STRENGTHENING CAPACITY AND CONNECTIVITY AMONG RESEARCH COUNCILS

Background Report for the 6th Annual Global Research Council Meeting

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INTRODUCTION

This report introduces the capacity strengthening and connectivity theme slated for discussion at the 6th Annual Meeting of the Global Research Council (GRC). It is based on a discussion paper that informed the five preparatory regional meetings held from October 2016 to January 2017. This report incorporates insight gleaned from those meetings, as well as survey data and suggested directions aimed at strengthening the capacity and connectivity of research councils.

CONTEXT

The Global Research Council (GRC) seeks to promote principles and practices for supporting research, and nurture collaboration and connectivity across countries, regions and continents for the benefit of current and future GRC participants, as well as the global research community.

To support this broad objective, research councils participating in the GRC network have issued statements at annual meetings on principles that all research councils have an interest in and seek to improve. These include topics such as merit review, open access, research integrity, and supporting early career scientists. In practice, however, the ability of many research granting agencies to develop and manage policies and systems in support of such statements is limited by a number of internal and external factors.

At the 2015 GRC annual meeting co-hosted by Japan and South Africa, research councils endorsed the *Statement of Approaches: Building Research and Education Capacity*.[1] Through this statement, GRC participants encouraged collaboration, partnerships and networking to strengthen their individual and collective capacity. To that end, the statement identified possible activities such as workshops on specific research management issues, staff exchange programs (e.g., short-term professional visits and traineeships), and institutional pairing.

Inspired by the 2015 GRC *Statement of Approaches*, IDRC, working with 2017 co-hosts the Natural Sciences and Engineering Research Council of Canada (NSERC) and the National Council of Science, Technology and Technological Innovation of Peru (CONCYTEC), proposed to explore in further detail opportunities to strengthen the capacity and connectivity among research councils participating in the GRC network. While GRC participants have already demonstrated their willingness in the past to host workshops, share technology, support staff exchanges and develop joint programs, it is timely to take stock of current efforts, priorities and approaches, and identify promising areas for future collaboration.

Consultations IDRC held with national research funding agencies in 2013/2014 in the Americas, the Middle East, Southern Africa and Asia were an early signal that emerging and established research councils recognized the merits of collaboration and coordination to advance their mandates. Similarly, the GRC regional meeting process in 2016 highlighted numerous opportunities to draw on the expertise and experience within the GRC network to support research councils as they, in turn, seek to collectively support the global research enterprise.

The demand for peer learning and coordination/ collaboration to improve agencies' performance and support scientific collaboration emerges from a number of encouraging trends. For example, numerous governments from low- and middle-income countries are creating new or reforming established research funding agencies, increasing their budgets and expecting results from their investments[2]. Another trend is that scientific collaboration is increasingly global, and national instruments that fund and structure research are experimenting with ways to promote international collaboration among researchers and enabling a domestic environment conducive to international mobility, participation in large networks, etc.[3]

PURPOSE AND ORGANIZATION

This report and the preceding discussion paper seek to promote awareness and summarize options generated through a consultative process to strengthen capacity and connectivity among research councils.

This report is organized as follows:

- Section two addresses some definitional issues.

[1] Available at: http://www.globalresearchcouncil.org/sites/default/files/pdfs/Statement%20of%20Approaches%20Building%20Research%20and%20Education.pdf.

[2] Katsnelson, A. (2016). 'Big Science Spenders' *Nature*, vol. 537, S2.

[3] Adams, J (2013). 'The Fourth Age of Research' *Nature*, vol. 479, pp. 557-560; InterAcademy Panel (2004) *Inventing a Better Future*. Amsterdam.

- Section three highlights several trends generating the demand for capacity strengthening, and opportunities to support global research that require some form of cooperation or coordination.
- Section four introduces capacity strengthening initiatives organized by research councils and related organizations.[4] These approaches and case studies were discussed at the GRC regional meetings as reference points for thinking about potential directions the GRC network might take. This section also summarizes the topics that research council representatives identified as priority issues where collaboration would add value to their organizations.

DEFINITIONS

In the context of organizational strengthening, 'capacity' refers broadly to the organizational and technical abilities, relationships and values that enable agencies to define their goals and manage their resources in a fair, transparent, and cost-effective manner. The goal of capacity strengthening is to improve organizational performance so that agencies are better able to achieve their goals.

Research councils perform numerous functions in pursuit of their goals and for simplicity, this paper identifies four functional categories: corporate, organizational, program, and partnership / linkage functions.[5]

Agencies have numerous options when they seek to improve their performance. Among the more common approaches are:

- professional development of staff through training, mentorship, or peer learning;
- organizational or group learning through dialogue, exchange or benchmarking exercises in concert with comparable agencies; and
- knowledge management / technology enhancement to support internal business processes and external collaboration / coordination.

Efforts to strengthen capacity can be an internal pursuit or undertaken in partnership with others. This report emphasizes the latter, and distinguishes between decentralized and short-term collaborations on the one hand, and more coordinated, long-term approaches to strengthening capacity on the other.

The term 'connectivity' is used to denote both a collaborative approach to strengthening capacity and a potential outcome. In the words of Subra Suresh (2012), the "GRC is a new model for discussing issues aimed at unifying and strengthening the global scientific enterprise." The desired goal, then, is a network of agencies better able to promote and support global science.

[4] Appendix 1 further details the case examples of current approaches to strengthening capacity. These were included in the discussion paper to identify ideas or approaches that might be emulated, adapted or scaled-up by GRC participating agencies, or in partnership with other organizations.

[5] These categories are adapted from Lusthaus, C. *et. al.* (2002). *Organizational Assessment: A Framework for Improving Performance*. Washington: IADB & IDRC. For a more expansive discussion of specific functions performed by research funding agencies, see for example, Mouton J, Gaillard J, and M van Lill (2015) "Functions of Science Granting Councils in Sub Sahara Africa" in *Knowledge Production & Contradictory Functions in African Higher*, (eds.) Cloete N., P. Maasen, T. Bailey. African Minds. pp. 148-170.

Suresh also anticipated the GRC's instrumental value for participating agencies. The GRC network unites agencies with domestic mandates, where in many countries there are no comparable organizations to learn from. In this context, the GRC network could provide a framework for agencies to learn from each other. Suresh signaled out the particular opportunity "For countries with recently established funding agencies … [as] ... participation in the GRC should accelerate their efforts in recognizing promising science, developing their science infrastructure, and collaborating with other nations."[6]

THE DRIVERS OF CHANGE

This section highlights the role of national policy changes, the changing conduct of research and emerging opportunities to support the global scientific enterprise as drivers of change. These factors impact the capacity of research councils, create new performance expectations and demand new capabilities and ways of working for research councils to collectively reshape or transform the research landscape to accelerate the pace, quality and use of research. The impact of these drivers will vary from agency to agency and from country to country, but for both emerging and established research councils, these drivers create a demand for organizational strengthening and coordination.

NATIONAL POLICY CHANGE

(1) Creation of new research funding councils
(2) Reform of research funding councils
(3) Increased public investment for research and ensuing expansion of operations and expectations, in particular regarding transparency and accountability

(1) In many regions, governments have created new research councils at an increasing rate. To take the Latin American context, in the 60 years between 1930 and 1989, governments established 12 research funding organizations. By contrast, during the 20 years between 1990 and 2009, 24 new agencies were created, representing a 6 fold increase in the creation of new agencies per decade.[7] Beyond Latin America, each GRC regional meeting noted similar developments. Poland, Indonesia, and Namibia, for example, have all recently established new research funding agencies. The demand for benchmarking, learning and adapting policies and practices from comparable agencies is particularly strong in these situations.

(2) In countries with established research councils, government-led reforms are common. A recent summary of these changes, again drawing on the Latin American experience observes:

> Over the past decade, many Latin American countries have demonstrated renewed attention to science and technology, with significant variation in legislative reforms from country to country …. . A number of countries have been attempting to better align their science and technology policy with broader development strategies and to include attention to social equity. Some of these have explicitly added innovation on to what

[6] Subra Suresh (2012). 'Cultivating Global Science' *Science*, Vol 336 (25 May). Available at: http://www.globalresearchcouncil.org/sites/default/files/pdfs/suresh-editorial02.pdf

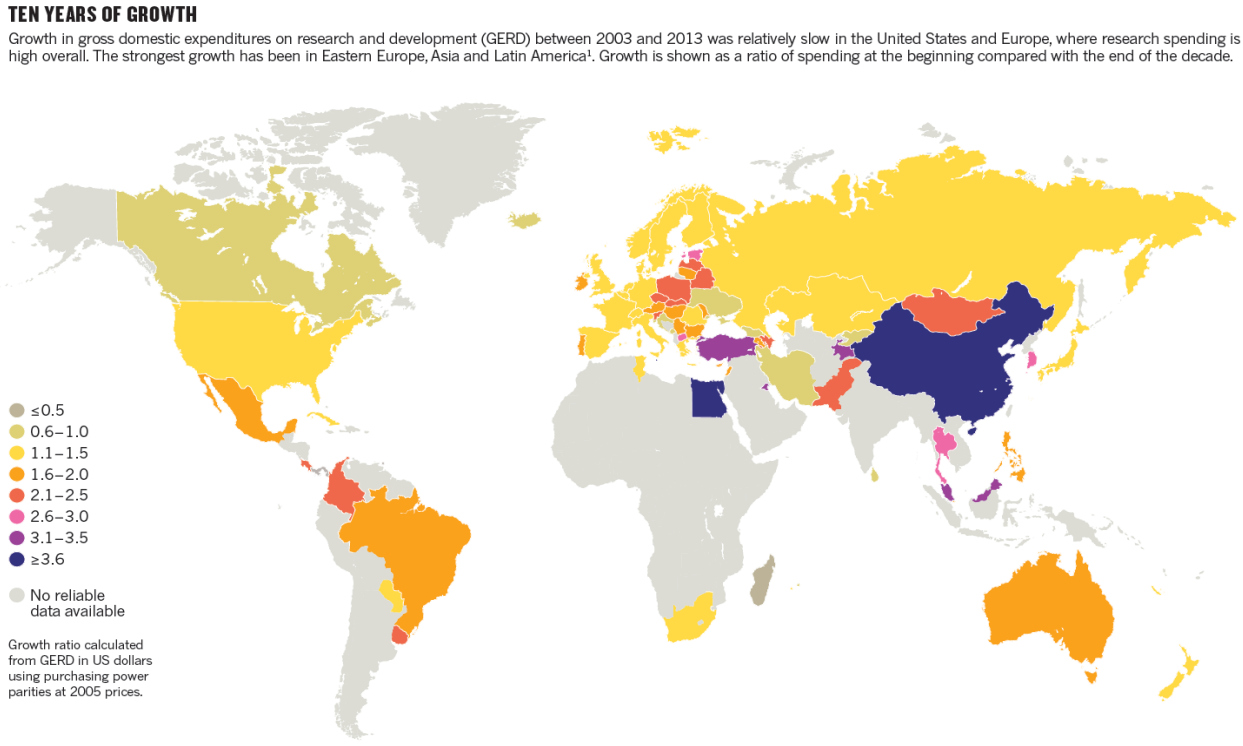
[7] Lemarchand, G. (ed) (2010). 'National Science, Technology and Innovation Systems in Latin America and the Caribbean'. *Science Policy Studies and Documents in LAC*, Vol. 1. Montevideo: UNESCO Regional Bureau for Science in Latin America and the Caribbean.

were previously laws on Science and Technology. […] These reforms have been accompanied by a new generation of policy instruments intended to stimulate innovation. A range of new funds have been established recently, aiming to bring public research and private enterprise closer together. Some reforms aim to improve the speed and transparency of resource allocation procedures, as well as monitoring, evaluation and accountability for public S&T policies, while others focus on assessing R&D results, promoting innovation, strengthening the relationship between research centres and business, designing long-term policies, employing strategic intelligence tools, monitoring public opinion on S&T issues, and disseminating knowledge, and improving links between universities and the productive sector.[8]

The changes noted above are prevalent in other regions as well. Structural reforms contemplated or recently undertaken in countries such as Kenya, China, Malaysia, and the UK were discussed at the regional meetings. While such reforms tend to build on institutional legacies, new structures and programmatic directions create a demand for peer support and learning.

(3) A final driver of change has been the increase in funding for research, though real growth in funding is principally located in countries with historically low investment. Regardless of a country's starting point, new investments necessitate increased capacity to manage, monitor and account for growing budgets.

Figure 1: Growth in Expenditure in R&D



Source: Katsnelson 2016, ibid.

[8] Arond E., Rodríguez I., Arza V., Herrera F. and M. Sanchez (2011) 'Innovation, Sustainability, Development and Social Inclusion: Lessons from Latin America', *STEPS Working Paper 48*, Brighton: STEPS Centre, pp. 23-24.

These various types of changes to the structure, mandate and budgets of agencies create a demand for peer-learning, among other approaches to strengthen organizations' ability to perform core programming and corporate functions. The case-studies of the **Science Granting Councils Initiative (SGCI),** the **Global Observatory of Science, Technology and Innovation Policy Instruments** (**GO-SPIN)** and the **OECD Innovation Policy Review mechanism** introduced in section four, are examples of coordinated initiatives to assist governments and research councils understand and shape their STI ecosystems and promote policy learning among peer agencies.

CHANGING CONDUCT OF RESEARCH

(1) New programmatic directions and evolving research practices
(2) Rise in international scientific collaboration

(1) There is a dynamic relationship between research funding agencies and researchers. When new funding mechanisms or programs steer research in a particular direction, the production of knowledge alters over time. Michael Gibbons and colleagues (1994) noted such changes in the 1990s with the growth in problem-based enquiry integrating multiple disciplines and involving larger teams, often from both academic and non-academic actors.[9] Such changes were a noted departure from stand-alone disciplinary research funding programs. Bringing about these changes, research councils deployed new research management tools, and guidelines and policies to support public-private collaborations or engagement with civil society stakeholders. In turn, such changes created new demands for monitoring and evaluating the broader societal impact of public science. The broad application research assessment exercises covering universities and other public research organizations became more common, both to account for public funding and to promote a 'social contract' between public science and society.

At the GRC regional meetings, numerous agencies from all regions discussed the approaches used to foster the dynamic interplay between research and innovation. Research councils from Argentina, Switzerland and Singapore, for example, presented new programmatic directions seeking to harness the potential of science to a wide range of public policy goals.

Generating commercial value from research remains a strong focus but research councils also reported growing investments research and knowledge mobilization programs for public and social innovation and environmental sustainability. As new programmatic and policy priorities emerge, research councils noted the important contribution that learning from peer councils can play in the design, monitoring and impact of such programs.

(2) One of the more noticeable forces reshaping the conduct of research is the rise of international scientific collaboration over the past two decades. As Wagner argues, this growth is largely organic, facilitated by the internet and the ensuing ability of scientists to identify and work with peers.[10] With the proliferation of international collaboration emerged bibliometric evidence indicating that jointly

[9] Gibbons, M, Limoges C, Nowotny H, Schwartzman S, Scott P, and M Trow (1994). *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: Sage
[10] Wagner, C (2008). *The New Invisible College*. Washington D.C.: Brookings Institution Press.

authored papers were more impactful and widely cited.[11] Taking note, many countries developed programs and altered policies to enable their scientific community to interact with peers in other countries.

A prominent example of government promotion of scientific collaboration are the European Research Area programs initiated in 2000. While many of the pan-European funding mechanisms are centrally funded by the European Commission, national funding agencies have also adjusted their policies and programs in response. For both countries that have successfully promoted scientific collaboration and countries that seek to encourage collaboration, the changing pattern of collaboration has pushed research funding agencies to change their policies and practices and establish new partnerships. There is extensive experience in supporting bilateral cooperation but opening such platforms to facilitate multilateral collaboration was identified as a priority issue by delegates to the North African/Middle East, Asia-Pacific and Americas meetings.

The **Science Europe** case study illustrates the collective response from national research councils to the internationalization of research, the changing conduct of research in Europe, and the politics of regional integration. Pan-African scientific collaboration promoted by the New Partnership for Africa's Development (NEPAD), and by the ASEAN Community create similar conditions for national research councils to support regional integration.

EMERGING OPPORTUNITIES TO SHAPE THE FUTURE OF RESEARCH

(1) Open access to publicly funded research
(2) Open science, innovation and government
(3) Science diplomacy and science for humanity

(1) The GRC Action Plan towards Open Access to Publications (2013) recognized the potential benefits of open access in terms of improving the quality and impact of research. Translating this principle into practice has taken different forms, from individual agency responses to regionally coordinated portals. The **Scientific Electronic Library Online (SciELO)** case study exemplifies the latter. SciELO was developed by funding agencies and interested stakeholders to create a viable long-term platform to make research public.

(2) The positive impact of open access publishing to the circulation and use of research findings, coupled with a push for 'responsible research,' has led funding agencies to experiment with applying 'openness' principles to how they fund and support research (e.g., via open data and other technology platforms that encourage virtual scientific collaboration). While open science is widely viewed as a creative force, it does generate new responsibilities for funding agencies. In Canada, for example, the federal government's commitment to 'open government' has made it a priority for Canadians to easily "access government data and information in open, standardized formats". [12] Worldwide, many research councils are developing or implementing policies to make the research data they fund accessible, but coordination is needed to promote inter-operable standards. The topic of open data was identified as a priority issue for peer learning and coordination at the regional meetings.

[11] Adams, J. (ibid).
[12] See, for example, the Open Government Partnership. Available at http://www.opengovpartnership.org/.

(3) The recently adopted Sustainable Development Goals (SDGs) (2015-2030) underscore the potential of science, technology and innovation to address pressing global challenges. While many of the SDGs mirror national development agendas that research councils seek to support, they have renewed attention to the contribution of science to sustainability. Moreover, the SDG Agenda calls for creative partnerships to mobilize scientific assets and technologies, and this is likely to create new demands on research councils and for cooperation among them. Aware of the demands on national agencies and their aspirations, the OECD Ministerial Meeting at the 2015 World Science Forum declared that "the governance of international science and technology co-operation should be made more inclusive vis-à-vis developing and emerging economies; the innovation capacities of these countries should be strengthened, they should be more involved in agenda and priority setting for research cooperation, as well as have a stronger role in global policy coordination and rule setting."[13]

The case examples of the **African Science Academy Development Initiative (ASADI)** and the **SGCI** have their origins in the opportunity to strengthen the voice of academies of science and research councils in Africa so they can advocate for science, support national research priorities and shape international cooperation. In addition, the **ESSENCE** case-study illustrates an approach taken by health research funding agencies to increase their impact on global health research outcomes by coordinating research funding and promoting knowledge translation with health systems.

APPROACHES TO STRENGTHENING CAPACITY AND IDEAS FOR ACTION

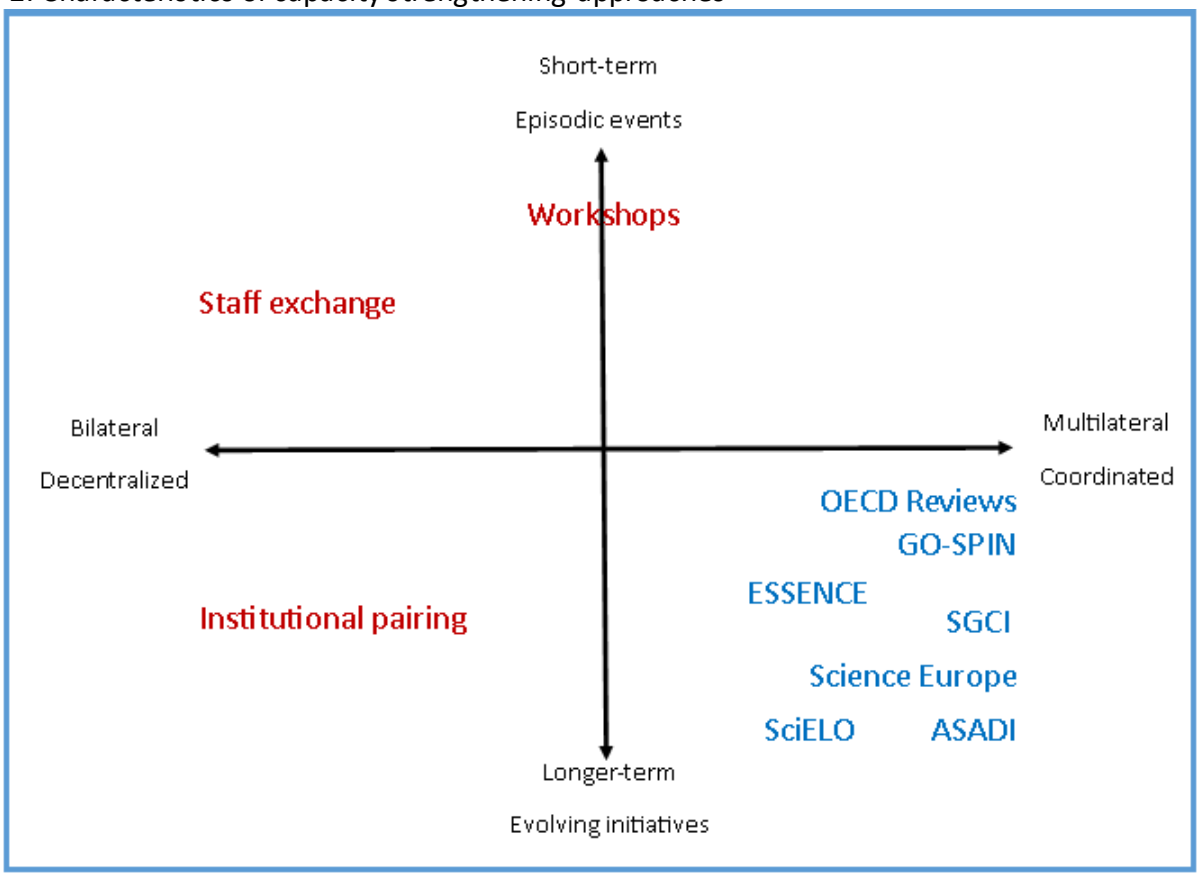
This section reviews different approaches to strengthening capacity and identifies priority topics emerging from the GRC regional meetings and survey responses. The approaches mentioned below were discussed at the GRC regional meetings with a view toward identifying (i) options that could extend the reach or reduce duplication of current efforts, and / or (ii) new initiatives that encourage connectivity and collaboration in a planned longitudinal manner.

MAPPING APPROACHES

Figure 2 locates both the long-standing practices identified in the GRC's *Statement of Approaches* as well as the case studies referred to in the section above and described in further detail in Appendix 1. The vertical axis indicates the time frame and frequency of activities. On the horizontal axis, the range extends from decentralized bilateral activities to more coordinated multilateral approaches.

[13] OECD (2015). Daejeon Declaration on Science, Technology, and Innovation Policies for the Global and Digital Age. Available at www.oecd.org./sti/daejeon-declaration-2015.htm.

Figure 2: Characteristics of capacity strengthening approaches



There is no single way to organize staff exchanges, institutional pairing programs and workshops, but as currently practiced research councils tend to support staff exchanges and institutional pairings bilaterally. Workshops, on the other hand, can be more inclusive. Recent workshops organized by Deutsche Forschungsgemeinschaft (DFG) in Germany and Research Councils UK (RCUK) to promote best practices in research management and open access attracted broad participation. Workshops and institutional pairing, particularly, can be highly responsive to the interests of participating agencies. Developed on a bilateral basis or with a few participants, they are also easy to organize and, perhaps, less demanding on agency resources.

Complementary approaches are located in the bottom right quadrant. The case examples are all multilateral initiatives that have a long time horizon. These organizational characteristics have emerged in recognition that the issues to be addressed are shared by a number of agencies and that ongoing collaboration is needed to address the complexity of the issue(s) or to support coordinated action. Also relevant, but not included in this Figure, are joint funding programs established by research councils. To varying degrees, such programs allow professional staff to interact with peers and facilitate learning by doing. For example, research councils in Latin America, Asia and Africa participating in the UK Newton Fund program commented how this program is based on the principles of co-design and joint implement, and how this approach strengthened their organizational practices.

The case studies identified in the Figure above focus on strengthening capacity through professional development, organizational learning and knowledge management/technological platforms. The main features of these approaches are summarized in Table 1.

Table 1: Summary of Case-studies

Initiative	Type	How / activities	What: targeted function	Where: GRC Region	Who: Origins & Governance
OECD Innovation Policy Review	Organizational learning	Peer review of innovation policies and outcomes	Strategic planning, domestic partnerships	OECD members & partner countries	OECD - led National STI agencies Executive staff
GO-SPIN	Organizational learning Professional development Knowledge management	Training, data collection, benchmarking	Strategic planning, monitoring and evaluation, domestic partnerships	Global	UNESCO - led National STI agencies Executive and program staff
Science Europe	Organizational learning	Policy analysis, working groups, expert panels, advocacy	Strategic planning, domestic and international partnerships	Europe	Research councils and research-performing agencies Executive and program staff
Science Granting Council Initiative	Organizational learning, professional development,	Networking, mentoring and training, joint programming	Strategic planning Program design / delivery Partnership development	Africa	Research councils Executive, program and corporate administrative staff
African Science Academy Development Initiative	Organizational learning, professional development	Mentoring, training, science advice, networking	Corporate governance, financial management, analysis and advisory capacity, domestic and international partnerships	Africa	Academies of Science Executive, program and corporate administration staff
ESSENCE in Health Research	Organizational learning, professional development	Peer exchange, benchmarking, Partnership development	Program delivery, program planning, international partnerships	North America, Europe, Africa, Latin America	Research councils and health funding agencies Program staff
SciELO	Knowledge management / Technology platform	Training and infrastructure for open access	Research communication	Latin America	Research councils Research libraries Program staff

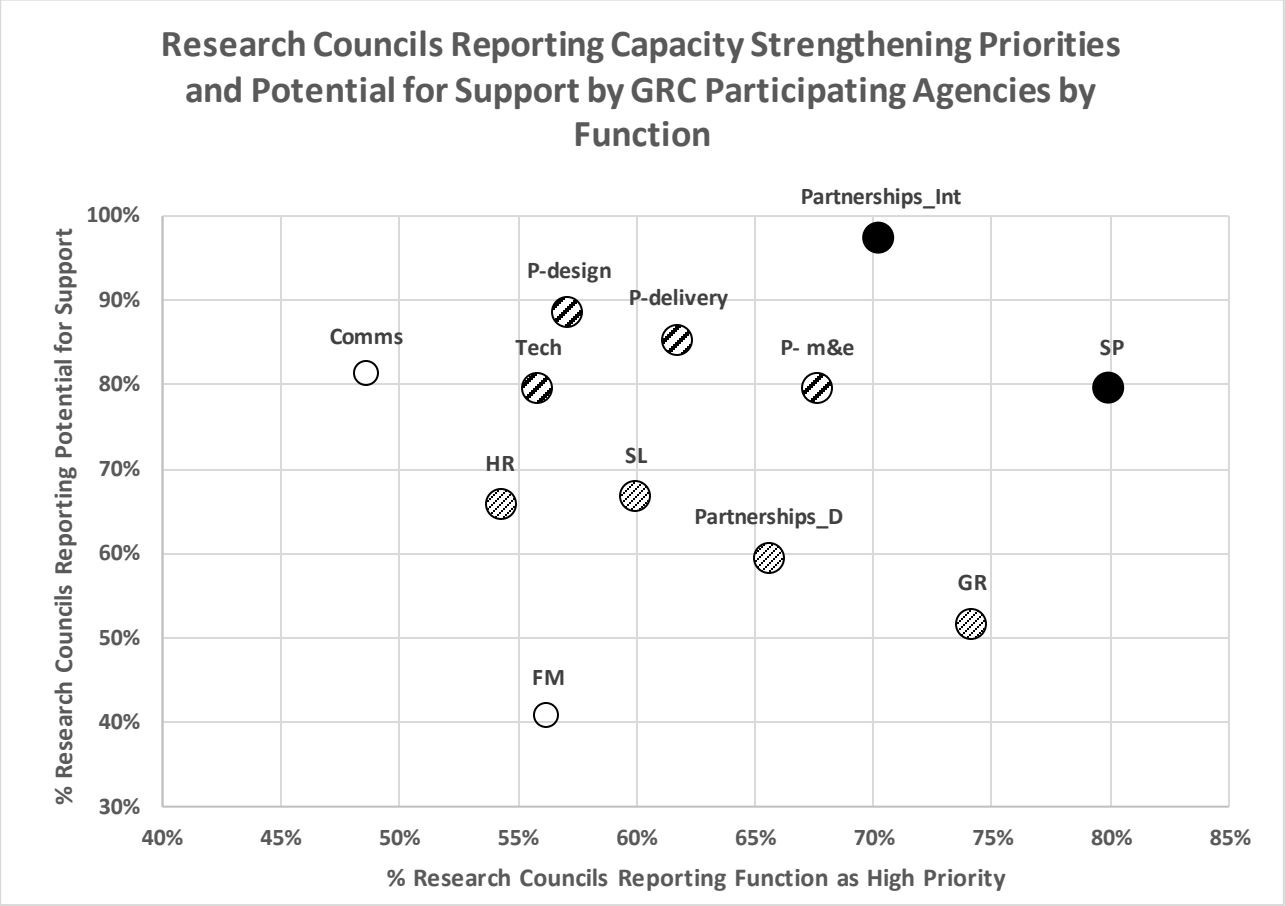
INSIGHT FROM THE CAPACITY STRENGTHENING SURVEY

To inform discussions at the GRC regional and annual meetings, IDRC invited research councils to complete a survey. The survey asked research councils to identify their priority areas for organizational strengthening, current involvement in peer-learning and/or mentoring activities, and suggestions for how GRC participating agencies might work together to extend the reach or reduce duplication of current capacity strengthening efforts, and/or develop new initiatives that advance the connectivity/collaboration goals of the GRC over the long term.

The survey was completed by 38 research councils from 36 countries from the following world regions: Americas (n=10); Europe (n=7); Middle East & North Africa (n=5); Southern Africa (n=6); Asia and Pacific (n=10). Sixty percent of the research councils are located in low and middle income countries and forty percent from high income countries using World Bank classifications. Research councils from five of the top ten most populated countries and nine of the top ten largest economies are represented.

Figure 3 is a scatterplot from two survey questions. The first question (horizontal axis) asked research councils to identify their current organizational strengthening priorities from a list of 12 functions (corporate, organizational, programmatic and partnership functions). A 'high priority' response indicates a corporate commitment, a strategy or plan to improving these stated function. A low or medium priority response indicates that no emphasis or additional financial resources or time is directed currently to strengthening this function. The second question (vertical axis) asked agencies to respond 'yes' or 'no' if the experience, tools or expertise of GRC participating agencies they knew of had the potential to help them strengthen their capacity in each of the functional areas through some form of collaboration, peer-learning or training.

Figure 3



Legend

Corporate functions	Organizational functions	Programmatic functions	Partnerships
GR: Government relations/accountability	**FM**: Financial management	**P-design**: Program planning/design	**Partnerships_D**: Agency linkages/partnerships (domestic)
SP: Strategic planning	**HR**: Human resources	**P-delivery**: Program delivery (e.g., competition processes and project selection)	**Partnerships_Int**: Agency linkages/partnerships (international)
SL: Strategic leadership	**Comms**: Communications/ knowledge management	**P-m&e**: Program/project monitoring and evaluation	
		Tech: Technological systems supporting program delivery	

On the horizontal axis, for each of the listed functional areas, except for communications, more than half of the agencies reported the listed function as a high priority. On the vertical axis, research councils were very positive when asked whether other research councils could potentially support their capacity strengthening efforts. Over 50% of the research councils felt that other agencies could offer valuable forms of support in each functional area. Only financial management fell below this threshold.

When combined, the data suggests that functions in the upper right are strong candidate areas for cooperation: there is both a motivation to improve and perception that inter-agency cooperation can benefit them. High on the candidate list are international partnerships and strategic planning (black dots). There is also high potential for collaboration to support programmatic functions (design, delivery

and monitoring and evaluation) and the technological platforms that underpin these functions (dark diagonal striped dots).

Figure 3 indicates that the majority of research councils view other agencies as potential sources of support to reach their capacity strengthening priorities. Fewer agencies, however, actually take advantage of the resources within the GRC network.

Table 2: Intentional and Indirect Capacity Strengthening Approaches

No interagency collaboration	Indirect via joint research calls	Intentional		
n=17 / 45%	n=7 / 18%	n=14 / 37%		
		Events (time bound)	Initiatives (ongoing)	Both Events and Initiatives
		n=7 / 18%	n=4 / 11%	n=3 / 8%

In the first column, the plurality of agencies did not identify involvement in any inter-agency capacity strengthening event(s) or initiative(s). In the second column, 18% of the sample indicated involvement in joint calls with other agencies, and it is assumed that that such collaborations generate indirect, learning by doing, benefits for those involved. The last column indicates that 37% of the sample cite intentional approaches. Looking more closely at these approaches, this subsample is equally divided between agencies involved in time bound approaches (workshops, institutional pairing and staff exchanges), and those involved in ongoing initiatives.[14]

Comparing the responses, the survey suggests that there is more interest and potential (Figure 3) than actual use of intentional capacity strengthening approaches (Table 2), whether they be time bound or coordinated ongoing platforms.

PRIORITY TOPIC AREAS EMERGING FROM THE REGIONAL MEETINGS

This section identifies six reoccurring topics for potential collaboration. The selection of topics is based on their identification in regional meeting reports and survey responses. While these sources and the regional meeting break out discussions generated numerous ideas, only those that were repeatedly mentioned are elaborated below.[15]

Table 3 lists the topics and the regional meeting location where they were discussed. The topics identified here were not predefined by the meeting organizers. Rather they emerged in response to the opportunity to discuss areas of common interest where a collaborative or coordinated approach is merited.

[14] Agencies listing their participation in multinational coordinated initiatives identified three of the case-studies in Table 1. There was only one agency that listed another similarly designed platform that is not profiled in this report.

[15] Appendix 2provides a long list of ideas generated from survey responses and regional meeting report, which were then used to code for the frequency of responses.

Table 3: Priority Topics by Regional Meeting

Topic	Americas	Europe	Africa	Asia-Pacific	MENA
(a) Strategic Planning / Foresight			X	X	X
(b) International partnerships and joint programming	X	X	X	X	X
(c) Open Data	X		X	X	
(d) Design, monitoring and evaluation of collaborative research programs	X		X	X	X
(e) Research management / program delivery	X		X	X	X
(f) GRC connectivity tools	X	X	X	X	X

These topics align with the functional areas discussed in the previous section. Strategic planning (a) and international partnerships for joint programming (b) match the high priority functions in Figure 3. Similarly, support for programmatic functions; namely open data (c) and monitoring and evaluation and managing program delivery (d, e) are closely matched to other high priority functions. The range of suggestions to develop tools to promote GRC connectivity (f) is tied to the overall focus of discussions on partnerships for peer-learning.

(i) STRATEGIC PLANNING AND FORESIGHT

The challenge

Many agencies use strategic planning and foresight methodologies to identify emerging issues and future trends to better position themselves and their work nationally and internationally. Research councils noted that experience with these tools creates an opportunity to compare methods and findings. Meeting discussions and reports commented that increased awareness would likely lead to the early identification of common interests for collaboration, among other benefits.

Potential areas for action

Agencies expressed interest in improving their understanding of different planning and foresight tools used for agenda setting and directing resources. Methods used and the potential for refining how agencies utilize these planning tools vary considerably. Raising awareness about current priorities was viewed as a means to foster collaboration and potentially minimize duplication of various national and regional programs with similar objectives. Finally, agencies expressed interest in examining the potential application of joint foresight exercises to inform strategic research programs/technology assessments; to scale the level of analysis from national to regional levels; and to inform the design of regional or continental initiatives that seek to address shared societal challenges (e.g., the SDG agenda).

(ii) INTERNATIONAL PARTNERSHIPS AND JOINT PROGRAMMING

The challenge

There is recognition that many key scientific challenges are global and that the geographical remit of many national research councils is a real or perceived constraint to enabling international scientific collaboration. Agencies reported the need for various types of bilateral arrangements and joint funding calls. While these are seen as building blocks for wider international collaboration, many agencies identified challenges in broadening collaboration in a trilateral or a multilateral context. This applies to joint funding calls, shared infrastructure, and promoting open science / innovation programs. There are rich experiences in Europe, but research councils in other regions generally view collaborative programming as administratively and conceptually challenging.

Potential areas for action

Discussions at one regional meeting signaled a strong intent to overcome the lack of regional scientific collaboration through a jointly funded program. There are numerous models to emulate, but they will need to be adapted to suit agency policies. Ethical conduct, intellectual property, data and benefit sharing, research management and monitoring are a few of the issues requiring attention. Participating in a multilateral call can be a learning opportunity by sharing and comparing good practices. A deliberate approach to documenting and sharing good practice could serve as a useful resource for others.

(iii) OPEN DATA POLICIES AND PRACTICES

The challenge

Many consider open data an opportunity to accelerate scientific discovery and improve research integrity. While open data requirements are becoming increasingly common for public research funders, there is considerable scope for research funders to bolster their efforts in making data available and accessible.

Potential areas for action

At the Americas regional meeting, several research councils committed to sharing and comparing their experience in promoting open data policies. A network of S&T ministries and research councils from nine Latin American countries is working on a coordinated agenda to promote common standards and the interoperability of data. There are similar initiatives underway in other regions. Many delegates felt the GRC network was an appropriate venue to compare and strengthen emerging research funder practices. Potential actions might include a comparative examination of funding agency policies, as well as sharing experiences of factors that support or detract from the implementation of data sharing policies. In terms of training and peer-learning, research councils felt staff training (legal and technical capabilities) and promoting networks are needed to enable staff to promote data sharing and use effectively.

(iv) PRACTICES AND TOOLS FOR RESEARCH MANAGEMENT AND PROGRAM DELIVERY

The challenge

Most regional meetings identified research management and program delivery as a high priority area for collectively improving practice. Research councils pointed to the increasing complexity and time demand of managing proposal applications, processing and peer-review. Technology enhancements have the potential to help manage increased workload; numerous research councils felt they could support other agencies in achieving this. Research councils, particularly those representing small research systems or those supporting research in specialized fields underscored the difficulties of recruiting peer reviewers.

Potential areas for action

Moving forward with common standards as well as common tools may render grant-making processes more cost-effective and fit for purpose. In some cases, common tools may also directly facilitate multilateral research calls and research collaboration. The choice of proposal / grant management technology platforms, for example, is a significant decision for all research councils, since numerous 'off the shelf' solutions and customized applications are in use. For newly created research councils or those thinking of replacing their systems, objective advice on the functionality of different systems could be a significant form of support. There may also be interest in co-developing new open source applications for shared use among research councils. Such an approach was behind the thinking to co-develop a peer-review portal with functionalities enabling contributing national councils to train and recruit peer-reviewers on a reciprocal basis. More generally, virtual tools and hands-on sharing and comparing of expertise on research management processes was frequently noted as an action deserving of a more intentional response.

(v) DESIGN AND EVALUATION OF COLLABORATIVE RESEARCH INITIATIVES

The challenge

Numerous research councils support a wide range of 'partnered research' programs to promote social and economic innovation by fostering collaborations between academic and non-academic organizations. Such programs are increasingly common, and seemingly benefit from both political support from governments and demand from universities, industry, and the not-for-profit sectors. The evidence on the impact of such programs is emerging but there is little consensus on methods and indicators used in such assessments. This is due, in part, to the methodological challenges of quantifying and qualifying performance. For programs seeking to support the productive sector, research councils expressed dissatisfaction with the reliance on patenting data and commercialization rates to assess impact, and the unidirectional emphasis on impact on firms.

Potential areas for action

Given the considerable public investments research councils direct to partnered research programs, that there is not a stronger evidence base enabling research councils to compare the design and results of programs across sectors or countries is surprising. A potential first step is to undertake a meta-analysis of existing knowledge on the subject and identify major knowledge gaps. Two of the regional meetings proposed to examine the merits and feasibility of standardizing assessment indicators, and of their use

in monitoring and evaluations commissioned by research councils. These areas for action could inform how such calls could be designed, monitored and evaluated in the future.

(vi) GRC CONNECTIVITY TOOLS

The challenge

Research councils participating in GRC events recognize the virtual nature of the network but at the same time commented on the opportunity to introduce tools of varying sophistication and functionality to promote connectivity among agencies.

Potential areas for action

Suggested areas for improvement largely focused on making the GRC website a reference and resource site. Delegates proposed that the GRC create an intranet providing contact information for research council representatives and experts willing to be consulted. Such a resource could promote connectivity beyond the personal contacts made at GRC meetings. Access to knowledge products (e.g., agency reports, public evaluations) and materials shared during GRC events could promote inter-regional learning. Other relatively straight-forward recommendations include a news board of relevant activities around the world (e.g., reports, international calls for proposals, evaluations, strategic plans, etc). The GRC could also facilitate discussion among members through a "listserve" or Q&A board. Finally, to facilitate connectivity, regional or linguistic nodes could be established as virtual "sub-sections" of the GRC on the web.

PRINCIPLES AND APPROACHES

Regional meetings, dialogues and survey responses offered the following guidance on principles and approaches, summarized below.

Shared objectives and voluntary collaboration

The GRC is a virtual organization and does not have the capacity to organize and finance actions proposed above. Current GRC processes can identify ideas and opportunities for collaboration but where shared interests exist, research councils need to devote their own time and resources. This principle of pursuing shared objectives and voluntary collaboration remains the cornerstone from which new actions are to be developed.

Long-term and sustainable individual and organizational learning

Capacity strengthening activities and efforts to increase connectivity should benefit individuals and organizational structures over the long-term. GRC participating agencies that seek to work together are encouraged to establish plans and mechanisms that are self-sustaining, adaptive and results based.

Transparency and open access to new knowledge and tools

Actions undertaken by GRC participating agencies should strive to make their respective agencies more accountable and transparent to the public. To the extent possible, accumulated knowledge, tools and

lessons learned should be made available to all current and future GRC participants. The deployment of 'GRC connectivity tools' outlined above would support this principle and approach.

Towards inclusive research and research councils worldwide

Agencies should ensure that actions are responsive to the current and future needs of the research community, as well as key societal actors who inform debates, shape the conduct of research and utilize findings. Actions should seize on the opportunity to deepen existing networks and broaden opportunities to engage societal actors outside the research and research management communities. Similarly, multilateral capacity strengthening efforts should include and support, whenever possible, agencies with historically low levels of resources and infrastructure.

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Appendix 1: Capacity strengthening case studies

The selection criteria for the case studies profiled in this section were based on the following considerations:

- How: identify diverse approaches to capacity-development peer learning, networking, etc.
- What: profile cases that target the range of agency functions (corporate, programmatic, organizational, domestic / international linkages)
- Where: select examples from different GRC regions
- Who: profile cases that reflect different origins (e.g., North-South cooperation, bilateral or multilateral agreements); involve diverse staff representation across agencies; and prioritize initiatives that are led by or involve research councils.

Case study 1: Science Europe

Science Europe is an association of 47 large public research funding and research performing organizations in Europe. Founded in 2011, it creates a platform for advocacy of common positions and for collaboration among its members on a range of research policy topics.

MISSION / PURPOSE

Science Europe promotes the collective interests of the Research Funding and Research Performing Organisations of Europe. It supports its Member Organisations in their efforts to foster European research. It contributes to the strengthening the European Research Area (ERA) through its direct engagement with key partners. In doing so, Science Europe is informed by direct representation of relevant scientific communities in its reflections on policies, priorities and strategies.

Predecessor organizations such as the European Heads of Research Councils (EUROHORCS) provided a discussion forum for senior management but lacked the capacity to implement the results of such exchanges. Recognizing this limitation, Science Europe was established to provide a formal structure to support implementation of policy and co-operation discussions among European research organizations.

CAPACITY-BUILDING ACTIVITIES

Staff of Science Europe Member Organisations gather in thematic working groups to pursue joint work in identified priority areas. The Science Europe Roadmap lists the priority areas and objectives to be achieved in each. The Working Groups for priority areas promote mutual learning and development of

joint actions (for example, definition of joint standards and principles) in areas that are central for the operations of the Member Organisations.

The current Roadmap lists the following priority areas:

- access to research data;
- cross-border collaboration;
- gender and diversity issues in research;
- open access to scientific publications;
- research careers;
- research infrastructure;
- research integrity;
- research policy and programme evaluation; and
- science in society.

The strategy aims to increase the interoperability of research organizations and the alignment of policies and practices. In turn, this leads to higher levels of research collaboration, more coordination and more circulation of researchers and funding.

MAIN ACTORS INVOLVED

Science Europe is primarily a platform for its Member Organisations – large national public research funding agencies or research performing organizations (see current list of members).

The Working Groups convene technical experts from member organizations to develop policy positions on priority topics. Executive staff are involved in ad hoc events at which Working Group outputs are presented, as well as at General Assembly Meetings twice per year to discuss strategic issues and adopt common positions, often based on preparatory work carried out by Working Groups. Executive staff are often also involved in representational roles when engaging policy makers and European Union Institutions with Science Europe advocacy activities.

In addition, Science Europe regularly collaborates with other stakeholders from the university sector, industry, government as well as international organizations such as the OECD and the EU Institutions. Science Europe is also directly advised by its own Scientific Advisory Committee (SAC), composed of 30 outstanding active researchers from different scientific fields.

GOVERNANCE AND ORGANIZATIONAL MATTERS

An office in Brussels acts as the secretariat for all Science Europe activities such as managing the Working Groups and SAC, providing policy analysis and developing advocacy activities. An elected Governing Board, composed of Heads of Member Organisations and lead by the President is responsible for the strategic management and guidance of the organization. It reports to the General Assembly, composed of the Heads of all 47 Member Organisations. The General Assembly defines the priorities of the Science Europe Roadmap, adopts all common positions and provides the financial decisions.

EXPECTED AND/OR REALIZED IMPACT

Science Europe seeks to support its members through influencing European policies and legislation in areas related to scientific research. Science Europe campaigns have targeted areas of legislation, such as privacy and data protection, copyright, animal testing, and clinical trials.

At an organizational learning level, members who participate in workgroups gain an appreciation of the policies and approaches adopted by peer organizations in neighbouring countries.

Uptake of Science Europe outputs by its members has been positive. Particular impact has been observed in topics such as Research Integrity and Open Access, where Member Organisations have used Science Europe outputs to define and review their own policies and practices. Efforts to increase the interoperability of data on research activity through the Current Research Information Systems (CRIS) project, is an example of a current project that is expected to yield long term impact in terms of comparability and compatibility of research activity data generated by the major European research organizations. Similarly, developing common research data management protocols is expected to support increased data sharing.

References:

Website: http://www.scienceeurope.org/

Reviewed by: Stephan Kuster, Head of Policy Affairs, Science Europe

Case study 2: Science Granting Council Initiative (SGCI)

The Science Granting Council Initiative (SGCI) is a recently created forum of research funding agencies in Africa that supports organizational learning and professional development through peer-to-peer exchanges, joint programmatic activity, and training/mentoring activities.

MISSION / PURPOSE

SGCI's mission is to strengthen the capacities of science granting councils in order to support research and evidence-based policies that will contribute to economic and social development in Sub-Saharan Africa.

This initiative emerged from a study and a consultation in South Africa in 2014 on the changing research landscape in Africa and, in particular, the emergence of new and reform of existing agencies mandated to support research. While noting many positive developments, the study also identified a set of interrelated challenges that constrained the potential of national agencies.

The interest of research councils attending the 2014 consultation to address their challenges through peer exchange was subsequently developed by IDRC and South Africa's National Research Foundation (NRF), and with the additional support by the UK's Department for International Development (DFID). This led to a five-year initiative involving 15 national agencies.

CAPACITY-BUILDING ACTIVITIES

SGCI activities support corporate, programmatic and linkage/partnership functions.

At the corporate planning and reporting level, activities center on the development, collection, analysis and use of STI indicators; use of foresight and scenario-building techniques to identify and prioritize future STI needs; the design and management of science and technology cooperation agreements; and effective communication of research results.

Strengthening programmatic functions focus on such areas as grant-making systems and procedures; aligning publicly funded research with the needs of the private sector; and implementing new modes of scientific practices, such as open access and open science.

The third set of activities is directed at improving both domestic and international partnerships. Within countries, members seek to compare and improve the linkages between research performing organizations and the private sector in such areas as agriculture, energy, and health and life sciences. Participating SGCs have plans to launch joint calls to support collaborative research projects. International linkages among research funding agencies are developed through learning forums on particular themes, and with other science systems actors within and outside the African continent.

MAIN ACTORS INVOLVED

SGCI involves fifteen public research funding agencies and ministries of science from West, Central, East and Southern Africa. Representation in activities varies from heads of agencies to program staff.

GOVERNANCE AND ORGANIZATIONAL MATTERS

The United Kingdom's Department for International Development (DFID), Canada's International Development Research Centre (IDRC), and South Africa's National Research Foundation (NRF) support the SGCI with an initial five year budget of CA$13.9M to cover a range of activities including training, background studies, technical assistance and some networking costs. Participating SGCs contribute time and funds to attend meetings and finance programmatic activities.

An inaugural meeting was held in Nairobi, Kenya in September 2015 and subsequently Annual Learning Forums (ALFs) are planned to provide an opportunity for the Heads of SGCs, the collaborating technical agencies, international experts, donors and other actors in STI to consider issues of continental relevance such as research excellence – the theme of the ALF in Maputo, Mozambique in November 2016. ALFs are held in collaboration with the African Union Commission and NEPAD and aim through their deliberations to contribute to the Science, Technology and Innovation Strategy for Africa 2024. In addition, regional meetings will take place alongside STI meetings of regional economic communities (RECs), attended by technical level staff of the SGCIs and the collaborating technical agencies. In this way the SGCI may help to strengthen the agendas of the RECs and enrich regional STI policy debates. One such event took place in Kigali, Rwanda in August 2016 alongside discussions of the East African Science and Technology Commission.

EXPECTED AND/OR REALIZED IMPACT

The initiative is too young to report on learning outcomes or organizational capacity strengthening. Of interest, however, is that the SGCI created monitoring indicators to assess progress toward its goals. These include more effective research management practices among Science Granting Councils; increased use of STI indicators to design and monitor research programs; increased knowledge transfer to the private sector; and, increasingly coordinated and networked science granting councils.

References:

Website: http://www.sgciafrica.org/

Reviewed by: Loise Ochanda, IDRC (Nairobi)

Case study 3: ESSENCE

ESSENCE on Health Research is an international collaboration coordinated by the World Health Organization bringing together research funders, development and philanthropic agencies, and multilateral initiatives. It aims to harmonize the practices of global health research funders to improve the impact of their investments and enhance research capacity.

MISSION / PURPOSE

ESSENCE was established in 2008 to increase the impact of global health research. It emerged in the context of growing investments in research by agencies located in high income countries to address critical health challenges in low- and middle-income countries, and the perception of all involved that funding agencies' current approaches and research conditions needed to be improved for their research investments to realize their full potential.

Specific shortcomings identified by ESSENCE members at that time include:

- a growing number of agencies involved in funding global health research with little coordination among them and an increasingly complex research funding landscape;
- a fragmented approach to funding such that some areas of research are well funded while other areas remain underfunded;
- research priority setting and implementation of efforts conducted without due concern for national priorities and involvement of national agencies where research is conducted or potentially applied; and
- less than optimal uptake of research results by health systems in locations where the research sought to make an impact.

CAPACITY-BUILDING ACTIVITIES

Capacity strengthening is focused on enhancing programmatic functions and improving how funding agencies partner with other research funding agencies and users of health research. To strengthen program delivery, members have undertaken good practice studies to understand how agencies cost research, evaluate research programs, and build capacity for health research. The participatory approach to these studies involves relevant stakeholders (e.g., policy-makers, health service providers, funders and researchers) so that funders appreciate the broader impact of their research funding programs. In some cases, commissioned studies have led to the development of training materials to further disseminate lessons and good practices.

Strengthening international linkages and partnerships with other funding agencies and with national users of health research is a major emphasis. ESSENCE meetings convene funders and stakeholders on a range of topics like priority research topics, geographic reach, program delivery and partnership models with a view to coordinate, harmonize and align external funding and research activities with a country's national health agenda.

MAIN ACTORS INVOLVED

Participation in ESSENCE is largely represented by public and philanthropic research funding agencies based in high income countries supporting research in low- and middle-income countries. Participation in the network's activities is typically represented by program staff.

Past and current agencies involved in ESSENCE activities include:

- development cooperation agencies (Austrian Development Agency, Swedish International Development Cooperation Agency, Swiss Agency for Development and Cooperation, Ministry of Foreign Affairs of Denmark, Norwegian Agency for Development Cooperation, International Development Research Centre, United Kingdom Department for International Development);
- multilateral organizations / initiatives (African Development Bank, European and Developing Countries Clinical Trials Partnership, European Commission);
- philanthropic agencies (Bill & Melinda Gates Foundation, Oswaldo Cruz Foundation, Wellcome Trust, UBS Optimus Foundation); and
- public research funding agencies (Canadian Institutes of Health Research, South African Medical Research Council, Fogarty International Center - National Institutes of Health, The Netherlands Organisation for Scientific Research).

GOVERNANCE AND ORGANIZATIONAL MATTERS

Secretariat functions are performed by one part-time coordinator based at the WHO. A steering committee oversees the annual work plan, the work of thematic committees and the Secretariat. It organizes an annual general meeting and two additional meetings in conjunction with health conferences.

At present, Sweden supports the core costs of the secretariat and all other costs are covered by voluntary contributions of participating agencies. Costs borne by members include attending meetings, sponsoring studies, and funding joint research projects.

EXPECTED AND/OR REALIZED IMPACT

A 7-year review of ESSENCE was undertaken in 2015. It found that participating members valued ESSENCE meetings and studies in that they improved the design and delivery of their health funding programs and strengthened the coordination amongst research funders.

Participating members felt further work was needed to define the goals of the network. The governance and the implementation of initiatives need to be strengthened, through greater investment in the Secretariat function. Members agreed to do further work on addressing this gap starting in 2016.

Website: http://www.who.int/tdr/partnerships/essence/en/

Reviewed by: Nicole Généreux, IDRC

Case study 4: African Science Academy Development Initiative (ASADI)

The African Science Academy Development Initiative (ASADI) was a 10 year capacity strengthening program involving select academies of science in Africa. It was established in 2004 to strengthen African academies' ability to inform government policy-making and public discourse with independent, evidence-based advice.

MISSION / PURPOSE

ASADI's mission was to strengthen the capacities of national academies of science so that they are better able to inform policymaking through evidence-based science advice. The program was motivated by the awareness that academies tended to be honorific bodies and did not take full advantage of the expertise within their membership to inform public policy decision-making through independent advice.

CAPACITY-BUILDING ACTIVITIES

The initiative employed a wide range of capacity building approaches. These included mentoring by more established academy staff, peer learning through regional meetings, and learning by doing through collaborating on policy advisory reports. ASADI's approach provided support to all four functional domains: corporate, organizational, programmatic and linkage / partnership development with other agencies.

At the corporate planning and reporting level, activities centered on strategy development and long-term planning. Challenges faced by some academies included building relations with government and establishing governance independence.

Strengthening organizational functions focused on human resource development and financial management and stability. As part of this effort, staff training in situ and in the United States was conducted and physical infrastructure was enhanced.

The principal focus for program development was coaching academies to conceive, implement and disseminate advisory reports. This was an area of little experience and effort was directed to health and sustainable development issues.

The final set of activities was directed to improving both domestic and international partnerships. Within countries, academies developed broader relationships with the business and social sectors, and government agencies. Such relationships were cultivated through programmatic activity, allowing academies to widen their networks. Complementing this work, ASADI organized annual regional symposia and collaborative workshops allowing academies to learn from each other.

MAIN ACTORS INVOLVED

ASADI had five core participating academies: Cameroon, Ethiopia, Nigeria, South Africa and Uganda. In addition, three national and one regional academy were also involved, including the academies of Ghana, Kenya and Senegal, and the African Academy of Sciences.

GOVERNANCE AND ORGANIZATIONAL MATTERS

The Bill & Melinda Gates Foundation was the major funder contributing $20 million to the Initiative. Their support was augmented by other funding agencies. Participating academies also contributed funds.

The ASADI program was implemented by the United States National Academy of Science from 2004 to 2015. In addition to annual meetings of participating academies, a wide range of training, advisory and networking activities took place involving secretariat staff and academy members.

EXPECTED AND/OR REALIZED IMPACT

ASADI was evaluated in 2014 by a panel established by the InterAcademy Council. Commenting on the release of the IAC Report, the chair of the review panel stated: "Africa is not alone in facing science and technology capacity challenges. This review shows that working in partnership has benefits for all partners, and that the more deeply and widely knowledge can be shared, the greater its potential benefit. These lessons apply globally.[16]" (Turner T. Isoun, former Nigerian Minister of Science and Technology)

The panel's high-level finding is that the "ASADI has met its objectives and milestones, and must be regarded as a success. Important quantitative metrics for staff training and for the production of consensus reports of policy value were both met and exceeded. ASADI aimed to grow the academies' abilities to be effective, objective sources of evidence-based policy advice, occupying a unique civic space in their respective societies. There is no doubt that this growth has occurred."

As ASADI was closing, South Africa convened 24 academies and other stakeholders to develop a successor program entitled Africa's Science Academy Development Agenda (ASADA). This represents continued interest in collaboration, as well as a transfer of leadership from agencies that conceptualized ASADI to those agencies who were involved in and benefited from their association with ASADI.

Websites:

ASADI website: http://www.nationalacademies.org/asadi/index.html

The IAC Report http://www.interacademycouncil.net/24026/28769.aspx

Case study 5: Global Observatory of Science, Technology and Innovation Policy Instruments (GO-SPIN)

GO-SPIN was established in 2012 by UNESCO to strengthen the understanding of national science, engineering, technology and innovation (SETI) policies through analysis of national policy instruments, networking, training and benchmarking. It seeks to build the capacity of officials responsible for designing, implementing and evaluating SETI policies. At the national level, GO-SPIN involves representatives across governments responsible for agenda-setting, policy formulation, decision making, policy implementation and evaluation of SETI policies.

MISSION / PURPOSE

GO-SPIN emerged in response to the lack of robust indicators and time series data to evaluate SETI policies. UNESCO realized that input and output indicators alone provide inadequate guidance to policy-makers. In addition, recent conceptual developments for understanding SETI policies argued for better analysis of the relationships among organizations involved in the SETI arena, and the formal and informal institutions shaping their performance. As such, GO-SPIN was designed to capture new data

[16] http://www.interacademycouncil.net/24770/28951.aspx

and relationships to benchmark country performance and do so in a way that would allow comparison across countries.

CAPACITY-BUILDING ACTIVITIES

GO-SPIN collects and reports country data through two mechanisms. First, UNESCO invites national agencies to complete country surveys; the data is then accessible through the GO-SPIN online platform. The second mechanism is in-depth country profiles. For these, GO-SPIN organizes preparatory training workshops for agencies contributing to the self-assessment profiles and validation workshops to discuss report findings. To date, 20 countries have participated in such workshops involving over 260 agencies. Research funding agencies contributing to these exercises profile their programs and map their domestic and international partnerships. Many more countries have completed national surveys to populate country data on the GO-SPIN online platform.

Corporate functions such as evaluation and benchmarking are strengthened through the self-assessment process. When a country volunteers to profile itself, participating agencies are guided by UNESCO staff to follow a methodology that involves data gathering and assessment of policies and implementation across government (UNESCO 2014).

Ultimately, GO-SPIN seeks to promote policy learning among countries by enabling countries to benchmark the performance of their policy instruments against others utilizing its analytical framework and open access data platform. A prototype of the platform is available at http://spin.unesco.org. Covering 34 countries in Latin America and the Caribbean, the platform provides access to SETI legal frameworks and organizational charts, an inventory of 750 operational policy instruments and around 400 temporal series of indicators.

MAIN ACTORS INVOLVED

GO-SPIN is a voluntary initiative that relies on national government leadership to initiate and support the GO-SPIN methodology in collaboration with UNESCO. This bilateral collaboration continues until the country profile is validated and published. At that time, broader policy learning across countries is facilitated through the GO-SPIN website and ad hoc training workshops on cross-cutting methodological issues and data collection.

UNESCO has a standard setting mandate for Education, Science and Culture statistics. To make UNESCO´s GO-SPIN system compatible with similar platforms and initiatives, it is currently developing the Paris Manual to systematize the way agencies collect information on policies and policy instruments. In addition to country collaboration, UNESCO has partnered with other multilateral initiatives such as the African Observatory of STI to support implementation and monitoring of GO-SPIN.

GOVERNANCE AND ORGANIZATIONAL MATTERS

GO-SPIN is managed by UNESCO's Division of Science Policy and Capacity Building. It builds on a predecessor program in Latin America and the Caribbean, and UNESCO's long-running support for SETI country studies dating back the 1960s.

The business model is similar to the OECD's Innovation Policy Reviews whereby the country requesting a study is expected to contribute. UNESCO has supplemented national contributions through member state contributions and special funds. The first three African country profiles, for example, were supported through Spain's international development cooperation agency (AECID) contribution to

UNESCO. Additional support from the Swedish International Development Cooperation Agency (SIDA) has allowed GO-SPIN to initiate five new country profiles and program support to strengthen the online platform and technical guidance documents.

EXPECTED AND/OR REALIZED IMPACT

UNESCO anticipates that GO-SPIN will help governments review their country's performance with more effective indicators and benchmark their performance. As a new initiative, GO-SPIN has yet to assess the impact of its work. However, it is anticipating this by working with the African Observatory of Science, Technology and Innovation (AOSTI) in Africa, who will work with countries commissioning studies to monitor implementation.

REFERENCES:

Website: http://www.unesco.org/new/en/natural-sciences/science-technology/sti-policy/global-observatory-of-policy-instruments/

UNESCO 2014. Proposed Standard Practice for Surveys on Science, Engineering, Technology and Innovation policy, SETI Governing Bodies, SETI Legal Bodies and Frameworks. http://www.unesco.org/new/en/natural-sciences/science-technology/sti-policy/global-observatory-of-policy-instruments/

Reviewed by: Guillermo Lemarchand, Consultant and Principle Investigator, GO-SPIN

Case study 6: OECD Innovation Policy Reviews

Starting in the early 1960s, the OECD carried out an influential series of science and technology policy reviews which were requested by member states with the goal of examining their performance and promoting peer learning through comparison with other countries. The OECD published 38 studies between 1963 and 1996.

In 2005, the OECD launched a new, demand-driven series of OECD Country Reviews of Innovation Policy with a different methodology and scope. The focus still centered on the role of public policy but the Innovation Policy Reviews adopted a wider innovation systems perspective and accepted requests for review from OECD members as well as partner countries, including major emerging economies. In the last decade, the OECD undertook 24 national and one regional review of Southeast Asia. Approximately half of the countries reviewed were non-OECD members.

Among the factors driving the demand for Innovation Policy Reviews are:

- the importance of science, technology and innovation to forming a knowledge-based economy;
- the need to develop appropriate policy responses to the emerging challenges and opportunities arising from new technologies;
- the key role of science, technology and innovation in tackling societal challenges that require systemic approaches, coordination, prioritisation and funding; and
- the desire by both OECD members and partners for international comparisons and peer-learning.

MISSION / PURPOSE

The purpose of *OECD Reviews of Innovation Policy* is to offer a comprehensive assessment of the research and innovation system, and the organizations and institutions that drive these activities in OECD member and partner countries. The principal aim is to identify opportunities to strengthen public policy as it relates to national policy frameworks governing research, higher education, innovation and economic development. Through policy dialogues within countries and broader fora bringing together OECD members and partners, each review also contributes to policy learning.

CAPACITY-BUILDING ACTIVITIES

An Innovation Policy Review provides analysis and concrete policy recommendations to improve the overall performance of a country's innovation system. As such, there are multiple agencies involved and policy learning is directed at the top levels of governments, executive decision-makers of national agencies of science, education, industry and associated agencies. In terms of targeted functions, the Reviews seek to enhance governance functions such as strategy development and implementation, funding, monitoring and evaluation, thus strengthening accountability and policy learning. Innovation Policy Reviews also contribute to strengthening the co-operation and co-ordination among government agencies. With innovation as the central focus, agencies that fund research are examined alongside ministries that support higher education and economic development.

MAIN ACTORS INVOLVED

OECD Innovation Policy Reviews involve staff from the OECD's Directorate for Science, Technology and Innovation, external consultants, peers reviewers from OECD countries and a team from the host country, typically led by the Ministry of Education, Science or Economy (individually or in cooperation). Policy dialogues on each Review are organized under the auspices of the OECD Committee for Science and Technological Policy (CSTP), a committee representing OECD member states and with participation of partner countries.

The process starts with the OECD accepting a country's request for an Innovation Policy review. If accepted, the country is asked to prepare a Background Report (often commissioned by the national authorities from national experts) that informs a fact-finding visit by the OECD review team (OECD staff and consultants). The fact-finding visit consists of interviews with a broad range of stakeholders, representing relevant agencies in charge of the subject matter of the policy review. Following, the OECD's draft report serves as a basis for consultations with national authorities, leading to an Assessment and Recommendation document which summarises the findings. This document is peer reviewed by the Working Party for Technology and Innovation Policy of the CSTP. The full Report is published by the OECD and typically launched at a high-level event hosted by the authorities of the country reviewed to promote wider policy learning.

GOVERNANCE AND ORGANIZATIONAL MATTERS

Innovation Policy Reviews are a corporate function of the OECD's Directorate for Science, Technology and Innovation. They are major exercises involving central coordination by the OECD in cooperation with numerous agencies and individuals in the country that requested a review. These individuals range from policy makers being interviewed to analysts providing historical data, case studies and contextual analysis of the policy instruments and performance.

The cost of each review is not published and is the responsibility of the country requesting the Review. The OECD contributes its datasets and accumulated knowledge base on science, technology and innovation – including their funding – combined with expertise in key policy areas such as education, public governance and macroeconomics.

At present, the OECD undertakes four reviews per year, each taking one or two years to complete.

EXPECTED AND/OR REALIZED IMPACT

The OECD has not published a meta-analysis of the impact of its Innovation Policy Reviews. However, the demand over the last decade from countries experiencing rapid economic transformation, as well as countries seeking structural transformation, speak to the value of the approach. Recent Reviews include dynamic emerging economies like China and Korea, and recently Viet Nam and Malaysia, and from advanced countries in science, technology and innovation (e.g., France, Netherlands, Sweden, Finland and Norway).

Their contribution to building capacity is also evidenced by examining changes within countries to implementing recommendations. For instance, in the first second-round review of Luxembourg 2016, following a Review in 2007, there was a strong impact on the expansion and restructuring the country's public research and funding system.

REFERENCES:

Website: http://www.oecd.org/innovation/inno/oecdreviewsofinnovationpolicy.htm

Reviewed by: OECD's Directorate for STI

Case study 7: SciELO (Scientific Electronic Library Online)

SciELO is a pioneering example of a partnership led by research funding agencies to advance their research communication mandates and improve the research environment in Latin America through the development and support of an open access platform for scholarly publication. Since its launch in 1997, SciELO has created a bibliographic database, digital library, and cooperative electronic publishing model for open access journals. As of 2016, there are 15 countries, mainly in Latin America, present in the SciELO network and its journal collections.

MISSION / PURPOSE

SciELO was created to reduce the cost of accessing publicly funded research and increase the visibility of, and access to, scientific literature. It is a model for managing and maintaining a network of publications, whereby common standards and policies can be developed for housing national and thematic collections of articles. Each collection has its own portal, as well as a centralized, consolidated search function and access point.

SciELO began as a pilot project to coordinate academic publishing on the web for Brazilian journals. An early priority for SciELO was to move journals online, following what is known as the "gold" route to open access. It then created a bibliographic index associated with a database that could track usage and

citations. The fact that SciELO offers both the articles themselves and citation data for them has been key to its growth. The "open" metadata, in particular, has been useful to researchers and research managers in examining the amount and type of research being conducted.

CAPACITY-BUILDING ACTIVITIES

SciELO is a coordinated effort by funding agencies and other partners to support the research community's access scholarly literature. As such, it is not designed as a mechanism to strengthen the capacities of research funding agencies per se. However, in establishing and expanding SciELO, the initiative required agencies to develop external partnerships and a common technological platform.

To support its expansion, SciELO provides training to ensure interoperability of the platform and a common methodology for setting-up and maintaining the collection. The Brazilian Institute of Information in Science and Technology (IBICT), for example, offers training and support in publishing in open access and on the use of the use of an open access platform. An unintended consequence of SciELO is its contribution to informing research policy through bibliometric analysis not available through other datasets.

MAIN ACTORS INVOLVED

SciELO originated as a partnership between the Science Foundation of the State of São Paulo (FAPESP) and the National Library of Medicine or the Latin American and Caribbean Center on Health Sciences Information (BIREME), itself a center of the Pan American Health Organization (PAHO/WHO). FAPESP's early motivation in driving the project was to make Brazilian science more visible globally. BIREME's original involvement provided institutional stability and expertise in the field library and information science, particularly useful as it pertains to networking institutions. Chile's National Research Council was an early adopter in 1998 and played a key role in the growth of SciELO in the region.

Since 2002, SciELO has received considerable support from Brazil's national science funding agency, CNPq, as well as other public funders. Over its life, SciELO has attracted long-term financial support. While each country funds the majority of its own SciELO operations, SciELO Brazil also serves as the overall secretariat for the network and benefits from a multi-million dollar annual grant from FAPESP.

GOVERNANCE AND ORGANIZATIONAL MATTERS

SciELO's content is provided through different national "collections," but relies on a central coordination function and explicitly defined criteria and processes to ensure common standards and methodologies. This certification process proceeds as follows: a national coordination institute presents the case for the establishment of a collection; participates in a pilot project (partially as a learning process); is listed in SciELO as "under development;" and continues to regularly publish content as a full journal collection.

SciELO relies on an advisory committee to inform its governance and decisions. It can propose to include or exclude journals (based on SciELO criteria), propose new indicators to assess existing content, and propose changes to evaluation criteria for inclusion/exclusion of content.

In many respects, the governance at the national level mirrors that overall structure and coordination of SciELO in terms of selecting and managing content in each collection. It is often the national academies of science that play a key role in maintaining and growing SciELO. The database also contains thematic collections, which are focused on improving global or regional coverage and visibility, and rely primarily

on journals within existing national collections. They follow essentially the same processes and governance as national collections.

EXPECTED AND/OR REALIZED IMPACT

The success of SciELO is reflected by the relatively high rates of open access publishing in Latin America. It also provides venues for locally- or regionally-relevant research that would otherwise not be viable through traditional subscription-based journal models. The recognition of the network has also led to it partnering with Thomson Reuters in 2012 to launch a citation index that combines its data with that of the widely-used Web of Knowledge journals. It has also inspired the creation of other free publishing platforms in the region such as Redalcyt.org.

On a broader level, SciELO has become a central part of the research ecosystem in Latin America and beyond, thanks to a relatively simple approach and methodology and a limited coordination function. The nature of this platform has led it to be expanded while maintaining its coherence.

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Appendix 2: Long list of ideas identified in regional meetings and survey responses

Development, exchange, adaptation of research management support tools / technologies

- A web-based training tools to support peer review processes; recruitment mechanism to help research councils identify international peer reviewers (co-developed database?)
- Exchange of practices and tools to strengthen research management processes to meet increased grant management workload
- Mechanism that promotes access to research findings; tools that reduce duplication of research
- Developing, standardizing, sharing research council 'data on research activity' (i.e., administrative data) and its use for planning and evaluation purposes

Peer exchange /working groups to inform policy and practice

- Promoting open data standards and data inter-operability; support adoption and use of open data infrastructure in the research community
- Experience sharing on Open Science platforms
- Strengthening management of program delivery processes
- Mechanisms / tools that support trilateral / multilateral research cooperation; financial and programmatic elements
- Inter-agency coordination and/or development of funding programs to tackle global challenges (e.g., Sustainable Development Goals)
- Measuring research engagement and societal impact of research; research communication
- Design, monitoring & evaluation of strategic research programs (e.g., academic / non-academic partnered research programs). 'Harmonize research impact assessments among GRC members'
- 'Technopreneurship' / commercialization programs: design & impact
- Foresight & strategic planning tools; benchmarking
- Strengthening STEM education / leadership
- National / regional mechanisms for promoting researcher mobility
- Develop shared codes of conduct on Intellectual property rights, research ethics, research funding in regions of political instability
- Shared research infrastructure

Proposed GRC website functionality to facilitate networking / connectivity

- Contact list of research council focal points for GRC business
- Experts / expertise registry by research council
- Q and A message board; listserve to distribute funding calls/opportunities
- Knowledge sharing repository (curated materials from past meetings / emerging topics of interest)
- Tracking tools to monitor implementation of GRC actions / prior Statements
- Promote regional / linguistic nodes with the proposed GRC website architecture