national institutes are not able to accommodate in their annual budgets.

### **3.1.9. Priority-setting, programme planning, monitoring and evaluation**

Since only 62% of the respondents rated the capacity to undertake priority-setting, programme planning, and monitoring and evaluation as adequate, we consider this a major weakness in the management of agricultural research which therefore requires strengthening. This conclusion is supported by the results summarized in Table 6(section 3.3.3), which show that NARIs perceive a strong need for capacity-building through training in research priority-setting, programme planning, monitoring and evaluation.

### **3.1.10. Discussion**

We recognize that governance of institutes is primarily the responsibility of the national governments that establish and fund them. However, we suggest that there are some critical issues for which external assistance through FARA can influence improvements in the governance of agricultural research institutes. These issues are (i) influencing effective participation of relevant stakeholders in the Boards of NARIs; (ii) formulation of agricultural research strategic and implementation plans; and (iii) strengthening capacities in research priority-setting, programme planning, monitoring and evaluation.

*Management Boards of NARIs:* The current pattern of memberships of NARIs' boards excludes important stakeholders from contributing to the governance and management of NARIs and thereby influencing the research agenda at the highest levels. There are many

obvious advantages to appointing more relevant stakeholders, especially from the private sector, onto the boards of NARIs. For example, appointing top management personnel from the business/private sector could not only open up opportunities for effectively designing research agendas to address priority agricultural development concerns, but also provide innovative mechanisms for sourcing funding for agricultural research. We believe that promoting such public–private sector partnership in the governance and management of NARIs can yield significant benefits for improving national agricultural research and development in Africa.

*Research strategies and implementation plans:* Analysis of the responses obtained from this exercise strongly suggest that NARIs require considerable assistance with the formulation of research strategic and implementation plans, which should derive from national agricultural development policies and development plans. Through this process, agricultural research can appropriately address national agricultural development priorities and thus contribute effectively to national development efforts. This exercise did not assess the processes adopted for developing agricultural research strategies and implementation plans, so it is difficult to comment on whatever processes were adopted.

*Priority setting, programme planning, monitoring and evaluation:* From the responses from NARIs, it is clear that the capacities of NARI scientists in research priority-setting, programme planning, and monitoring and evaluation require considerable strengthening.

### *3.2. Financial status and management*

#### **3.2.1. Research budgets – sources of funding**

The health and effectiveness of any agricultural or other research institution is conditioned by the financial resources available to it and the extent to which those resources are properly managed. This and other studies show that most African NARIs are chronically short of funds and they depend on donor support to conduct effective research and to survive. With the exception of South Africa (*see* Figure 2) and Mauritius, where no donor funds are provided, international donors provide up to 75% of NARIs’ budgets. With donor support, NARIs purchase laboratory and field equipment and supplies, vehicles and sometimes pay a proportion of staff salaries. Responses to the questionnaires confirm that government contributions to NARIs’ budgets are inadequate (78% said government contributions were “inadequate”, and an additional 11% said that they were “very inadequate”; only 11% of NARS respondents thought that government contributions to budget were “adequate”). The disbursements are irregular and often very late, and do not take into account seasonal cycles.

The World Bank is the largest supporter of agricultural research and development, giving loans and sometimes grants. Bilateral donors (EU, USAID, DANIDA, SIDA, DFID) also provide substantial contributions in grants to NARIs’ budgets. Some NARIs receive grants from private not-for-profit foundations, such as the Rockefeller Foundation, the Gatsby Trust Foundation and the International Foundation for Science (IFS). Recently, the KirkHouse Trust, through the African Agricultural Technology Foundation (AATF), has also been planning to provide funds for agricultural biotechnology research and training in Africa.

Self-generated funds are insignificant and private-sector support to public-sector research institutions is almost nonexistent. (Syngenta is reported to be providing some support to Mali

NARIs and AATF has plans to source private-sector support for biotechnological research and transfer.)

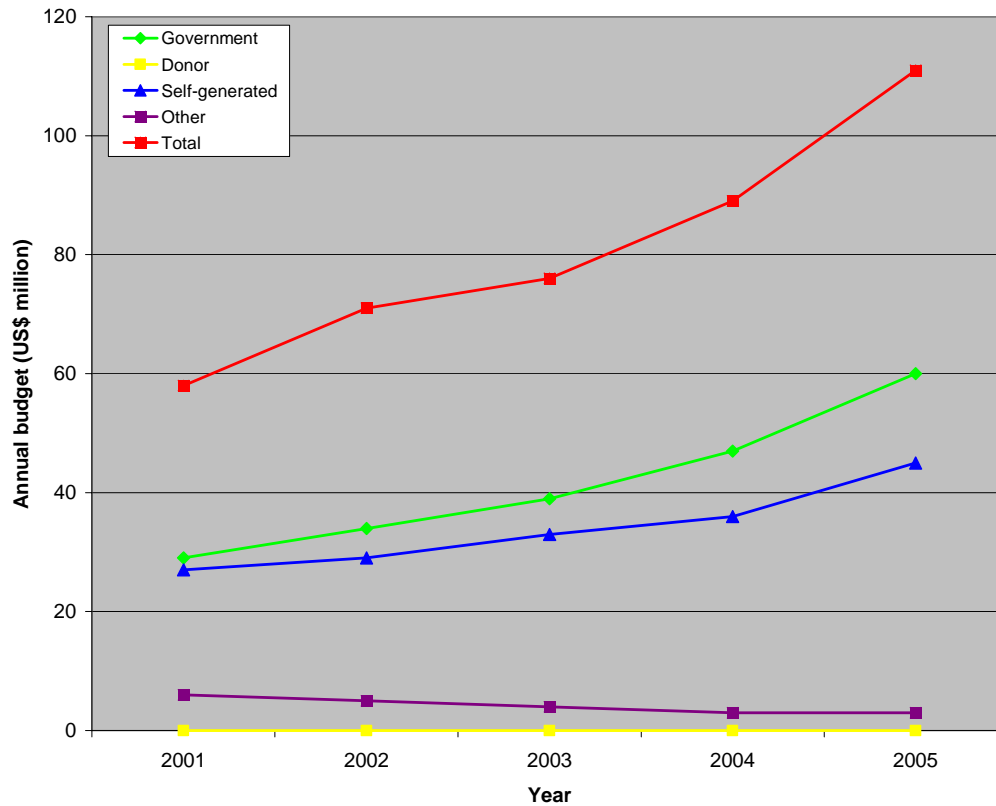


Figure 2. Funding pattern for the Agricultural Research Council (ARC), the NARI of South Africa (no donor funding).

On the basis of the funding patterns revealed in this study, we can recognize three main categories of NARIs. However, some NARIs—such as INRAB (Benin), NCRI (Nigeria) and IIAM (Mozambique)—were either unwilling or unable to itemize details of their funding patterns. These NARIs did not state reasons why they could not reveal details of their budgets.

The *first category* consists of NARIs that receive no or very little donor funding and receive small budgets from their governments. These include the Departments of Agricultural Research in Malawi and Zambia, ISAR in Rwanda, FOFIFA in Madagascar, INPA in Guinea Bissau and the Institute of Agricultural Research (IAR) in Sierra Leone. The annual budgets of these institutes are less than one million dollars.

The *second category*, consisting of the majority of NARIs, receive modest amounts of both government and donor funding (Table 2). In this category of NARIs, donor funding accounts for more than 50% of the total budget, while government funding accounts for an average of about 30% of the budget.

The *third category* consists of ARC of South Africa, AREU of Mauritius and the Department of Agricultural Research of Namibia. We describe these as well-endowed NARIs supported entirely by their governments. The ARC South Africa annual budget (Figure 2) is 5 to 10

times the combined average annual budget of the next eight best-funded African NARIs (Table 2).

Table 2. Funding patterns for the eight best-funded African NARIs (after South Africa) (US\$ million)

Year	Funding source				Total
	Government	Donors	Self-generated	Other	
2001	2.8	5.8	0.7	0.1	10.6
2002	3.9	5.6	0.7	0.5	12.0
2003	4.1	6.4	0.7	0.3	11.3
2004	4.1	8.0	0.9	0.1	11.8
2005	5.9	5.8	0.9	0.2	11.7

### 3.2.2. Funding modalities

Government and donor funds of NARIs are part of the annual estimates. Most donor funding comes as short-, medium- or long-term project support. However, DFID provides general budget support to some countries. Funds are supposed to be released by the Ministries of Finance on a monthly or quarterly basis. However, we were informed that in some countries the budget releases to NARIs are partial, irregular, or both. In some countries, the Ministry of Finance releases can barely accommodate the staff salaries, so that funds for research and other operations are not available. In such situations, the NARIs are compelled to depend entirely on external donor funds for research and related support activities.

Some NARIs (less than 20%) have established Agricultural Research Trust Funds as part of World Bank loans; these trust funds enable them to operate a competitive funding mechanism (CFM). This mechanism is meant to increase the efficiency and effectiveness of research as well offer some sustainability for research funding. However, no African government to date has contributed money to such a fund and therefore the sustainability of trust funds is in jeopardy. It must also be noted that more than 75% of NARIs do not have an agricultural research trust fund.

### 3.2.3. Financial management and oversight

Most NARIs indicated that they keep books of accounts, which are audited regularly by government or independent private auditors. They also use a range of financial management software (Figure 3) and contend that they have a good standard of financial management. However, when they were asked whether or not their standards of financial management were comparable to those of IARCs, most admitted that they were not. Furthermore, about 50% of the NARIs seemed not to be sure whether they had audit manuals.



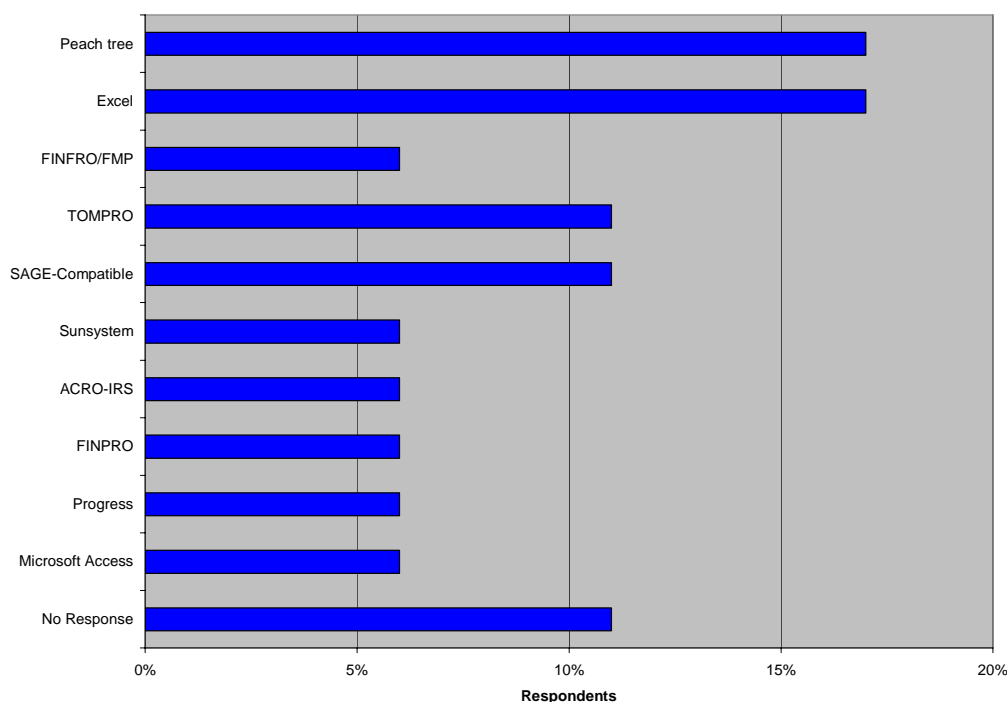


Figure 3. Software used in financial management by NARIs.

Financial oversight responsibilities are carried out by the supervising ministries for ministerial departments of research. Semi-autonomous research institutions have finance committees, most of which meet more than four times a year.

Personal interviews with NARI leaders confirmed that the standard of financial management and oversight requires considerable improvement.

### 3.2.4. Discussion

The financial status of most NARIs is weak or unsustainable, as they receive inadequate funds from their governments and are heavily dependent on donor funding. The major issues regarding funding of agricultural research in Africa are as follows:

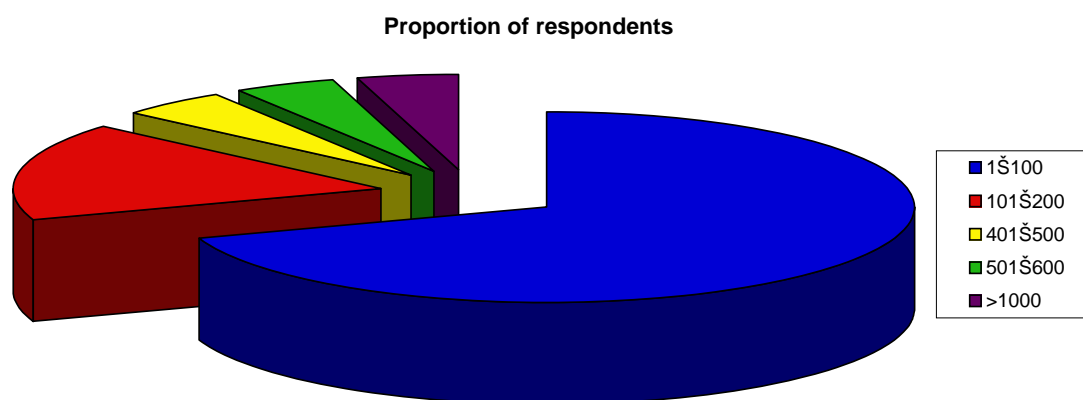
- i. National government funding of agricultural research needs to be substantially increased in most African NARIs, to the extent that adequate funds are available to support agricultural research, training and maintenance of infrastructures and other related activities. The examples of South African and Mauritius should be emulated by other African governments.
- ii. African NARIs should develop a strategy of drastically reducing dependence on external donor funding for agricultural research, because this pattern of funding is not only unsustainable, but tends to place the major responsibility for agricultural research and development of the countries outside the full control of the national governments. This is not in line with the spirit of the vision for African agricultural research and development of the New Partnership for Africa's Development (NEPAD), which is well articulated in the Comprehensive Africa Agricultural Development Programme (CAADP).
- iii. The contribution of the private sector to African agricultural research is insignificant and governments need to explore the potentials of increasing funding

for agricultural research through greater engagement of the private sector in this aspect of the socio-economic development of their countries.

### 3.3. Scientific capacity and management

#### 3.3.1. Research personnel

Sixty-two per cent (62%) of NARIs have a research staff complement of less than 100 scientists (Figure 4). Only Kenya, Nigeria and South Africa have NARIs with more than 500 scientists. The proportion of total scientists with PhDs is 69%; however, less than 54% of the African women agricultural research scientists have a PhD degree.



*Figure 4. The numbers of scientists in African NARIs.*

Note: 12% of respondents did not answer this question.

The number of agricultural research scientists in most African NARIs does not seem to be related to the critical mass of scientists required for delivery of outputs approved in the Research Strategic Plans. No NARI has assessed the critical mass of research scientists required for agricultural research delivery.

The age distribution of scientists in African NARIs is summarized in Table 3. In over 20% of NARIs, the age distribution of scientists clustered around the 31–50 years age range. A significant proportion of NARIs have very few young scientists in the 21–30 years age range. It is noteworthy that in over 20% of NARIs, about 89% of the research scientists are within the 51–60 years age range. The implication of this age distribution is that in the next 10 years, this high proportion of scientists will retire from the NARIs and will no longer be available for effective agricultural research to contribute to African agricultural development.

During our interaction with Directors of NARIs, we were also informed in some countries (e.g. Benin, Kenya, Nigeria and Senegal) that the governments had introduced a policy of rationalization of the civil service involving a ban on new staff recruitments during the past 4 years. This policy affected agricultural research scientists in the NARIs; therefore, in the last 4 years, no young scientists have been recruited who could be mentored by the aging and experienced researchers. The lack of a well-planned and steady replacement programme of agricultural research scientists, together with the complete absence of mentoring of young scientists, is a serious weakness in agricultural research and development in Africa.

Table 3. Age distribution of research scientists in African NARIs

Age range	Frequency (% of NARIs)		
	1–10	11–20	>20
21–30 years	15	31	20
31–40 years	19	4	43
41–50 years	12	4	58
51–60 years	15	19	31

Research scientists in African NARIs cover a wide spectrum of disciplines (Table 4). The disciplines that are reasonably well represented in terms of number of scientists are: plant breeding, livestock management, animal diseases, plant pathology, insect pest management, agronomy and soil science. Many institutions (42%) are weak in social sciences, agricultural extension, animal breeding, agricultural engineering, food science and technology, weed science, forestry and agroforestry, biotechnology, biometrics, information technology, aquaculture and fisheries.

Table 4. Distribution of research scientists in research disciplines in African NARIs

Research discipline	Frequency (% of NARIs)		
	No scientists	1–10	More than 10
Aquaculture	54	8	-
Animal/Livestock Diseases	23	42	12
Animal Genetics/Breeding	31	35	4
Animal/Livestock Management	12	50	16
Agric. Economics	19	50	8
Agric. Engineering	31	35	4
Agronomy	12	35	20
Agricultural Extension	27	42	4
Biometrics	42	27	-
Biotechnology	31	35	4
Forestry	46	19	4
Food Science & Technology	27	50	8
Information Technology	35	35	4
Insect Pest Management	15	4	20
Plant Pathology	15	42	16
Plant Genetics/Breeding	15	35	24
Rural Sociology	31	42	-
Soil Science	8	58	4
Weed Science	35	27	-

### 3.3.2. Terms and conditions of service

Almost two-thirds (62%) of the respondents indicated that they enjoyed good terms and conditions of service, but 15% reported very poor conditions of service. Personal interviews confirmed this finding, which is causing some staff on training overseas not to return and leading to severe brain drain (i.e. the departure of good scientists for better-paid jobs within or outside the country).

Most of the issues (promotion, training, salary increases, and attending conferences) indicated as incentives (Table 5) are really the normal rights of employment and cannot be considered as incentives. Nevertheless, NARIs offer very few incentives to encourage research scientists and technicians. Only 8% of NARIs reported having competitive salaries. While 58% of the institutions reported the existence of training programmes for scientists, 39% did not have training programmes. Interactions with Heads of NARIs revealed that no single NARI encountered has established a Minister’s or Director General’s award for achievement in research. Such an award would be highly effective in encouraging (particularly young) scientists.

Only 12% of the institutions have special training programmes for women scientists, which suggests that African women scientists are not sufficiently encouraged to develop careers in agricultural research.

Table 5. Incentives available to NARI staff

Incentive type	Respondents (%)
None	23
Promotion/Training	4
Opportunities/Allowances	4
Competitive remuneration	8
Competitive salaries/Training/Sabbatical	4
Attending conferences and symposia	12
Yes, but incentive not indicated	4
Cash/Certificate acknowledging of years of service	8
No response	23

### 3.3.3. Training programmes for research staff

The pattern of distribution of research scientists in the different research disciplines (*see* section 3.3.1) was skewed, with some disciplines strongly neglected. Furthermore, there is no evidence that NARIs have designed and implemented staff-development training plans aimed at achieving a balance in the distribution of scientific staff or that reflect institutional research emphasis.

We sought information on the need for training of scientists in key research areas of performance, management and delivery. The responses were grouped into *very much* and *some* categories, scored for each category and prioritized by ranking.

Over 60% of the NARIs recorded that scientists very much need training in all these topics (Table 6). Training in impact assessment and intellectual property rights management, project management, monitoring and evaluation, and priority-setting were ranked highest. Training in scientific report writing, financial management and personnel management for scientists ranked next.

These results point to the fact that there is a critical need for capacity-building through training of scientists in these key areas of agricultural research performance, management and delivery.

Table 6. Training needs for key aspects of agricultural research performance, management and delivery

Topic	Need for training (% respondents)	
	<i>Very much</i>	<i>Some</i>
Impact assessment	88	4
Intellectual property rights management	84	15
Project management	83	11
Monitoring & evaluation	81	15
Priority-setting	81	11
Programme planning	77	19
Scientific report writing	61	35
Financial management	76	15
Personnel management	72	35

### 3.3.4. Research competences – Biotechnology & research programme design

The competences of NARIs were assessed in the following key areas of agricultural research: biotechnology, intellectual property rights management, and research programme design. Overall competence of NARIs in these aspects of agricultural research is considered weak (Table 7). The lowest competence was registered in the area of intellectual property rights management, which was also identified as a high priority area for capacity-building through training (Table 6). Competence in biotechnology, which is currently internationally recognized as an important agricultural research discipline, is rated fair to poor by 38% of NARIs, while 26% of NARIs rated their competence in agricultural research design as fair to poor.

Table 7. Research competences of NARIs

Research area	Competence levels (% respondents)		
	<i>Good</i>	<i>Fair</i>	<i>Poor</i>
Biotechnology	33	15	23
Intellectual property rights management	8	23	42
Research programme design	74	23	3

### 3.3.5. Scientific publishing – institutional and research staff

Publishing of agricultural results is an essential and integral part of agricultural research activity for promoting agricultural and socio-economic development of any country. In this assessment, we considered various aspects of scientific publishing, including publication of research papers in refereed journals, books, institutional publications (such as Annual Reports, Research Monographs and Bulletins), conference proceedings, as well as agricultural extension and training materials.

#### *Institutional publications*

The numbers of institutional publications released by NARIs during the past year are presented in Table 8. Publication performance of the NARIs is poor. Publication of books from research projects or on special research themes and refereed journal articles was minimal. National research institutes focused attention on the publication of research reports

(42%), extension bulletins (23%), brochures and pamphlets (24%). ‘Reports’ did not distinguish between institutional annual reports and reports of research projects.

Discussions during the field missions revealed that the publication of institutional annual reports was highly irregular and poorly coordinated and undertaken in an unprofessional manner. Most institutes were several years behind in the publication of their annual reports, due to lack of competence and capacities in the preparation of annual reports. Furthermore, institutes do not seem to allocate adequate funds to the publication of annual reports. Many of the NARIs did not respond to the questions on publication of CD-ROM, audio/video cassettes, training materials and scientific newsletters.

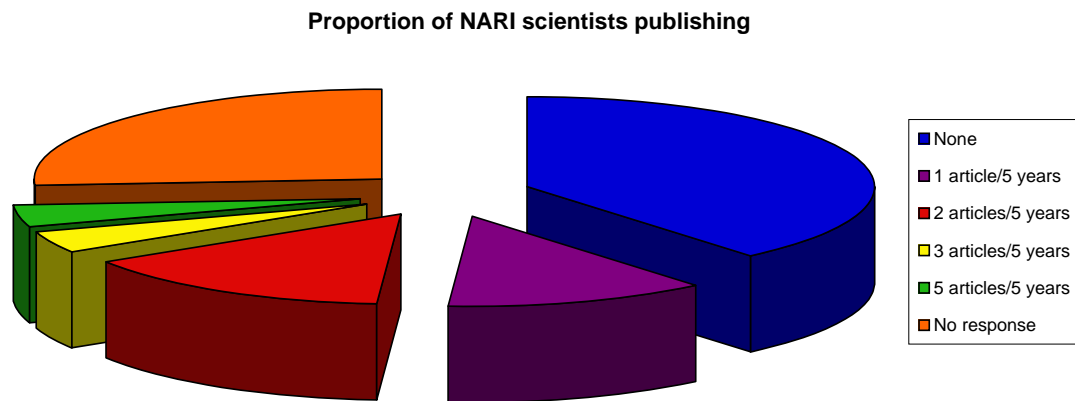
However, NARIs that have impressive institutional publications, for example Benin, Cameroon and Ghana, have achieved this through technical assistance from international development partners such as *Gasellschaft für Technische Zusammenarbeit* (GTZ), Sasakawa Global 2000 and the Natural Resources Institute (NRI).

### ***Publications by research scientists***

We assessed the publication performance of NARI research scientists, since the professional advancement of research scientists should ideally be based largely on their publications performance. The average number of research articles published by scientists in refereed journals during the past 5 years is presented in Figure 5; at least 39% of NARI scientists had not published a single article in a refereed journal during the past 5 years. Only 4% of scientists have published an average of 5 articles in the past 5 years. We consider this a poor publication record for NARI scientists.

Table 8. Institutional publishing patterns of African NARIs

<b>Type of publication</b>	<b>Numbers of publications produced during the past year (% respondents)</b>			
	<i>None</i>	<i>less than 10</i>	<i>more than 10</i>	<i>No response</i>
Books	39	39	4	15
Articles in refereed journals	19	50	15	15
Articles in conference proceedings	19	31	43	15
Reports	19	27	42	15
Extension bulletins	27	31	23	19
User brochures/pamphlets	19	23	24	35
CD-ROM	42	4	8	42
Audio/video cassettes	39	12	4	42
Training materials	23	39	4	35
Newsletters	35	19	4	39



*Figure 5. Publication performance (numbers of articles in refereed journals in 5 years) of agricultural scientists in African NARIs.*

### **3.3.6. Technology generation and dissemination**

Research by NARI scientists results in the generation of agricultural technologies that are disseminated to farmers, processors and other users. All the NARIs assessed have generated agricultural technologies and disseminated them to farmers through a variety of systems involving the national agricultural extension service, direct contact between scientists and farmer groups, or through farmer participatory mechanisms.

Figure 6 presents data summarized from the responses in the questionnaires. The dissemination of technologies was comparable to the generation of technologies. Effective generation and dissemination of agricultural technologies tends to be more successful in countries where effective partnership and collaboration through the participatory technology development (PTD) model has been established between the NARI, FBOs and NGOs—for example, in Burkina Faso, in the past 5 years, INERA generated 300 agricultural technologies and transferred 200 of them.

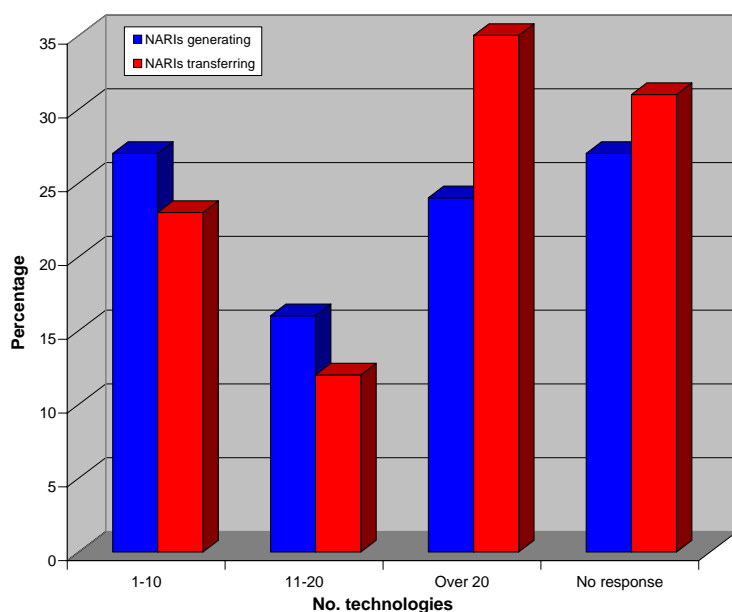


Figure 6. Generation and transfer of agricultural technologies by *agricultural research scientists in African NARIs*.

### 3.3.7. Connectivity (information and communication technology, ICT)

Issues of connectivity assessed relate to the availability of the NARIs' publications on the Internet and national scientists' access to the Internet. Efficient Internet connectivity is essential for agricultural research, because through connectivity, scientists are able to access up-to-date technical information from international sources. Furthermore, Internet connectivity enables institutions and scientists to contribute technical information to the international scientific community and therefore increase their visibility to foster international collaboration, sharing of information and experiences.

The results of assessment of various aspects of connectivity are summarized as follows.

*Status of STI (science and technology information) in African NARIs:* The overall status of STI was regarded as *fair* in 27% of the NARIs, *good* in 23% and *very good* in 34% of the NARIs responding.

*Availability of institutes' publications on the Internet:* Half of the responding NARIs do not have any of their institutional publications available on the Internet. A further fifth (19%) of NARIs had only 5% of their publications accessible via the Internet. Only 6% of the NARIs recorded that 75% of their publications can be accessed via the Internet; a further 6% had 50% available, and another 6% had 25% available.

*NARI scientists' access to external information:* In Table 9, we present a summary of the possibilities that NARI scientists have to access various kinds of information available from outside the country. Except for accessing information via distance learning, radios, television programmes, and audio and video cassettes, over 50% of the NARIs claim to be able to access information from outside.

*Staff proficiency in Internet searching:* An assessment of the proficiency of NARI staff to access the Internet and to conduct searches for technical information showed that staff



proficiency was recorded as excellent in 12%, adequate in 54% and inadequate in 27% of the NARIs responding (Table 10). Similarly, proficiency in accessing on-line journals and in participating in e-conferences was very low (Table 10). We consider this level of proficiency in searching the Internet for technical information too low for effective agricultural research performance and delivery. All research scientists should be equipped with a high level of proficiency in sourcing information internationally from the Internet.

*Connectivity facilities:* The availability of connectivity facilities in NARIs is presented in Figure 7. The data suggest that infrastructure facilities for efficient connectivity are grossly inadequate in most NARIs. This means that scientists are seriously constrained in their efforts to communicate with their peers both locally and internationally. Most telephone land lines are not functional and installation of satellite dishes for Internet connectivity is not considered a priority in budgeting, although the cost of this vital facility is only about US\$ 4000, which could be readily accommodated within the financial resources of the NARIs (however, annual subscriptions to Internet service providers may run as high as US\$ 1500!). Experience shows that information-related activities tend to be the first targets for elimination during budget difficulties.

*Internet connectivity:* We requested NARIs to assess the efficiency of their Internet connectivity. Over 65% of NARIs lack any Internet connectivity; where connectivity is available, 12% recorded that this facility was satisfactory, 77% recorded that internet connectivity was unsatisfactory. The major reasons for unsatisfactory Internet connectivity were stated as (most common reason first):

- Narrow bandwidth
- Problems with server/network
- Poor Internet access
- Very few researchers with Internet access.

In addition to these problems, other constraints identified by NARIs are poor telephone land lines and the lack of constant and regular electricity, especially outside the national capitals.

Table 9. Accessibility of external information to NARI scientists

Information to be accessed	Percentage NARIs responding	
	Can access	Cannot access
In-house library/journals/books	89	8
CD-ROM	62	35
Internet on-line resources	85	12
Distance learning	19	69
Agricultural news bulletins	69	23
Personal contact with peers	85	12
Radio programmes	50	46
Audio cassettes	27	65
Video cassettes	31	65
Conferences	85	12
Institutional collections	54	42
Newspapers/magazines	73	23
Television programmes	50	46

Table 10. NARI staff proficiency in Internet searching for information

Type of information	Level of proficiency			
	Inadequate	Adequate	Excellent	No response
Internet searching	27	54	12	7
On-line journals	42	34	12	7
e-conferences	42	15	22	15

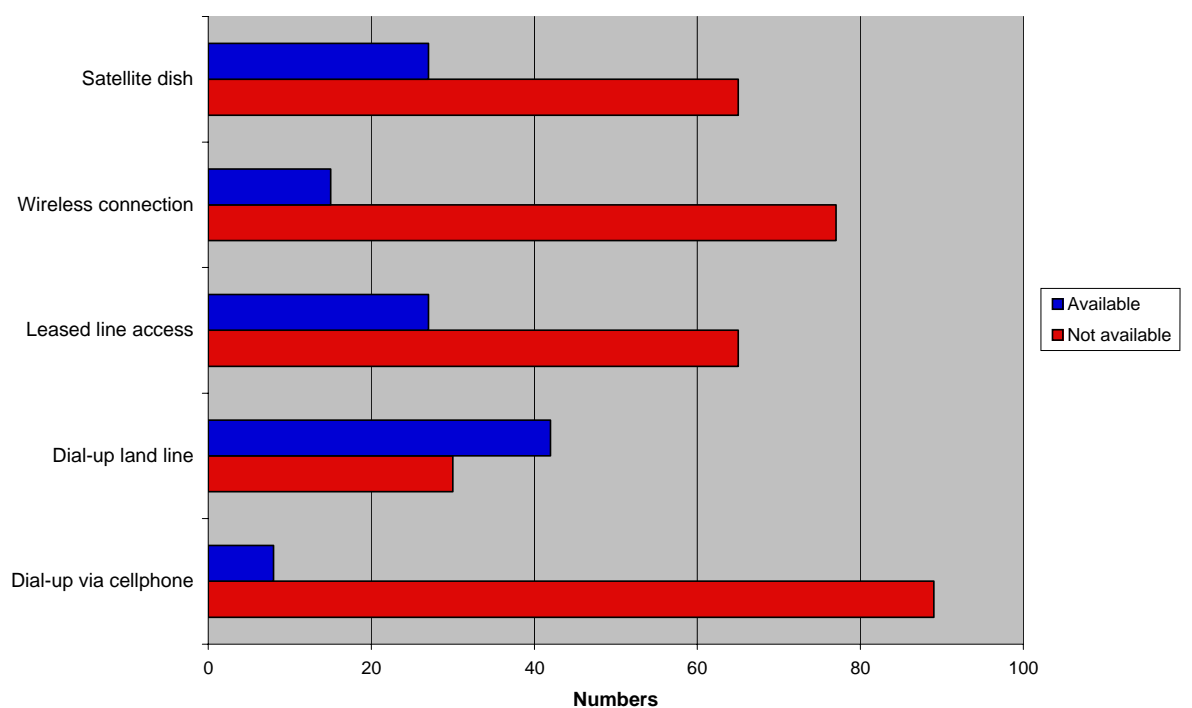


Figure 7. Availability of connectivity facilities in African NARIs.

### **3.3.8. Library and documentation facilities**

Library and documentation facilities were rated as good by 31% and fair by 46% of the NARIs responding; however, it is not clear from these responses what NARIs mean by 'good' and 'fair'. During country visits, issues regarding the kinds of services provided by the NARI libraries were discussed in order to gain a better understanding of the real situation. Apart from a few book and journal acquisitions, most NARI libraries lack adequate budget allocations to acquire journals regularly, in many instances the most recent journal acquisitions are at least 3 years old. Only a few NARI libraries are computerized, thus limiting the scope of services that can be provided to research scientists.

### **3.3.9. Laboratory facilities**

Over one-third (35%) of the NARIs indicated that they had good to very good laboratory facilities. More than 57% stated that their laboratory facilities were very poor to fair. Personal interviews showed that laboratory facilities are generally lacking basic supplies (glassware, chemicals, even distilled water) and equipment such as microscopes.

### **3.3.10. Research partners**

Possible research partners of NARIs are universities, non-profit institutions (commodity boards), private-sector institutions, NGOs and FBOs. Of these, the most important as research partners are universities with 57% of them carrying out a significant amount of agricultural research complementing the work of NARIs. Most NARIs have non-profit institutions as partners in research, with NGOs and FBOs mostly involved in on-farm trials and technology dissemination. A recent report of the InterAcademy Council (IAC, 2003) indicates the following contributions of different elements of the African NARS to national agricultural research: government research institutes 81%, universities 18%, NGOs and the private sector 1%. In this assessment, we found that, with the exception of South Africa and Mauritius, the contribution of the private sector to agricultural research in Africa is insignificant.

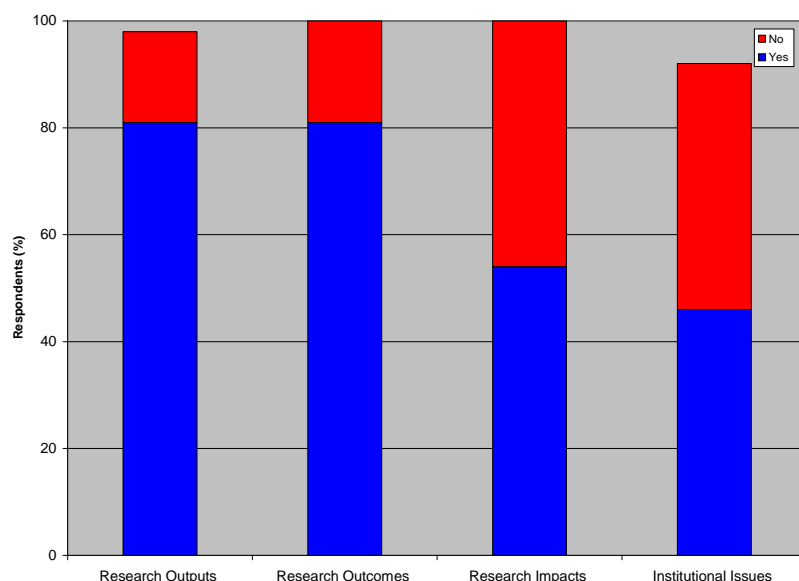
### **3.3.11. Research programme management**

As noted elsewhere in this report, most NARIs have strategic and research implementation plans, management boards and management executives. However, only 35% carry out *ex-ante* evaluations of research. Most institutions (77%) have internal programme reviews as well as external programme reviews (62%). However, it is not clear whether the results of these reviews are utilized as a guide in the implementation of the research programme.

Over a third (35%) of the institutions contacted conduct impact studies, while 54% do not. Again, it is not clear whether the results of impact studies are ever used in guiding research programmes.

### **3.3.12. Monitoring and evaluation of research**

The vast majority of NARIs conduct monitoring and evaluation (M&E) for research outputs (81%) and research outcomes (81%) (Figure 8). However, only 54% of NARIs conduct M&E exercises for research impacts and a smaller proportion (46%) do M&E for institutional issues. The status of the management information system for monitoring and evaluation was rated as very good in 16% of institutes and good to fair in 58% of institutes; 12% rated this facility as poor. The conclusion would be that M&E is not sufficiently or fully institutionalized.



*Figure 8. Monitoring and evaluation for research outputs, outcomes, impacts and institutional issues by NARIs.*

### **3.3.13. Discussion**

Research scientists in government agricultural research institutes are civil servants who progress professionally via systems that do not necessarily consider their publications output. Therefore, there is no incentive, pressure or obligation to publish research papers. However, in university-affiliated NARIs (such as the Institute for Agricultural Research and Training of the Obafemi Awolowo University and the Institute of Agricultural Research affiliated to the Ahmadu Bello University, both in Nigeria), research scientists are assessed for promotion on the basis of the same criteria used for the assessment of university lecturers, which is usually principally on the publications performance; therefore, researchers in these institutes are compelled to publish like their university counterparts.

Many NARI scientists seriously lack capacities in the writing and publishing of research papers; in some cases, the culture of publishing is not an important component of agricultural research.

The data obtained from this assessment strongly indicate that African NARIs are particularly weak in the publication outputs of the results of agricultural research. Publication of articles in refereed journals by individual scientists is woefully poor. Heads of research institutions and national scientists suggest that some of the major reasons for this poor performance are:

- Poor funding for agricultural research from national governments, which do not provide scientists with adequate resources to conduct research that would lead to good publications;
- There is a high rejection rate of manuscripts submitted by African NARI scientists to foreign refereed journals, which tends to discourage many NARI scientists from further efforts to write and submit research papers for publication;

- Avenues for publication of the results of agricultural research in Africa are severely limited. As in most developing countries in the Africa, Caribbean and Pacific (ACP) region, most journals published locally are chronically poorly managed and manuscripts tend to take very long, often years, to be processed and published, which is again highly frustrating for the scientists. INASP and CTA have drawn attention to the teething problems constraining publication of agricultural results in ACP countries (Youdeowei, 2002).

Analysis of the agricultural technology generation and transfer capacities of NARIs also reveals that although several technologies are generated by NARI scientists, only a few are actually transferred to the farming community who need the technologies to increase food and agricultural production. In recognition of this deficiency and in an effort to address this issue, FARA has developed the Framework for African Agricultural Productivity (FAAP) to strengthen the capacities of NARIs to generate and to more effectively disseminate agricultural technologies. NARIs should, therefore, fully exploit this opportunity to move technologies from research shelves to the fields at national, sub-regional and regional levels.

While most of the NARIs encountered during this assessment have some ICT and STI capacities, and the majority of the scientists claim to be able to access technical information from electronic sources (including the Internet), the efficiency of connectivity is seriously constrained by several problems including the following:

- Internet connectivity at the NARIs is generally unreliable due to poor services from local Internet service providers
- Narrow bandwidth making Internet access slow and tedious
- Unreliable and fluctuating power supply from the national electricity providers
- Insufficient numbers of scientists having direct access to Internet services at their working desks; most scientists depend on private cyber-café's to search the Internet for information
- Inadequate supply of up-to-date computers for research scientists, as well as lack of reliable and efficient technical backup service for computers and related hardware.

NARI scientists have very limited access to connectivity facilities; there is an acute shortage of connectivity facilities in over 65% of African NARIs. Furthermore, a large proportion of NARI scientists are not sufficiently proficient in searching the Internet for technical information.

Efficient connectivity is a basic requirement for conducting research and NARI scientists should have adequate modern electronic facilities and high levels of competence in sourcing research information from electronic databases and disseminating their research results.

This deplorable connectivity situation in African NARIs is deeply frustrating to scientists, and is an impediment to research performance and delivery, especially in the atmosphere where international development partners (including CTA, USAID, French Cooperation) have implemented several ICT projects and set up electronic networks in Africa. The FARA-RAILS (Regional Agricultural Information and Learning System) programme, and the RAIN (Regional Agricultural Information Network) project of ASARECA should offer additional opportunities for improving the capacities of NARIs to more effectively employ ICT for information management. The lack of efficient connectivity facilities hinders research scientists from obtaining the full benefit from these projects.

Laboratory research facilities are grossly inadequate in most NARIs and this is bound to affect the quality of research negatively. NARIs do not seem to be aware of, and have therefore not taken advantage of, the opportunities offered by the Improvement of Scientific Research Equipment project implemented by the Academy of Sciences of the Developing World (TWAS).

Research programme management in many NARIs is on the whole poor. It is important that FARA and SROs should pay particular attention to strengthening the capacity of NARIs in research programme management.

Private-sector participation in agricultural research in most parts of Africa is still insignificant (according to 77% of respondents), essentially because agriculture is not yet sufficiently market driven.

### *3.4. Collaboration*

#### **3.4.1. Introduction to collaboration, partnerships and linkages**

Establishing viable, functional partnerships and linkage mechanisms promotes maximum exploitation of research resources and strengthens individual members of the partnership for research delivery. This is the fundamental basis of the concept of collaboration in research networking, which has been successfully organized in African agricultural research institutions within the SROs, as well as in the NARIs. However, research networking in African NARS is mainly donor driven and not initiated or sustained from national or sub-regional resources or through non-donor supported programmes.

Evidence from Burkina Faso shows that where collaboration and partnerships between INERA (the national agricultural research institute) and FBOs are strong, through the donor-dependent PTD model, agricultural technologies generated are particularly relevant to the problems of farmers, who play a major role in the effective dissemination of agricultural technologies to support increased and sustainable food and agricultural production.

In this assessment, we address issues of the establishment of partnerships, collaboration between NARIs and local and foreign universities and agricultural research institutes, as well as with NGOs and FBOs. But first we report on the NARS awareness of the existence of FARA and its programmes.

#### **3.4.2. Awareness of FARA**

The current system for organizing African agricultural research and development is based on efficient continental coordination involving NARS and SROs, with FARA at the apex of this system. It is recognized that NARS are the critical building blocks of FARA; therefore, it is vital that the NARS are fully aware of the existence, mandate and organizational structure of FARA.

This assessment sought information on the current level of NARS awareness of FARA, especially its role in strengthening NARS capacities through the SROs.

While 54% of NARS are well aware of FARA, about 27% are only marginally aware of its existence (Figure 9). Clearly, FARA requires greater publicity to create strong visibility for its work in Africa.

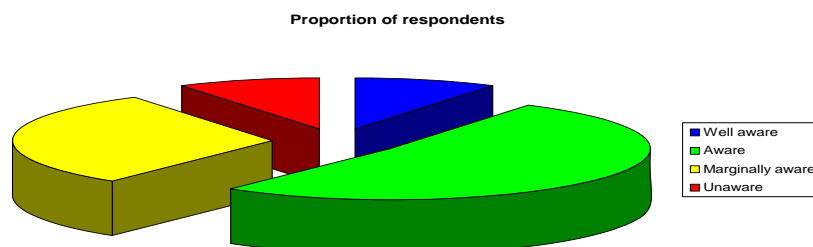


Figure 9. Assessment of NARS awareness of FARA.

### 3.4.3. Establishing partnerships

A significant number of research institutions (39%) have guidelines for establishing partnerships and linkages; however, even more (over 50%) have not established guidelines for forming partnerships and partnership committees (Table 11). Among those that have developed of partnership guidelines, most have only done so during the past 5 years. In 22% of the NARIs, partnership committees meet about four times each year, while in 6% of the NARIs, the frequency of partnership committee meetings is either once a year or *ad hoc*.

Table 11. Research partnership patterns in African NARIs

Partnership factor	Percentage of NARIs responding			
	Present	Absent	Years since development	
			1-5	>5
Guidelines for partnerships & linkages	39	54	35	4
Partnership & user committee	31	50	12	15

### 3.4.4. Linkages with universities and other research institutes

While about 58% of NARIs recorded strong linkages with local universities, 34% recorded weak linkages with local universities (Table 11). This was confirmed during the country visits when it was revealed that there are no formalized national mechanisms for forging linkages between NARIs and universities.

Linkages with foreign universities were weak in 65% of NARIs, and linkages with advanced research institutes in the North were weak in 62% of NARIs.

These weak linkages are further reflected in the numbers of joint research projects implemented between NARIs and local institutions or institutions in the South or advanced research institutions (ARIs) in the North. Implementation of joint research projects between

African NARIs and other research institutions or universities was dismally poor, with 23% of NARIs recording implementation of only 1–5 research projects (Figure 10).

This means that NARIs have not fully exploited the opportunities of collaboration or linkages with other institutes or universities for implementation of research projects, to enhance the potentials of additional funds, expertise and resources for effective agricultural research delivery. Furthermore, these results suggest that African NARIs have not made sufficient use of opportunities offered by organizations like TWAS and the African Academy of Sciences, which have ongoing collaborative linkage programmes between research institutions in Africa and elsewhere in the Third World. It is not clear whether the managers of NARIs are aware of the existence of these collaborative opportunities and how to benefit from them.

Table 12. Linkage patterns of African NARIs with universities, other research institutes, SROs and NGOs

Linkage agency	Degree of linkages			
	<i>Very strong</i>	<i>Strong</i>	<i>Weak</i>	<i>None</i>
Local universities	12	46	34	4
Foreign universities	0	19	65	4
ARIs in the North	4	12	62	15
Research institutes in the South (South–South cooperation)	4	8	62	19
CGIAR Centres	19	35	27	12
FBOs	15	47	30	4
NGOs & CBOs	4	46	42	8
SROs	12	39	35	4
Policy-makers in ministries	19	54	19	4

Although over 54% of NARIs recorded having strong linkages with the CGIAR Centres, 39% of them have not managed to implement real joint research projects with IARCs. The partnership and linkages with IARCs can best be described as highly limited (*see* Figure 10).



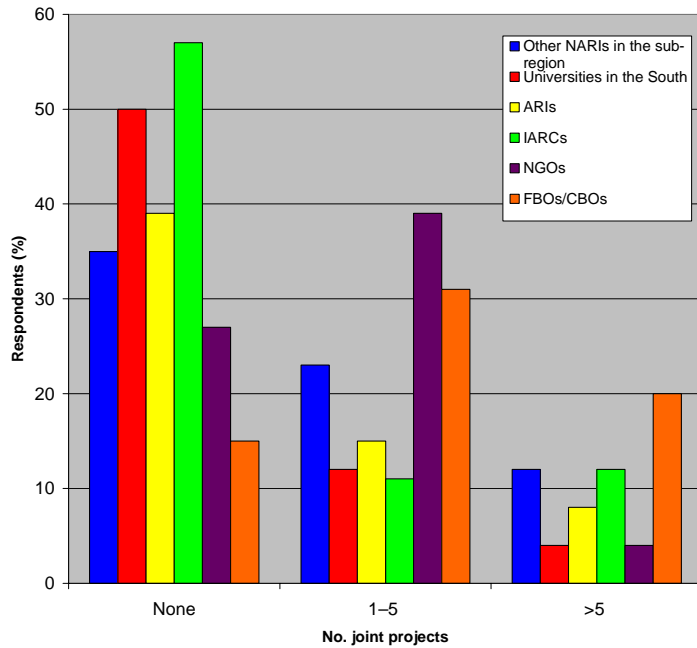


Figure 10. Joint research projects implemented collaboratively by African NARIs with other institutions, NGOs and FBOs.

### 3.4.5. Linkages with NGOs

A multitude of local and international NGOs (too numerous to cite here) operate in Africa, especially in grass-roots agricultural development, interacting closely with rural communities. Examples of well-known international NGOs implementing programmes in food security and agriculture include World Vision International, Winrock International, ActionAid, CARE International, Sasakawa Global 2000, Save the Children and Heifer International. Major local NGOs interviewed include COSADER (Network of Cameroonian NGOs on Food Security and Rural Development), OBEPAB (*Organisation Béninoise pour la promotion de l'agriculture biologique* in Benin) and Rodale (Senegal) in West and Central Africa, and the National Farmers Union of South Africa, Uganda Cooperative Alliance, and the Uganda National Farmers Federation in Eastern and Southern Africa.

These NGOs depend on agricultural technologies generated by the NARIs and are highly efficient in promoting the dissemination of these technologies to beneficiary farming communities. Effective collaboration and linkages between NARIs and NGOs, NARIs and farmer groups should therefore be highly beneficial to all the members of the partnership.

About 50% of NARIs recorded strong linkages with NGOs (Table 12), but interaction with field staff of key NGOs during the country visits revealed a different picture. Over a quarter of NARIs (27%) are not implementing joint research or development projects with NGOs (which is a high percentage), while 39% of NARIs are implementing 1–5 joint projects with NGOs (Figure 10).

Important issues relating to effective collaboration and linkages between NARIs and NGOs include:

- NGOs tend to have their own development agendas, which may not be related to or fully integrated with the national agricultural research strategies and implementation plans of the NARIs;
- Funding sources and patterns of NGOs are entirely different from those of NARIs;
- NARI scientists often expect, and actually demand, financial compensation for working with NGOs, which normally lack adequate resources to accommodate such demands;
- Although in some instances, NGOs have signed Memoranda of Agreements for partnerships and collaboration with NARIs, field implementation of these agreements tends to be very weak; so, the NGOs continue to conduct their business in isolation from NARIs.

Effective NARI–NGO collaboration and linkages tend to be seriously constrained by these factors. The general feeling among NGO and NARI staff is that such linkages are mutually beneficial, therefore a more effective mechanism for NARI–NGO collaboration is highly desirable.

#### **3.4.6. Linkages with farmer- and community-based organizations**

Linkages between NARIs and FBOs and CBOs are weak in over 30% of the NARIs sampled (*see* Table 12). And the implementation of joint research and development projects tends to follow the same weak pattern: 15% of NARIs have no joint projects with FBOs and CBOs, while 31% are implementing 1–5 projects with these organizations (Figure 10).

#### **3.4.7. Linkages with policy-makers in ministries**

Over 73% of NARIs recorded strong linkages with policy-makers in the government ministries, purely because the NARIs are placed under supervisory ministries, which are responsible for approval of the budgets and release of annual financial allocations. These may be the Ministry of Agriculture, Ministry of Scientific Research or Ministry of Science and Technology; these are strongly represented in the Boards of Management of NARIs.

#### **3.4.8. Linkages with sub-regional organizations**

The three SROs in Sub-Saharan Africa (CORAF/WECARD, ASARECA and SADC-FANR) are founding members of FARA, which they created to serve as a continental mouth-piece and apex regional organization on agricultural research for development. FARA is to facilitate an accelerated and even growth in the agriculture-led economies of the sub-regions under the three SROs (*see* the African vision on agriculture)—a motor in efforts to achieve the agreed Millennium Development Goals in Sub-Saharan Africa.

An essential requirement for the successful operation of FARA is the development of strong and effective SROs, which have the mandate for strengthening NARIs in their sub-regions. This study of African NARS therefore included CORAF/WECARD in West and Central Africa, ASARECA in eastern Africa and SADC-FANR in southern Africa. The SROs were established to coordinate agricultural research and development in Africa. The study sought to identify the SROs' strengths, weaknesses and opportunities that are relevant to the work of FARA. The information obtained from this study will be useful in determining FARA's role in strengthening the weaknesses, building on the strengths and assisting the SROs to fully exploit the opportunities for supporting NARIs to improve their efficiency in agricultural research and delivery for sustainable development.

A summary of the responses from NARIs of their assessments of linkages with SROs is given in Table 12. While 51% of NARIs regard their linkages with SROs as strong, 35% regard their linkages with SROs as weak. This emphasizes the need to re-examine the mechanism of NARI–SRO linkages with a view to strengthening them.

#### **3.4.8.1. Linkage with CORAF/WECARD, the SRO in West and Central Africa**

CORAF/WECARD management also serves on the Executive Board of FARA.

CORAF/WECARD is charged with grass-roots implementation of FARA programmes at the sub-regional level through coordination of member-country partnerships, mobilization of scientific expertise, facilitating focused stakeholder involvement, and ensuring impact. One such programme is the Sub-Saharan Africa Challenge Programme (SSA CP) being implemented in the Kano–Katsina–Maradi (KKM) area—a project transect cutting across Nigeria and Niger.

#### *Strengths:*

1. CORAF/WECARD has successfully established viable and strong working relationships with the NARIs. For example:

(a) The competitive research grant scheme of CORAF/WECARD has provided research grants to NARI scientists working in partnership with international and regional centres in the following research networks: Groundnut; Cotton; Forestry/agroforestry; Livestock; Drought Resistance network; Root and tuber crops; Cereals; Vegetable and Horticultural networks; Seeds and planting material; Banana/plantain

(b) Research Base Centres: CORAF/WECARD has recognized three key research institutes as Base Centres and/or Centres of Excellence in NARS for implementation of specific sub-regional collaborative research projects:

- i. *Centre d'Etudes Régional pour l'Amélioration à l'Adaptation à la Sécheresse* (CERAAS) – regional centre for the study of plant adaptation to drought, Senegal
- ii. *Centre International de Recherche-Développement sur l'Elevage en zone Subhumide* (CIRDES) – regional livestock centre for sub-humid zones, Burkina Faso
- iii. ITC – International Trypanotolerance Centre, The Gambia.

(c) Special projects:

- i. The Kano–Katsina–Maradi (KKM) Pilot Learning Sites (PLS) of the Sub-Saharan Africa Challenge Programme (SSA CP)
- ii. Competitive funded projects (17)
- iii. Fallow research project
- iv. Irrigation project
- v. Special project on the savannah of Central Africa – *Pôle régional de recherché appliquée au développement des savanes d'Afrique centrale* (PRASAC)
- vi. Groundnut Seed Project
- vii. Genetic resources policy initiative project
- viii. Biodiversity project  
etc.

2. International donors and sub-regional organizations, including the Economic Community of West African States (ECOWAS), *Comité Permanent Inter Etats de Lutte Contre la*

*Sécheresse dans le Sahel* (CILSS) and *Union Economique et Monétaire Ouest Africaine* (UEMOA), have identified CORAF/WECARD as the technical agency for coordination of agricultural research in the sub-region.

*Weaknesses:*

1. The programmes of CORAF/WECARD are expanding rapidly at a rate that is well beyond the current technical and administrative capacity of the agency. Consequently, considerable strain is placed on the Executive Secretary, Scientific Coordinator and staff at the Dakar office, with potential implications of declining efficiency.
2. There seems to be a lack of sufficient clarity and formal procedures in establishing collaborative agreements with development partners.
3. Inadequate and unsustainable funding has continued to constrain the performance of CORAF/WECARD operations. For example, the lack of long-term funding arrangements has seriously impaired the sustainability of collaborative research programmes with NARIs.

*Opportunities:*

1. The involvement of CORAF/WECARD in the implementation of the SSA CP provides excellent opportunities for FARA to assist with strengthening the agricultural research capacities of NARIs and further strengthening of partnerships and collaboration between FARA and CORAF/WECARD and international donors.
2. The FARA programme Building African Scientific and Institutional Capacity (BASIC) for strengthening the capacity of universities in West and Central Africa, to build capacity for agricultural research and development offers opportunities for FARA to work with CORAF/WECARD in strengthening agricultural education in the sub-region.
3. The CAADP Pillar IV recognizes the importance of agricultural research in increasing African agricultural production. CORAF/WECARD should take this opportunity to develop advocacy strategies that their member NARIs could use to lobby their national governments.
4. The Regional Agricultural Information and Learning System (RAILS) of FARA offers potential to strengthen the capacities of NARIs and CORAF/WECARD in exchanging information and sharing knowledge among stakeholders.

**3.4.8.2. Linkages with ASARECA**

*Strengths:*

1. ASARECA has been, and continues to be, successful in attracting strong support from a wide spectrum of donors (Table 13). This is because of the commitment of the Committee of Directors, the management and the scientists in the sub-region to the ideals of the SRO. ASARECA is regarded by many as the strongest of the three SROs.

Table 13. ASARECA budget and funding by donor source, 2005

<b>Donor</b>	<b>US\$</b>	<b>Percentage of budget</b>
European Union	6,325,965	44.4
USAID/REDSO	3,892,220	27.3
AfDB	1,357,010	9.5
SIDA-Sweden	1,238,840	8.7
SDC-Swiss	440,000	3.1
IDRC	197,880	1.4
CIAT	168,100	1.2
World Bank	150,000	1.1
DANIDA	140,000	1.0
GTZ	109,840	0.8
IFAD	100,000	0.7
CTA	68,400	0.5
Member NARIs	50,000	0.3
<b>Total</b>	<b>14,238,255</b>	<b>100</b>

2. The rotational Chair of ASARECA gives each country an opportunity to serve and builds a sense of ownership among all Directors. Furthermore, each country serves on the executive committee of the Committee of Directors for 3 years; as vice chair, chair and past chair.

3. High degree of participation of nearly all stakeholders (NARIs, IARCs, universities, NGOs, farmers) in the implementation of the 17 networks, programmes and projects (NPPs) of ASARECA. The NPPs cover all the priority areas of ASARECA: Animal Agriculture Research Network; African Highlands Initiative; Banana Research Network; Biotechnology and Biosafety Program; Coffee Research Network; East African Plant Genetic Resources Network; Eastern Africa Root Crops Research Network; Eastern and Central Africa Bean Research Network; Eastern and Central Africa Maize and Wheat Research Network; Eastern and Central Africa Program for Agricultural Policy Analysis; Eastern and Central Regional Sorghum and Millet Network; Eastern and Central Africa Rice Research Network; Post-harvest Processing Network; Regional Potato and Sweet Potato Improvement Network; Regional Agricultural Information Network; Soil and Water Management Network; and Trees-on-Farm Network. The NPPs are coordinated quite well by regional staff.

*Weaknesses:*

1. The most important weakness of ASARECA is the lack of financial support from national governments—only 0.3% of ASARECA’s funding is contributed by member NARS. This threatens the long-term sustainability of this important and active SRO.

2. The large number of NPPs, some with overlapping responsibilities, is a weakness. However, this problem may be resolved soon because ASARECA has initiated action on rationalization of the NPPs.

3. There is poor representation of farmers and other end-users of ASARECA’s products and partners in the Committee of Directors. Universities in the region have only one seat, while the rest of the members are mostly directors of NARIs.

#### *Opportunities:*

1. The prevailing good will of donors, regional organizations—such as the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), Economic Commission for Africa (ECA), Inter-Governmental Agency for Desertification and Development (IGADD)—towards ASARECA offers opportunities which the SRO should seize.

2. FARA's regional initiatives are adding value to current ASARECA activities by providing technical and financial assistance.

#### **3.4.8.3. *Linkages with SADC-FANR***

The sub-regional research organization for the SADC region was the Southern Africa Centre for Cooperation in Agricultural and Natural Resources Research and Training (SACCAR) until it was dissolved in 2001. The functions of SACCAR are now under the Food Agriculture and Natural Resources (FANR) department of SADC. This office has one SADC national and a technical adviser provided by the EU, and is responsible for the liaison function for agricultural research. Thus, at present, there is essentially no SRO similar to CORAF/WECARD or ASARECA in the SADC region, just a department within a regional economic community. However, a Regional Indicative Strategic Development Plan (RISDP), drawn up in 2004, recognized the need for regional coordination of agricultural research and a thorough review of SADC's agricultural research is planned for 2006. It is believed that one of the outputs of that review will be a proposal for establishing a mechanism for coordinating agricultural research in the SADC sub-region outside of the SADC Secretariat, but with strong linkages to SADC. When that mechanism is in place, FARA's input will be vital in assisting to strengthen the envisaged collaboration.

#### **3.4.9. Discussion**

Although guidelines for establishing partnerships and linkages between NARIs and universities and NGOs have been developed through MoUs in many African countries, actualization of these partnerships and linkages for effective collaboration in agricultural research among NARIs is very weak indeed. Weak linkages are also evident between NARIs and NGOs despite the fact that both organizations are supposed to be working for the benefit of rural farming communities. Enormous advantages can be derived from effective partnerships and linkages, as demonstrated by the INERA–FBO example in Burkina Faso. However, successful partnerships are driven by donor support and the likelihood of their sustainability may be quite slim, unless the national governments allocate adequate funds to sustain the activities, or the FBOs are strong enough and have sufficient resources to continue implementing projects in the partnerships. Recent efforts by FARA to organize the NGO Consortium hold considerable promise for strengthening partnerships between NARIs and the NGOs, FBOs and CBOs. This platform should be fully exploited to strengthen the NARI–NGO–FBO–CBO partnerships.

Scientists in university faculties of agriculture and agricultural universities are engaged in agricultural research and partnerships, and linkages with NARIs are essential, not only to strengthen research efforts and delivery, but also to enrich the universities' agricultural education curricula. Our assessment shows that linkages between most government agricultural research institutes and universities are weak, except where NARIs are historically affiliated with universities through their development, as for example in Nigeria. During our field missions, university scientists expressed strong desires to forge stronger partnerships and linkages with NARIs, because they recognize the advantages of such partnerships. The

NARI scientists also expressed a comparable level of interest in partnering with universities, although some reluctance to forge this partnership could be detected lurking behind their enthusiasm.

An important issue that emerged from our discussion with the universities is the total lack of coordination of or linkages between the agricultural research conducted within the universities and that conducted in the NARIs. Furthermore, there is a poor relationship between the research in the universities and the national agricultural research strategies. Better coordination and linkages between university research and NARI research, in the context of national agricultural research strategies, is highly desirable and would confer enormous benefits for agricultural development in African countries.

However, the SROs have been particularly successful in establishing collaboration and partnerships among the NARIs themselves, and between NARIs and IARCs through the research networks and competitive research grant schemes. Implementation of the four FARA programmes and its Framework<sup>1</sup> will further reinforce these collaborations and partnerships, but it will be necessary to strengthen the programme management capacities of the SROs.

In South Africa, a forum has been established for interaction among NARIs, universities, the private sector, NGOs, FBOs and policy-makers, but the full effectiveness of this forum is yet to be realized. However, no such important exists elsewhere in Africa and that the establishment of such a forum would be beneficial for exchange of experiences and for forging functional partnerships between important stakeholders in national agricultural research and development.

SROs are the building blocks of FARA and they are already involved in the implementation of FARA's programmes, with FARA providing the necessary resources for the activities. But the key question in this relationship is: *to what extent can the SROs mobilize support to sustain FARA?* During our field missions, we observed some level of discomfort about the different roles being played by FARA and the SROs in the African agricultural research for development arena. This is a potential area of conflict between FARA and the SROs, and an early clarification of the individual areas of FARA and SRO responsibilities is desirable.

## **4. General conclusions**

### ***4.1. Introduction: Some concepts of innovation systems for integrated agricultural research for development (IAR4D)***

Our aim in this section is to bring together commonalities in the weaknesses, strengths and opportunities identified across the NARS and SROs that will lead to recommendation of a series of continental actions that should be taken by FARA—engaging other development partners—to strengthen agricultural research delivery in Africa (the recommendations are presented in section 5).

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<sup>1</sup> FARA's four programmes and framework are: Building African Scientific and Institutional Capacity (BASIC), Dissemination of New Agricultural Technologies in Africa (DONATA), Regional Agricultural Information and Learning System (RAILS), Sub-Saharan Africa Challenge Programme (SSA CP), and Framework for African Agricultural Productivity (FAAP).

Traditional expectations from agricultural research in Africa include promoting food security, contributing to the fight against hunger and poverty, as well as the achievement of sustainable development, especially in rural communities. Although this role for agricultural research in Africa remains unchanged, the needs of African societies and human populations have continued to change rapidly and dramatically. For example, rapid urbanization all over Africa has given rise to massive urban agricultural enterprises that contribute substantially to urban domestic food baskets and youth employment, as well as offering challenges to urban planners and developers.

Meeting the changing agricultural needs of African societies requires the application of new knowledge systems and operational mechanisms for strengthening institutions and agricultural research performance and delivery. We note that rapid progress in science and technology for development—in particular advances in biotechnology, information technology and facilities (Internet access and connectivity)—provide wide-ranging opportunities for highly efficient sharing of knowledge, experiences and skills in agriculture. All relevant stakeholders in agriculture have major and important roles to play in national agricultural research enterprise. Therefore, the critical role of the innovation systems approach to sustainable development, which fully engages a wide range of stakeholders, needs to be adopted in the development of African agricultural research endeavours. The United Nations Millennium Project Task Force on Science, Technology and Innovation defines innovation as follows: “*the means whereby individuals and groups apply their creative capacities and their social, organizational and institutional knowledge for the generation and application of new scientific and technical knowledge.*” Thus, innovation includes the harmonious mix of activities of formal science and technology enterprises and informal grass-roots ideas and inventions of people not formally associated with institutions.

Innovation systems concept is the model of research viewed as part of a larger dynamic whole dedicated to improving the lives of poor people. It recognizes multiple sources of innovation generated by a network of actors or partners, comprising the organizations and individuals involved in generating, diffusing, adapting and using new knowledge, skills and technologies. Organizations and individuals engage in the generation, diffusion, adaptation and use of new knowledge, and the ways in which this process leads to innovation (products and processes). Innovation systems promote the integration of research and education systems, encourage public–private sector partnerships, and strengthen organizational mechanisms such as FBOs and CBOs.

The term ‘science, technology and innovation’ is now commonly used to describe this complementary, interdependent nature of different concepts. African agricultural research must therefore critically examine its current *modus operandi* and shift the research paradigm to adopt modern science, technology and innovation concepts to promote sustainable human development in Africa. FARA, in collaboration with the CGIAR Centres, has already adopted the innovation systems concept in the design and implementation of the Sub-Saharan Africa Challenge Programme (SSA CP). We suggest that the adoption of this innovation systems concept for agricultural research by African NARS should now be aggressively pursued to enable agricultural research to make the necessary impact on human development in order to fulfil its objectives and to achieve the NEPAD vision for agricultural development in Africa.

In the remaining part of this section, we outline the conclusions derived from the analysis of the responses to the questionnaires and consultations with national partners during country missions to NARS.



The next section (5) is devoted to Strategic Recommendations formulated in the context of the science, technology and innovation concepts, and the urgent need for increased and sustainable financing support and commitment of African governments to agricultural research for national development.

#### *4.2. Governance and management*

Although a majority of the NARIs have developed mission and vision statements, over half of them have not designed research strategies and implementation plans. This raises issues of the kind of framework on which such NARIs base their research implementation and evaluation activities. We consider this situation a weakness and a possible constraint to effective agricultural research.

While the use of management manuals in NARIs is desirable to improve the management of research institutes, it does not seem that the use of a variety of these management manuals is widespread among African NARIs.

The current exclusion of key stakeholders (who are the intended beneficiaries of agricultural research) from membership of the Boards of Directors of most NARIs, negatively affects the efficiency and effectiveness of agricultural research. Furthermore, the absence of the private sector from most NARI boards does not promote public–private sector partnerships, which are needed to support national agricultural research. The appointment of people from the private/business sector onto NARI boards could increase the role played by the private sector in African agricultural research. It is therefore important that African governments reconsider their criteria for appointing members to the boards of NARIs with a view to moving away from strict political considerations towards engaging many more relevant stakeholders in the governance of agricultural research institutes. We also note that there could be advantages in appointing politicians to the boards of NARIs, but the identification and selection of such members should take serious account of their technical qualifications and scientific experiences, as well as the understanding and commitment of potential members to agricultural research for development.

#### *4.3. Financial status and management*

This study shows that most African NARIs experience considerable difficulties with financial capacity and sustainability because of inadequate allocations by governments (less than 2% of GDP) and consequent unacceptable heavy dependence on donor funding. The exceptions are South Africa and Mauritius. When donor funding ceases or diminishes—as happened, for example, in Ghana, Nigeria, Senegal and Togo—research activities are severely curtailed and the best scientists leave for better paying jobs in the country or abroad. This emphasizes the point that NARIs' dependence on external donors to fund national agricultural research for development is untenable and is not in the best interest of the countries concerned. We strongly believe that national governments should fund agricultural research to the levels where NARIs can conduct agricultural research for national development without outside donor support. It is only when this can be achieved that the scientists can have complete control of the research activity and address the real problems of the farmers and other stakeholders.

While reasonable financial management capacity exists in many NARIs, it needs improvement to the level of generally accepted international standards.

Private-sector contributions to agricultural research and self-generated funding are significant only in South Africa, and may not be strong sources of funding for agricultural research in Africa in the foreseeable future. Some countries, for example Côte d'Ivoire, are experimenting with the concept of privatizing agricultural research, so that the NARIs can move towards complete funding independence from government. We did not have an opportunity to assess progress in this experiment, which should be highly informative. However, we consider the results of agricultural research activity as 'public goods', for which national governments have the responsibility of committing adequate resources.

While the idea of privatizing agricultural research has considerable merit, we signal the obvious danger of this concept moving national agricultural research away from producing public goods to satisfying the interests of the private sector that provides the funding for research. Such interests may be entirely dominated by commercial considerations to the benefit of only a minority rather than a majority of the populace.

Perhaps an innovative mix of public- and private-sector funding of national agricultural research may reduce the current high level of unacceptable dependence on donor funding of agricultural research in Africa.

#### *4.4. Scientific capacities and management*

According to FARA (2005a), five major areas need to be targeted to significantly improve the capacity and efficiency of African NARIs:

- Developing NARIs' capacity for priority-setting and linking resource allocation to priority research programmes;
- Upgrading the technical skills and human-resource management of NARIs through sustained training programmes, severing NARIs from civil-service policies and procedures, and introducing performance-based human-resources incentive and management systems;
- Developing information technologies to link NARIs to external scientific information networks;
- Establishing efficient internal Management Information Systems;
- Introducing systematic scientific external reviews and evaluation, and strengthening monitoring and evaluation systems to track the efficiency of outputs and impacts.

The results obtained from this assessment reveal major weaknesses in several aspects of the scientific and management capacities of NARS. Despite several training and capacity-building activities in agricultural research and management undertaken by international development partners and the CGIAR Centres in Africa, these weaknesses remain. Clearly, new directions and mechanisms are required to strengthen NARIs' capacities in agricultural research and management.

Experience from previous capacity-building programmes in agricultural research in Africa informs that two major aspects have always been and often still are neglected, namely

(a) strengthening the capacities of NARS to conduct training (i.e. so they can design, plan, manage and evaluate training), and (b) implementing viable trainee follow-up programmes.

Strengthening institutional capacities of NARIs in the management of agricultural research, and individual research scientists' capacities in the conduct of research and communication of research results to target audiences, is urgently needed for effective research delivery. Furthermore, we identify scientific writing and communication of agricultural research results, agricultural journal management, as well as improving connectivity facilities and competence in accessing technical information over the Internet, as priority areas for strengthening.

#### *4.5. Collaboration*

The current levels of collaboration and partnerships between NARIs and national universities are weak and need considerable strengthening. Collaboration and partnerships between African NARIs and foreign institutions in the developing world and in developed countries is even weaker. We believe that the implementation of FARA's BASIC programme can address these weaknesses. However, in addition to the BASIC programme, opportunities for strengthening these linkages (involving South–South cooperation) are available and should be explored with other initiatives of the United Nations and Science Academies.

Most NARIs have established commendable partnerships with NGOs and FBOs based on the understanding that the NARIs are a guaranteed source of agricultural technologies, while the NGOs and FBOs are the mechanisms for the effective dissemination of the technologies to users. However, the dwindling resources of NARIs are creating considerable difficulties in continued collaboration and partnerships. Some mechanisms need to be developed to ensure that this collaboration and partnership is enhanced on a continuing basis. FARA's FAAP provides a unique opportunity to strengthen the relationships between NARIs and NGOs, and NARIs and FBOs.

The implementation of FARA's four regional programmes and FAAP will create abundant opportunities for strengthening various weaknesses of NARS that have been identified in this report. However, the inadequate awareness of the existence of FARA and these regional programmes will tend to reduce the extent to which these opportunities can be effectively exploited to strengthen the capacities of African NARS. An aggressive public-awareness and promotion campaign of FARA and its programmes has the potential to make significant positive contributions to FARA's current efforts to strengthen African NARS.

#### *4.6. Categorizing sub-regional NARS and NARIs*

Analysis of the data collected during this assessment was designed to provide global information which helped us to identify commonalities in the critical issues affecting the efficiency and effectiveness of African NARS. No attempt was made to segregate and analyse the data into sub-regional groupings in order to assess the relative effectiveness of the NARS in each sub-region. Furthermore, time did not permit us to undertake such an exercise, which would require development of sets of criteria that would form the basis for this kind of assessment of sub-regional NARS groupings. Nevertheless, using only the criteria of funding

patterns, we identified three major categories of NARIs, not necessarily related to sub-groupings, as follows:

*Category 1:* NARIs with annual budget of less than US\$ 1 million. Such NARIs receive very little national governments and donor funding; examples are ISAR (Rwanda), FOFIFA (Madagascar), INPA (Guinea Bissau), IAR (Sierra Leone), Departments of Agricultural Research in Malawi and Zambia.

*Category 2:* NARS which receive modest funding from national governments and their major funding from donors. National funding is estimated to be 30%, while donor funding is above 50%; most African NARIs fall into this category.

*Category 3:* We describe this category as well-endowed NARIs, because they continue to receive adequate and substantial funding support from national governments. There is no donor funding support; examples are South Africa, Botswana and Mauritius.

It is possible, however, and highly desirable, to re-examine the raw data for the NARS in each sub-region and to analyse the segregated data in order to characterize the sub-regional NARIs and NARS on specific criteria that would enable realistic comparison of the performance status of different NARIs. Such an exercise would provide valuable information on weaknesses that are specific to the NARS in each sub-region and that can be addressed by the relevant SROs in collaboration with FARA.

#### *4.7. Options for strengthening African NARS*

The overall result of this NARS assessment tends to paint a rather gloomy and frustrating picture of the conditions of these important components (NARIs) of national development. Thus, the task of strengthening the vast majority of African NARS becomes a highly complex one that can be considered daunting and possibly an overwhelming endeavour.

However, it is important to draw attention to the fact that some African NARIs are much better off and much more functional and productive than others, especially where the national governments, for example South Africa, Mauritius and Botswana, provide adequate financial support and other resources, as well as a conducive and enabling climate to facilitate agricultural research efficiency and performance. An enabling environment for supporting high levels of agricultural research performance incorporates the existence of well-articulated national Science & Technology Policy and Strategies, adequate and sustained investments in science and technology, particularly agricultural research for development, and programmes to identify, prioritize and address critical national needs for agricultural development. The InterAcademy Council Panel suggests that developing countries must increase investments and spending on national research and development activities to 1.5% of GDP if they expect to keep pace with industrialized countries.

But the **big** question is: *‘What strategies can be adopted to strengthen African NARS, and what options are available to be considered?’*

We venture to suggest some options here for the consideration of national governments, NARIs, SROs and FARA. With assistance from the relevant SROs, individual or groups of

countries in a sub-region may consider the adoption of one or a combination of these options according to the status of their NARIs.

*Option 1. Strengthen individual NARIs* – this effort could be initiated by first using this FARA–SRO initiative as a point of departure for conducting a critical review of the status of individual NARIs within the framework of the four major domains identified in this assessment, to prioritize the areas that need urgent attention. A strategy should then be developed for rectifying the identified weaknesses; this effort could be enhanced through developing collaborations with relevant sub-regional and regional organizations and international development partners (some of these organizations and partners are cited in section 3.3 of this report).

*Option 2. Privatizing agricultural research* – in this option, the NARIs would be given the authority to operate as autonomous private–public sector organizations, with completely different and attractive conditions of service for their staff. That would free NARIs from total dependence on governments and donor funding, so that they could develop mechanisms for sourcing funding for research and development activities. NARIs could bid for research contracts from the private sector or may be specially commissioned by governments or private industry to conduct research and deliver outputs of interest to the contracting party. Privatization may be total or partial and vary according to the particular circumstances of the national agricultural development strategy of the countries concerned.

*Option 3. Adopt the use Centres of Excellence for Agricultural Research (CEARs)* – the concept of this option is to invest adequately in agricultural research, technology generation and dissemination, and to concentrate expertise and scarce resources in a few well-established centres of excellence for agricultural research where research and capacity building, through training, can be efficiently conducted. The InterAcademy Council Panel points out that Centres of Excellence are the key to innovation and that major scientific and technological advances are made at such locations.

National African governments may review the status of promising local NARIs and reform them into CEARs. Such centres will be few and will be autonomous institutions with adequate and sustainable funding, capable of scientific leadership. They should collaborate extensively with relevant advanced research laboratories and international organizations. If necessary, and if resources are available, new local CEARs could be created to address specific research agendas. The research programmes of CEARs would be interdisciplinary, with clearly defined objectives and deliverables over specific time frames.

National CEARs may be created by each country or sub-regional CEARs may be created by groups of countries to promote effective sharing of resources as well as expertise, knowledge and experiences for the benefit of agricultural development in the sub-region.

## **5. Strategic recommendations**

### *5.1. Introduction*

In this section, a series of strategic recommendations is presented for consideration by FARA in its effort to help the SROs improve agricultural research by African NARIs. It is recognized that these recommendations would be implemented in the complex and rapidly

evolving environment of African agricultural development, and FARA has a major role to play in making this a positive development. However, it is also recognized that donors and international development partners have undue influence, because African governments seem to have abandoned their responsibility to effectively support agricultural research, science and technology as the engine for socio-economic development. FARA will need the utmost support from its stakeholders to counteract this. African governments have made serious commitments through NEPAD and CAADP to support agricultural research for development, but practical realization of these commitments remains elusive. In this regard, it is most appropriate that NEPAD has requested FARA to be its technical arm for the implementation of CAADP Pillar IV.

It is emphasized that the successful implementation of these recommendations by FARA will require the full commitment of national African governments in providing enabling environments for African NARS to flourish and to function efficiently and effectively.

### *5.2. Implementation process*

The strategic recommendations are presented within the four major domains of intervention identified by the SRO–FARA Retreat.

It is suggested that implementation of most of the recommendations should involve partners in the community that is technically described as *'the FARA Constituency'*. For each recommendation, specific partners have been identified who should take the lead in implementing the recommendations. It is stressed that the FARA Secretariat will have to continually initiate, facilitate and guide the overall processes for implementing, monitoring and evaluating these recommendations.

Some of the recommendations require further development into full project proposals so that they can be adequately resourced. FARA Secretariat should take responsibility for identifying appropriate expertise to develop these proposals.

### *5.3. Grouping of recommendations*

To facilitate consideration of the Strategic Recommendations they have been organized into two major groups:

**Group A** – General Recommendations that address the issue of possible options which could be adopted for strengthening African NARIs

**Group B** – Specific Recommendations that address particular issues related to the four domains identified by the SRO–FARA Retreat. These recommendations target the major weaknesses that emerged from the analysis of the responses to the questionnaires and critical issues raised during interactions with NARS partners during the field missions to African countries.

## A. General recommendations

### **Recommendation A.1. Building efficient, effective and productive African NARS**

In view of the very wide variation in the status of research management and scientific capacity of African NARIs, the patterns of national government and donor financial support, and resource allocation for agricultural research as well as the enormity of some of the constraints identified, it is recommended that *National Governments* should:

- a. Critically review the status of the components of the NARS and consider adopting any one or a combination of the following options for improving the impact of agricultural research:
  - *Strengthen specific components of NARS* – Identify specific weaknesses in the governance, management and scientific capacity and partnership arrangements of the NARIs and other components of NARS, and target specific areas for their strengthening
  - *Privatize national agricultural research* – Consider adopting appropriate patterns for partial or complete privatization of agricultural research phased over a time frame, for example, over a 5-year period. Such privatization will minimize the strong dependence of the NARIs on unreliable government and donor funding, and create a better focus for agricultural research. It will open opportunities for private research institutions
  - *Use Centres of Excellence for Agricultural Research (CEARs)* – Identify promising NARIs for upgrade into national centres of excellence or, if resources permit, create new national collaborative centres of excellence for agricultural research where resources and expertise will be concentrated. Such centres of excellence would be institutionally autonomous; well funded on a sustainable basis, primarily from local sources; and challenged and contracted to respond to key local problems of agricultural development through conducting agricultural research for national development. Countries within a sub-region may also create sub-regional CEARs to promote efficient sharing of resources, expertise, knowledge and experiences.
- b. Engage SROs and FARA in technical consultations to explore the areas for support to implement the chosen options for strengthening agricultural research delivery in African NARS.

**Action:** *NARIs, SROs, FARA*

### **Recommendation A.2. Characterization of specific sub-regional NARS issues**

In order to identify specific issues related to the performance of NARS and NARIs in each sub-region, and to enable SROs to address these issues, we recommend that SROs should use this assessment to conduct more detailed studies that could characterize and compare NARS and NARIs in each sub-region, and reveal specific areas that require strengthening.

**Action:** *SROs, NARIs*

## *B. Specific recommendations*

### **B.1. Improving governance and management**

**Recommendation B.1.1.** NARIs should be encouraged, through appropriate institutional reforms, to move away from the current traditional disciplinary-centred approach to agricultural research towards adopting the Innovation Systems approach of integrated agricultural research for development. This system will create more conducive agricultural research opportunities to engage relevant stakeholders in research programme formulation, implementation, monitoring and evaluation. It will also enable stakeholders to contribute effectively to research partnerships to address the agricultural production constraints especially of African small-holder farmers. Implementation of the SSA CP and the Framework for African Agricultural Productivity (FAAP) provide good opportunities for promoting this research concept and should be exploited.

*Action: NARIs, SROs, FARA*

**Recommendation B.1.2.** FARA should commission a detailed study of the processes adopted by NARIs for formulating agricultural research strategies and implementation plans in order to document the major areas of weakness in the processes and methodologies adopted. The study should include a review of the mechanisms for implementing national Agricultural Research Strategies and Implementation Plans.

*Action: FARA, SROs, NARIs*

**Recommendation B.1.3.** Using its comparative advantage as the apex continental agricultural research coordinating agency, and in the execution of its advocacy role, FARA should encourage national governments and policy-makers to promote the inclusion of a wider range of stakeholders in the Boards of NARIs. Some emphasis should be placed on attracting top personnel from the business/private sector to serve on the boards of NARIs in order that they can play a greater role in national and sub-regional agricultural research and development efforts.

*Action: FARA, SROs, NARIs*

**Recommendation B.1.4.** FARA should establish an African Agricultural Research Services Facility (AARSF) within the FARA Secretariat, to coordinate sustained support for building agricultural research and management capacities for African NARS. We suggest the following general terms of reference for the AARSF:

- i. to organize compilation of a more detailed training needs assessment of NARIs in agricultural research performance and agricultural research management;
- ii. in collaboration with the three SROs and relevant development partners, implement a Pan-African Training Capacity Building Programme;
- iii. design and implement a strategic training or follow-up programme for African NARIs.



More detailed terms of reference (ToRs) for this Facility should be developed in the proposal for the establishment of the AARSF. FARA should commission the formulation of this proposal for submission to donors.

*Action: FARA*

## **B.2. Improving financial status and management**

One major factor constraining successful agricultural research for development in Africa is diminishing national government commitment, financial support and poor policy directives for agricultural research. Although the Heads of State and Governments in Africa, in the context of NEPAD and CAADP, committed themselves to allocating 6% of national budgets to support agricultural research, this commitment is not being fulfilled. FARA, in collaboration with the SROs, should explore new and innovative mechanisms for drawing the attention of African governments to the serious and disastrous implications of declining support to agricultural research in achieving the vision of NEPAD for Africa's development.

**Recommendation B.2.1.** Through its advocacy role, FARA (through FAAP) should encourage national governments to fulfil their pledge to contribute 6% of Agricultural GDP to the agricultural sector. A substantial proportion of this contribution would be allocated to supporting agricultural research for development.

*Action: FARA, SROs, NARIs*

**Recommendation B.2.2.** FARA has been facilitating various sub-regional meetings to harmonize external support to agricultural research for development in each of the sub-regions. Results of these consultations should be moved forward for action. Adopting a model of partial privatization of national agricultural research for development could be explored, so that NARIs could generate their own operational funds and gradually move away from heavy dependence on foreign donors and national governments.

*Action: FARA, SROs*

**Recommendation B.2.3.** The SROs, with support from FARA, should commission an inventory of innovative and successful programmes for and experiences of sustainable funding in specific countries of the developing world and identify lessons applicable to Africa.

*Action: SROs, FARA*

**Recommendation B.2.4.** Since financial management of most NARIs needs considerable improvement to bring them up to the standards of IARCs, the AARSF of FARA should include financial management in the capacity-building programme for African NARIs.

*Action: FARA, SROs*

**Recommendation B.2.5.** The SROs, with support from FARA, should establish training programmes for NARI accounting staff and encourage national governments to offer the same terms and conditions of service to accounting staff as they offer scientists.

*Action: SROs, FARA*

**Recommendation B.2.6.** Private-sector participation in agricultural research in most parts of Africa is still rudimentary, because the private sector—especially commercial farming and agricultural processing and marketing communities—is not yet effectively integrated into the national agricultural research industry. FARA should encourage African governments, through NEPAD, to engage the business/private sector to develop greater interest in and support for agricultural research in Africa.

*Action: FARA*

### **B.3. Strengthening scientific capacity**

**Recommendation B.3.1.** In collaboration with relevant partners such as the CGIAR Centres, FAO, CTA, International Network for the Availability of Scientific Publications (INASP), TWAS, African Academy of Sciences and the AARSF of FARA, scientific and institutional capacity building should be integrated in all regional programmes of FARA as well as in the SROs and NARIs. The main focus should be on training of trainers in order to strengthen national and sub-regional training capacities for agricultural research.

*Action: FARA, SROs, NARIs*

**Recommendation B.3.2.** FARA should provide support to the three SROs to conduct a detailed study of the critical mass of scientists required for effective agricultural research and delivery in NARIs; this critical mass should be related to the approved National Agricultural Research Strategies and Implementation Plans.

*Action: FARA, SROs*

**Recommendation B.3.3.** Special schemes of incentives should be developed by national governments for attracting, recruiting and retaining good scientists, especially the young, in order to build strong NARIs.

*Action: NARIs, FARA*

**Recommendation B.3.4.** The proportion of women agricultural research scientists in NARIs is still very low. It is recommended that FARA should encourage national governments and donors to establish and implement special programmes for accelerated training of women agricultural scientists. FARA should explore possibilities of expanding the Norman Borlaug Fellowship for African Women. FARA should establish cooperation arrangements with National Academies of Sciences in Africa, and TWAS, to set up special higher degree training programmes for African women agricultural scientists.

*Action: FARA, universities, NARIs, SROs*

**Recommendation B.3.5.** In order to encourage African agricultural scientists, NGOs, FBOs and CBOs, FARA should establish annual FARA awards for:

- i. institutional (NARIs) excellence in agricultural research performance
- ii. excellence in individual research by African agricultural scientists—these may be individuals or groups of scientists, or agricultural research consortia, as well as

NGOs and FBOs/CBOs who have been involved in a collaborative research endeavour and agricultural development.

FARA should commission the preparation of the criteria, guidelines and procedures for these annual awards.

*Action: FARA*

**Recommendation B.3.6.** In view of the importance of publishing and disseminating agricultural research results for development, we recommend that this aspect of the agricultural research endeavour should receive urgent attention. Two major components of this weakness are identified to be addressed, namely:

- i. strengthening the publications production capacities of the national institutions, especially in scientific editing and the editorial process, as well as the management of agricultural journals and books;
- ii. strengthening the scientific writing and communication skills of NARI scientists in Africa—FARA should collaborate with CTA, FAO, INASP and other international agencies that are actively implementing similar programmes in Africa.

We recommend that the FARA RAILS explore possibilities of collaboration with CTA, FAO and INASP through the SROs, to implement a pan-African group training programme to build capacities in the following major areas:

- Scientific writing and communication of agricultural research results
- Scientific editing and publications management of agricultural journals and books.

*Action: FARA, SROs*

**Recommendation B.3.7.** Several studies have already been commissioned by CTA and RAIN on the problems of journal publishing in Africa. FARA should undertake a detailed critical review of the reports of these studies and identify key African agricultural journals for support to strengthen the editorial and publications management capacities through training and possibly additional financial support.

FARA should dialogue with the publishers of carefully selected agricultural journals, published in Africa, in order to:

- i. identify the major areas for which financial and technical support are needed, to improve efficiency;
- ii. explore the possibility of providing financial and technical support to establish additional agricultural publishing nodes in the sub-regions of Africa.

*Action: FARA*

**Recommendation B.3.8.** NARIs should take full advantage of CAADP and FAAP to strength their capacities to generate and to more effectively disseminate agricultural

technologies. This can be achieved partly through extensive and wide-scale publicity of FAAP and CAADP to African NARS.

*Action: NARIs, FARA*

**Recommendation B.3.9.** NARIs should pressurize national governments to provide resources to support priority investment in ICT and connectivity. The current RAILS programme should be expanded to provide full support to NARS. In this effort, FARA should establish strong linkages and collaboration with the existing international agricultural information system providers, such as CTA and FAO, that are implementing ongoing and established agricultural information programmes in Africa.

*Action: NARIs, FARA*

#### **B.4. Strengthening collaboration**

**Recommendation B.4.1.** Through the implementation of FARA's five regional initiatives—i.e. FAAP, SSA CP, BASIC, DONATA and RAILS—collaboration and partnerships between NARIs, the universities and NGOs should be formally established for a number of pilot countries. Evaluation of the success achieved and lessons learned from these pilot countries should guide FARA in extending the successful partnership models.

*Action: FARA, SROs, universities, NGOs*

**Recommendation B.4.2.** The recently formed Sub-Saharan African NGO Consortium should be used as a platform for forging formal relationships between NGOs, FBOs and NARIs.

*Action: NGOs, CBOs, SROs, NARIs*

**Recommendation B.4.3.** FARA should dialogue with relevant United Nations agencies, Academies of Sciences and other international agencies that are involved in South–South cooperation programmes, to explore opportunities for forging linkages between African NARIs and agricultural, science and technology institutions elsewhere in the South and in advanced countries.

*Action: FARA*

**Recommendation B.4.4.** FARA and the three SROs should continue in their annual retreats to clarify their specific roles and responsibilities in the effort to support different components of African NARS.

*Action: FARA, SROs*

**Recommendation B.4.5.** FARA should develop and implement a major and effective public-awareness strategy to create much greater awareness of FARA and its regional initiatives and programmes among African NARS.

*Action: FARA*

## 6. Documents consulted

FARA, 2004. FARA-RAIS: Regional Agricultural Information Systems. Program Proposal.

FARA, 2004. DONATA: Widespread Dissemination of Proven Agricultural Technologies. Program Proposal.

FARA, 2004. Securing the Future of African Children: Building Sustainable Livelihoods through Integrated Agricultural Research for Development. Sub-Saharan Africa Challenge Programme Proposal, Volume 1. June 2004.

FARA, 2005a. Multi-Country Agricultural Productivity Program (MAPP) Proposal.

FARA, 2005. BASIC: Building African Scientific and Institutional Capacities. Program Proposal.

FARA, 2005. Promoting inclusiveness of Civil Society Organizations (CSO) in African Agricultural Research Agenda: A FARA/GFAR Collaborative initiative. Report of the Sub-Saharan Africa NGO Consortium in ARD.

IAC, 2003. Realizing the Promise and Potential of African Agriculture. InterAcademy Council Report.

IAC, 2004. Inventing a Better Future. InterAcademy Council Report.

ICSU, 2005. Harnessing Science, Technology and Innovation for Sustainable Development. A Report from the ICSU–ISTS–TWAS Consortium *ad hoc* Advisory Group. ICSU, Paris, France.

IFPRI, 2004. Agricultural R&D in Sub-Saharan Africa. Recent Country Briefs and Databases: Agricultural Science and Technology Indicators.

NEPAD, 2003. Comprehensive African Agricultural Development Program Document

Youdeowei, A., 2002. *Guidebook on Journal Publishing for Agricultural and Rural Development*. INASP, Oxford, UK and CTA, Wageningen, The Netherlands.

## Annexes

### Annex 1. The 21 conditions for creating strong African NARS<sup>2</sup>

Cadre d'orientation strategique pour le renforcement du FARA: Joint presentation by FARA President and Vice President. Accra 26 –27 August 2003.

#### Fundamental hypothesis

- In order to have a strong FARA, we need to have in place strong and effective SRO's which are in turn only possible if there are strong NARS
- The NARS are the critical building blocks for FARA

#### 21 Conditions majeurs pour garantir l'efficace, l'efficience et la rentabilite des NARS

- Improving governance
- Strengthening financial position
- Ensuring scientific capacity and management
- Ensuring collaboration

#### Improving governance

- 1 Plan strategique
- 2 Manuel de procedures administrative et scientifique
- 3 Ouverture du Conseil d'administration aux partenaires
- 4 Elaboration de letter de mission pour l'appréciation objective du travail
- 5 Suivi-Evaluation des activites de l'Institut
- 6 Evaluation des programmes et des structures operationnelles
- 7 Stabilite des dirigeants
- 8 Redimensionnement permanent des infrastructures pour tenir des evolutions;  
National Policy on Agricultural Research

#### Strengthening financial position

- 9 Equilibre financier
- 10 Compatibilite transparente et auditable

#### Ensuring scientific capacity and management

- 11 Mite scientifique et technique
- 12 Institutionalisation des etudes d'impact de la recherché sur le developpement
- 13 Evaluation ex-ante des programmes
- 14 Unite de volarisation des resultats de la recherché
- 15 Comite annuel de programmes avec les utilisateurs
- 16 Programme de formation pour les scientifique surtout pour les femmes
- 17 Conditions de maintien des chercheurs de haut niveau dans le NARS

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<sup>2</sup> Direct extract from the Report of the SRO–FARA Retreat, 26–27 August 2003.

- 18 Disponibilite et maintenance des outils (infrastructures,laboratoires,etc)
- 19 Capacites accrues des chercheurs a elaborer des programmes de recherchés

**Ensuring collaboration**

- 20 Solides relations avec les Universites
- 21 Cooperation regionale et internationale tenant compte du plan strategique et des moyens financiers a long terme (contrepartie).

## **Annex 2. Concept note: Strengthening NARS in Africa: A pan-African training capacity building programme**

*Title: Strengthening Agricultural Research and Management Training Capacities in African NARS*

### **Background**

It is now recognized by NEPAD, and in the international community, that there is an urgent need for capacity-building in science and technology as the engine for driving knowledge-based agricultural development in Africa. According to a report of the InterAcademy Council (IAC, 2003), national strategies for science and technology should recognize the need for high-level training to develop, as much as possible, national competence in selected frontier areas of science and technology that are most suitable for sustainable economic development.

FARA identified strengthening scientific capacity as a priority area to support African NARS in agricultural research and delivery.

A recent assessment of the requirements for efficient, effective and productive African NARS, conducted by FARA, revealed serious weaknesses in scientific capacities in critical areas of agricultural research performance and management. In particular, weaknesses were identified in the areas of impact assessment, intellectual property rights management, project management, priority-setting, programme research planning, writing and publishing of agricultural research results, financial management and personnel management.

Although the international agricultural research centres, especially ISNAR, as well as other regional and international development partners, have conducted several group training courses in various aspects of agricultural research performance and management for NARIs in Africa, these institutes are still strongly deficient in these areas that are vital for efficient agricultural research and delivery. One reason for this continuing deficiency is the lack of adequate training management capacity in NARS to sustain scientific competence in these areas.

This concept note outlines the framework for FARA to provide the support needed to strengthen the capacities of African NARS in agricultural research and management. FARA's current approach (through four regional programmes and the FAAP) provides adequate opportunities for providing this support to African NARS. This concept note will be further developed into a full project proposal in accordance with the requirements of potential donors.

### **Objective and expected outputs**

The overall objective of this project is to build agricultural research and management training capacities in African NARS through training a cadre of trainers who will conduct regional sub-regional and national training of African agricultural research scientists in key aspects of agricultural research and management. It is proposed that 20 trainers will be developed in each of CORAF/WECARD and SADC-FANR, and 15 trainers will be developed for ASARECA. A training follow-up programme will be implemented to support trainers to conduct in-country training for NARIs and other scientists.



### **Suggested contents for training-of-trainers courses**

Areas for strengthening scientific capacities identified by the FARA assessment include the following topics. (Others will be included in the full programme proposal.)

#### *Group 1*

- Management of training courses in agricultural research and development
- Research priority-setting
- Research programme planning
- Monitoring and evaluation
- Impact assessment
- Agricultural research management in the African environment
- Human-resources management
- Financial management

#### *Group 2*

- Management of training courses in agricultural research and development
- Scientific writing and communication of agricultural research results
- Scientific editing and management of agricultural journals
- Preparation and publishing of agricultural documentation, including institutional annual reports and agricultural extension materials (print and electronic formats)
- Agricultural publishing
- Computerized library and documentation services

#### *Group 3*

- Management of training courses in agricultural research and development
- Intellectual property management

### **Partners**

The project training activities will be implemented in collaboration with the following partner agencies that have interest and expertise in conducting such training activities:

Group 1 – ISNAR, IFPRI and SROs

Group 2 – FAO, CTA, INASP, RAIN (ASARECA) and SROs

Group 3 – AATF.

### **Implementation arrangements**

Implementation of project activities will be coordinated by a unit at FARA to be known as the African Agricultural Research Services Facility (AARSF) recommended to be established at FARA. AARSF will work in close collaboration with the three SROs in Africa and with the regional and international partner agencies identified above.

**Provisional budget (US\$'000)**

	<b>Years</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Preparatory activities	25	25	25	25
Training-of-trainer courses	300	300	250	200
Training materials	20	20	20	20
Training follow up	50	150	200	200
Resource persons costs	35	35	20	15
ARS facility costs	150	150	150	150
Capital equipment	25	25	25	25
<i>Sub-total</i>	<i>605</i>	<i>605</i>	<i>690</i>	<i>635</i>
Contingencies (5%)	30.3	30.3	34.5	31.8
Administrative overheads (18%)	114.4	114.4	130.4	120.0
<b>Grand Total</b>	<b>749.7</b>	<b>749.7</b>	<b>855.9</b>	<b>794.0</b>