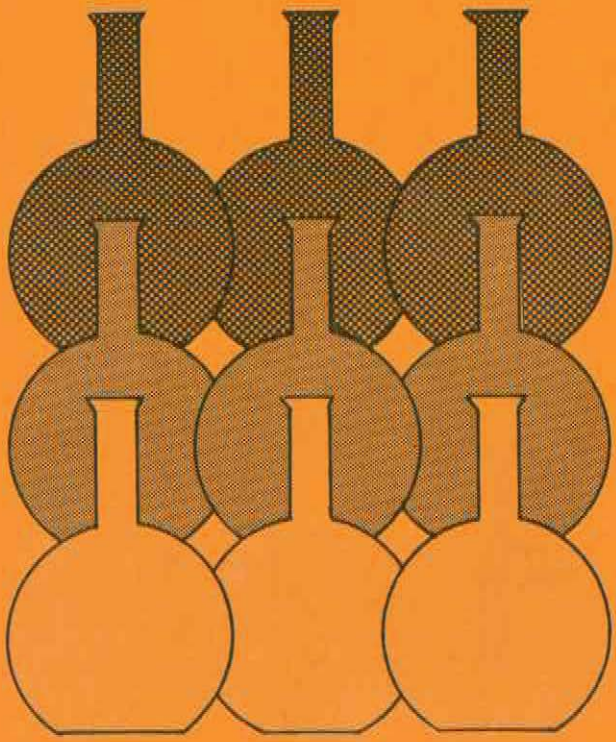
SCIENTIFIC INSTITUTION BUILDING IN AFRICA



Summary Report of a
joint Symposium by
The ICIPE Foundation
The African Academy of Sciences and
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Rockefeller Foundation Conference Centre
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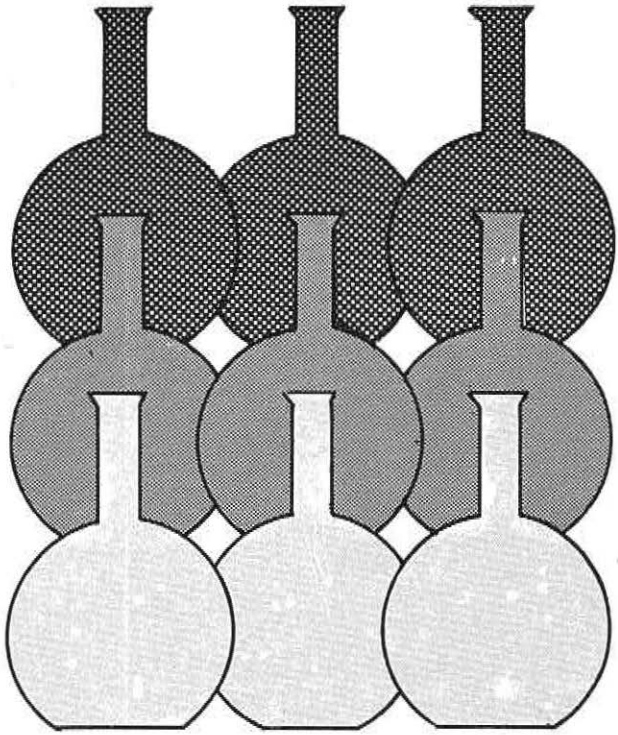

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Summary

Participants in the Symposium on Scientific Institution Building in Africa, sponsored by the ICIPE Foundation and the African Academy of Sciences, gathered at Bellagio for three days of discussion based on presentations by African scholars and by representatives of donor agencies contributing their support to African development.

The presentations and discussions led to a striking convergence of views. It became apparent that all participants, from their widely differing perspectives and experiences, found they shared a remarkably common perception of the evolution of Science and Technology (S&T) institutions, of their importance, of what had gone wrong with them, and what fresh approach was needed to create an effective S&T institutional capacity in Africa. Although no particular information that emerged from the presentations or discussions was especially new or unexpected, the very fact of this convergence of perceptions, shared by African scholars and donor agency representatives, at a time when many donors are evaluating the effectiveness of their programmes and projects, is believed to signal the opening of an important new window of opportunity in African development. Because of Africa's plight, and because the window will not remain open long, it is urgent to re-emphasize the importance of African scientific institutions to the future of economic and social development, and in particular to reorient all levels of education towards creating a science-based African culture.

To this end, it was agreed that the meeting could most usefully contribute to promoting and reshaping support for new approaches to African S&T institutional capacity building, by circulating the following concise statement of these shared perceptions to African governments and the donor agencies that are assisting them. It does not offer detailed recommendations — these will require more specific discussions among many more people than was possible during three days — but rather defines the context for new directions and opportunities from what has been learned from the past three decades of African scientific and technological development.

SUMMARY OF CONCLUSIONS FROM THE SYMPOSIUM

1. The marked success of past efforts in building scientific and technological institutions

A number of African universities have built fine science departments and have produced some of Africa's most outstanding scientists. Numerous national and regional research institutes were established in many countries, particularly in the 1960's. The total number of these institutions was considerable, as were the numbers of scientists trained. World-class research was carried out, and is still being carried out, at a number of centres. Subsequently, however, support for universities as intellectual centres weakened, and in aggregate there has been a failure of technical assistance programmes with African governments to create an effective African S&T capacity, particularly in later years, for many reasons. These include, especially, a frustration with the pace of development in the face of new and mounting problems. This frustration led to pressure to focus on solving problems through external solutions, rather than to continue to create the capacity for Africans to solve their own problems, and to look for "quick fixes" rather than long term solutions.

2. The importance of the macropolitical and sociocultural context, which has exerted pressures on institutions often in counter-productive ways

The expansion and creation of African institutions — universities, governmental research institutes, regional organizations and programmes — worked well in a period of relative affluence following independence in which national and donor budgets were able to increase or at least keep level. In the subsequent period of contracting resources (largely due to external forces), scientific and research infrastructure has deteriorated at a time when it was, and continues to be, badly needed to solve long-term problems of sustainable agriculture, health, and natural resource management. Although the importance of science, technology and research is acknowledged by governments, political realities have directed higher priority to other needs, such as broad-based elementary education and support of a large urban government civil service and military with subsidized food, payment of oil bills and repayment of loans and interest.

3. The increasingly vulnerable economic position many African countries have been placed in since 1974

New conditions determining agricultural development arose from a combination of factors. These include population pressure on land, drought, overgrazing, and particularly the high price of fertilizer and other petroleum-based agricultural inputs. By 1974, after the dramatic rise in oil prices, it was no longer economically feasible in most locations to continue promoting agricultural development based on inexpensive, mechanized, food production dependent on cheap energy. Nor was it possible, because of shortage of arable land, to return to the long natural fallow on which the restoration of fertility depended in traditional farming systems. To develop systems of crop rotation and agroforestry that can be continued indefinitely on the same land and can generate economic surpluses requires research in areas that are not currently being adequately supported, including: soil and water management; soil microbiology and nutrient cycling; and, collection, selection, and distribution of suitable germplasm. This research must be done in Africa, mainly by Africans, and is qualitatively and quantitatively different from much research that has been carried out heretofore.

4. Lack of political commitment to S&T at top government levels, low public awareness of the importance of a strong S&T capacity, and weakness of commercial technical intrastructure

Characteristics that distinguish African societies from their counterparts in Latin America and Asia include: the absence of an effective commitment to S&T at top levels of government and effective demand for S&T by the public at large; and, the absence of a middle layer between these two strata—a small-business, entrepreneurial, adaptive product-developing, technical "intrastructure" (as opposed to infrastructure) — which both demands and produces adaptive technology. The absence of these key elements is believed to be responsible for the failure to sustain earlier achievements in building S&T capacity, since there is insufficient public and private commitment to and demand for S&T.

5. The central role for the future of science in education

The importance of S&T to develop has led to the recognition of the urgent need to promote the evolution of a science-driven African culture, based on science-oriented educational system. Traditional African society was, and in many places still is, based on a system in which technology for successful exploitation of natural resources was passed from parents to children, and through guilds of craftsmen to apprentices. This system sustained African society until the colonial period, during which it was widely superseded by the introduced system of education and the economic exploitation of agricultural commodities based largely on plantation systems with technical support from expatriate, commercial firms and technical institutes. With independence, these enterprises were mainly nationalized, and either taken over as governmental or parastatal enterprises or turned over to smallholders. At the same time, the importance of education as a means of advancement, which had become recognized by Africans during the colonial period, was translated into a public demand for universal free education. The African thirst for education is a striking characteristic and a powerful political force. Large percentages of national budgets not directed to oil purchases, debt repayments, and military forces are spent on education.

However, for the most part, the educational systems are now not able to foster excellence, nor to reward innovation and achievement. Teachers are poorly paid and poorly trained; learning is often by rote, and there is little quality science and mathematics, or local relevance, in the curricula. There is, therefore, a need to direct serious attention to changing education policies, as a recent World Bank study has recommended, to strengthen the functional coherence of the educational systems. Resource-poor countries ultimately must rely on their human talent. Excellence must be allowed to "float in the sea of mediocrity," recognized and fostered in S&T as it is in sport.

6. The key role of the universities

Educational policies in Africa will have to recognize the key role of the universities where the new teachers will be produced to staff and lead the functionally coherent educational system that will foster and will in turn be supported by a science-based culture.

Following the heyday of the 1950's and 60's when the major investment was made in university development, budgets tightened and student numbers grew. Universities were asked to take on additional tasks for which they were ill-suited. The "development university" attempted to play a direct, major role in national development, beyond training people, in order to justify its budget and special status in society. By and large these efforts were unsuccessful, and even counterproductive, because of the disillusionment they engendered. Universities should return to their primary function: the pursuit of knowledge, and its dissemination to students and society. Research is an instrinsic and fundamental part of this process, if the universities are to attract and retain high-calibre staff and students. The knowledge produced must be relevant, and the research sustained and managed so as to encourage excellence. A vote against the ivory tower is not incompatible with a vote for excellence. It is senseless to idolize and promote excellence in sport while at the same time denying facilities to talented scientists, so that they are deprived of the conditions they require to make their contributions to the society and the future.

7. The need to protect, regionalize or internationalize research centres, to insulate them and their budgets from capricious government cuts

The national research systems that have been set up with the support of donor agencies over the past 25 years have not, by and large, been successful. They have often had a narrow focus and have primarily aimed at short-term solutions to specific problems, rather than at strengthening African capabilities to solve generic problems. In some cases, they have created an isolated layer of modern research that is neither supported by a broad base of technically trained personnel nor emerges from a science-based culture in which a motivated extension service can transfer suitably adapted technology from the international centres to a willing peasantry. Their work is seldom subjected to peer review scrutiny, unlike that of their counterparts in the universities, and this has protected mediocrity. Their budgets have generally been drastically cut in response to government revenue shortfalls, and while their budgets may look adequate on paper, there is actually seldom money for equipment, periodicals, fieldwork, or anything else beyond salaries – and often these are not

paid on time. The systems have been able to retain good people as long as better opportunities were not available elsewhere. The entire apparatus of government research has tended to collapse when donor support phased out.

There is an important role for applied research centres focussed on areas that require continual, service-oriented assistance to be produced on a routine basis. Much commodity-oriented research falls into this category. A good deal of this applied research should be returned to the private sector, where it resided during the colonial days, and where it still flourishes in some places — for example, the Tea Research Foundation in Kenya. In many cases, however, the industry is still in government hands, and until this changes, there is an important role for donor agencies in helping to insulate good research facilities from the instability of government budgetary support. It may also make good sense to support the more effective of these applied research centres to play a regional role in serving the needs of smaller countries, as some of them did in the past.

8. The need for stability and continuity in support of research

The history of African R&D in universities, and in national and regional institutions, is marked by a lack of firm support for research on the part of governments. As we have seen above, much of this is due to changes in economic circumstances, as well as to ideology and political instability. There is also instability in the support of R&D by the donors. Seldom are donors able to support institution-building consistently and flexibly over the long haul. "Donor fatigue" is a common phenomenon. So is faddism: as one donor develops a new strategy for supporting development, others follow suit, with the result that there may be neither the consistency that allows time for success, nor the variety that permits selectivity and comparison among different approaches. There is need for donor innovation to response to the new opportunities presented by development in technology (such as in biotechnology and computer and informatics technology), while at the same time guarding against overcorrection and wide swings in direction in policies and programs.

Africans and African scientists are going through a difficult period. Much of this difficulty is due to global political and economic forces beyond their control; much also results from their willingness to

accept foreign ideas, institutions, and development objectives, which has left them stranded midway between traditions to which they cannot wholly return, and a modern, science-based society at which they have not yet arrived. It has been barely a generation since most Africans gained political independence. They need to gain more time, with assistance from abroad, to overcome present difficulties and achieve their cultural and economic independence. The international scientific community and the donor community have special roles to play in providing carefully sustained support for reorienting African education and for strengthening scientific and technological institutions and capacities.

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