Science-granting councils in Sub-Saharan Africa

A typology of diverse science funding configurations

Johann Mouton

Centre for Research on Evaluation Science and Technology
and DST-NRF Centre of Excellence in Scientometrics
and Science and Technology Policy
Stellenbosch University
South Africa

1 Context

Science granting councils (SGCs) (and agencies with equivalent missions such as national commissions for science and technology, national science councils and national academies of science) are essential actors in national systems of innovation. In well-defined and clearly articulated systems of innovation they perform a number of crucial functions that contribute to the effective and efficient functioning of such systems. Ideally, such councils act as fair and disinterested agents of government while, at the same time, representing the interests of the scientific community nationally, regionally and internationally. They are crucial 'intermediaries' in the flow of international funding and technical support to R&D-performing institutions in a country.

There is now a renewed realization by most role players in recognizing the importance of developing STI capacity in developing countries. [1] The creation of Science Granting Councils and Competitive Research Funds is of a rather recent origin in SSA. Over the past decade, however, we have seen an increase in either the establishment of dedicated science granting councils or agencies or promulgation of policies which stipulate that such agencies must be established in the foreseeable future. All of this points to a

1. See for example the African Union's *African Innovation Outlook* (2010) and the UN Rio+20 Report (United Nations 2012).

general and emerging consensus as to the necessity of having such councils as part of the national science system.

Despite the significance of these organizations and a growing body of scholarship about the nature, roles, functions and impacts of such bodies, few systematic studies of SGCs and related organizations in Africa have been done.

2 Empirical Approach and Main Findings

Against this background, the Centre for Research on Evaluation, Science and Technology at Stellenbosch University examined the strategic priorities, objectives and practices of SGCs in 17 sub-Saharan African countries. [2] SGCs are embedded in the science and innovation systems of their respective countries. In sub-Saharan Africa, the STI systems vary significantly with regard to socio-political histories, geography, political and economic (in)stability, colonial legacies and, most importantly (for this study), the degree of institutionalization of R&D (Gaillard & Waast 1988 ; Mouton 2008).

One of the first results of our study was to 'map' key milestones in S&T governance and policy development in each of the countries included in the study. Most African countries obtained their independence during the 1960s. But the establishment of a national ministry of science and technology (or equivalent ministry) would have to wait, in most cases, for another 20 years to materialize. In fact, in four countries (Namibia, Rwanda, Tanzania and Uganda) there is as yet no such dedicated ministry. In most of these cases, the S&T portfolio is located in a ministry of higher education. One country, Cameroon, does not have a science policy document. These facts may point to a lack of commitment to prioritize S&T matters in these countries. On the other hand, we also found evidence of a recent commitment to prioritizing S&T as illustrated by the fact that nine countries have revised their S&T policy documents since 2010.

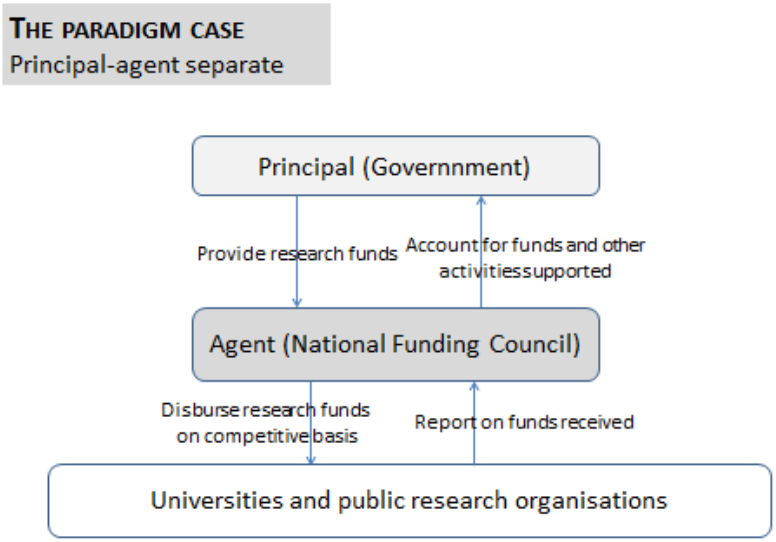
Another result of the study was applying the principal-agent framework to identify science and research funding configurations or models. The table in the Annex summarizes the high-level results of our analysis of national STI funding arrangements in the 17 countries of interest. Within this sample, we identified at least six different funding models, which are briefly summarized below.

The paradigm principal-agent model — The "paradigm" or "model" case of science funding is the simplest manifestation of the principal-agent principle. The government delegates its responsibility for science or research funding to an autonomous body (usually a national research or science foundation or council) that receives its funds directly from government and accounts for these funds on a regular basis. It derives its autonomy through a statutory act and the appointment of a separate board or council. This council establishes structures, policies, and procedures to ensure fair, transparent, and efficient disbursement of funds to public universities and research organizations. Foundations typically use different "funding instruments" (e.g., scho-

2. This study was funded by the International Development Research Centre in 2012.

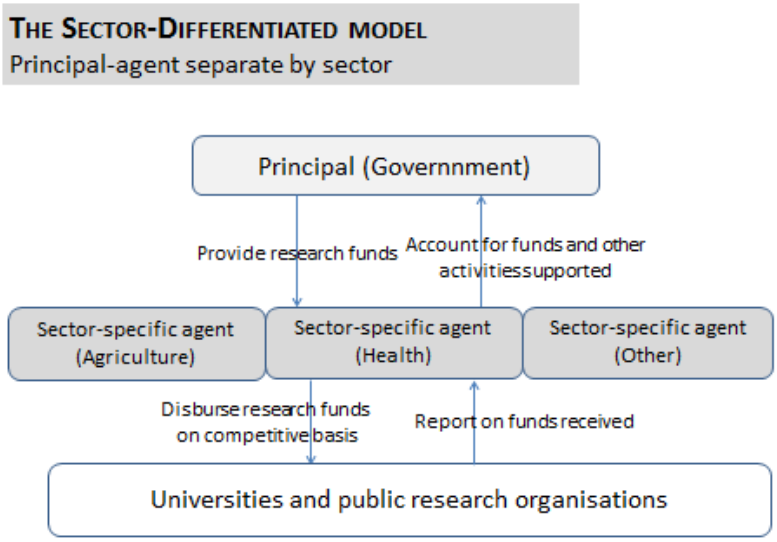
larships, bursaries, travel grants, grants for emerging and established scholars, and capacity-building grants).

The best example of the paradigm case is the *South African National Research Foundation.* Other countries with similar arrangements are Senegal, Côte d'Ivoire and Namibia where a science granting council under this model should be established in the very near future.



The sector-differentiated model — Many countries have sector-specific funding agencies, particularly in agriculture and health. In this case, governments have established different research funding councils or foundations for different sectors in the science system. With this configuration, the funding agencies report to the different "principals" within Government. This model often causes challenges around co-ordination in science funding in the science system.

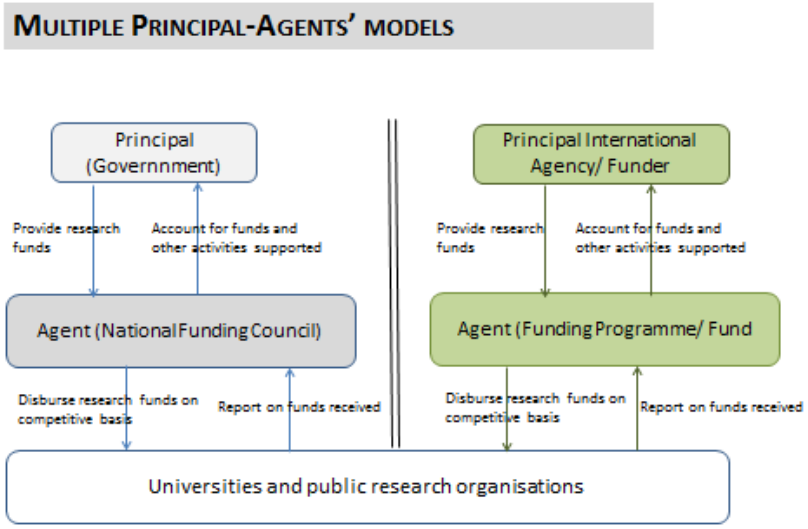
There are several examples of this sector-differentiated model in Africa. In the case of Burkina Faso, three funding agencies report directly to their respective ministries : FONRID reports to the Ministry of Scientific Research and Innovation ; FONER is responsible to the Ministry of Secondary and Higher Education ; while FARES reports to the Ministry of Health.



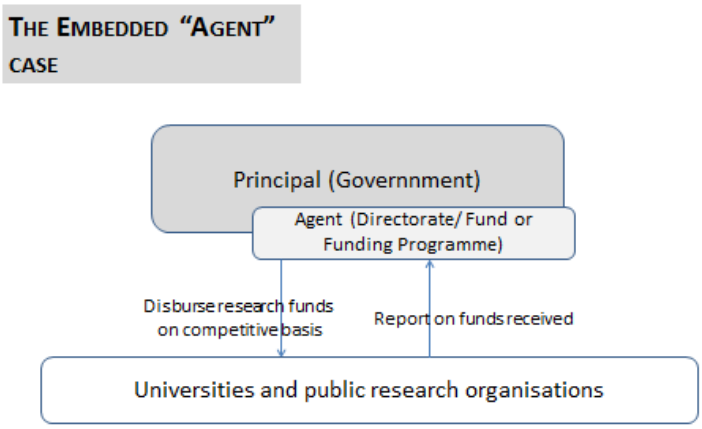
Multiple principal-agents model — A "popular" configuration of the paradigm case found in labelled the "multiple principal-agents" model. In addition to the funding that is channelled from government (via some council or fund) to the universities, there are also various other "principals" at work in the national science system. These are typically international funders, foundations and development agencies that all channel funds predominantly to universities and research institutes but also to NGOs in African countries.

In the representation below we emphasize that these two configurations are often found to co-exist (like "parallel universes") in the same system. We found that there is often very little or no co-ordination or interaction between these two funding channels. Such a situation obviously raises many questions : about priority setting, parallel lines of reporting and accounting, duplication, and so on.

There are a number of variations on the multiple principal agent's model. We distinguish two such variations. The most common variation is the *non-equivalent model* where there is relatively weak government and strong non-government funding. Within the *equivalent model*, there is greater equivalence or parity between the government and non-government funding models. In fact, in some cases governments (such as Côte d'Ivoire) actively collaborate with other governments (Switzerland) to manage the parallel fund. And finally, the "green" section in the "multiple principal agents model", can also be included in the embedded principal agent model to form a variant of the latter. This means that there is not only one, but two, additional variants of the "embedded principal-agents model" : the one described above as well as a "sector differentiated embedded agent model". This variant would refer to more than one ministry with an embedded research fund in each.



The embedded principal-agent model—- A different configuration of the Paradigm Case exists when the "agent" is not institutionally separate from the government (Ministry or Department of Science and Technology/ Higher Education). We labelled this the "embedded agent".



In cases such as these, it is typical that the "agent" is (1) either a sub-department or directorate within a Ministry or Department of S&T ; or (2) a Fund/ Funding Program that is administered by a department. It is evident that here the agent is an extension of government with no obvious autonomy or independence from the department in which it is located. One could argue that the agent, under this model, is not a proper "agent" (as suggested by the principal-agent framework) as it acts more as a commissioning agency than a disbursing agency.

Examples of the "embedded principal-agent" are found in Tanzania, Senegal, Ethiopia (the Local Research and Development Grant) and Mozambique (Fund for Poverty Research).

3 Main messages for policy and practice

The differentiated landscapes of research funding models found in this study are not only the result of different histories in science-policy development and different trajectories in the institutionalization of a science ministry in the respective countries, but also different science governance models. These governance models are related to the historical roots of these systems in the British and French models of science management.

A dedicated science funding council is largely a feature of the STI systems of countries in the Anglophone tradition (e.g. Kenya, South Africa, Uganda, Zambia and Zimbabwe). In the Francophone countries, such as Rwanda and Cameroon, there are no STI funding councils (although a project to establish a National Fund for Research and Innovation is currently being discussed in Cameroon). Burkina Faso, Côte d'Ivoire and Senegal, however, have dedicated funding agencies. In the case of Côte d'Ivoire and Senegal, funding systems promoting agricultural research have been recently established.

In many of the countries included in the study, the national landscape is characterized by a multitude of funding agencies, programs, and instruments often organized around sectoral interests (e.g., health and agriculture). In addition, these councils face a variety of challenges (e.g., resource constraints, governance issues, lack of clarity on institutional differentiation, lack of coordination within science systems, and marginalization of influence). There is little evidence of sharing of expertise and experience among SGCs — often within the same country, but definitely within regions and across the continent.

Within this environment, we found that SGCs in sub-Saharan Africa perform a wide range of functions : disbursement of research grants (various categories) ; disbursements of scholarships and loans (mostly masters and doctoral students) ; funding support for infrastructure development ; communication of results (dissemination and uptake of research reports and findings) ; supporting scientific publishing and scientific journals ; advocacy for STI ; collection of data and statistics on S&T and R&D ; capacity building and training of researchers ; policy advice ; setting research agendas and research priorities ; management of scientific collaborations and agreements ; and coordination of the national innovation system.

The relatively poor investment in R&D in many sub-Saharan Africa countries, which has a direct impact on the science funding models, points to different levels of commitment to science in different countries as well as to different values afforded to science. Some governments clearly recognize the value and importance of science, and therefore invest in science funding and the establishment of a national funding agency. However, many governments have not (at least until very recently) judged science to be of sufficient value and importance to invest in the establishment of a relatively autonomous agency to disburse state funds for R&D. The fact that there has been a surge of interest in reformulating existing science policies, and in the establishment of separate ministries of science, may be indicative of a change, even among those countries that have been slow to invest in R&D.

Related Resources

African Union. 2010. *Africa Innovation Outlook 2010.* Tshwane : African Union.

Gaillard J & Waast R. 1988. La recherche scientifique en Afrique. *Afrique Contemporaine* 148 : 3-30.

Mouton J. 2008. Africa's science decline : The challenge of building scientific institutions. *Harvard International Review*, 30(3).

United Nations. 2012. *Report of the United Nations Conference on Sustainable Development.* New York : United Nations.

4 Annex 1 : Funding bodies in the 17 selected countries

	Ministries / departments	Funding councils / intermediaries	Funds / funding instruments
	l'Enseignement – PASE)		FARP)
			Fund for the Development of Cocoa and Coffee Sectors (FODECC) (Fonds de Développement des filières Cacao et Café)
			Competitive fund to reward researchers, including for Scientific Research and Innovation Excellence Week (JERSIC) (Journées de l'Excellence de la Recherche Scientifique et de l'Innovation au Cameroun)
			Fund to Support Research, the University Fund for Dissemination of Scientific and Technical Information (FUDIST)
CAMEROON *(Proposed)*	Ministry of Scientific Research and Innovation (MINRESI)		National Fund for Research and Innovation (*Fonds National de la Recherche et de l'Innovatio*n – FNRI)
CÔTE D'IVOIRE	Ministry of Higher Education and Scientific Research	Strategic Support for Scientific Research Programme in Côte d'Ivoire (*Programme d'Appui Stratégique à la Recherche Scientifique* – PASRES)	
	Ministry of Agriculture	Interprofessional Fund for Agricultural Research and Council *(Fonds Interprofessional pour La Recherche et le Conseil Agricoles* – FIRCA)	
CÔTE D'IVOIRE (Proposed)	Ministry of Higher Education and Scientific Research	National Fund for Scientific and Technological Research *(Fonds National de la Recherche Scientifique et Technologique - FNRST)*	
ETHIOPIA *(Current)*	Ministry of Science and Technology (MoST)		Local Research and Development Grant
ETHIOPIA *(Proposed)*	Ministry of Science, Technology and Innovation	National Science, Technology and Innovation Council (NSTIC)	
GHANA (Current)	Ministry of Environment, Science and Technology (MEST)	Council for Scientific and Industrial Research (CSIR)	Science and Technology Research Endowment Fund (STREFund)

	Ministries / departments	Funding councils / intermediaries	Funds / funding instruments
	Ministry of Education		Ghana Education Trust Fund (GETFund)
GHANA *(Proposed)*		National Research Funding Council (apex body)	
KENYA *(Current)*	Department of Science and Technology in the Ministry of Education, Science and Technology (MoHEST)	National Council for Science and Technology	Science, Technology and Innovation (STI) Fund
KENYA *(Proposed)*	Department of Science and Technology in the Ministry of Education, Science and Technology (MoHEST)	National Commission for Science, Technology and Innovation (NACOSTI)	National Research Fund (NRF)
			Kenya National Innovation Agency (KENIA)
MOZAMBIQUE *(Current)*	Ministry of Science and Technology (MCT)		Fund for Poverty Research (*Fundo de Investigação sobre Pobreza* – FIP)
MOZAMBIQUE *(Proposed)*	Ministry of Science and Technology (MCT)		National Research Fund (NRF)
NAMIBIA *(Current)*	Line ministries fund research, researchers and research institutes operating with the ministries		
NAMIBIA *(Proposed)*	Ministry of Higher Education	National Commission for Research, Science and Technology (NCRST)	National Research Fund (NRF)
		Council for Research and Innovation (CRI)	
NIGERIA *(Current)*	Research funding by the various ministries i.e. Federal Ministries of Health, Agriculture, and Environment		
			Tertiary Education Trust Fund (TETFUND)
NIGERIA *(Proposed)*	Ministry of Science and Technology		National Research and Innovation Fund (NRIF)
		National Research and Innovation Council (NRIC)	
		State Science, Technology and Innovation Council (SSTIC)	
		National Council on Science, Technology and Innovation (NCSTI)	
			Education Trust Fund Research Fund (ETF)

	Ministries / departments	Funding councils / intermediaries	Funds / funding instruments
RWANDA *(Current)*	Directorate of Science, Technology and Research (DSTR) in the Ministry of Education (MINEDUC) directly funds research in the country		
	Ministry of Education (MINEDUC)		Rwanda Research Innovation Endowment Fund (RIEF)
RWANDA *(Proposed)*	Directorate of Science, Technology and Research (DSTR) in the Ministry of Education (MINEDUC) directly funds research in the country	National Commission for Science, Technology and Innovation	National Research Fund
SENEGAL *(Current)*	Ministry of Higher Education and Research	Fund to promote Scientific and Technical Research (*Fonds d'Impulsion de la Recherche Scientifique et Technique* – FIRST)	
	Ministry in charge of Agriculture	National Fund for Agriculture and Agrifood Research (*Fonds National de Recherches Agricoles et Agro-Alimentaires* – FNRAA)	
SENEGAL *(Proposed)*	Ministry of Higher Education and Research	National Fund for Research and Innovation (FNRI)	
SOUTH AFRICA	Department of Science and Technology (DST)	National Research Foundation	Various funding instruments
		Technology Innovation Agency (TIA)	Four funding instruments
	Department of Health (DoH)	Medical Research Council (MRC)	Various funding instruments
	Department of Water and Environmental Affairs (DWEA)	Water Research Commission (WRC)	Two funding instruments
TANZANIA *(Current)*	Ministry of Communication, Science and Technology	Tanzania Commission for Science and Technology (COSTECH)	National Fund for the Advancement of Science and Technology (NFAST)
TANZANIA *(Proposed)*		Tanzania Commission for Science and Technology (COSTECH)	National Research Fund (to replace NFAST)
UGANDA	Treasury		Presidential Science Initiative (PSI)
	Ministry of Finance Planning and Economic Development (MoFPED)	Uganda National Council for Science and Technology (UNCST)	Science, Technology and Innovation Fund (STIF)
			National Innovation Fund (NIF)
ZAMBIA *(Current)*	Department of Science and Technology in the Ministry of Education, Science, Vocational Training and Early Education (MESVTEE)	National Science and Technology Council (NSTC)	Two funding instruments (Strategic Research Fund and Science and Technology Innovation Youth Fund)
		National Technology Business Centre (NTBC)	National Technology Business Fund (NTBF)

	Ministries / departments	Funding councils / intermediaries	Funds / funding instruments
ZAMBIA *(Proposed)*	Department of Science and Technology in the Ministry of Education, Science, Vocational Training and Early Education (MESVTEE)	National Research Council (NRC)	None, as it will not be a funding agency
			National Research and Innovation Fund (NRIF)
		National Technology Innovation Agency (NTIA)	Unknown
ZIMBABWE	Ministry of Higher & Tertiary Education, Science & Technology Development	Research Council of Zimbabwe (RCZ)	Two funding instruments (Small research grants for M&D students and large research grants open to all)
			Research and Development Commercialisation and Innovation Fund (RDCIF)