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Financial and Administrative Management of Research Projects in Eastern Africa (FAMEA)

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IDRC-MR64e

FINANCIAL AND ADMINISTRATIVE MANAGEMENT OF RESEARCH PROJECTS IN EASTERN AFRICA (FAMEA)

Report of a workshop cosponsored by the International Development Research Centre (IDRC) and the International Centre of Insect Physiology and Ecology (ICIPE) held at the Duduville International Guest Centre, Nairobi, Kenya, 18-22 January 1982

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FOREWORD

The skills required to administer research institutions are as important as the skills of research itself. Used effectively, they ensure that the resources -- both human and material -- are devoted to the goals of the institution in the most efficient way possible. Good management is important everywhere but is particularly critical in developing countries where needs are great and resources few.

Research management is not confined to work within the institution but extends to contacts outside, especially government decision-makers. Most research projects, even if their resources are funded by international aid agencies, require some cooperation and management assistance from host-government officials because the results of research will only be dispersed if accepted and promoted by such officials.

Any institution or organization can behave effectively in a complex and changing environment if it incorporates the principles of management and builds into the framework a mechanism that allows it to respond to the demands that the environment places on it -- that is, flexibility. Research institutions are no different from other organizations in this respect. They all need to perceive the options open to them, to delineate the priorities, and to manage rationally their economic resources. This means planning -- an essential component of development. In some countries, planning is regarded simply as the preparation of a comprehensive and detailed document. However, planning is a continuing process in which action is taken and the results are analyzed for future action.

These are some of the ideas that prompted a workshop on research management, the proceedings of which constitute this report. The initiative shown by staff at the International Centre of Insect Physiology and Ecology in organizing the meeting is commendable. The International Development Research Centre is pleased to have had the opportunity to support their initiative financially and is committed to the concept of upgrading the skills of research managers in Eastern and Southern Africa.

With the commitment and foresight of such individuals as ICIPE's director, Dr Thomas Odhiambo, and the other workshop participants, I believe that FAMESA will develop and produce the training and skilled personnel so badly needed by research institutions in this region.

V.G. Jorssen
Comptroller
IDRC

PREAMBLE

Improving the management of research projects and institutions in agriculture, health, and industry in Africa is being recognized as an important component of development. Recently, the participants at several fora have recommended assistance for African institutions in building up their capacities so as to make more effective their technical output.

In June 1977, for example, members of the Association for the Advancement of Agricultural Sciences in Africa (AAASA) met in Nairobi and discussed how productive agricultural research in Africa could be achieved through stronger and adequate research management. Among the problems highlighted at the meeting were those inherent in research administration; others included research coordination, policy training at various levels, and the promotion of communication among researchers and research organizations.

A more detailed account of some of the problems of agricultural management at the national level can be gleaned from Strengthening of National Agricultural Research, the proceedings of a workshop sponsored by SAREC (Swedish Agency for Research Cooperation with Developing Countries). The workshop was held in Sweden in 1979 and was attended by participants from Asia and Africa. The list of problems summarized in the report was further extended in a consultant's report to AAASA in 1980. The extension includes lack of proper financial controls, meagreness of materials and resources, and the inadequate availability of personnel with highly specialized skills and talent. These are all serious constraints to efficient agricultural management in Africa.

At the Second Extra-Ordinary Assembly of OAU (Organization of African Unity) Heads of State and Governments in April 1980, the Lagos Plan of Action for Economic Development in Africa was adopted. This strategy recognized the function of research institutions in national development. Specifically, the plan states that the establishment and the sustenance of research institutions at the national level depend on:

> Restructuring and streamlining of national administrative structures so that these are capable of monitoring their own internal operations, of implementing their activities and programmes, and of adjusting to the changing internal and external demands of development efforts through:
>
> (i) continuous monitoring of performance of these structures in relation to national development effort, making necessary structural, resource...mix, and the plan being executed;
>
> (ii) continuous review and monitoring of the application and effectiveness of rules, procedures, communication patterns and machinery, and readjusting them for better results;
>
> (iii) setting up performance audit systems and units in order to ensure that (i) and (ii) above are effected and institutionalised, and that open communication systems, organizational development and policy examination analysis and review process form an integral part of the organizational performance audit and renewal process;
>
> (iv) maintaining an efficient merit system for the attraction, retention, motivation, training and career development of public servants in order to ensure the use of staff... motivated by internal standards of excellence and by commitment to development objectives, as they discharge their duties.

The International Centre of Insect Physiology and Ecology (ICIPE), which has a record of excellence in research in insect pest and vector management, has long recognized the need for improving and upgrading its research management system as a major tactic for achieving its research and development goals. Therefore, ICIPE staff approached the International Development Research Centre (IDRC) of Canada to assist in efforts to develop a capacity in research management, and the latter agreed to cosponsor a planning workshop that would devise a strategy for improving the administration and output of research institutions as a whole.

The objective of the workshop was, specifically, to review the status of research administration and to assess the impact, if any, of past discussions in this area and, further, to forge a framework for more directed efforts in tackling the problems of research management in Eastern Africa.

The original proposal was that the action programs emerging from this planning workshop would be called FAMEA, but, at the final session, participants decided that FAMESA, Financial and Administrative Management of Research Institutions in Eastern and Southern Africa was more appropriate because the program activities logically cover the entire subregion of Eastern and Southern Africa.

This report documents the proceedings of the workshop: identifies the gaps and problem areas that exist and proposes approaches to bring about lasting solutions to the problems.

PROBLEM AREAS

The major problems for effective research management in Eastern and Southern Africa are:

- Inadequate understanding on the part of government decision-makers of the relevance and impact of socioeconomic factors in the planning, design, and implementation of research in research institutions;

- Insufficient skills, among middle and senior managerial staff, in policy formulation and implementation;

- Lack of a system for information retrieval and dissemination to aid research institutions in their planning;

- Lack of goal congruence and effective interaction among functional units in the planning process in research institutions;

- Lack of effective general management skills (e.g., recruitment policy, administrative audit, motivation, personnel records, reward system, career structures, performance appraisal, staff welfare, job description and allocation, industrial relations, insurance, job security, and staff travel);

- Inadequate understanding of institutional administration, especially the roles of administrators, their teams, and the trustees, in the achievement of institutional goals;

- Inadequate supervisory and office-management skills;

- Ineffective communication systems, both internal and external: within organizations, there is little exchange of information or interaction between staff and there is a lack of mutual trust, confidence, etc.; the setups for reaching the public are also weak such that the research institutes have been unable to identify and to stratify their external constituency, to advertise effectively their activities and achievements, to publicize the social and economic impact of research results, to create general awareness of the role of institutions at national and international levels, or to maintain contact with other institutions;

- Lack of effective financial reporting systems;

- Lack of decentralized fiscal systems -- a deficiency that hampers functional initiative and creativity;

- Few staff who are skilled in writing project documents for funding;

- Absence of personnel with skills in program planning and budgeting (PPB);

- Weak resource-allocation skills in project analysis, selection, and execution;

- Inadequate supply- and material-control systems; and

- Inadequate marketing of research output, such as information dissemination, patents, and industrial licences.

OBJECTIVES

To overcome the problems requires directed input from governments, funding agencies, research-institute staff and trustees. Objectives include:

- Creating awareness and understanding among government administrators of the fundamental link between national socioeconomic plans and the role of research findings in national development;

- Helping research administrators in the formulation and implementation of a viable research policy;

- Organizing information as a decision-making support mechanism for planners;

- Creating a system whereby the different functional units of a research institute interact effectively in the planning process;

- Effectively marketing the output of scientific research;

- Sharpening the financial-management skills of senior and middle management in research institutions to enable them to formulate and write better project documents for funding and to recognize the need for a decentralized fiscal system based on the organization's structure;

- Strengthening supply- and material-management divisions in research institutions;

- Upgrading general management skills in research institutions;

- Upgrading supervisory and office management skills and;

- Developing effective internal and external communication systems and skills.

RECOMMENDATIONS

The objectives suggest several steps that should be taken; it is, therefore, recommended:

- That selected decision-makers in government and research institutions meet to discuss ways and means by which fundamental problems in research management could be solved in the interest of national development;

- That training programs be developed in policy formulation and implementation and be organized separately for top- and middle-level managers in research institutions;

- That the development and delivery of a training program be undertaken on management-information systems for a decision-support system (DSS) for researchers and administrators;

- That efforts be made to initiate a training program in organization development (OD) and management of change for senior and middle managers;

- That immediate steps be taken to establish a forum to assist research institutions in planning and coordination of research activities and findings;

- That a course in basic principles and practices of accounting and financial management be developed;

- That a course in project management (i.e., identification, analysis, selection, implementation, and evaluation) be developed;

- That a training program in supplies and materials management be developed for research institutions;

- That an in-house training program on the relevance of the analysis and interpretation of project documents and proposals to the planning process be held for materials and supplies divisions;

- That a study entitled "An Audit of Effective Management in Research Institutions" be undertaken, indicating the strengths and weaknesses of research institutions in Eastern and Southern Africa and that this study be incorporated in subsequent training programs. Ultimately, the results of such an undertaking should be a document to be incorporated in a publication of case studies to be used as teaching materials;

- That a subregional advisory committee be established to meet at least once a year to review the progress made in the achievement of objectives;

- That a training program in general management be mounted; and

- That a training program in supervisory and office management skills be mounted.

PROPOSED PLAN OF ACTION

To achieve the objectives and recommended steps to solve the problems, a long-range plan of action is necessary. Such a plan should have three phases, of which the first should be 2 years and the succeeding ones 3 years each. Evaluation exercises of each phase should be integral to the plan so that useful experience and information can be incorporated subsequently. The first phase should run from July 1982 to June 1984, the documentation being prepared before February 1982 with projected requirements for phases 2 and 3. ICIPE should act as the executing agency, with a mandate to prepare project documentation and to set up an appropriate machinery to put the recommendations into effect. It would be responsible for:

- Taking inventory of existing training programs and compiling case studies;

- Developing links between research projects with similar focuses in developing countries;

- Setting into motion the development of programs that are currently not available;

- Immediately initiating a study entitled "An Audit of Effective Management in Research Institutions";

- Drawing up the framework for, and then developing, relevant case studies to facilitate implementation of needed training programs;

- Surveying the possibility of organizing a first seminar for decision-makers in government and research institutions about the importance of research in national development;

- Establishing the subregional advisory committee for FAMESA; and

- Promoting, or marketing, the project among all governments and research institutions in the subregion.

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APPENDIX 1. WELCOMING COMMENTS

Thomas R. Odhiambo, Director, ICIPE, Nairobi, Kenya

I wish to welcome the participants of the Planning Workshop on the Financial and Administrative Management of Research Projects in Eastern Africe (FAMEA), which will be meeting here at the ICIPE Duduville International Guest Centre from 18 to 22 January 1982.

We at the Centre believe that the concept behind FAMEA is a new and imaginative initiative for Eastern Africa. And we have to thank the International Development Research Centre (IDRC) for having the foresight and interest to give immediate support to ICIPE's tentative proposals along these lines. The planning workshop would not have been possible without the financial support and the intellectual interest of IDRC.

Our expectations are that we will agree, by the end of the workshop, on how most effectively we can enhance Eastern Africa's capabilities in research management, the main focus being on the national research system. Part of the research-management problem is how to uplift the management skills of senior managerial staff, most of whom are basically scientists with no training in either personnel administration or financial control. Another part of the research-management problem has to do with ensuring that professional administrators trained through business-management programs or accountancy schools acquire special skills that enable them to service the research system in a more effective and relevant manner.

Yet a third aspect of the problem involves the organizational infrastructure of the research-management system -- for instance, the manner in which assurance can be given that one has the information essential to make proper research-management decisions.

I am certain that all these and other critical problems in research management will be aired freely at Duduville, and I hope, therefore, that clear-cut recommendations will come from the planning workshop.

I wish you all, on behalf of ICIPE, a very productive week.

APPENDIX 2. MANAGEMENT OF SCIENTIFIC RESEARCH*

R. Bruce Scott, Regional Director, IDRC, Nairobi, Kenya

First, I would like to express gratitude to Professor Odhiambo and the ICIPE staff, especially Dr Luka Abe, for providing the initiative and guidance for this important workshop, for all the organizational arrangements, and for providing the venue for our discussions.

It is an honour for me, as Regional Director for the International Development Research Centre, to join hands again with ICIPE on this occasion and to have an opportunity to share some thoughts with you on the subject of this workshop.

The issue that is on all our minds is the management of scientific research. In Africa, the research environment is far from healthy. There is a colonial legacy that still affects the research climate, there is a shortage of trained personnel, and there is a shortage of funds and facilities.

To some extent, a "credibility gap" exists between the public and the scientific community as a result of some of the research in the past in which scientists pursued studies of academic and personal interest; in cases where relevant research was undertaken, often the results were not effectively communicated to policymakers and decision-makers who have the power and authority to implement research findings.

* Opening address.

In a continent that is in the process of development, the role and need for the scientific community is to develop a basis of knowledge that can be applied systematically to solve development problems and improve the welfare of the communities. And, given the fact that there are limited human and financial resources as well as complex social and economic problems, the scientific community must be able to establish scientific priorities to ensure maximum efficiency.

In my view, then, the management of research is the ability to maintain a creative and innovative environment whereby scarce resources are used efficiently to find solutions to critical development problems.

I have often wondered whether managers are born with the abilities to manage and administer efficiently or whether people can be exposed to certain tools and be taught to become managers. As with all professions, I think it is probably a combination of the two; in this case exceptional managers are born and good managers can be taught.

The basic problem with the management of research throughout the world is that the exceptional scientist soon becomes a manager, with little or no exposure to management skills and techniques. The management of research activities is unique. Although there may be certain lessons one can extract from the practices of business management, research management is, in general, a field where the problems are unique and therefore the tools must be tailor-made. The objectives of this workshop, therefore, must be to identify the critical problems and to explore the possibilities of structuring courses that will help to overcome these problems and train research staff to ensure more efficient operation of research activities.

Let me attempt to put this workshop into perspective and to establish parameters for the discussions. In my view, good management of research requires an appropriate research strategy and the personnel skilled in planning and overseeing the tactics to carry out the strategy. The development of a research strategy involves an examination and possibly the development or realignment of a number of interrelated facets, including:

- The ultimate goals of the research program, the beneficiary, and the uses for results;

- The organizational structure so that the atmosphere and the climate of research are appropriate (this means assessing the advantages and disadvantages of parastatal versus government structures and reviewing the avenues for coordination between research institutions at national and international levels, government and university, etc.);

- The research policy, which should have clearly identified project priorities that are consistent with national development plans;

- The system to assess the allocation of scarce financial and human resources so that research planning reflects realities;

- The criteria and system to evaluate the performance of research projects based upon the stated objectives as well as the performance of scientists and research staff; and

- The system to forecast the human-resource requirements to accomplish the research policy and priorities -- the personnel planning program, which must be coordinated with education and training institutes.

Skills for effective control as well as means to exploit opportunities need to be developed so that the research strategy and the research policy are effectively implemented. Once the strategy has been established, it is necessary to ensure an environment within which creativity and innovation can flourish. This means:

- The development of procedures to ensure proper management of projects -- with particular emphasis on project budgeting -- to ensure that the resources are made available to achieve the stated objectives and methods;

- The application of procedures for regular accounting of expenditures;

- The identification and development of procedures to ensure necessary support services for the research projects and programs -- for example, purchasing of supplies and equipment, the development of documentation and information systems, etc.; and

- The development and implementation of appropriate personnel policies to ensure maximum creativity from scientific staff and research personnel.

In other words, I am talking about the proper management of material, of people, of money, and of information.

As you all know, IDRC was established to support research projects that are intended to provide results for solving clearly identified problems that are deemed development priorities. Through this process, there is also an intention and hope that the capacity for a research institution to undertake relevant research is strengthened.

The management of research is a component of the process of strengthening institutional capacity. IDRC has been very interested and directly involved in both supporting activities dealing with the development of research strategies and strengthening control systems within research institutions on questions of research strategy and policy. For example, it has supported projects in seven countries around the world, including Kenya, which have been undertaking research to develop methods for allocation of resources for agricultural research. Although most of the country studies have not yet been completed, a workshop was held in Singapore in June 1981, in which the participants reviewed the strengths and weaknesses of the methodology, and the proceedings of that meeting have been published in English and French (IDRC-182e, IDRC-182f). Currently, a handbook on methodology is being prepared.

For many years, IDRC has also been financing the development of a research-management course at Southeast Asian Regional Center for Graduate Study and Research in Agriculture in the Philippines. In 1977 in Africa, the Association for the Advancement of Agricultural Sciences in Africa (AAASA) organized a workshop in Kenya in conjunction with Ford Foundation and IDRC, and participants discussed the problems of agricultural research management. The papers have recently been published by AAASA. The problems identified were clearly and precisely presented along with recommendations for follow-up. Unfortunately, there

was no follow-up activity, possibly because there was no group that took the lead to initiate action on the recommendations. However, perhaps a more important reason was that the recommendations were not precise and were not presented in the form of "bankable" training programs to organizations with available financing.

IDRC has, at the same time, taken initiative with various research institutions in Asia and West Africa to examine ways and means of strengthening the operation of research, by focusing specifically on finance and administration. Its approach has been to ensure that administrative control is established within research institutions and that there is enough flexibility to encourage scientific creativity and the expansion of the knowledge base. Both Vernon Jorssen and Pierre Sané, who are here from IDRC, can discuss these activities with you in more depth during the course of this workshop, as they have both been directly involved with these programs.

The subject of research management is dear to the host for this workshop, ICIPE, and in particular to the Director, Professor Odhiambo, who has spoken and written on the subject for many years and is a living testimony to many principles of sound research management. With scarce resources, Professor Odhiambo has been able to collect a high quality staff and develop a research program that is highly problem-oriented and respected internationally.

With ICIPE's practical experience, and with the relevant and personal knowledge that each of you brings to bear on this subject, an interesting and challenging week lies ahead. Practical recommendations are required if the problems and bottlenecks facing research managers are to be overcome. My hope

is that the recommendations agreed to in this meeting will be developed and presented as a project proposal.

Let me close by again thanking Professor Odhiambo and ICIPE for hosting this workshop and for giving me the opportunity to share some thoughts with all of you.

APPENDIX 3. PROBLEMS OF RESEARCH MANAGEMENT IN AFRICA*

Thomas R. Odhiambo, Director, ICIPE, Nairobi, Kenya

Scientific research is concerned with the pursuit of creativity -- whether in terms of new discoveries in nature or in terms of technological innovations of products or processes (Odhiambo 1979). Some authorities might extend this definition to encompass the delivery of the intellectual goods or technological products to the consumers, who might variously be described as decision-makers, or farmers, or industrialists, or the general public. Whatever are the limits of the definition, it is quite clear that the research manager does not make scientific discoveries or bring forth technological innovations; he or she plays quite a different role in the whole scientific enterprise -- that of conjuring up the environment within which the scientific spirit can prosper and wherein scientific creativity is stimulated and fostered (Odhiambo 1979).

It is essential that policymakers are aware of the different but complementary roles the scientist and the research manager play in the research enterprise. This awareness has largely been lacking, and Africa, and developing countries in general, have inflicted upon themselves untutored administrators who have become their research managers. Enterprising scientists have been shifted into the administration of projects or research stations; or senior scientists have sought to advance their careers by shunting themselves into administration wherever this is the major line of progress to the top. Research management has been taken over by amateurs, by those who learn management

*Keynote address.

on the job, as if management of such an enterprise is so easy that one does not need any special gift or training to undertake it. As I have argued elsewhere (Odhiambo 1979):

> A common and prevalent myth regarding administration is that any sensible person can become one (an administrator). A further myth, much more insidious than the first, is that the management of science and technology runs along exactly the same pathway as that for any other enterprise. Nothing can be so mistaken....

Clearly, research administration needs to be taken more seriously and the untested assumptions about who is best qualified to undertake it need to be abandoned. One needs to have considerable knowledge of the landscape of research management to understand its problems and its opportunities. An analogy can be drawn with Edberg's (1979, p.8) description of foreigners who are anxious to be at one with the East African savanna:

> Moving about the savanna by day, you feel painfully like an intruder in a world belonging to other creatures, keenly observed on all sides. You must be still, find the rhythm and enter it in order to be accepted as part of the pattern...

NATURE OF THE PROBLEM

There seems to be three important facets to research management. First, there is the most obvious facet, that dealing with the administrative operational skills required for management -- program planning, financial control, and budgeting; the management of research personnel; and the evaluation of the institution's work. Second, there is the need for a deep understanding of, and empathy with, the scientific environment and institutional culture in which the research manager is

required to operate. And, third, there is the facet concerned directly with the research manager -- his or her training and motivation, which entails not only reasonable compensation policy but also recognition of the vital role he or she plays in the scientific enterprise as well as encouragement to experiment and innovate toward a more efficient supportive administrative role. What one is striving toward, in clearly delineating the role and special responsibilities of the research manager is to draw together the strands of a partnership with scientific research that will make the research enterprise more productive and more relevant to its constituency.

The constituency -- in terms of the great majority of African states -- is largely a rural community if one is considering health, agriculture, and so on. Choosing among the various priorities of this rural community, one would probably say that the key priority is the creation of adequate livelihoods (Chambers 1980). Thus, adequate livelihoods should be at the centre of research objectives in most African rural environments. This central priority has at least three consequences. First, researchers must work in close collaboration with the rural people (except on questions that can best be dealt with under controlled laboratory conditions); for instance, prospective technologies will need to be appraised, with the rural people as both the starting point and the end point. Second, research scientists who have pioneered new technologies for the rural community and especially those who have worked in a creative partnership with the rural poor (Chambers 1980) need to be recognized and rewarded professionally. And, finally, the problems of the rural poor must be solved through a multidisciplinary approach. In other words, just as agricultural research and development (R & D) is too important to be left to the technical scientists alone, so it

is that social and economic implications of prospective technologies are too important to be left simply to the social scientists (Chambers 1980). Although I have illustrated this problem by focusing on agricultural research, similar arguments could be advanced for industrial research, medical research, or any other research field in Africa.

The African research manager cannot escape taking into consideration the characteristics of the constituency of the research scientist. Indeed, the research manager's strategy must reflect the fact that African farmers, their traditions, and their social environment are perceived as central to the priorities of the research enterprise (Fall 1980). This concept was stated rather more clearly by Mosher (1981) in his comments on the components involved in agricultural growth in Africa. He considered the first component to be the farmers: "it is they who manage, and largely accomplish, production." The second component consists of a number of agricultural support activities -- such as making available fertilizers, pesticides, implements, and other farm inputs; ensuring adequate incentives to farmers; and training technicians who are the key to realizing successful agricultural R & D and to helping farmers develop new husbandry and management skills.

Agricultural productivity is a pivotal factor in the economic well-being of most of Africa and policymakers on the continent are becoming aware that agricultural R & D is an essential part of productivity. Thus, they are beginning to recognize the need to build national capabilities in research management to complement the drive to build the scientific capacities. The training of research managers must be considered as important as the training of scientific researchers and technologists. Yet, as the Consultative Group on International

Agricultural Research stated in their report on strengthening national agricultural research (CGIAR 1978): "There is a particular lack of trained research administrators and managers at all levels, from policy and program over-view to managers of experimental stations...." Indeed, there are only two institutions in the developing world with specific training programs in research management: the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), at Laguna, in the Philippines, and a newly established project financed by the United Nations Development Programme (UNDP) based at Centro Internacional de Agricultura Tropical (CIAT), in Cali, Colombia. The International Development Research Centre (IDRC) is sponsoring a new program in Singapore shortly. There are at present no institutions in Africa undertaking this task. We in Africa, therefore, will need to begin our effort in the training of research managers from the beginning. As Lewis Carroll wrote in Alice in Wonderland:

> "Begin at the beginning," the King said gravely, "and go on till you come to the end; then stop."

RESEARCH MANAGEMENT IN AFRICA

In a review of the regional differences in the effectiveness of the agricultural research system, a World Bank policy paper (World Bank 1981) has stated that, in Western Africa, many countries suffer from a chronic shortage of funds to operate effective national research programs; there is great reliance on expatriate research staff, as the national supply of qualified staff is limited, and much of the research effort is fragmented, uncoordinated, discipline-oriented, and not particularly directed to solving problems of agricultural production. In contrast, in the Middle East and North Africa, the more developed countries have a sound national research system, although others within

that region have weak research organizations and limited indigenous research staff.

In Eastern Africa, the situation is appalling. The national research organizations are generally weak; there is chronic shortage of qualified researchers in the organizations and the shortage is exacerbated by the scarcity of financial resources to support the organizations; there exists reluctance to borrow funds for research, the national governments preferring instead to receive external funds through technical assistance; and there is poor linkage between research and extension services (World Bank 1981). In a further clarification of the situation, and talking specifically about Kenya, Thairu (1980) stated that Kenya's ability to improve the research capabilities of the Agriculture Ministry' s Scientific Research Division has been frustrated by the division's inability to recruit and retain good scientists. First, the emoluments and benefits were low, and the gifted scientists moved elsewhere: in 1979, the division had lost 16% of its trained scientists of a total of 220 established posts, and another 34% of the total establishment remained as unfilled vacancies. Second, the scientific staff were regarded as part of the public civil service, and they did not enjoy a separate scheme of service; this often meant that the path to promotion was through advancement to an administrative position. The research system, therefore, ended with a large number of amateur managers at the top and lost the professional services of promising scientists. Third, field experimentation suffered as a result of the factors already outlined; the result has been frustration for the few trained experimental station managers, who have frequently resigned. At the same time, it has been difficult to attract experienced people from other organizations. A similar saga can be narrated from other countries in Eastern Africa. For instance, Oland (1980) made a

strong plea for Botswana to develop an effective and strong cadre of staff to run the national research institutions so that they can contribute substantially to the needed agricultural R & D in the country.

The experience in Africa extends to other developing regions, and some weaknesses in the national agricultural research systems are common to the whole developing world (other than newly industrialized countries such as Brazil, India, South Korea, and Singapore):

- There is a deficient and weak organizational structure for research and extension. Research administrators are largely untrained. Fragmentation of effort is prevalent; there are only tenuous links between research and extension; and the generation of scientific knowledge and technological innovation is of little practical value to the farmers and the rural community;

- The research capabilities are low, partly because of inadequate incentives for researchers and partly because of the half-hearted attempts at training for researchers and technologists;

- There is no clearly articulated perception by the state authorities of the effective role of R & D in agricultural growth and development. Therefore, governments give low priority to agricultural R & D in terms of finance and skilled personnel; and

- The national economic policies quite often emphasize low food costs, which immediately discourage the farmers from adopting new or improved technologies because of the low

returns from such investments. Many discerning observers have reported that small farmers are slow to adopt new technologies because they see no compelling economic reasons for such adoption; the underlying reason is often that the government's price policy demands low farm prices as the outcome of the advocacy of the politically stronger and more vocal urban community (World Bank 1981).

The persistent underpricing of food grains in many developing countries is a crucial factor in limiting the demand for research and, in consequence, limiting the transfer of new technologies to the farmers. As the World Bank (1981, p.32) graphically put it:

> Too often the tendency has been for national economic planners to ignore the impact of their policies on the research establishment and for the research managers to retreat into the more comfortable confines of the research institute. One consequence is that an efficient source of economic growth (agricultural research) is sacrificed and food deficits are larger than they need be.

There is no doubt that the economic growth potential in the developing world will not be realized as long as farm entrepreneurs are confronted by wrong incentives. Schultz (1978) gives an illustration from Nigeria, where, over a number of years, research scientists developed varieties of palms that are much more productive than the native palms in Nigeria. However, few Nigerian farmers can afford to replace the old varieties with the new because the State Marketing Board radically reduced the price of palm fruits paid to the farmers. In contrast, in West Malaysia, palm producers have not been so exploited, and they embrace the new Nigerian palm varieties and have harvested handsome incomes from this new technology advance.

So far, I have, in a way, been looking at the pathological side of research management in Africa and other developing regions of the world. I do not wish to remain at this horizon to the detriment of reviewing more positively the prospects and opportunities of good research management. As a wise man once remarked to me, "It is much better for a medical scientist to discover a new disease than to find a cure for an old one. Your cure will be tested, disputed, and argued for years -- and your name is likely to be simply forgotten, whereas a new disease is readily and rapidly accepted, and you are likely to make your name forever." But I am more inclined to agree with Aristotle whose view was that:

> Contemplation is the best activity. It is also the most continuous since we can contemplate truth more continuously than we can perform any action.

I hope to be able to contemplate with you the way that research management in Africa should be viewed and the manner in which Africa's capability in this field should be enhanced and assured in the shortest possible time.

TASKS

There are five tasks that I see as central to the process of building up capabilities in research management in Africa. Some of these have been identified by Mosher (1981) in his book Three Ways to Spur Agricultural Growth. The first two tasks are what I have called earlier those related to "the scientific environment and institutional culture." The last three are those that I have grouped as "administrative operational skills."

Lewis Thomas (1973), in an analogy of the scientific worker and the honeybee hinted at the payoff from performing the tasks well:

> If you want a bee to make honey, you do not issue protocols on solar navigation or carbohydrate chemistry, you put it together with other bees (and you'd better do this quickly, for solitary bees do not stay alive) and you do what you can to arrange the general environment around the hive. If the air is right, the science will come in its season, like pure honey.

Gaining a clear understanding of the mandate of the research institution, what it is supposed to do, whom it is supposed to serve is essential. Whereas an agricultural institute may be expected to serve small farmers, an industrial research laboratory's main constituency may be the manufacturing entrepreneur or the food processor. Furthermore, it is essential to be aware of the circumstances under which the research institution must operate, the resources available to it, and how it incorporates the national policies for socioeconomic development. Finally, the research manager should perceive how his or her institution's tasks complement the mandates of other institutions and agencies at the national, regional, and international levels. These tasks are related to the scientific environment.

The tasks related to the institutional culture are those that are peculiar to the research function. The task of the research staff is to discover, to innovate, to develop creative products or processes for adoption or application by the institution's constituency and to ensure that the advances are communicated adequately to the constituency. The research manager's task, on the other hand, is a supportive one -- to establish an environment that encourages scientific creativity,

to create a collegiate atmosphere that will permit all the staff to work together constructively, and to act as a facilitator for the research process. A science administrator commands considerable authority, but the skill in being a good administrator is to know that one can "...accomplish so much more by leadership that wielding authority is seldom necessary" (Mosher 1981). Therefore, this supportive role is not simply one of censuring or of constraining the limits of the scientist or even that of mechanically and automatically imposing leadership on the research staff; it is one of productive interrelationship between the two interlocked groups, each striving toward the common goals of the institution by employing their best skills and expertise. But there should never be any doubt at all that the reason for the existence of the research institution is to undertake research.

Several responsibilities that should be performed by the research manager come under the rubric of planning tasks. Planning is not simply sophisticated budgeting, however important budgeting is. First and foremost, planning demands the clear identification of performance objectives for the next fiscal functions and careful assessment of the impact of the institution's work on previous goals.

The executive tasks are those that are most readily invoked by the term research administration or management: personnel and financial management, including:

- The selection and recruitment of staff, the evaluation of their performance, and their promotion. The revision and modification of the procedures involved in these processes, as well as the policies and levels appertaining to the reward system, are measures that should be clearly thought

out as an integral part of the institutional commitment to the staff. Creativity should be rewarded because rewards for good performance gradually generate the feeling that one is part of a well-run institution of excellence.

- Assignment of tasks to all staff, whether research or support personnel.

- Resolution of conflicts and coordination of staff conferences in which all staff have an opportunity to participate in decision-making.

- Authorization of expenditures in line with work schedules, budgetary provisions, and actual financial resources. The procedures should include means for reallocating resources to meet unforeseen expenditures such as follow-up for an unexpected technical breakthrough. Financial control is a significant element in this financial function.

- The maintenance of the physical fabric of the institution and the servicing of equipment, instruments, and vehicles. This is one of the most difficult administrative tasks in Africa because spare parts must be purchased from abroad and there are few technicians skilled in maintenance. Research institutions in Africa largely constitute a vast cemetery of once-expensive scientific instruments simply because of lack of servicing and spares. This factor contributes more than any other toward the low morale so prevalent within the African scientific community.

Finally, there are the <u>strategic tasks</u> that are part of the

research manager's portfolio. These include:

- The maintenance of staff morale through appropriate policies such as easy communication links between the laboratory staff and field personnel, between the institution's staff and those from other institutions, exposure to the international scientific community, and the development of internal yardsticks of excellence and relevance.

- Development of means and strategies for expanding the resources of the research institution to match its goals. This task requires an enterprising spirit and the drive to act as an effective advocate for the institution in competition for the resources available through the state.

- Anticipation -- thinking ahead -- of changes both within and outside the institution that have an effect on its operation. This task, not always thought of as part of research management is, without doubt, vital to the research institution, and it is a task to which the director of an institution must give adequate time and thought. He or she needs help from senior scientific and administrative colleagues in thinking ahead -- in reviewing the broad sweep of the institution's progress in terms of its mandate, in gauging the resources available for the task ahead, in identifying the strategies to get those resources, in anticipating the impact the institution must make, and in planning how the entire gamut of institutional mechanisms and instruments can be orchestrated to reach its goals in the most effective and productive manner -- but, in the end, must make the final decisions on the strategies. Too many institute directors are concerned with the day-to-day routines and do not think of the medium or long term. They

cannot afford this approach any longer: they must prepare for the shrinking of resources and the bludgeoning demands of the public for practical progress from scientific institutions.

There is an important matter that I have not specifically addressed so far -- that of the type of training for the research manager.

TRAINING

I believe that the first requirement for the nonprofessional administrative and financial staff of a research institution in Africa -- and this includes scientist-cum-administrators in managerial positions -- is that their administrative and financial skills be upgraded and sharpened. Not all staff members will end up becoming permanent administrators, but an institution certainly functions better if all its members understand its administrative and financial processes. They need to know the fiscal policies of the institution and how they are implemented, they need to be aware of the personnel policies and functions of the institution, and they need to know about the strategic processes of the institution.

The second requirement is that professional administrative and financial staff be given training in the special skills needed to work in the scientific research environment. The purely technical aspects of administrative and financial work are the same in every sphere of human endeavour, but their application to a particular enterprise can be different, and certainly the needs of research are peculiar. For instance, whereas, in the business community, fiscal policy is oriented toward as large a profit as possible within 1 - 2 years, in

scientific research, the bottom line is to achieve scientific breakthroughs and technological innovations approximately commensurate with the original investment, which is generally considered over a period of several years, even 10 years. The former is producing directly marketable goods, and the latter is drawing on productive tactics to bring forth intellectual goods, which might later be turned into marketable products.

The personnel and accounting practices must fit the mould, and the first step is to provide complementary training to science administrators and financial experts in research institutions. Both groups can be research managers, but neither is inherently.

REFERENCES

CGIAR (Consultative Group on International Agricultural Research). 1978. Report of the task force on international assistance for strengthening national agricultural research. Washington, D.C., CGIAR.

Chambers, R.J.H. 1980. Socioeconomics of prospective technologies: people and priorities. In ICRISAT (International Crops Research Institute for the Semi-Arid Tropics), Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture. Patancheru, Andhra Pradesh, India, ICRISAT, 86-92.

Edberg, R. 1979. Dream of Kilimanjaro. London, Heinemann.

Fall, M. 1980. Socioeconomic aspects involved in introducing new technology into the Senegalese rural milieu. In ICRISAT (International Crops Research Institute for the Semi-Arid Tropics), Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture. Patancheru, Andhra Pradesh, India, ICRISAT, 45-51.

Mosher, A.T. 1981. Three ways to spur agricultural growth. New York, International Agricultural Development Service.

Odhiambo, T.R. 1979. Status of insect science in the tropical world: administration of scientific research in Africa. Nairobi, ICIPE (International Centre of Insect Physiology and Ecology).

Oland, K. 1980. Agricultural research in Botswana. In Bengtsson, B., and Tedla, G., ed., Strengthening National Agricultural Research. Stockholm, SAREC (Swedish Agency for Research Cooperation with Developing Countries), 7-19.

Schultz, T.W. 1978. On economics and politics of agriculture. In Schultz, T.W., ed., Distortions of Agricultural Incentives. Bloomington, Indiana University Press, 3-23.

Thairu, D.M. 1980. Agricultural research system in Kenya. In Bengtsson, B., and Tedla, G., ed., Strengthening National Agricultural Research. Stockholm, SAREC (Swedish Agency for Research Cooperation with Developing Countries), 48-54.

Thomas, L. 1973. Lives of a cell. Boston, Massachusetts Medical Society.

World Bank. 1981. Agricultural research: sector policy paper. Washington, D.C., World Bank.