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Introduction and Overview

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In the first three decades of the post World War II development era, national governments and aid agencies placed high priority on higher education capacity building. Based on the assumption that higher education would produce social benefits as well as individual returns, these investments were guided by two principles. The first principle was that insuring access to the frontiers of knowledge had high development "leverage." By sending young faculty to the leading universities in developed countries for advanced degrees, a developing country could quickly build one or more "flagship" universities where these faculties could work at the frontiers of their disciplines and offer leading-edge training for their countries. The second principle was that these universities would integrate the arts and sciences with the applied science and engineering disciplines to serve as a research conduit to the technological frontiers of developed countries. They would also train a domestic work force to build local prosperity and compete in world markets. These "first-wave" programs were supported by U.S. Agency for International Development (USAID) and FAO as well as private foundations such as Rockefeller and Ford Foundations.

Evaluations of these first-wave programs of support for higher education generally concluded that they did in fact achieve their objectives in most Latin America and Asian countries. Several programs were also developed in Africa, but these started later and had less success. Despite their overall success, support for these higher education programs dried up in the 1980s and 1990s. As they were discontinued, African higher education was particularly disadvantaged.

Several factors appear to be responsible for this decline in support. Supporters had conceived them as "one shot" programs and did not plan for continued support. Most first-wave support programs did experience brain drain losses (donor-supported candidates did not return to the home university or research center), but these were often considered manageable. Finally, many host governments, especially those in Africa, failed to provide the financial resources and institutional support required for flagship universities to succeed. It appeared not to be based on the brain drain problem.

Two additional factors contributed to the downgrading of higher education in the portfolios of development agencies. First, reviews of "returns to schooling" studies in developing countries appeared to be showing highest returns, especially for girls, to primary and secondary education programs, not to university education. These higher returns were in the forms of higher wages on income or improved social conditions. Returns to schooling studies are typically based on private returns and do not include an analysis of external benefits in the form of better access to technology or societal resources. Second, many development agencies shifted their support to projects promising short-term pay-offs. Often these projects were administered by nongovernment organizations (NGOs), and generally their success did not depend on high-level skills, such as Ph.D.'s or technical degree. This approach reinforced the shift away from higher education as a development priority.

Recent interest in a potential "second wave" of support for higher education programs is based on the prospects of improved institutional and host government support in countries where first-wave successes were not achieved. Thus, Africa is now considered promising for a second-wave support program.

This renewed interest in higher education led to support by the Rockefeller and Ford Foundations and by the Carnegie Corporation for convening a conference on International Higher Education and African Development at Yale University in October 2001. This conference was organized to:

- Review and refine elements of a policy-oriented research agenda and contributions from different professions and disciplines.
- Assess the costs of and benefits from strengthened higher education programs in Africa.
- Critique the underlying approaches.
- Explore the feasibility of enhancing the development impact in Africa of higher education in a globalized world.

The conference brought together a group of interdisciplinary experts involved in issues of higher education in Africa, development in Africa, and, for comparative purposes, higher education in Latin America and the United States.

The conference began with two keynote papers: Mamphela Ramphele on the university's role as an actor in national development and Kenneth Prewitt on the effects of changing global dynamics on higher education with special attention to Africa.

Four papers focused on the economic dimension. Benno Ndulu's paper provides detailed analysis of human capital mobility or brain drain issues with

innovative insights. Papers by T. Paul Schultz and by David E. Bloom and Jaypee Sevilla present a debate on private and public returns to investment in higher versus other levels of education. Robert E. Evenson's paper caps the economists' contribution with a focus on the contribution of high-level research, especially in agriculture and health sectors, to national development.

The final two papers focus on the institutional dimension. Ebrima Sall reviews the historic and contemporary challenges to and responses from Africa's higher education systems. Akilagpa Sawyerr concludes the series with a provocative analysis of the causes of the research and training gaps in Africa, accompanied by concrete responses to enable higher education to meet the development challenges of Africa.

In this overview, we summarize these topics and suggest further research and action options. Where possible, we have included the additional ideas generated during the conference and also in the formal comments.[1]

The University: Changing Roles in a Changing World

The conference began with a speech by Mamphela Ramphele, in which she stated: "There is no longer a debate about the importance of knowledge as a critical element of sustainable development in today's competitive global economy." Later in the conference, Ebrima Sall explicitly made the link that had been implicit in many of the discussions: "The growing importance of knowledge makes higher education more important than ever." This premise was at the heart of many of the discussions at the conference. Robert E. Evenson begins his paper with the claim, "Knowledge . . . is an international public good" and discusses why higher education is needed for individual countries to be able to tap into the global flows of this crucial public good. Clearly, there is a consensus that knowledge is important to national and human development. There is also consensus that higher education enables nations to both create and use this knowledge for development.

What is less clear is *how* higher education serves these purposes. What types, levels, and functions of higher education are suited to meet the spectrum of national development needs? Much of the discussion at the conference focused on teasing out the nuances in, if not actually on, this question.

A key question is what we mean by higher education. Higher education may include everything from postsecondary school vocational Ph.D. level training. Generally, we use higher education to refer to university education. Even the universities encompass a broad range of education. There is education at baccalaureate and higher levels, such as those for an M.A. or Ph.D. There are programs that prepare students for specific professions, such as business, law, or medicine, and those that prepare students for broader research or

policy-oriented fields. Different programs will have different impacts on students. They also have different spill-over effects within society.

Without explicitly stating so, many of these papers refer to flagship public universities. In discussions, there is a tension between what African universities could contribute and what they actually are able to do. The ideal form of these flagship public universities would provide quality undergraduate, graduate, and professional education for students and be involved in both theoretical and applied research. When discussing the benefits of universities and higher education, the participants are usually talking about the potential benefits from such a university. Unfortunately, even some of the premier universities in Africa are unable to perform these tasks, due to lack of funding, faculty, and infrastructure.

Kenneth Prewitt and Ebrima Sall both discussed the evolution of the "development university" as a successor to the colonial era flagship university. The development university is a university self-consciously linked to the development goals of the country. The development university was conceived to be more closely associated with community service and less tied to the discipline boundaries of traditional academic programs. It was to contribute to both long-term economic benefits in the form of trained manpower and short-term policy benefits.

The development university model has largely failed in developing countries. Prewitt attributes much of this failure to the collapse of donor support although he also considers the possibilities of design flaws in the model itself. Sall added political and ideological factors to the list of causes. Most followers of development aid programs generally and of those focused on higher education specifically, agree that these programs have become less coherent in recent decades. Virtually all development programs have increased their emphasis on short-term program objectives over long-term objectives and market versus public approaches. Today, higher education programs have lost their privileged place in donor priorities and strategies. There are fewer common views as to how a second wave of support for higher education programs should be shaped.

Human Capital Mobility and Brain Drain Issues

One of the most emotionally charged issues at the conference was that of brain drain. Prewitt reviews the global demographic and income forces that influence such movement. Ramphele and Sall, in different ways, both argue for the importance of a critical mass of scholars "at home" as a threshold requirement for university success in Africa. Although there continues to be a tension between Africans who are committed to remaining in Africa, regard-

less of the professional costs, and those who have left, some areas of consensus evolved. David Collis provided his own case as a contrary view. Though British and working in the United States, Collis is never accused of contributing to a brain drain from Great Britain to the United States.

Benno Ndulu makes a compelling case in his paper, documenting through a variety of sources the large numbers of skilled Africans who emigrate and establishing why this is detrimental to Africa's development potential. The level of losses of skilled people from Africa is quite high relative to other parts of the world. Kenneth Prewitt notes further that demographic changes in virtually all OECD countries mean that their demand for African talent will grow. In the OECD economies, the rate of entrance into the labor force will decline over the next few decades; and traditionally, they compensate by allowing more immigration.

The literature on the brain drain has several strands. The early literature of the 1960s and 1970s developed the notion that developing countries have a comparative advantage in exporting skilled workers. This argument is simple: Skill creation is a time-intensive activity on the part of both the trainers and the trainees. Thus, low-wage economies have a comparative advantage in producing skills, provided they have the same skill production technology as high-wage countries. The export of these skills requires migration. Those who migrate benefit, and they also send remittance payments home to their families and, possibly, to the institutions that trained them. The skilled migrants may be fully trained or, if partially trained, they migrate to obtain further training.

For this model to actually work, the following conditions must be met: (a) The trainers need to be more talented and skilled than the trainees, (b) the incentives must be in place to limit the migration of the trainers, and (c) the trainers and their organizations must have high levels of skill production technology.

The model does apply to some professions, especially the medical professions. For example, nurses trained in the Philippines migrate to OECD countries. They obtain higher incomes and send funds to their families in the Philippines. Incentives systems are adequate to bring talented trainees into the nurse training industry and to keep them there. The skill production technology has high standards. Most nurses trained in the Philippines have skills appropriate for model hospital facilities in the United States and Canada. In the social sciences and other fields, we do not see this model working. Although U.S. universities offer Philippine students places in Ph.D. programs, they do not offer many assistant professor positions to them.

One reason that the brain drain phenomenon is costly is that there is not an abundance of potential Ph.D. students in any society. Although there may be a

large pool of talented individuals, the best pre-Ph.D. students are more than talented. To succeed in getting into Ph.D. programs, they have been competitive in disciplinary courses. They have exhibited discipline, drive, and energy. They are committed to understanding and mastering the field. They have creative potential. The pool of candidates who have all of the characteristics necessary for success as Ph.D. students and researchers is quite small. Thus, the loss of these people may have a significant and magnified impact on African development. Ramphele, Sall, and Sawyerr all underscore this point.

Moral or loyalty arguments have been used to encourage people from developing countries to return home. Promoting teaching and research environments in African countries that are conducive to effective careers may be one way to lessen the number of skilled workers leaving Africa. Several conference participants noted the necessity of having a critical mass of scholars and researchers in a community for it to be effective. Ramphele refers to the importance of agglomeration economics, and Sall stresses the need for renewal of intellectual capital.

Research and scholarship now requires that people be part of a global community. Researchers, whether working in New Haven or Accra, must be part of networks of other scholars working on similar issues. Thus, it may be useful to also think about brain circulation, as well as, or instead of, brain drain. Claudio de Mauro Castro noted that Brazil has the problem, not of brain drain, but of a lack of brain circulation. Due to Brazil's size and its reliance on Portuguese, many Brazilian scholars do not circulate enough among other scholars, refreshing and refining their thinking. Rather they become isolated within Brazil with stultifying results.

There is little direct evidence on the benefit to Africa of having skilled people emigrate. Clearly there are losses, but there are also some gains in terms of remittances and in terms of contact with ideas and people in other countries. Preservation of intellectual capital may be an unintended result of brain drain. To understand the reasons behind the brain drain phenomenon in Africa, David Rubadiri, in his response to Ndulu's paper, reminded us that conflict and civil strife in Africa have been among the most important causes of skilled emigration.

One issue that should be further considered is that African countries subsidize education at all levels. To the extent that the social benefits of the education are transferred to the country where the person migrates, Africa is transferring resources to the OECD countries. It is agreed that Africa cannot simply place restrictions on allowing people to emigrate, but it is also important for African countries to find ways to recoup some of their investment in these individuals. A number of schemes were suggested, including insisting that

emigrants repay a portion of the cost of their education. Yet even if they repay the cost of their university education, the cost of all of the previous years of education will have been subsidized by the African governments. In addition, only a few students have the potential to gain Ph.D. degrees abroad, but it is not possible to know which ones have this potential at the time they begin primary school. Thus, many children must be educated in order to have a few who are able to do doctoral work.

Valuing Higher Education: Measuring Benefits and Costs:

A key question for policy regarding higher education is the extent to which the net benefits of higher education are received by the individuals obtaining the education and the extent to which they spill over into society in general. The presence of externalities to higher education is one key argument for the public subsidy of higher education. A second argument is that the institutions of higher education provide a public good in their own right. In this section, we examine first the costs and benefits of higher education to individuals and then the value of universities.

There was relatively little discussion of the costs of higher education at the conference, although there was discussion about who should bear the costs. Private costs of education are the costs that individuals incur when they attend the university. They include any school fees, costs of materials including books, and living costs. There are also opportunity costs of attending the university; time spent in class and studying is time that is not spent doing something else, such as working in a family business or in agricultural production.

The public bears much of the cost of higher education in Africa. As many of the papers discuss, higher education in Africa is highly subsidized. Students frequently pay no tuition or fees; and in many countries, students are also given a stipend to cover their living expenses. Thus, many of the costs are publicly covered. There is political pressure in most African countries to maintain at least some of the subsidies, although many universities are beginning to think about ways to have students contribute to the financial costs of their education. The costs are typically not well documented, but there is relatively little controversy about what the costs include.

Much more discussion focused on the benefits of higher education and to whom they accrue. Paul Schultz's paper uses the limited data available in household survey data sets to estimate the private benefits of higher education in Africa by examining the effects on wages. He finds substantial private benefits to higher education in Ghana, Kenya, Côte d'Ivoire, and South Africa. He is unable to distinguish among various forms of higher education in his analysis due to limitations of the data.

The research on returns to higher education, as reported by Schultz, typically looks at the relationship between individual income and additional years of education. Such studies for higher education versus primary and secondary education usually show higher education unfavorably in terms of return on investment. Schultz's findings suggest a more favorable comparison, admittedly based on limited data. He encourages more careful empirical analysis to guide educational investment policy. Due to data limitations, few studies distinguish between university and vocational programs. Nor do they distinguish between students obtaining professional degrees, such as law, medicine, or business, and those obtaining more academic degrees in the sciences, social sciences, and humanities. The data are limited in part due to the relatively small numbers of people with any form of tertiary education in nationally representative household surveys.

Even though the returns may be high, Evenson argues that private returns to skill acquisition in many developing countries, including African countries, are not sufficient to justify sending students abroad to study in developed country programs. Thus, although there are private returns to higher education-–even for those living in Africa upon the completion of their degree-–the returns are not high enough to cover the costs of sending students abroad for their education because of the large and growing income differentials between African and developed economies. To justify these expenses, it is necessary to also consider the public benefits.

Simply looking at the effects of additional education on wages may not capture other private benefits. Education may confer status. Students may also enjoy their studies and the work that they are able to do upon completion of their studies. In addition, the literature on gender and education at the primary and secondary levels discusses the empowerment effects of education—people, especially women, with more education are more able to take advantage of opportunities that are available to them and to create new opportunities. They are better able to succeed within the formal sector, including businesses, extension offices, credit institutions, and health care professions. Little work has been done on the empowerment effects of higher education.

The most difficult aspect of the costs and benefits to measure is the social benefit of higher education. In fact, in his discussion of these issues, Schultz challenges those who claim that these benefits are high to find ways to measure them. Evenson claims that the public returns are significantly higher than the private returns for inventors and innovators. Thus, there is an argument that the education of potential innovators should be subsidized. Prewitt also stressed ways that institutions of higher learning have a beneficial aspect. They include generating economic growth through increasing productivity and tech-

nological capacity enhancement, creating space for public dialogue, and creating an intellectual infrastructure of people who can be involved in solving development problems.

These are benefits that may accrue from having successful universities within a country but do not necessarily accrue by simply having a well-educated population. These benefits, along with reasons of status and prestige, are reasons that individual countries want to have their own flagship public university and not simply depend on other African or other developed countries to provide this service.

There clearly are social benefits to higher education. Two areas of innovation that were discussed in the papers were the areas of agriculture and health. Both areas require well-educated people within the country taking advantage of knowledge available elsewhere and applying it within the particular context and constraints of the country. Sawyerr, Evenson, and Sall argue this topic from different angles. Evenson focuses on why it is important for individual countries to have people with Ph.D.-level training capable of the innovation and invention crucial to their country's development. Using the example of the agricultural sector, he demonstrates why it is not possible to simply borrow innovations from developed countries. Instead, it is necessary for African countries to have their own scientists, working in their own countries, to adapt and innovate to meet local conditions.

Yet it is important to find ways to measure these social benefits so that the benefits from expenditure on higher education can be weighted against the social benefits from other public expenditures. Schultz stressed that social returns to higher education may be lower than those to health or primary school expenditures. Yaw Nyarko noted that we do not know whether spending on higher education has a larger impact on development than expenditure on roads. Documenting both the potential and the actual social benefits will be a challenge, but a task it is important to do.

Related to the issue of who benefits from higher education is the question of who should pay for higher education for Africa. If all of the benefits were private, then it would be appropriate to allow the market to allocate higher education in countries where educational markets function. Given that at least some of the benefits are public benefits, the government will have a role to play in the provision of higher education. This role is even larger in the absence of efficient private markets.

If the private benefits to higher education are high, as Schultz suggests, then there are reasons to create a system where students pay some of the cost of higher education. In addition, in a world where universities are severely

underfunded, it would be appropriate for universities to charge at least some students for their education. The challenge becomes to create such a system that does not disadvantage students from low-income households.

Bloom and Sevilla note the relative lack of externalities to be gained or to be captured by public subsidies. "The most likely reason for this to occur [i.e., for the demand for education to be unresponsive to costs] would be for people to so strongly value the benefits of higher education that reasonable variations in its costs do not dissuade them from investing in it. Under these conditions, subsidies are ineffective as an inducement to investing in college, since people would have made the investment in the absence of the subsidy anyway." Yet Chacha Nyaigotti ChaCha and other conference participants disagree. ChaCha claims that education can still serve as an equalizer in Africa and notes that many at the conference were from humble beginnings and have arrived here due to the public subsidization of higher education.

Several propositions for ways to allocate funding to less advantaged students were proposed. Schultz recommended targeting subsidies to students from rural areas or students whose parents had very limited education. Either of these approaches would be a good proxy for targeting low-income households without trying to obtain accurate household income data. ChaCha suggested that student loan schemes can and do work, based on his work with the loan board in Tanzania and Kenya.

Institutional Foundations and Research Initiatives in African Higher Education

New private universities are also challenging the traditional public university. Although there have been few private universities historically in Africa, they are beginning to emerge on the landscape. Private universities have the potential to make higher education more widely available and, by providing competition to the public universities, to improve the quality of higher education overall. Yaw Nyarko, in his response to Sall's paper, argues that a new private nonprofit university being developed in Ghana will serve this function and is meeting rigorous academic and professional standards. Others worry that the introduction of private universities may lower these standards. In addition, it is feared that the private universities will provide services only to students who can afford to pay for them, either because they are from wealthier families or because they can obtain resources based on the expectation of relatively high returns on their education investment. The public universities may be left with poorer students and those who are in fields that will have lower returns. This will limit the ability of the public universities to charge tuition and other fees.

Distance education programs, especially those from developed countries, may also pose a challenge to public universities in Africa. At the moment, however, access to the Internet is still relatively limited in Africa; thus, it may be some time before Internet courses provide a serious challenge to universities.

Many participants at the conference spoke to the need for a diverse set of institutions to provide higher education in Africa while enhancing the quality of all of the programs. After carefully reviewing the history of universities in Africa, Sall suggests that Africa needs a plural and well-managed higher education system centered on public universities. The large flagship public universities are likely to continue to be at the core of higher education in Africa, even as new forms of education develop.

Many of the authors suggest that it is important for Africa to figure out how to appropriately use these new actors within the higher education system. Ramphele suggests, "Most sub-Saharan African countries also have [only] a small nonuniversity sector, with the exception of Nigeria, Kenya, and South Africa. This is a major concern not only because nonuniversity institutions can absorb a significant share of the demand for higher education, but also because they are in general more capable of responding to rapidly changing labor market needs and are better positioned to offer lifelong education."

Research Needs and Action Options

As the conference participants engaged in debate across disciplinary boundaries, a number of issues were raised that warrant additional research. In many cases, the data are not available to answer these questions, so any research project would need to include data collection. Two main categories of research questions emerged.

First, better information is needed on the costs of higher education and who bears the costs. Although data may be available on government budgets for higher education, this is only a fraction of the total costs. We need to know the full costs, including the opportunity costs to students of being in school. In addition, we need to know who is bearing the cost. What fraction does the government pay? Of the portion paid by students, who actually pays it? To what extent are donors or the private sector bearing any of the costs of higher education? Although it should be relatively easy to locate expenditure data, Teboho Moja noted that she was unable to find any data on expenditures on research by the government or the private sector.

The second set of questions relates to the emigration of skilled professionals. Although Ndulu did an excellent job in his paper of pulling together the available data on the outflow of skilled emigrants, his paper demonstrated that

there are significant gaps in our knowledge of who is leaving Africa. In particular, our information is far from complete on the skill sets of those who leave and how they obtained their education. The other aspect of the brain drain that needs additional research is the possible benefits to Africa of having skilled emigrants. There was some consensus at the conference that some level of emigration may benefit Africa but that too much skilled emigration is detrimental. We found no agreement on what the optimal level of emigration would be. Quantifying the benefits and costs of skilled emigration would be useful in determining the optimal level. It would, of necessity, also contemplate the corollary issue of a critical mass and the threshold numbers of faculty in what fields for viable intellectual capital in Africa.

It is important to have national flagship universities in Africa, although not necessarily in every African country. Flagship universities require national faculty trained at the frontiers of their discipline and with sufficient support and colleagues to work at that same frontier.

Simply admitting African students to U.S. universities will not be sufficient to increase the skill levels in Africa. The public benefits of having a university in terms of its role in the creation of civil society would not be achieved by simply sending students to universities in developed countries.

To have faculty trained at the frontiers of their discipline, it will continue to be important for some time to send Africans abroad for Ph.D. degrees. One set of challenges revolves around how to successfully send Africans abroad to get the necessary training. Many African students with the potential to succeed are not well prepared for Ph.D. programs at U.S. universities. Thus, predoctoral programs may be useful and necessary.

New solutions may be through joint degree arrangements through African and U.S. universities. These might provide coursework and exams at U.S. universities with the student conducting much of the dissertation research based at the African university, with both universities approving the final dissertation. This has the advantage of encouraging faculty at both universities to work together to insure a strong program of study. It insures a high quality of education while insuring that the public benefits of dissertation research are realized in Africa.

Traditional "sandwich" degree programs have been in place informally (and, in some cases, formally) for a number of years. They have not attained success, partly because U.S. and European universities have not seen these programs as enhancing their reputations or providing other serious benefits. But they could be more effective if supported by joint university research programs.

As new universities and other forms of higher education emerge in Africa, as they are doing globally, it will be important to find ways to insure the standards of these institutions. Ramphele proposed using international credentialing mechanisms. Requiring that African students pass standardized exams may be one way to provide some quality control. Sall cautions that, when setting such standards, we must also work to find ways to improve support so that African universities can meet standards.

Finally, it is important to find ways to keep faculty at African universities up to date with the frontiers of knowledge. Improved technology can be useful, as the Internet can provide a means for faculty to access information. The resources to be able to access this information via the Internet can be expensive. Networks, such as the African Economic Research Consortium, have worked well in Africa to bring faculty together and continue the peer pressure that encourages good research. As Sall points out, systematic evaluations of the disciplinary networks will help refine and strengthen their contributions. Postdoctoral programs, especially with a few flagship universities, are another way to insure that faculty at African universities spend time with colleagues working on the cutting edge of the disciplines.

The papers that follow provide lively insights and provocative questions on many of the ways that higher education works for African development and also some of the constraints on these important roles. The four key themes, identified by the editors, that emerged from the conference were: (a) the potential importance of African universities in contributing to development nationally, regionally, and globally, especially in the areas of agricultural and health research; (b) the need to rethink traditional notions of "brain drain" into a more comprehensive notion of "brain flow" where people, ideas, and resources circulate among institutions and sectors globally; (c) the crucial role of the multifunction flagship university in providing a critical mass of intellectual capacity to support research and teaching and also insure successive generations of academic leadership; and (d) the need to redirect approaches to valuing higher education to include much more than the private returns but also to include the public and social returns. Such value concepts have been more thoroughly refined for primary education in development worldwide and in Africa than for higher education.

Note

1 At the conference, each paper received formal commentary by two experts from different fields and/or world regions than the paper's author. Each set of papers and commentary is available through the YCIAS Working Papers Series at www.yale.edu/ycias/publications.htm.