INTERNATIONAL SCIENCE AND TECHNOLOGY

Also by Mekki Mtewa

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International Science and Technology

Philosophy, Theory and Policy

Edited by
Mekki Mtewa
Founder and Chief Executive Officer
Association for the Advancement of Policy, Research and Development in the Third World

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To my parents for their dreams of a brighter,
humane tomorrow and to Lessie Viola,
for her commitment to the present

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Acknowledgments

Since founding the Association for the Advancement of Policy, Research and Development in the Third World in 1981, I have been surrounded by budding Third World professionals with exceptionally promising talent and expertise. A selection of their thinking and work is incorporated in this volume. My gratitude and thanks go to them with the hope that the dawn of the next decade unveils more professional opportunities for them as they map out new horizons of scientific discovery and technological application.

The collation of the papers appearing in this volume was first undertaken by Edward C. Pytlik at Morgantown, West Virginia, but the follow-up and completion of that process was very much facilitated by the refinement of those papers by Dr Louis Armijo. However, niether of these colleagues can be held responsible for any editorial errors of context, organization or substance in the individual contributions to this volume. The authors and I cannot escape that responsibility.

I am especially indebted and equally appreciative of the professional support of Brenda Lee Hickey who sacrificed a substantial amount of her leisure time in order to help me meet the editorial deadline for this volume. And to all our colleagues in the global community who are dedicated to the advancement of the quality of human life through science and technology – Cheers!

Foreword

Mekki Mtewa

While on a visit to the offices of the Mexican Council of Science and Technology (CONACYT) in Mexico City and again at the offices of the Indian Council of Social Science Research, New Delhi, I got to thinking about how many excellent social science and technology institutions are located in India and Mexico. Between these two countries, there are more scientists and technologists than can be found in sub-Sahara Africa and the Middle East combined. And that between Mexico and India there are not only exceptional institutions and professional talents that continue to make significant contributions in science and technology but that these two countries stood the best chances of playing leadership roles in science and technology within the developing group of countries. Within the confines of those institutions with their exceptional professional talents are thousands of individuals, each one a unique reflection of professional culture, values and politics. Every one of them was as capable of winning the Nobel Prize as the next one and each with a determination of advance the legacy of science and technology for the service of mankind.

Quite often, for those of us who spend most of our efforts and time in building communication bridges between our institutions and societies, it is important, when we talk about scientific, technological and developmental concerns first to value individual professional contributions and to make sure our institutions nurture and efficiently utilize them.

Creativity, innovation and productivity remain the most important characteristics in science, technology and development. CONACYT embraces all these. However, I see CONACYT like its counterparts in other developing countries playing also the role of a catalyst. There are millions of students entering public schools each year who, we could hope in some way, are influenced by what is happening in institutions such as this. As professionals involved in science, technology and development we should tend to be contagious, that is to say professional and individual excellence should set the standard(s) of education for all generations in developing countries.

We should not only be concerned about existing laboratories, curricula, teachers and students, but equally about professional leadership. By leadership, I mean the process of priority-setting for the 1990s and beyond, and the influences and impact which dedicated professional organizations may have. Priority-setting is not made in a value-free context; it transcends complicated boundaries. These are essential since they are structured around recognized and familiar needs. The crossing of each boundary involves some changes and flexibility in our structure of values. It is rudimentary, therefore, that decisions made without considering values and institutional capabilities would become irrelevant.

The foundations for some of our Third World development ills are clear and need continuing attention. The Third World has been plagued for years by ambitious, unattainable priorities. Declining capital and unadjustable, uncontrollable budgets, complex and inflexible structures of restrictions and an absence of incentives to encourage technological investments and growth have decelerated economic productivity, economic creativity and industrial innovation. All of these problems have a way of affecting science and technology. Recognizing the real constraints imposed by today's economic realities on science and technology, what should we do to ensure, at the minimum, the utilization of existing science and technology resources in the 1990s? Let me summarize our Association's attitude toward science, technology and the Third World future.

There is an apparent correlation between a country's emphasis on scientific achievements and adoption of technology with the overall positive direction and strength of its economic development. A good science and technology foundation could provide developing countries with some measurable ability and readiness to meet development challenges of the unforeseeable future. The predictable value of science, supported by well-endowed technologies and institutions, could guide us in our definition of optimum priorities for the future. Without this infrastructure, no one in the Third World can with certainty tell us what the alternative futures of development will be.

In contrast to the expectations and perceptions of many individuals and organizations, our Association believes that the condition of basic research in developing countries is generally good and healthy. That health is reflected in the sound exciting basic research taking place in many diverse fields. As a developing entity, the South spends more money on applied R&D in agriculture and other fields than on social science research, and generally has more scientists and engi-

neers engaged in those activities than in social science fields. As a developing entity, the ratio of R&D to GNP in the South compares favorably to that of medium industrialized countries in the North. We cannot use the award of Nobel Prizes as a measure of the true value and standard for the health of basic science in the Third World. In the last ten years, a number of Third World scientists have won or shared Nobel awards – and the future is likely to compensate for their low rate of recognition in years past.

Notwithstanding the generally sound health in Third World science and technology, maintaining and advocating it requires that we continue to address a number of sensitive emerging problems:

1. Research related to science, technology and development must be clearly articulated and defended if we are to ensure at least some basic strength and capability.
2. Educational institutions must enshrine the values of science and mathematics in their curricula so that present and future generations are exposed to scientific and mathematical thinking.
3. Priority-setting should take advantage of the increasing sophistication and available technologies within our centers of learning and affiliate organizations.
4. Comparable emphasis should be placed on basic as well as social science research so that a constant infusion of interrelated ideas, talents and perspectives is assured.

In addressing these issues, the Association for the Advancement of Policy, Research and Development in the Third World recognizes with considerable satisfaction the readiness of Third World professionals to excel. There are a number of good reasons why we feel professional communication between Third World professionals is desirable even though we cannot expect it to pre-empt political protocol in all fields. The realization that we may not be the first to cross the spectrum of protocol is not simply a function of our own maturity as Third World professionals. Rather, we prefer to look at our common efforts as a prerequisite to the future celebration of science, technology and development as well as professional freedom and scholarly responsibility. As a group of Third World professionals we continue to ask about the equitable distribution of resources between science, technology and development and also about the relative effect of these apportionments on social and cultural activities. Our perception is that priority-setting can do a great deal in determining the ranking of these apportionments. We have to be rather

courageous in facing the future and remember, too, that science and technology should not lag behind in the way they have in the previous three-and-a-half decades. The scientific and technological professionals in the Third World should participate in priority-setting exercises before mandatory budgeting allocation decisions are made. This Association's view is that unconsultative budgetary decisions everywhere are subject to inherent cynicism. Science and technology suffers because it is, quite often, not clearly quantifiable and rationalized with the help of cost-benefit ratios.

To summarize, it seems evident that tomorrow's development issues will be different from those of today. A changing view of priority-setting in national development calls for changes in professional roles and policy perceptions. Science, technology and development priorities of the future should not be a regurgitation of old formulae and indefensible growth ratios and strategies. It is in this context of shifting professional responsibilities that we invite and encourage our colleagues in developing countries to join together and embark upon the search for an enlightened scientific and technological agenda through an elaborative pursuit and commitment to excellence in science and technology in development, and forever repudiate developmental pursuits devoid of these foundations! I am proud to be the editor of this definitive book.