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SUPRANATIONAL COLLABORATION IN AGRICULTURAL RESEARCH IN SUB-SAHARAN AFRICA

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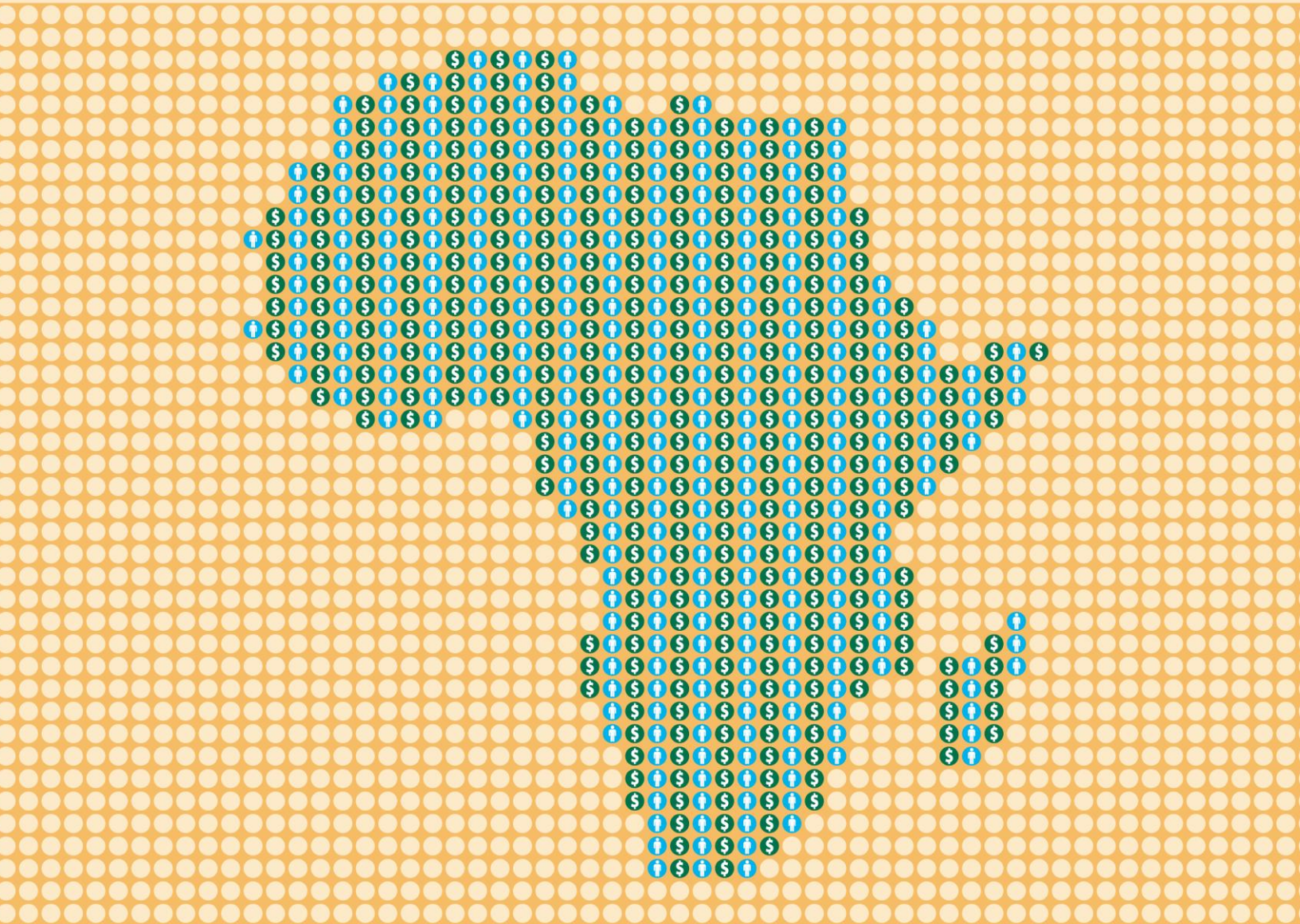
AGRICULTURAL R&D: INVESTING IN AFRICA'S FUTURE
Analyzing Trends, Challenges, and Opportunities



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Acronyms and Abbreviations

AARINENA	Association of Agricultural Research Institutions in the Near East and North Africa
AFAAS	African Forum for Agricultural Advisory Services
AKIS(s)	agricultural knowledge and information system(s)
AIS(s)	agricultural innovation system(s)
APAARI	Asia Pacific Association of Agricultural Research Institutions
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CAADP	Comprehensive Africa Agriculture Development Program
CARDESA	Centre for Agricultural Research and Development for Southern Africa
CGIAR	Consultative Group on International Agricultural Research
CGMs	competitive grant mechanisms
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CORAF/WECARD	West and Central African Council for Agricultural Research and Development
EAAPP	Eastern Africa Agricultural Productivity Program
FAAP	Framework for African Agricultural Productivity
FANR	Food, Agriculture, and Natural Resources (directorate of SADC)
FARA	Forum for Agricultural Research in Africa
FAO	Food and Agriculture Organization of the United Nations
FONTAGRO	Regional Fund for Agricultural Technology
FORAGRO	Forum for the Americas on Agricultural Research and Technology Development
IARC(s)	international agricultural research center(s)
IEG	Independent Evaluation Group
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
ISNAR	International Service for National Agricultural Research
IPR	intellectual property rights
NARS(s)	national agricultural research system(s)
NEPAD	New Partnership for Africa's Development
PPP	purchasing power parity
R&D	research and development
S&T	science and technology
SACCAR	Southern African Centre for Cooperation in Agricultural Research
SADC	Southern Africa Development Community
SPAAR	Special Program for African Agricultural Research
SRO(s)	subregional organization(s)
SSA	Sub-Saharan Africa
WAAPP	West Africa Agricultural Productivity Program

Abstract

This paper focuses on how supranational collaboration in agricultural research in Sub-Saharan Africa has evolved over the past 10 years. It focuses primarily on the various institutional developments, but also presents some quantitative data on investments in the Forum for Agricultural Research in Africa, the subregional organizations, and the Consultative Group on International Agricultural Research. Institutional reforms introduced in recent years (such as a programmatic approach at the SRO level, multi-donor trust funds, competitive grant mechanisms, and centers of excellence) are reviewed and assessed, and suggestions are made for further improvements. The principal conclusion is that the overall institutional architecture for supranational collaboration in agricultural research is now in place, and that for the coming years the focus should be more on mastering and further fine tuning the various internal decisionmaking and implementation processes. Despite all efforts to increase African ownership of the supranational agricultural research agenda, high donor dependency remains a factor that limits such ownership. The only way to change this is by introducing an African funding base for supranational agricultural research. Unfortunately very little progress has been made on this front to date.

1. INTRODUCTION

The large majority of the agricultural research activities in Sub-Saharan Africa (SSA) are organized nationally and formulated with only local objectives in mind. However, many observers have argued that this national approach is leading to a considerable amount of duplication and fragmentation in the agricultural research effort. All countries (many of them rather small) are trying to cover the whole spectrum of agricultural research topics and are doing more-or-less the same research. The strong conviction exists (in particular among donors) that substantially more impact could be achieved with the same resources through supranational collaboration in agricultural research. The challenge, however, is how to organize such collaboration.[1]

While supranational collaboration in agricultural research was quite common in SSA during colonial times (although separated by metropolitan interests and languages), after independence most of these structures collapsed as African countries assumed control over their own, nationally oriented agricultural research. Serious interest from within the region toward regional collaboration in agricultural research only started to emerge in the 1990s, resulting in the creation of the three sub-regional organizations (SROs) and the Forum for Agricultural Research in Africa (FARA). The Framework for African Agricultural Productivity (FAAP)—Africa's roadmap for agricultural research matters—proposed a massive increase in investment in supranational agricultural research in Africa to be managed by FARA and the SROs (from US$25 million to US$500 million per year by 2010 [FARA 2006]). This makes the institutional arrangements to initiate and manage such supranational activities all the more important.

This paper focuses on how supranational collaboration in agricultural research in Sub-Saharan Africa has evolved over the past 10 years. The focus is primarily on institutional developments, but will be complemented with some quantitative data on investments in FARA, the SROs, and the Consultative Group on International Agricultural Research (CGIAR). Institutional reforms introduced in recent years are reviewed and assessed, and suggestions are offered for further improvements in the institutional arrangements.

2. WHY IS SUPRANATIONAL COLLABORATION IN AGRICULTURAL RESEARCH IMPORTANT?

Most public agricultural research is organized along national lines. Local taxpayers foot the bill for such undertakings, and the national dimension of agricultural research is often further enforced through national policies, language, communication systems, markets, and so on. However, the impact of a part of the public agricultural research effort does not stop at "artificial" national borders. The same knowledge and technology can be used at both sides of the border, if not across multiple countries. This leads to what economists have labeled "spillovers"—economic benefits accruing to farmers and consumers in countries that did not share in the costs. For the receiving countries these benefits are termed "spill-ins."

This incongruence in the distribution of costs and benefits has some important implications for investment in public agricultural research. National policymakers will usually only take the national benefits into account when making decisions regarding investments in agricultural research. Research projects with potentially large benefits, but to be shared with farmers and consumers in other countries, are less attractive from a purely national point of view. From a supranational point of view, this will result in underinvestment in public agricultural research, as well as considerable duplication of research effort because multiple countries will be targeting the same agricultural challenges with their research.

[1] The term "supranational" has been used in this paper rather than regional or subregional to avoid possible confusion with in-country regions or subregions.

By initiating supranational collaboration in agricultural research, three important benefits can be captured that otherwise would be lost:

1. By assessing research project proposals from a supranational rather than a national perspective, the expected rate-of-return of some research projects will improve substantially as the potential benefits that enter the cost–benefit analysis are no longer restricted to national benefits only. This in turn will lead to a larger portfolio of potentially attractive agricultural research projects to invest in. In other words, by working together at the supranational level more innovation opportunities become economically feasible.
2. By working together at the supranational level, some duplication of public research effort can be eliminated, reducing the aggregate costs of public agricultural research.
3. The higher benefits (see 1) and lower costs (see 2) can be used (in part) to conduct more in-depth and advanced research. This steers the supranational agricultural research agenda toward the more basic and strategic end of the agricultural research spectrum.

Despite these important potential benefits of supranational collaboration in public agricultural research, one should be careful not to oversell it. A great deal of agricultural knowledge and technology remains highly site-specific, depending on local soil and climate conditions, as well as other structural variables (such as local policies, market access, affordable credit, and education) that cannot be altered overnight. Most adaptive agricultural research, for example, generates relatively little spillover benefits and, although the research may look very similar, there is no real duplication of effort. In line with the subsidiarity principle, this type of agricultural research is best handled at the national (or lower) level. One of the challenges for supranational collaboration in agricultural research is to separate very clearly those research topics that would truly benefit from supranational collaboration from those that do not.

3. THE EVOLVING INSTITUTIONAL LANDSCAPE AT THE SUPRANATIONAL LEVEL

Key Institutions Dealing with Supranational Agricultural Research in Sub-Saharan Africa

During the colonial period, many agricultural research facilities in Africa had a supranational mandate covering multiple countries. Often they matched the federal government structures setup by the colonial powers in an attempt to foster government efficiency.[2] Moreover, the agricultural research efforts in the colonies (both at the federal and the national levels) were coordinated and supported by metropolitan research agencies, facilitating the cross-border exchange of information and experience (in part also by rotating research officers among different locations). With relatively limited capacity, a lot was achieved.

However, with the coming to independence of the African nations most of this supranational collaboration disintegrated quite rapidly in the British colonies and somewhat more slowly in the French colonies. After independence, it took African nations several decades to build up their own agricultural research capacity and to start recognizing the importance of supranational collaboration in agricultural research. In the mean time, however, this lack of supranational collaboration was supplied from outside by the CGIAR, which currently comprises some 15 international agricultural research centers (IARCs). All of them have activities, and four have their headquarters, in SSA. Together they represent by far the largest component of supranational agricultural research activities in SSA, and they are relatively well funded by donors. This is at the same time their weakness because they are seen, particularly from an African perspective, as largely donor-driven, top-down agencies. Moreover, coordination between the different CGIAR centers and programs in the field is relatively weak, leading to duplication and

[2] Most importantly, the East African High Commission (today's Kenya, Tanzania, and Uganda), the Federation of Rhodesia and Nyasaland (today's Malawi, Zambia, and Zimbabwe), and French West Africa (today's Benin, Burkina Faso, Côte d'Ivoire, Guinea, Mali, Mauritania, Niger, and Senegal).

sometimes outright competition (CGIAR Secretariat 2005). Much has been done in recent years to improve collaboration among the CGIAR centers, and between the CGIAR centers and their local counterparts in Sub-Saharan Africa through consultations and joint priority setting. For example, the CGIAR developed two region-specific medium-term plans in 2005/06 (one for West and Central Africa and one for East and Southern Africa) unifying the different activities of the CGIAR centers within these regions (Mokwunye 2010). However, these region-specific medium-term plans seem to have been one-off exercises without any follow up.

Regional agricultural research networks between national agricultural research agencies began to emerge in Sub-Saharan Africa during the 1980s and 1990s, often operating under the auspices of CGIAR centers or other external agents, such as the Food and Agricultural Organization of the United Nations (FAO), France's Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), or Canada's International Development Research Centre (IDRC) (Roseboom, Pardey, and Beintema 1998). Characteristic of this period was that the drive for this new supranational collaboration came mainly from outside and not so much from within. This often resulted in a top-down approach, with the external agent in charge and the national partners as relatively passive participants (so-called central source networks in contrast to collaborative networks). Mrema (2003, 7), for example, characterized the CGIAR networks as a mechanism "more for testing and outreach of technologies developed by IARCs in their headquarters." Regional networks not only differ in terms of their internal power relationships, but also in terms of their activities. Plucknett, Ozgediz, and Smith (1991), for example, identified the following four distinctive tasks of regional networks: (1) information exchange, (2) sharing of (genetic) material, (3) scientific consultation, and (4) collaborative research. Each regional network does not necessarily conduct all four tasks, some just concentrate on the exchange of information, while others aim to implement collaborative research.

It took a while for the "internal drive" toward supranational collaboration in agricultural research in SSA to emerge. Important in this process has been the establishment of three SROs:

1. **The Southern African Centre for Cooperation in Agricultural Research** (SACCAR), established in 1984 and covering the Southern Africa Development Community (SADC) region, which currently comprises 15 African countries. Unfortunately SACCAR was phased out between 1997 and 2001. Some of its tasks were continued by the Food, Agriculture and Natural Resources directorate of SADC (SADC–FANR), but at a substantially lower level of activity and within an administratively restrictive setting. A plan to re-establish a semiautonomous SRO in the SADC region was developed in 2007/08 (SADC 2008b) and approved by the SADC Council in 2010. The new **Centre for Agricultural Research and Development for Southern Africa** (CARDESA), which operates under the auspices of the SADC Secretariat (but is financially and administratively autonomous), became officially operational in August 2011.
2. **The West and Central African Council for Agricultural Research and Development** (CORAF/WECARD), established in 1987. Initially CORAF/WECARD only covered French-speaking African countries and was dominated by French advisors. The first few years the Secretariat was based in Paris, and it was only transferred to Dakar, Senegal, in 1990. That same year it was also decided to open up CORAF to English and Portuguese speaking countries in the region, which eventually materialized in 1995. At present, 15 countries in West and Central Africa are members of CORAF/WECARD.
3. **The Association for Strengthening Agricultural Research in Eastern and Central Africa** (ASARECA), established in 1994. At present 10 countries are members of ASARECA.[3]

[3] Madagascar and Tanzania are members of both SADC and ASARECA, and D.R. Congo is member of both CORAF/WECARD and ASARECA. Djibouti, Equatorial Guinea, the Seychelles, and Somalia are not members of any SROs. The status of South Sudan is still unclear, but it most likely will join ASARECA.

Initially, the SROs only aimed to coordinate the work of the different regional agricultural research networks and programs within their mandate areas. By the late-1990s, however, they started to develop their own subregional agricultural research strategies. This was a first clear sign of the SROs and their members really taking charge of the supranational agricultural research agenda in their subregions. However, such strategies are not going far if they are not backed up by financial support to implement them. Unfortunately, NARS membership fees to the SROs are very low (and even then difficult to collect) and so much depends on whether donors come along and direct their support for subregional agricultural research activities on the basis of the strategy and priorities of the SROs. Initially this only happened very partially, but donor support has increasingly been rallying behind the SRO strategies in recent years.

From merely coordinating regional agricultural research networks, the SROs have assumed the following five functions over the past decade: (1) advocacy and policy formulation, (2) capacity strengthening, (3) knowledge management and information exchange, (4) coordination of agricultural research in the region, and (5) promotion of supranational agricultural research activities in selected priority areas. The fifth function is usually seen by the SROs as the one with the biggest growth potential. The SROs are not aiming to build any research capacity of their own (at least not for the moment), but leave the implementation of supranational agricultural research to the NARS, CGIAR centers, and advanced research organizations outside SSA. In addition, it is hoped that through increased cross-border collaboration, national centers of excellence or specialization will emerge with a supranational research mandate and impact.

In addition to the three SROs, FARA was established in 2001 to promote and coordinate supranational collaboration in agricultural research for all of Africa (including North Africa). It took over from the Special Program for African Agricultural Research (SPAAR), which was first conceived by the World Bank and some other donors at a CGIAR meeting in Tokyo in 1985. SPAAR, which was primarily a donor instrument, became operational in 1987 and was hosted by the World Bank until 2001. The three SROs are the founding members of FARA. The division of labor between FARA and the SROs is based on the "subsidiarity" principle, under which responsibility is to be adopted by the lowest level possible. FARA should only take on responsibilities that are better dealt with collectively than by the SROs individually. The same principle applies to the division of labor between the SROs and the NARSs. While FARA differs from SPAAR in terms of ownership (SPAAR was controlled by donors, while FARA is controlled by the SROs and NARSs), but some argue that this is only a cosmetic change because donors still provide the large majority of funding for both FARA and the SROs.

Key Instruments to Promote Supranational Collaboration in Agricultural Research

The current instruments to promote supranational collaboration in agricultural research in SSA include the following.

1. *Investing in the CGIAR*. This is still the preferred option by most donors because of its strong track record and scientific leadership in supranational agricultural research (Renkow and Byerlee 2010). However, it has been criticized in the past for its top-down approach. Greater stakeholder participation should help to overcome this problem.
2. *Investing in commodity-specific or thematic regional research networks*. This option was quite popular during the 1980s and 1990s, but has been taken over by the programmatic approach adopted by the SROs in recent years. This should help to increase the efficiency and effectiveness of the SROs by reducing overhead and increasing the flexibility in identifying the most promising options for supranational collaboration.
3. *Investing in supranational agricultural research projects in line with the strategic priorities of the SRO programs.* Allocation of resources to such projects can be either through competitive funding schemes using specific calls for proposals or through commissioning. A

typical requirement for these supranational projects is that they involve multiple partners from different countries; in that sense these projects still tend to have a strong network dimension.

4. *Investing in national centers of excellence or specialization with a supranational research mandate and impact*. This is a rather new approach promoted by the World Bank through regional agricultural productivity programs (one in West Africa, one East Africa, and a third under development for Southern Africa). The approach is based on the idea of mutual interdependence. Among a group of countries that share similar ecologies and commodities, agricultural research programs are selected for their excellence (or their potential for excellence), and are stimulated to adopt a supranational research agenda. Although other countries are expected to benefit, the costs of the center of excellence are to be carried by the host government. The compensation for the spillover of benefits only comes indirectly as the other participating countries are expected to take the lead on other commodities by creating similar centers of excellence that adopt a supranational research agenda (see also Section 4).
5. *Investing in the exchange of knowledge and information.* Perhaps the least glamorous of the possible interventions, but none-the-less a very crucial one. By improving the mutual exchange of research results, expertise, proven technologies, and so on, more impact can be generated from the same resources by maximizing the volume of spillover benefits. In addition to setting up virtual databases and feeding them with relevant information (usually the weak spot of such databases), it is important to create opportunities for research and extension officers to interact face-to-face with their peers in neighboring countries on topics of mutual interest. This can take the form of regional consultations and conferences, study tours, and so on.
6. *Investing in joint advocacy and policy formulation*. This is an important function of both FARA and the SROs, in terms of endeavoring to (a) influence national, regional, and international agricultural policies to maximize their conduciveness to raising agricultural productivity, and (b) mobilize more investments in agricultural research, extension, education, and training.
7. *Investing in joint capacity building.* This includes (a) providing on-the-job training in relevant skills, such as proposal writing and laboratory techniques; (b) improving research management through training and sensitization; and (c) promoting African MSc and PhD programs in agricultural sciences that are open to students from across the region.

Investments in Supranational Agricultural Research

Most of the investments going into supranational agricultural research in Sub-Saharan Africa are still controlled by the CGIAR (Table 1). In 2010, the CGIAR spend a reported US$336.5 million on agricultural research targeting SSA. This represented about half of the total CGIAR expenditures worldwide. The SSA share in CGIAR expenditures has steadily increased over time from 39 percent in 1992, to 43 percent in 2002, and 50 percent in 2010.

Table 1. Expenditures targeting supranational agricultural research activities in Sub-Saharan Africa, 2006–10

Organizing body	2006	2007	2008	2009	2010
			Million US dollars		
CGIAR	219.8	242.9	254.7	307.5	336.5
FARA Secretariat	2.3	3.3	4.3	3.7	5.5
FARA programs	3.0	5.5	7.8	12.8	14.7
ASARECA Secretariat	0.2	0.4	1.0	1.4	1.6
ASARECA programs	7.9	12.6	4.6	7.6	13.5
CORAF/WECARD Secretariat	0.4	0.6	0.7	0.7	1.0
CORAF/WECARD programs	0.5	0.8	0.9	1.9	7.8
SADC-FANR Secretariat	not available	not available	not available	not available	not available
SADC-FANR programs	not available	not available	not available	not available	not available

Source: Data were extracted from the annual reports of the different organizations.

Data for the SROs are unfortunately incomplete. In the case of SADC-FANR, no official expenditure data are available; however, based on some estimates we assume that expenditures on agricultural research and extension have been in the order of US$3–5 million per year in recent times.[4] The most recent budget projection for CARDESA is to reach a budget of about US$11 million per year in five years time (of which US$1.8 million represents CARDESA's operating costs and US$9.2 million for its program activities). The 2008 dip in the program expenditures by ASARECA was caused by legal problems with European Union funding to the competitive grant mechanism. As a consequence European Union funding was cancelled and subsequently re-channeled through the newly established Multi-Donor Trust Fund (MDTF), which did not come on board until late-2008. The sharp increase in CORAF/WECARD's expenditures in 2010 was in part due to funding channeled through the West African Agricultural Productivity Program. CORAF/WECARD's MDTF is only coming on board this year (2011). FARA expenditures have been projected to level off in 2011 and 2012 as several big FARA projects are coming to an end. Moreover, some stakeholders have argued that FARA should be less involved in the direct implementation of projects. An external review of FARA's program is currently underway and a leadership change is expected to take place mid next year.

One has to be careful in interpreting these data. There is quite a bit of double counting occurring because funding is flowing from the CGIAR to FARA and the SROs, but also from FARA and the SROs to the CGIAR. For example, the SSA Challenge Program is financed by the CGIAR but managed by FARA. FARA in turn has contracted the SROs to coordinate the program at the subregional level, and they in turn have contracted CGIAR centers to implement components of the program.

Moreover, not all activities financed by the CGIAR, FARA, and SROs are necessarily targeting supranational agricultural research—some of it is just support to national agricultural research. At the same time, however, the reported supranational figures do not include the substantial contributions in kind made by the participating NARSs. Usually salary costs of the national partners are not being covered by the supranational agricultural research projects, only the operational costs.

The Framework for African Agricultural Productivity (FARA 2006) projected major growth in investment in subregional agricultural research (and extension) activities, from US$25 million to US$500 million per year in 2010, and no growth in global investment (remaining constant at US$250 million, relating mainly to the CGIAR). Interestingly enough, the trend is just the reverse: the CGIAR remains by far the biggest player and has increased its investments in SSA substantially over the past decade. The political vision of less reliance on the CGIAR and more on Africa's own internal strength in agricultural research is still far away.

[4] The biggest contributor has been the European Commission, which financed the Implementation and Coordination of Agricultural Research and Training project to a tune of €15 million for the period 2004–10. In addition, SADC-FANR has been involved in the implementation of some FARA–led projects, such as the Strengthening Capacity for Agricultural Research and Development in Africa, and Promotion of Science and Technology for Agricultural Development in Africa (FANR 2010).

A more basic question that needs to be addressed is whether this US$500 million figure for subregional agricultural research (and extension) as proposed by FAAP is in any way realistic, but also whether it is desirable. Is this not putting too much emphasis on supranational agricultural research? Firstly, CGIAR expenditures per 100 dollars of national agricultural research expenditures were far higher in SSA than in the other developing regions in 2000 (see Table 2). Secondly, in the case of SSA this indicator has continued to increase further after 2000 to 13.58 dollars/per 100 dollars of NARS expenditures in 2008.[5] Third, the volume of supranational agricultural research activities funded by NARS membership organizations in other developing regions (such as the Asia Pacific Association of Agricultural Research Institutions[APAARI], the Forum for the Americas on Agricultural Research and Technology Development [FORAGRO], including the Regional Fund for Agricultural Technology [FONTAGRO], and the Association of Agricultural Research Institutions in the Near East and North Africa [AARINENA]) is very modest in comparison to the national effort (Stads and Beintema 2008; Beintema and Stads 2008a, 2011). Moreover, in most instances their activities focus more on support functions (such as information exchange, capacity building, coordination, and so on) than on actually funding supranational agricultural research activities.

Table 2. Consultative Group on International Agricultural Research expenditures per 100 dollars of national agricultural research system expenditures, 2000

Region	2000 expenditures by National agricultural research system (NARS) Million 2005 PPP dollars	2000 expenditures by Consultative Group on International Agricultural Research (CGIAR) Million 2005 US dollars	CGIAR expenditures per $100 of expenditures by NARS 2005 US dollars
Sub-Saharan Africa	1,239	160.0	12.91
Asia and Pacific	5,120	121.9	2.38
Latin America and Caribbean	2,755	64.8	2.35
West Asia and North Africa	1,412	34.3	2.43

Source: Beintema and Stads (2008b); CGIAR (2001).
Note: In order to make them more comparable with the NARS expenditures, the 2000 CGIAR expenditures have been inflated to 2005 values using the U.S. gross domestic product inflation index.

A big challenge for the regional NARS member organizations in both SSA and elsewhere is the mobilization of financial support for their agenda. Membership fees are usually very modest and insufficient by far to finance their ambitions.[6] They all depend strongly on donor support and in-kind contributions by their members. In the medium-to-long run, however, mobilization of more local financial support for the supranational agricultural research agenda will be crucial in order to substitute for declining donor support, and truly capture control over the supranational agenda. In order to pull this off, further economic and political integration of African countries into regional economic communities seems to be an important precondition for creating a stable, local funding basis. The

[5] The calculation is based on NARS expenditure data for 2008 extracted from Beintema and Stads (2011) and CGIAR expenditure data for 2008 from CGIAR (2009).

[6] The Regional Fund for Agricultural Technology (FONTAGRO) in Latin America and the Caribbean is the only example of a funding scheme for supranational agricultural research in a developing region that is predominantly financed by its members. Each member country has to contribute a substantial entrance fee to FONTAGRO's endowment fund, which at present stands at US$65.2 million (but which is substantially less than the US$200 million originally planned). The idea is to keep the principal sum intact and only use the interest to fund supranational agricultural research projects (currently about US$ 1 million a year). In addition, FONTAGRO has managed to leverage substantial current contributions by third parties, such as the CGIAR and the Inter-American Development Bank. Only about half of the countries in the region are members of FONTAGRO. Most importantly, the two biggest countries in the region (Brazil and Mexico) do not participate. The initial capital contribution is a major stumbling block to participation for many countries. The designers of the fund, however, believed that a big, one-time contribution for an endowment fund is easier to mobilize than a steady stream of yearly contributions.

additional problem is that the regional economic communities in SSA themselves are still heavily dependant on donor support and have very limited or no power to raise taxes.[7]

Of the principal donors over the past decade, the European Commission has been the most important supporter of FARA and the SROs, followed by the United States and Canada (Table 3).

Table 3. Principal donors of the Forum for Agricultural Research in Africa and the subregional organizations, 2000–10

FARA	ASARECA	CORAF/WECARD	SADC-FANR
African Development Bank	African Development Bank*	African Development Bank	African Development Bank
Canada (CIDA)*	Canada (CIDA/IDRC)*	Australia (AusAID)	European Commission
Denmark (Danida)	European Commission*	Canada (CIDA)*	France
European Commission*	International Fund for	European Commission*	United Kingdom (DFID)
Italy	Agricultural Development*	France	United States (USAID)
Ireland	Sweden (Sida)*	United Kingdom (DFID)	
Japan*	Switzerland (SDC)*	United States (USAID)	
Netherlands*	United Kingdom (DFID)*		
United Kingdom (DFID)*	United States (USAID)*		
United States (USAID)*			

Source: Various annual reports and World Bank project documents related to the MDTFs.
Note: FARA indicates the Forum for Agricultural Research in Africa; ASARECA, the Association for Strengthening Agricultural Research in Eastern and Central Africa; CORAF/WECARD, the West and Central African Council for Agricultural Research and Development; SADC-FANR, the Food, Agriculture, and Natural Resources directorate of the Southern Africa Development Community; CIDA, the Canadian International Development Agency; Danida, the Danish International Development Agency; DFID, UK Department for International Development; USAID, the U.S. Agency for International Development; AusAID, the Australian Agency for International Development; IDRC, the International Development Research Centre; Sida, the Swedish International Development and Cooperation Agency; and SDC, the Swiss Development Cooperation. An asterisk indicates that countries are listed as participating in the Multi-Donor Trust Fund (MDTF) for this particular organization.

The World Bank has not been listed as a donor because it has not provided any direct financial support to FARA or the SROs (it does not have a mechanism to do so), but it has provided financial support indirectly through the CGIAR for the SSA Challenge Program. It is also responsible for managing the MDTFs for FARA and the SROs, which have become the principle vehicle for financing these organizations. While managed by the World Bank, funding for these MDTFs is coming from other donors.[8] The same is true for some funding for CORAF/WECARD included in the West African Agricultural Productivity Program. It is coming from a special bilateral funding facility separate from the standard World Bank loans, which are always country specific.

4. POLICY AND INSTITUTIONAL REFORMS AFFECTING SUPRANATIONAL AGRICULTURAL RESEARCH IN SUB-SAHARAN AFRICA

Supranational agricultural research in Sub-Saharan Africa has been the focus of various policy and institutional reforms in recent years. The important ones are discussed below.

An African-Owned Policy Framework

With the adoption by the African Heads of State of the Comprehensive African Agricultural Development Programme (CAADP) in Maputo in 2003, a process was set in motion by the New Partnership for Africa's

[7] The European Union is the only example of a regional economic community that has a substantial program in support of supranational collaboration in science and technology (S&T). The current S&T framework program (FP7) has a budget of €50.5 billion for the period 2007–13, of which about €1.8 billion (or about €250 million per year) targets collaborative research in the bioeconomy cluster (food, agriculture, fisheries, and biotechnology) among European Union countries.

[8] MDTFs became operational for ASARECA in 2008 (US$50 million for 2008–13) and for FARA in 2009 (US$50 million for 2009–13). An MDTF for CORAF/WECARD is planned to become operational later in 2011 (US$34.6 million for 2011–16[?]). CARDESA's MDTF is still pending.

Development (NEPAD) to bring agriculture back to the top of Africa's development policy agenda (NEPAD 2003).[9] In recent years, CAADP has assumed a leading role in strengthening agricultural policies and investment plans across Africa with the ultimate goal of ending hunger and poverty. To this end, CAADP has set an agricultural growth target of 6 percent per year, which requires that governments spend at least 10 percent of their budgets on agriculture. At the time that these targets were formulated, they were quite ambitious; in the 1980s and 1990s many African countries had experienced negative agricultural growth and government spending on agriculture had dropped to a low 2–3 percent of total government spending on average. Donor investments in agriculture had also dropped considerably.

The implementation of the CAADP agenda is following a twofold approach.

- The first approach is through collaboration with regional economic communities (the Common Market for Eastern and Southern Africa, East Africa Community, Economic Community of Central African States, Economic Community Of West African States, and SADC) and national governments—each translating the CAADP objectives into regional and national agricultural policies and investment strategies, while acknowledging the specific circumstances in each country/region. The regional economic communities also facilitate and monitor the implementation of CAADP at the national level. This process of national and regional consultations on agricultural policies and investment strategies is being financed through a MDTF managed by the World Bank. However, this facility does not provide funding for investments as such. Funding for investment in agriculture has to be mobilized by each country individually in consultation with the national Ministry of Finance, Parliament, and donors. To date, progress on getting CAADP implemented at the national level has been disappointingly slow (NEPAD 2010).
- The second approach is more thematic, around the CAADP's four thematic pillars: (1) land and water management; (2) rural infrastructure and market access; (3) food security and poverty reduction; and (4) agricultural research, technology dissemination, and adoption. FARA has been asked by NEPAD to take the lead on the fourth thematic pillar. To this end, FAAP—the previously mentioned Framework for African Agricultural Productivity developed by FARA—proposes an institutional reform agenda putting farmers at the center of agricultural innovation and requiring a substantial increase in investments in agricultural research, extension, education, and training (FARA 2006). FAAP is being implemented in close collaboration with the SROs (which have taken CAADP and FAAP on board in their own, updated, strategies [ASARECA 2006, CORAF/WECARD 2007, and SADC 2008a]), national governments, international organizations, and donors. Of the four thematic pillars, the one on agricultural research, technology dissemination, and adoption has made the most progress (NEPAD 2010). CAADP has very much helped FARA and the SROs to position themselves in the overall agricultural research and innovation landscape.

CAADP and FAAP have also been taken on board by the CGIAR centers as the overall policy framework within which their African activities have to operate. Coordination between the CGIAR centers and FARA and the SROs seems to have improved over the past decade. Nevertheless, there is still considerable friction between the CGIAR centers and FARA and the SROs about the optimal division of responsibilities because they target the same supranational agenda, but from different angles. Finding the right division of labor and effective modes of collaboration remains a challenge.

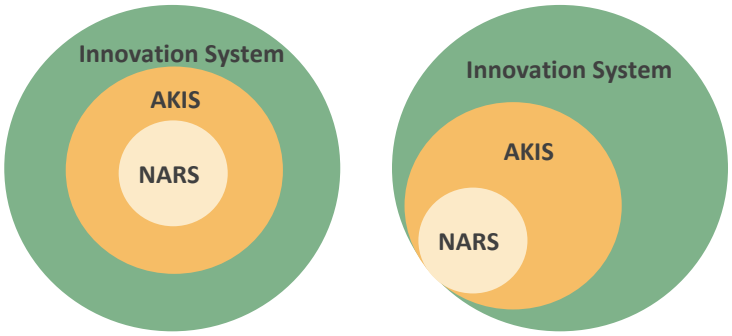
[9] This document was complemented by the addition of a document integrating livestock, forestry, and fisheries more firmly into the CAADP mandate in 2006 (NEPAD 2006). Both documents were prepared by the FAO. By assuming ownership, NEPAD gave CAADP the necessary political credibility as an African-owned strategy.

The Adoption of an Agricultural Innovation System Perspective: Widening the Circle of Stakeholders

During the past two decades, a shift has occurred in agricultural innovation policies and strategies from a NARS perspective, to an agricultural knowledge and information system (AKIS) perspective, and more recently to an agricultural innovation system (AIS) perspective. The AIS perspective not only covers the generation and diffusion of agricultural knowledge, but also the actual application of such knowledge throughout the economy. Hence it involves a far broader set of actors than the traditional agricultural research, extension, and education agencies. This new perspective places far more emphasis on the role of markets and market actors in the innovation process.

While each of the three system concepts has its own strengths and weaknesses, they can be seen as interlinked and cumulative: NARS focuses on the generation of knowledge, AKIS on the generation and diffusion of knowledge, and AIS on the generation, diffusion, and application of knowledge (Figure 1).

Figure 1. Linking national agricultural research systems and agricultural knowledge and information systems within an agricultural innovation systems perspective



Source: Chema, Gilbert, and Roseboom (2003).

The problem with the left-hand side of the figure is that it depicts research as the sole source of innovation. It implies that without research there is no innovation. A more accurate way of depicting the link is shown in the right-hand side of the figure, in which the NARS is no longer seen as the epicenter of innovation but as one of its sources. Knowledge and information may spill into the AIS from domains other than NARS and, perhaps even more crucially, knowledge and information may emerge from outside the realm of formal research because of on-farm, as well as off-farm, learning (up and down the agricultural production chain)—that is, learning through doing, using, and interacting. Institutional, organizational, and managerial types of innovation, in particular, more often have their origins in on-site learning processes rather than off-site formal research. These forms of innovation are often far more complex and difficult because one cannot experiment with and fine-tune them off-site (Chema, Gilbert, and Roseboom 2003).

One way of bringing the innovation system concept into practice is by creating "innovation platforms" that bring together all relevant stakeholders around a certain innovation challenge. This approach is currently being tested in Africa by the SSA Challenge Program led by FARA and the SROs and financed by the CGIAR. The most common type of innovation platform in agriculture is that of commodity-specific innovation platforms. They bring together the various actors and stakeholders that make up the value chain for that commodity in order to identify, discuss, and resolve innovation issues. Hence there is generally a strong overlap between the institutional strengthening of the agricultural value chains and the introduction and institutional strengthening of agricultural innovation platforms. Innovation platforms on specific topics in agriculture (for example, soil erosion) are possible as well, but they are somewhat handicapped because of their substantially weaker link to the market.

When it comes to commodity-specific innovation platforms, an important question that needs to be tackled is, "What is the appropriate level of aggregation for an agricultural innovation platform? Or

should it be multi-layered?" The experiments with innovation platforms currently undertaken by the SSA Challenge Program across Africa, for example, are at the level of the village or district. From a cost point of view, it is unlikely that this model can be replicated nationwide without some serious aggregation of effort. While some aspects of innovation may need to be organized locally (for example, reducing the costs of getting produce to the market), research typically requires a large impact area in order to pay off. It is still possible to have local innovation platforms, but researchers cannot be expected to participate in all of them with the same intensity. An important prerequisite for research to participate in local innovation platforms is to what extent the generated innovations can be applied over a far larger geographic area.

The emergence of the AIS concept has also had a major influence on FARA and the SROs. While initially set up as meeting places for directors of national agricultural research organizations only, in recent years FARA and the SROs have adopted a far more inclusive membership, including faculties of agriculture, agricultural extension services, farmer organizations, agroprocessors, input suppliers, agribusinesses, NGOs, and so on. However, one of the weaknesses is that most of these other stakeholders are not (or are only very poorly) organized beyond the national level. The opinions they bring to the table at supranational forums tend to lack the legitimacy of being representative for that particular group of stakeholders (Roseboom 2004). In order to overcome this shortcoming, FARA has for example been instrumental in setting up the African Forum for Agricultural Advisory Services (AFAAS).

Supranational collaboration among other agricultural innovation actors/stakeholders, such as agricultural extension agencies and farmer organizations, is often substantially weaker than in agricultural research. Apparently the rationale and incentives for supranational collaboration are not the same for each actor or stakeholder in the agricultural innovation system. This suggests that the relative weight of the innovation actors and stakeholders in AIS differs according to the level of analysis, be it global, regional, national, or local. For example, while farmer participation in setting research priorities is becoming quite common at the local level, this sharply declines when you move to priority setting exercises for research at the national, regional, or global level.

Moreover, with the clustering of stakeholder interests across commodities a lot of the specificity gets lost. This could be somewhat counterbalanced by putting more emphasis on the supranational collaboration of value chains and their related innovation platforms. This would also allow for a differentiation in the level and form of supranational collaboration as value chains tend to differ in strength and innovativeness. Many traditional export crops, for example, have relatively strong value chain organizations and innovation platforms (often also financing their own research) in comparison to other commodities. In such an instance, a more industry-led type of supranational collaboration in research is warranted.

The Adoption of a Programmatic Approach by the Subregional Organizations

In recent years, both CORAF/WECARD and ASARECA have adopted a new strategy that sets out to replace the old structure of an ad hoc collection of regional agricultural research networks and initiatives (with diffuse and varied management structures and levels of accountability) by a more centrally managed and program-based approach. CARDESA in the SADC region is expected to adopt a similar program structure. It is hoped that this new approach will lead to

- more streamlined management;
- clearer lines of accountability;
- a stronger orientation on results;
- better integration between activities;
- more effective monitoring, evaluation, and learning;
- simplified streams of information and knowledge sharing;

- strengthened corporate cohesion; and
- greater attractiveness for development partners (for example, the MDTF requires a clear program of work to which it can allocate its resources).

The new programs are expected to absorb the ongoing activities of the regional networks and projects. More importantly, each program has to develop its own strategy and workplan in consultation with all the relevant stakeholders. The identified supranational research priorities are to be implemented by third parties (that is, national and international agricultural research organizations). This can be organized by the programs through directly commissioning activities or through the competitive grant mechanism (see below).

The implementation of the new program structure at the SROs has taken some time, in part because the program leader positions were not filled immediately. Some of the CORAF/WECARD programs, for example, still have to come on board and develop a strategy and workplan that can mobilize funding. Moreover, priority setting by the programs has been very much a bottom-up approach, resulting in what is in essence an aggregation of national agricultural research priorities. It gives an idea about the relative weight of commodities and research topics across the region. The more difficult step (and one that the programs are still struggling with) is to select those research topics for which a supranational approach is really going to make a difference and concentrate on those. This requires visionary leadership in the programs. However—inherent to the participatory approach embedded in the SROs—the system will face permanent pressure to spread resources thinly over all possible research topics and participating countries.

What also doesn't help is that some of the donors see assistance to the SROs as a more efficient way to support the NARS rather than doing it on a bilateral basis. They are less concerned about resources ending up financing national research priorities rather than supranational ones.

The Introduction of Competitive Grant Mechanisms at the Subregional Organization Level

The use of competitive grant mechanisms (CGMs) to fund agricultural research has increased significantly over the past decade at both the national and subregional levels in SSA. This is in line with the increased popularity of CGMs to finance research around the world. In particular, the World Bank has been instrumental in promoting CGMs at the national level (Chema, Gilbert, and Roseboom 2003), while the European Union and United States Agency for International Development have been promoting CGMs at the subregional level; all three SROs have been operating one or more CGMs for several years now.

CGMs introduce a clear separation between funding and implementation (in contrast to the more traditional institutional support), which should help to improve the relevance, efficiency, and effectiveness of the research that is being funded. Moreover, it can be used to (a) promote cross-institutional or cross-border collaboration; (b) open up the involvement of multiple research service providers (which should induce more competition between them); and (c) leverage resources from third parties (for example, from the private sector or, in the case of the SROs, from national agricultural research resources toward supranational agricultural research priorities).

The focus of CGMs can range from completely open to highly restricted, depending on the level of upfront problem identification and research priority setting that is being fed into the calls for proposals by the CGM. In general, CGMs for basic research tend to be very much open (the competition is among ideas), while CGMs for applied and adaptive research are a lot more restricted toward research priorities selected upfront. The competition in this case focuses on which proposal can tackle the prioritized research problem most effectively and efficiently. In the case of the SROs, the problem identification and research priority setting by the programs (see previous section) constitute an important input into the calls for proposals managed by CGMs.

The selection of project proposals submitted to CGMs is usually done by a review panel of external experts. In the case of basic research, such review panels are staffed with peer researchers only. In the case of applied and adaptive research, however, it is becoming more common to also have market experts sitting on such panels in order to evaluate the projected impact pathway of the proposals.

The CGM is just one of several funding mechanisms that governments, SROs, and donors can use to support agricultural research. However, it should never be used as the sole instrument or as the appropriate instrument in all instances. For example, CGMs do not create any new capacity, but instead thrive on exploiting existing capacity. They usually provide operational funding only and contribute very little to the development of the research infrastructure or human capital (Tizikara and Kwesiga 2006). Another problem is that many agricultural research organizations in Africa lack the necessary administrative capacity to manage project budgets according to the administrative rules required by donors. A serious concern about CGMs is that their running costs tend to be high. This is particularly so during the start-up phase. In the longer run costs can come down considerably as selection processes become more streamlined and fixed costs (such as software to manage project documentation) can be shared over larger numbers of projects.

Over the past decade, the SROs, as well as participating NARSs, have learned a lot in terms of how to operate and participate in CGMs. The underlying administrative processes seem to have settled in. However, some concern exists that CGM resources will end up mainly with the stronger and bigger NARIs. Special measures may be needed to make sure that research projects are more inclusive, for example, by including capacity building in countries that lag behind.

Another weakness of the CGMs currently run by the SROs is that their calls for proposals are still far too generic. They do not steer applicants forcefully enough toward the supranational parts of the agricultural research agenda. The fact that a particular problem is common across the region is not a sufficient argument to pursue a supranational solution instead of separate national ones. The supranational solution is only attractive when it can achieve considerably more with the same resources (or leads to a considerable cost saving by eliminating duplication).

The Adoption of Multi-Donor Trust Funds to Finance the Activities of the Forum for Agricultural Research in Africa and the Subregional Organizations

Over the past decade, trust funds have become an increasingly important vehicle for organizing and channeling donor assistance. Trust funds are used in situations such as assistance to fragile states, in response to natural disasters, or in support of global public goods. The World Bank, in particular, has ample experience with managing development-related trust funds.[10] One type of trust fund managed by the World Bank is that of the financial intermediary trust fund, which is usually used for activities that are not under direct control or responsibility of the World Bank. The MDTFs setup for FARA and each of the SROs fall within this category. The role of the World Bank in these funds is that of an intermediary between donors and beneficiaries. The Bank, as trustee, administrator, or treasury manager, provides financial and administrative services—that is, managing donor contributions and transferring them to the beneficiaries. However, the Bank usually does not financially contribute to these trust funds and charges for the services rendered.

MDTFs are usually setup in support of a program of activities over multiple years, and tend to use a two-stage funding mechanism. Initially (at the time of contribution), donors agree to a thematic framework with criteria for supporting a program of activities on the basis of which they commit their

[10] In 2007/08, about 11 percent of Official Development Assistance was channeled through trusts (IEG 2011). The World Bank Group plays a lead role in this area, as it oversees more than 1,000 trusts (World Bank 2010a, 2010b). These trusts vary greatly in size, objective, focus, the way they are financed, and the involvement of the Bank, but together they disbursed some US$9.5 billion of donor assistance in 2010 (up from US$5.2 billion in 2006).

funds. In the second stage, grants are approved for specific activities on the basis of the agreed criteria. The advantage of the MDTF for donors is greater aid efficiency and effectiveness, while still being able to earmark their contribution. Rather than each donor managing its own contribution individually (including monitoring and evaluation, administrative controls, and so on), it is now done collectively. This should significantly reduce transaction costs for both donors and beneficiaries, and minimize duplication of effort. The important advantages of the MDTF mechanism for the beneficiaries are better coordinated and streamlined donor assistance, and more stable and reliable funding with a multi-year outlook.

In order for the MDTF mechanism to work, the beneficiary agency needs to have a clear strategy, a detailed work program with performance targets, a functioning monitoring and evaluation system, and a reliable accounting system. To date, MDTFs are operational for ASARECA (since 2008) and for FARA (since 2010). An MDTF for CORAF/WECARD is expected become operational in 2011, and the MDTF for CARDESA is still pending. The time horizon for these MDTFs is five years, but with the expectation that, if successful, they will be extended. The implementation of the ASARECA MDTF seems to be reasonably on track, but for FARA and CORAF/WECARD it is too early to make an assessment.

One of the issues coming out of the recent Independent Evaluation Group (IEG) evaluation of World Bank managed trust funds (IEG 2011) is the relative proliferation of such funds in recent years. Consolidation of trust funds into larger funds seems to be on the agenda. In that sense, a single trust fund for FARA and the SROs combined may be the next step in the future.

The Transformation of Selected National Agricultural Research Programs into Centers of Excellence or Specialization with a Supranational Mandate and Impact

The effectiveness of African agricultural research is seriously constrained due to the high level of fragmentation of research capacity across countries. As a result, most African countries have only very limited capacity in any scientific or technological domain, which leads to (a) a major constraint on the research ambition of each country individually (resources are spread too thinly over a very broad range of research topics); and (b) duplication of effort, whereby countries pursue the same, rather limited, research agenda. The whole idea of supranational collaboration is to try to improve the effectiveness of agricultural research by pooling resources and talent so that a more ambitious research agenda of common interest to the participating countries can be pursued. One mechanism to achieve this is through ad hoc collaborative research projects (see the section on the competitive funding mechanisms), but the other method that has been promoted by the World Bank is the idea of transforming some selected national agricultural research programs into centers of excellence or specialization with a regional mandate.

The idea is based on the principal of mutual interdependence. The costs of the center of excellence or specialization will be covered by the host government, but a substantial part of the research benefits will spill over to neighboring countries. By clustering countries together, each will absorb the costs of one or more centers of excellence, while benefiting from the research generated by centers in other countries. This is a rather delicate balance of mutual interdependence, in that if one country pulls out (for whatever reason) it affects the willingness of the others to continue.

Both the East African and West African Agricultural Productivity Programs have been set up as adaptable program loans by the World Bank, which can be adapted both horizontally (that is, to include more countries), as well as vertically (that is, a possible extension in time after the first phase). There is no similar program for Southern and Central Africa, which is probably due to the absence of a well functioning SRO. With CARDESA coming on board, this may change in the future. Both programs largely follow the same approach in order to promote supranational collaboration in agricultural research. There is, however, an important difference in the sense that the East African program focuses exclusively on the selected commodities covered by the centers of excellence, whereas the West African

program also provides competitive funding for regional research priorities other than the ones covered by the centers.

Table 4 provides an overview of the different phases of both programs. For both programs a second phase is lined up in principle, but implementation will depend on the success of the first phase and, in the case of WAAPP, some triggers related to the introduction of biosafety and intellectual property rights (IPR) legislation. Again it is too early to assess the impact of both programs and of the approach in general. The assumption that this type of mutual interdependence will work is not without risk.

Table 4. Agricultural productivity programs in East and West Africa

Project/phase	Participating countries	Centers of excellence or specialization	Budget (of which IDA loan)
A. East Africa Agricultural Productivity Program			
Phase 1 (approved June 2009)	Ethiopia, Kenya, Tanzania	Wheat, dairy and rice	US$90 million (US$ 90 million)
Phase 1a (approved November 2009)	Uganda	Cassava	US$30 million (US$ 30 million)
Phase 1b (still pending)	Other East African countries	Yet to be determined	Yet to be determined
B. West Africa Agricultural Productivity Program			
Phase 1a (approved March 2007)	Ghana, Mali, Senegal	Roots and tubers, irrigated rice, and drought-tolerant cereals	US$49.4 million (US$45 million)
Phase 1b (approved September 2010)	Burkina Faso, Côte d'Ivoire, Nigeria	Onion, mango, bananas/ plantains, and fisheries	US$122.2 million (US$90 million)
Phase 1c (approved March 2011)	Benin, Niger, Sierra Leone, Togo, Guinea, Liberia, The Gambia	Maize, livestock, and mangrove rice	US$118 million (US$83 million)

Source: Project documents (World Bank 2007, 2009a, 2009d, 2010c, and 2010d).

Structural Changes within the CGIAR

Despite its unique character and achievements, the CGIAR has been struggling to survive in a permanently changing world. Systemwide reforms have followed each other quite frequently, the latest being the Change Management Initiative implemented in 2009/10. There are three important problems that the CGIAR has been struggling with for quite some time:

1. In 1971, the CGIAR was set up as an informal, donor-driven entity, coordinating the work of a limited number of independent IARCs (originally only four). It did not have a legal status as such and decisions were made on the basis of consensus. Over time, however, the CGIAR became increasingly more complex (more centers, more donors, more stakeholders, and more objectives), while at the same time various systemwide functions (such as oversight, finance, scientific review, impact assessment, and partnerships) became more formalized—while still organized informally as standing committees of the CGIAR. In order for the system to work more effectively, there have been frequent calls in the past to formalize and streamline the decisionmaking within the CGIAR by bringing it under a single board with directive power. It is only with the recent restructuring of the CGIAR that this step finally seems to have been taken.
2. One of the original concepts of the CGIAR was that donors would finance the overall work programs of the CG centers instead of specific projects. In order to operate this system, centers had to submit multi-year work programs (updated annually) for independent review. Based on this information, donors would make their commitment. This system worked quite well until the late-1980s. At that time, more than 80 percent of CGIAR funding was "unrestricted" (that is, allocated to the overall work program), but this share has

steadily declined since then to less than 40 percent in 2010. By their own actions, donors undermined the very concept of the CGIAR.[11] Moreover, it increased the administrative costs of running the centers because they not only had to report to the CGIAR (which, with all its international meetings and procedures, is quite costly in itself), but also had to report to numerous individual donors on specific projects.

3. In the past, because of its structure and decentralized decisionmaking, the CGIAR often experienced difficulties in acting coherently as a collective. In particular, for the national partners of the CGIAR centers, this often led to confusion and frustration because they had to interact with multiple CGIAR centers and programs, each with its own specialized agenda.

The recent Change Management Initiative finally seems to have nailed these problems. It has proposed to restructure the CGIAR into two principal pillars: (1) The Consortium of CGIAR Centers operating under a single board; and (2) the Fund Council, which brings together all donors. The two entities interact with each other on the basis of a Strategy and Results Framework, which is implemented in the form of Mega Programs usually comprising multiple centers. Once agreement has been established between the Consortium Board and the Fund Council on the content and funding of the Mega Programs (considering also the advice by the newly established Independent Science and Partnership Council), an agreement will be formalized in the form of a performance contract.
The ongoing restructuring seems to address the first two problems in particular, but not as much the third problem. In addition to dealing with individual CGIAR centers, the national counterparts will also have to deal with CGIAR Mega Programs. Better coordination of CGIAR activities with NARS partners on the ground continues to be a challenge. It is still too early to assess how this restructuring will settle in. For example, it is still unclear how the restructuring will affect the Boards of the individual CGIAR centers. What will be their new role (in particular regarding program content), and how will they interact with the Consortium Board? Another issue that is of relevance to FARA and the SROs is to what extent and how they will have access to the CGIAR Fund. The Challenge Program mechanism launched by the CGIAR in 2001 aimed to promote greater collaboration between CGIAR centers and third parties; it even left the option open for non-CGIAR centers to lead Challenge Programs, thereby introducing more competition into the system. However, only one Challenge Program led by a non-CGIAR center managed to get through the selection—the SSA Challenge Program led by FARA. The latest external review of the SSA Challenge Program (Lynam, Harmsen, and Sachdeva 2010) leaves the option open for a continuation of the program after the completion of its current phase. It seems, however, that the Mega Programs under the new structure can only be initiated from within the CGIAR. Third-party access to CGIAR resources is only possible through participation in the Mega Programs led by CGIAR centers. This does not affect the NARS that much, but definitely affects FARA and the SROs.

The more centralized management approach that is now being adopted by the CGIAR seems to block the road toward a more demand-driven funding approach, by which donor funding for the CGIAR centers is channeled through the SROs and thereby empowers the CGIAR's clients. Apparently this is a bridge too far for the CGIAR system.

5. CONCLUSIONS

Considerable progress has been made over the past decade in establishing a supranational structure for agricultural research in Sub-Saharan Africa that is driven from within. An Africa-owned policy framework has been put in place, an innovation system perspective has been adopted, donor funding has been

[11] Three factors played a role in this particular development: (1) most centers have been struggling financially and so any support available was welcome; (2) donors have been increasingly under pressure by their electorates to show direct impact of their investments, and this is easier to accomplish by supporting specific projects rather than joint programs; and (3) when one donor starts to pick specific projects, the others end up paying for the less attractive things, including overhead, which forces other donors to adopt the same behavior.

secured through the establishment of trust funds, a programmatic approach has been introduced at the SROs, and competitive grant mechanisms are working. Moreover, CARDESA has finally come on board, completing the supranational architecture. The principle building blocks are in place, and for the coming years it will be a matter of further fine tuning the system and increasing the volume of activities.

What stands out in the design of the supranational agricultural research system in SSA is that it does not envision the establishment of regional or subregional agricultural research agencies (positioning themselves between the NARSs and the IARCs), but instead makes use of the existing national and international agricultural research capacity. In particular donors have shown little interest in pursuing this option.

When it comes to the support functions that FARA and the SROs perform (such as advocacy and policy formulation, coordination, capacity strengthening, and information exchange), they fill important functions that otherwise would go unresolved.[12] However, when it comes to the promotion of supranational agricultural research activities, an apparent overlap exists with the CGIAR centers. Both are targeting the same supranational agenda, but approaching it from different angles. The weakness of the top-down approach by the CGIAR is the lack of adequate interaction with local counterparts, while the weakness of the bottom-up approach by FARA and the SROs is the lack of clear leadership in identifying a truly supranational agricultural research agenda. Ideally, one would like to see a mix of both approaches.

The current move within the CGIAR system toward a more centralized management and funding structure under the Change Management Initiative holds the risk of the CGIAR system becoming more top-down and less responsive to local initiatives. For example, the new structure does not favor CGIAR centers participating in research projects initiated by third parties, such as those funded through the competitive grant mechanisms of the SROs. To counterbalance this risk, the CGIAR centers will have to strengthen its collaboration with the SROs and the NARS and develop appropriate modalities to do so.

In the case of the SROs, a more explicit differentiation between national and supranational agricultural research is needed. The programmatic approach adopted by the SROs has been an important step toward getting a better handle on the supranational agricultural research agenda. However, to date the priority-setting process in most programs has not moved much beyond an aggregation of national agricultural research priorities. Most programs still do not prioritize explicitly enough which parts of this aggregate agricultural research agenda would benefit most from a supranational research effort and which parts should be left to the national level. This often results in calls for proposals for research projects that tend to be very generic and not really steering project proposals toward the supranational part of the agricultural research agenda. The consequence of this is that less impact is being achieved as funding leaks away to the national part of the agenda. This can only be amended by stricter priority setting upfront, which gets translated into far more specific calls for proposals.

In relation to this appeal for more specific calls for proposals, CGMs are perhaps not the most optimal funding instrument for fostering a truly supranational agricultural research agenda. In some instances—for example, when you have an immediate supranational problem at hand, such as a disease outbreak—commissioning research may be a far more effective way of achieving a timely impact. Moreover, the CGM (which requires SROs to take a rather impartial position vis-à-vis project proposals) limits the role of the SROs as incubators for supranational agricultural research projects—that is, bringing the different national and international partners together around a particular challenge and developing a joint project proposal.

The funding of FARA and the SROs is still largely based on donor support. Member contributions only cover a very small component of the costs, and in the long run this is not sustainable. Moreover,

[12] Additionally so because the CGIAR has strongly cut back on its involvement in training researchers and strengthening the organizational and managerial capacity of NARSs.

high donor dependence limits local control over the agenda. It is important for FARA and the SROs to start exploring how they can secure more local funding in the future, but it will be difficult to organize this on the basis of member contributions only. The more logical option would be to collaborate more closely with the regional economic communities and secure funding as part of the political process of regional integration. In addition, it may be worthwhile to explore the possibility of introducing a specific levy to finance supranational agricultural research—for example, a levy on the import of agricultural inputs.

Although a welcome addition, the promotion of national centers of excellence or specialization under the East Africa and West Africa agricultural productivity programs is not an alternative for the supranational agricultural research projects funded by the SROs. It is hoped that these national centers of excellence will be able to play a leading role in promoting the supranational agricultural research agenda for their particular commodity, but it is a strategy that is not without risks.

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The Agricultural Science and Technology Indicators (ASTI) initiative compiles, analyzes, and publishes data on levels and trends in agricultural R&D investments, capacities, and institutional arrangements in developing countries. ASTI is managed by the International Food Policy Research Institute (IFPRI) and involves collaborative alliances with many national and regional R&D agencies.

Jointly convened by ASTI/IFPRI and the Forum for Agricultural Research in Africa (FARA), the conference, "Agricultural R&D—Investing in Africa's Future: Analyzing Trends, Challenges, and Opportunities," brought together experts and stakeholders from the region to contribute their expertise for the purpose of distilling new insights and creating synergies to expand the current knowledge base. The themes under focus were (1) why African governments under invest in agricultural R&D; (2) how human resource capacity in agricultural R&D can be developed and sustained; (3) how institutional structures can be aligned and rationalized to support agricultural R&D; and (4) how the effectiveness of agricultural R&D systems can be measured and improved.

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