



Scientific mobility and institution building in science in developing countries

Policy Brief

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ResIST Deliverable #16

January 2009

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This Policy Brief looks at the relationship between migration and the sustainability of universities in developing countries. It focuses on scientific mobility between developing countries in the South (specifically sub-Saharan Africa) and the North and the consequences of sustained brain drain on the quality and sustainability of universities in these developing countries. The paper develops further a thesis on the “de-institutionalisation of science” in developing countries as it pertains to scientific migration.

One of the prevailing arguments about scientific migration and “brain circulation” is that the movement of scientists and academics between institutions and countries is a positive feature of the modern global world. The argument is that individuals accrue benefits in terms of new experiences, competencies and networks gained and also that there are also obvious benefits to the returning country. This paper argues that this “brain circulation” thesis is premised on (incorrect) assumptions about equal and symmetrical flows of highly skilled personnel (HSP) between countries. Moreover the circulation and mobility of scientists across different countries and institutions occurs where there are reasonably strong and well-resourced institutions.

Scientists returning to a country where there is a science system that is well-funded and governed and where research institutions are properly managed and adequately resourced are in fact able to “give something back” (cf. Thematic Paper 1). The South African science system is in most respects a modern and self-sustaining research system with many strong and internationally acclaimed universities. But this is not the case for many countries in the rest of Africa.

The effects of scientific mobility on weak and dysfunctional institutions are quite different and the worst effects of “brain drain” are apparent in these systems. The institutions of science in many sub-Saharan countries have been systematically eroded and broken down over the past three decades through various international economic policies as well as the devastating effects of domestic policies and events. The cumulative effect of these policies over time has had various impacts:

- A decline (at least in relative terms) in scientific output,
- Changes in modes of scientific work,
- The devaluing and degrading of the profession of science;
- The brain drain.

The relationship between the state of the institutions of sciences and the brain drain is a reciprocal one – the continuing decline of human capital in science and technology through the brain drain has become itself a major cause of the de-institutionalisation of science. The continuing drain of high level human resources in many developing countries continue to weaken the institutions of science which in turn cause more scientists to turn away from “normal” scientific practices and increasingly to seek employment elsewhere – a true “vicious circle”

Focus on scientific institutions: The most general policy implication here speaks to the relationship between brain drain from the South and the state of scientific institutions in these countries. The continuing brain drain from this region will not be reversed simply by looking at interventions that target individual scientists (such as home coming initiatives or diaspora networks or exchange programmes). This paper points to the key role of the institution and how the brain drain continues to erode institutional capacity and institutional research culture. Any attempt to reverse the brain drain will fail if it does not also consider interventions and initiatives that restore and eventual make these institutions sustainable research institutions.

Numerous studies have been conducted over the past 10-15 years that convincingly demonstrate that research at former well-resourced and supported institutions in many African countries have

deteriorated; that research infrastructure and the general state of laboratories at many institutions has suffered from a lack of maintenance and timely replacement of old equipment. In addition the generally poor quality of library resources has not improved significantly with many university libraries not even using automated management systems; the demand for sufficient research funding for ongoing research and scholarship continues as does the need for proper research management and support at most of these institutions.

Continuing investment in the essential Information and Communication Technologies. Research centres and programs are in a sense the “superstructure” of science. But this is dependent on an extensive ICT infrastructure (fibre optic networks, information systems development, sufficient bandwidth, automated library management systems). Much effort and funding has over the past 5-10 years been invested in this area. However, it is clear that many challenges remain. Experience has shown that many universities have outdated administrative systems with archaic procurement policies that make the simple acquisition of computer equipment extremely difficult. Moreover the absence of a local support system (in the form of local vendors and maintenance companies) means that broken equipment often do not get repaired or replaced.

The de-institutionalisation thesis – Many of the scientific institutions in Africa are fragile and susceptible to the vagaries of political and military events. They are severely under-resourced and suffer because of a lack of clarity and articulation of science governance issues (demonstrated by constant shifts in ministerial responsibility for science). One could even refer to some of these science systems and the associated institutions as operating in a “subsistence” mode where they struggle to even reproduce themselves. A “subsistence mode” in this context would refer to a system that basically produces knowledge for its own use only and does not export knowledge. In fact it does not make a significant contribution in the global game of knowledge production. It is even debatable whether one can talk of a science “system” in many of these countries as they do not exhibit typical “systemic” characteristics.

Four factors that have in the past and still continue to shape and affect the (de)institutionalization of science in these countries:

- The continuing legacy of colonial science in many countries;
- The destabilizing influence of political events and civil wars;
- The role of international agencies in shaping African sciences;
- The gradual erosion of human capital through the brain drain.

Training and technical advice in research management and graduate studies. Very few African universities (outside of South Africa) have well-established research management offices. Although some effort has been made in recent years to strengthen the local expertise in this field, this is simply not enough. Our experience shows that many research managers at these universities are recently appointed, have very little knowledge of how to manage the institutional research profile and how to access funding and support to do so. In addition research directors and managers of doctoral programs require much more training and support across a wide range of skills and competencies in such areas as the supervision of graduate students, development research plans and strategies, codes of conduct on integrity in research and so on.

The paper sets out a discussion of the effects of sustained de-institutionalization on modes of knowledge production in these countries. Because of low domestic investment in R&D, most African universities and scientists rely heavily on international funding. In addition, because of poor institutional capacity, funding for research is not channelled through a properly articulated and monitored system of public funding (e.g. through a national funding agency), the individual scientist and academic at a university receives his or her funding directly from foreign funders (or through the mediation of a local representative). Those who are privileged to receive such funding use it to pursue their own research interests (not surprisingly) and also to advance their own careers. This allows them to travel overseas, attend international conferences and in general have the

required resources to build their own individual research capital. This focus on building one's own curriculum vitae must be understood within the context of poor academic salaries and working conditions and a general lack of sufficient research and library resources. But, this kind of scientific endeavour rarely converts into building institutional research capacity. It is not linked, for example, to training doctoral or even post-doctoral researchers. The fact that there are so few doctoral programs at many of these universities means that "reproducing" existing scientific work through doctoral students is not even possible.