

# Management of Human Resources in Agricultural Research

Report of the International Workshop on Management  
of Human Resources in Agricultural Research held  
March 3–5, 1986 in Dhaka, Bangladesh

1986

Bangladesh Agricultural Research Council  
International Service for National Agricultural Research  
Winrock International Institute for Agricultural Development

**Management of Human Resources in Agricultural Research** is the report of the International Workshop on Management of Human Resources in Agricultural Research held March 3–5, 1986 in Dhaka, Bangladesh, conducted jointly by the Bangladesh Agricultural Research Council, the International Service for National Agricultural Research, and the Winrock International Institute for Agricultural Development, with financial assistance from the U.S. Agency for International Development (Project 388-0051). A grant from ISNAR provided partial support for this report.

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## Foreword

The number of people involved in agricultural research is expected to increase significantly in the next decade. A major challenge to managers of national agricultural research systems is to plan for this growth. The issues facing them include assessment of the current manpower situation in their research institutes or programs, identification of critical variables in estimating future personnel needs, planning of in-career training, and management of the information necessary to make recruitment and training decisions.

To explore potential approaches to these and related issues, an International Workshop on Management of Human Resources in Agricultural Research was held March 3-5, 1986, in Dhaka, Bangladesh. It was organized by the Bangladesh Agricultural Research Council for senior agricultural research officials of the Bangladesh national system, and for manpower development and planning managers of the agricultural research systems of Bhutan, India, Malaysia, Nepal, Pakistan and Thailand. The Workshop was co-sponsored by the International Service for National Agricultural Research and the Winrock International Institute for Agricultural Development, with major funding from a grant of the U.S. Agency for International Development.

The objectives of the Workshop were for the participants:

- To share national experiences on manpower planning and training management for agricultural research.
- To become informed on what the national agricultural research system of Bangladesh is doing to strengthen the management of human resources.
- To generate ideas as to how the agricultural research systems of Bangladesh and other countries can improve their human resources management.

The Workshop program included a series of papers on human resources management in an agricultural research system, focusing on the establishment of a database containing basic information on its scientific and managerial personnel. Work group sessions challenged the participants to make decisions about actual problems of manpower planning, as well as giving them opportunities to use the BARC computerized database as a resource in solving such situations.

The Workshop sponsors believe that efficient and effective management of human resources is a key factor in directing agricultural research in South and Southeast Asia in the next decade. Through the Workshop, BARC was able to share its experience in this important management field, and to make plans for further improving its coordination and service functions for the

Bangladesh agricultural research system. The information presented in the various papers and working group discussions should be a continuing reference, and for that reason has been published in this book to be widely available for agricultural research managers.

# Inauguration

# Welcome Address

EKRAMUL AHSAN

*Chairman  
Bangladesh Agricultural Research Council*

It is my proud privilege to welcome you to the inauguration of the International Workshop on Management of Human Resources in Agricultural Research.

I am particularly proud to mention that in this workshop we have distinguished delegates from a number of countries of South and Southeast Asia. The countries represented are Bhutan, India, Malaysia, Nepal, Pakistan, Thailand and the host country Bangladesh.

The Workshop is being co-sponsored by the International Service for National Agricultural Research (ISNAR), Winrock International Institute for Agricultural Development, and the Bangladesh Agricultural Research Council (BARC). The major funding has been provided by the United States Agency for International Development (USAID).

We at BARC feel very happy to collaborate with these two major international agricultural development agencies in organizing this important workshop on management of human resources in agricultural research.

This Workshop is the second in series working towards strengthening our agricultural research systems. About one year back we had the first such international workshop on research evaluation under a similar collaborative arrangement with ISNAR and Winrock International. The outcome of that workshop has been well appreciated by the research leaders in Bangladesh and in other countries of the region, and the international agricultural research centers.

We hope the deliberations of this Workshop will guide us toward more efficient research systems through improvements in human resources management.

The subject of human resources management consists of the activities within a given organization that deal with the employees in respect of:

- Selection and recruitment
- Promotion
- Performance appraisal
- Compensation
- Training
- Job design
- Career development

The activities related to human resources management are to be integrated with the goals of the organization. Effective use of human resources is the shared responsibility of line management and each individual employee.

Manpower planning, the first step in the management of human resources, is the process of forecasting the need over some future period of time for added human resources and a stock-taking of the pool of skills.

The agricultural research system in Bangladesh consists of component units which are at different levels of development in terms of their manpower planning and human resources management systems.

The concept of manpower planning and management is a rather recent adoption in the agricultural research system in Bangladesh. The Bangladesh Agricultural Research Council recently initiated a manpower planning exercise for the agricultural research institutes in the country. Simultaneously a project on human resources management in agricultural research has also been initiated by BARC in collaboration with ISNAR. The project aims to establish a research manpower database at the BARC Computer Centre. Significant progress has been made in creating this database.

This Workshop is designed to use this database to try for alternative management decisions in career development, promotion considerations, program development, and manpower planning.

This Workshop provides an opportunity to share ideas and experiences among the leaders of research systems of the participating countries to improve the format of our research manpower database and other different steps of the human resources management.

Through this collaborative exercise of the participating research leaders of agricultural research systems of the countries of South and Southeast Asia, we have the expectation of developing improved management skills and efficiencies of our agricultural research systems.

The Workshop is an opportunity to share experiences of the participating countries on human resources management by the presentation of country papers. There are arrangements for practical exercises in small working groups with computer-based manpower data of a selected research institute of Bangladesh to test alternate management decisions in relation to any given objective function.

I invite all the delegates — from Bangladesh and other countries — to actively participate in the working group exercises to put your hands on microcomputers to seek answers to your questions on manpower management issues.

To the distinguished delegates from other countries and the international agencies I wish you all a pleasant and productive stay in Bangladesh.

# Inaugural Address

M.A. MUNIM

*Minister for Agriculture*

I am very happy to be able to join with you at the inauguration of the International Workshop on Management of Human Resources in Agricultural Research.

As we all know, in a developing country like ours agricultural research is the foundation stone for successfully meeting the demands of hunger and poverty by increasing the production of food as well as other products derived from our land, water, and other limited resources. We must have the best qualified men and women to carry out this research work, and they must have the best possible facilities in order to achieve their objectives.

As the planning and development of human resources is so important, I am pleased to see the representation today of the top managers of agricultural research in Bangladesh and from the national agricultural research systems of many other countries of South and Southeast Asia. I hope that by sharing ideas and experiences during these three days you will devise procedures that will advance the management of human resources in agricultural research in all of these countries.

The countries represented here are at different levels of development in the operation of their national agricultural research systems. Many of our scientific traditions have their roots in the times of the colonial governments. It is only in more recent times — as we have gained independence — that most of our countries have given proper attention to systematically developing the improved technologies needed by our farmers.

The Bangladesh situation is typical. Our research institutes and scientists have made significant progress in the fourteen years since liberation. We now have reasonably good facilities in place for research. Needed additions and improvements are being planned, and many are in progress. There is a good core staff of scientists and technicians. They are receiving additional training to build on that which they have already achieved. By making good use of these facilities, our scientists have produced many useful results in a relatively short time.

Day by day agricultural research is becoming more specialized, complex and sophisticated. Scientists are having to become more skilled at identifying priority researchable problems, planning and conducting experiments, and producing useful technology. Our farmers are learning that they can rely on our scientists to understand their problems and devise practical solutions to them. These accomplishments have helped our country to move ahead

despite some very difficult times of natural disasters, economic stress, and rapid population growth.

Now we must look to the future. For that this Workshop is relevant and important.

National policymakers in most developing countries are keenly aware that investments in agricultural research earn good economic returns. In fact, these are often the highest returns of any sector of the economy. It is safe to predict that agricultural research institutions will continue to grow over the next decade, though probably not at the same rapid rate that was experienced during the past ten to fifteen years. Our research institutions are in place; now we must look to their orderly development. Management of human resources is now the key factor for efficient management of research.

In Bangladesh, under the leadership of the Bangladesh Agricultural Research Council, there have been several important and timely opportunities for scientists and those who administer the research institutes and centers to improve their skills of management. In the recent past BARC sponsored a series of manpower training courses for the top research managers. This was followed by courses on the management of agricultural research institutions, and on diffusion of agricultural research results to the farm community. Last year, there was a Regional Workshop on Research Program Evaluation. This Workshop is a continuation of BARC's efforts in strengthening agricultural research.

As research managers, it is your responsibility to make an assessment of the present stock of human resources and estimate the needs for the coming years. It will be necessary to examine the in-service training required to develop the personnel to reach their full potential as scientists.

This means having a recruitment plan that brings into the research service the best-trained and most capable young men and women. Their academic preparation is a special concern, which means working closely with the universities so they will provide their students with the knowledge and experiences that enable them to become good researchers.

The new recruits as well as the established personnel must be provided with the incentives that will help them reach their professional and personal goals. Obviously, an adequate salary is a basic incentive, but there are many other factors which also contribute to making a productive research organization. One of these is to provide timely and useful training. The capabilities of our research personnel must be continually improved if we want them to develop the new technologies required by our farmers and other end-users.

To have a proper human resources plan, it is necessary to know the present situation. BARC has initiated preparation of an inventory of human resources within the agricultural research system. At the same time, BARC is revising and expanding the *National Agricultural Research Plan, 1984-1989* which will include additional details about the current situation and a look at future requirements. And, BARC is also giving leadership to the collection of

a database on professional personnel of the research system. This is being computerized, and I understand it is to be the basis for instruction in this Workshop.

It is important in assessing human resources — as in any research problem — to have accurate data. Unfortunately, most of our research institutions have not had that up to now. With this new computerized database, for the first time it will be possible to have an accurate counting of the persons in the research system as well as in-depth information about each individual.

I commend your commitment to establish and maintain a human resources database for your research institutions. I also commend BARC for its leadership in conducting this International Workshop. Our countries must work together to develop procedures to make the best use of our resources so that maximum benefits for our peoples can be achieved. Each national agricultural research system must of necessity operate independently, but by cooperating we can learn from each other and make our meager resources go further.

I am also pleased that BARC is working with two major international agricultural development agencies in conducting this Workshop. This is another excellent example of cooperation among national and international organizations that ultimately benefits the small farmers of the developing countries.

Through these joint efforts of the national organizations together with regional and international collaboration I hope our agricultural research system can be further strengthened with efficient management of its human resources.

# Chairman's Address

S.A. MAHMOOD

*Secretary  
Ministry of Agriculture*

It is indeed a privilege to chair the Inaugural Session of this very august gathering to deliberate the very important issue of human resource management in agricultural research. Agricultural research, in the country context, is for the purpose of developing technology to help the farmers in overcoming their handicaps and to achieve more cost-efficient and higher yields, and thus to meet the national goals and objectives in agricultural production.

In the system of research the very key factor is the available human resources. As has already been mentioned, it is necessary to make an inventory of available human resources, to identify gap areas where resource availability is delicate, and to utilize the human resource in the appropriate areas. This means providing adequate facilities for research because upper on a research scientist — just like any other highly skilled person — needs to utilize his skill for the purpose of providing an output.

Management is also very important in establishing complementarity between the research activities going on in various institutes within the country, including the university systems and the public sector research systems. Most of us do not have private research systems as they do have in the more developed economies. Our research systems, being in the public sector, had to be directed to make their objectives both in the short run and on a long-term basis. We have experienced that although the Bangladesh agricultural research system has been improving its capacity, the area of manpower development or human resource development has not been dealt with very efficiently from a management point of view.

In the research area, manpower development depends first on the identification of the potential individuals. This manpower has to be continuously developed because in isolation no country today can afford to do all research on its own. The resources that it has must keep abreast of the developments that are taking place in other countries — particularly developing countries — and we must use that knowledge to our best advantage.

Also in the area of complementarity in the use of available manpower and the development of potential manpower in gap areas, it is difficult for countries to work in isolation. As a result it is necessary that there should be not only intra-country coordination between different research institutes and agencies but also inter-country collaboration and interaction to achieve

optimum results from available human resources and also the physical facilities that are available within a country.

I am confident that with your collective expertise and experience that your deliberations will provide recommendations which would help both us and all the participating countries in formulating or fortifying the executive policies to suit the needs of the moment and also to meet the future needs that we cannot envisage for the development of a more efficient agricultural research system.

# Vote of Thanks

AHMED HUSSAIN

*Director (Training)  
Bangladesh Agricultural Research Council*

Reference is increasingly made to the revolutionary effects of scientific and technological advances, notably automation and computerization. Financial resources devoted to agriculture have increased significantly in recent years in Bangladesh. But they are only one part of the equation. The other part consists of the skilled management of human resources which can be achieved through well-conceived agricultural education and training.

This Workshop on Human Resource Management is being jointly sponsored by the Bangladesh Agricultural Research Council (BARC), the International Service for National Agricultural Research (ISNAR), and the Winrock International Institute for Agricultural Development. It has brought together scientists and human resources management specialists from 31 organizations and agencies of 17 countries. Sixty-six senior scientists and managers have been invited to participate.

I am extremely delighted to have the opportunity to extend the Vote of Thanks in this Inaugural Session. First, on behalf of the Organizing Committee, I express deepest gratitude to the Honorable Minister for Agriculture who is so kind to inaugurate this Workshop in spite of his immense preoccupations. His wholehearted support to agriculture and human resources management is inspiring to us.

We are grateful to our Secretary, who is the Chairman of the Session, for his personal initiative and leadership in agricultural development in general and human resource management in particular. He has always valued the cardinal virtues of diligence, self-help and cooperation which constitute the three spiritual pillars of human resources management. We express our thanks to him for his constant support to us spiritually, physically and administratively.

We are indebted to the Chairman of BARC, who is also the Chairman of the Organizing Committee of this Workshop, for his untiring endeavors in direction, personal supervision and management of such an important international meeting.

We wish to thank the eminent scientists and managers from home and abroad who are to participate in this Workshop. We look forward to their continuing interest, discussion and suggestions for human resources management.

In organizing this Workshop we have drawn on the counsel and guidance, insights and experiences of a large number of our colleagues and staff members. We sincerely acknowledge their cooperation.

We at BARC always express our sincerest gratitude to the journalists of our national dailies, and officers and technicians of Bangladesh Television and Radio. Today we again take the opportunity to express our thanks to these professionals who have been continuously supporting the cause of agriculture in Bangladesh.

We should mention the contribution of ISNAR and Winrock International, two organizations that have worked shoulder-to-shoulder with BARC in organizing this Workshop. We also thank the support services personnel of Winrock for their assistance.

And last but not least, we express our deepest gratitude to our farming community for whose ultimate benefit this Workshop is conducted.

# The International Service for National Agricultural Research: Opportunities for its Second Five Years

ALEXANDER VON DER OSTEN

*Director General  
International Service for National Agricultural Research*

I appreciate this opportunity of addressing this first plenary session of this International Workshop on Management of Human Resources in Agricultural Research.

There are five points that I want to make. First, I would like to express my appreciation to the People's Republic of Bangladesh and to the Bangladesh Agricultural Research Council for organizing this Workshop. I am delighted to be here and to witness the enormous progress made by the agricultural sector in this country — thanks in large part to the well-focused efforts of its national research organization.

Second, I wish to express my pleasure at meeting on this occasion an impressive number of eminent research leaders from countries of the Association of Southeast Asian Nations (ASEAN) and South Asian Regional Cooperation (SARC) regions. Some are longstanding friends of the International Service for National Agricultural Research (ISNAR) — others are new acquaintances with whom I hope to gradually build a lasting collaborative relationship.

Third, a comment on the topic of this Workshop. The relevance of this subject to all of us is obvious. The level and number of participants in this Workshop are indicative of the importance of this subject to any successful research organization or program. For precisely this reason, the management of human resources ranks high among the priority issues on our agenda at ISNAR. I will come back to this in a moment.

My fourth point concerns the model of this Workshop. It has a number of interesting features that merit our attention: its regional approach, its clear focus on one important subject, and the way it is organized and structured. This model is not new. You have used it — with considerable success — on other occasions for other topics. Similar workshops at the regional level have been held as on resource allocation and on evaluation.

We at ISNAR are convinced that the regional approach to problem solving is practical, effective and cost-efficient. It lends itself to operations such as this, focusing on the discussion of common issues and problems, the

sharing of information on experiences, and the exchange of views on possible approaches to solutions.

It equally lends itself to what comes next — a more active and extensive collaboration (probably on a network basis) — stressing common interests, common goals, common problems, and similar approaches. In short, it is useful as a tool for dealing with common problems. It helps us to identify the problems and constraints, to develop practical approaches leading to solutions, and to organize joint action, if that is needed.

The way this Workshop is organized and sponsored is most welcome to us at ISNAR. We believe in such triangular arrangements in which the host country institution — in this case BARC — is taking the lead, in which a collaborating agency — in this case our friends from Winrock — carries an important share of the total effort, and in which an institution like ISNAR can contribute from a technical point of view — bringing in its experience in dealing with the topic in many parts of the world. We are proud in being associated with this event, and we are confident regarding the outcome. Undoubtedly, we can all benefit from sharing our experiences.

My fifth and final point concerns ISNAR, the institution I represent. I would like to share with you a few salient points regarding recent developments of ISNAR, and raise with you a few questions of mutual concern.

The kinds of questions I have in mind:

- How does this Workshop relate to ISNAR's evolving program?
- And looking beyond this Workshop: Where do we go from here? What comes next?
- What are the important issues and topics that we should start concentrating on next?
- In other words, what are your priority issues and needs?
- What can ISNAR do for you in terms of finding solutions to your key management constraints?
- What are the avenues for productive collaboration in the future? How can we combine our efforts in a most rational division of labor?
- How do we go about in organizing such collaboration?
- How should we allocate our scarce resources?

Why do I raise these questions at this particular time? At ISNAR we are engaged in a major reassessment of our program priorities. We are about to make some strategic decisions and introduce some changes in program emphasis.

I would like to explain some of the changes we envisage and the rationale for them. But, more importantly, I would like to have your advice and comments on the future direction of our program. I shall attempt to be practical and down-to-earth. We can continue that dialogue outside of our meeting times.

ISNAR has undergone a major review, an external evaluation organized by the Technical Advisory Committee (TAC) of the Consultative Group on International Agricultural Research (CGIAR). This review — at the end of ISNAR's initial five year period — coincided with a change in management. The outcome of the review was positive. ISNAR was found to have a meaningful program, a positive record of performance, and the potential to develop into a true center of excellence in its areas of competence, namely the organization and management of agricultural research.

Nevertheless, the review team indicated — and we wholeheartedly agree — that the time has now come for strategic decisions on the orientation of ISNAR's future program. We are about to take those decisions, and to develop ISNAR's program strategy for the next five year period. We need to set priorities, determine the areas of emphasis, and reconcile the expectation of ISNAR's partners with the available resource base — a problem that all of you are facing constantly.

In developing our strategy and setting our priorities we are guided by four major factors:

- The recommendations of the review team which made very insightful comments.
- ISNAR's own knowledge base, built up with the experience of five years of operation.
- Comments and suggestions from the donor community and our partners in the development assistance field — such as from Winrock.
- Most important of all, we seek the guidance of our clients and partners in national agricultural research systems (NARS). We need continuing dialogue with people like you.

As you would probably expect, in our program orientation we find the need for both continuity and change. In my comments now I shall emphasize the elements of change. I should point out, however, that any change in emphasis will be gradual — by evolution rather than radical change. Our philosophy is to build on acquired strengths and adjust from there. Institution building, after all, is a long-term enterprise.

Our program in pursuit of ISNAR's central goal — the strengthening of national agricultural research systems through enhanced organization and management — will continue to be centered around three basic thrusts:

- The first and central thrust is on system building, in direct collaboration with and in support of our partners, the national agricultural research systems. This is ISNAR's service function. Its focus is on improvements in the system's organization and management capacity.
- The second thrust — in support of ISNAR's service function — is on the development of management concepts and methodologies. This is ISNAR's research function. Its focus is on concepts, methodologies and tools for research management. Its products are expected to be of direct use to

national agricultural research systems and a key input into ISNAR's work with them. Hence the emerging concept of ISNAR as a research-based service.

- The third main thrust — closely related and complementary to the other two — is directed towards the enhancement of management capacities and skills of research managers. This is ISNAR's training function. Its focus is on people, on managers at various levels in a given system.

Quite clearly these three program thrusts are closely related. They are mutually supportive. They are complementary. It is not a question of either/or. Each is targeted to the development of a specific management component: better concepts, methods and tools; more effective systems; and better leadership and management. All three are truly collaborative: ISNAR works with NARS (or groups of NARS — as in this Workshop) in achieving common objectives.

Let me illustrate briefly the kinds of activities we expect to perform under each of those thrusts and where we think changes should occur.

Under its main and central thrust — focused on system building — ISNAR will continue to collaborate with NARS and assist them in such efforts as:

- Broad-based system reviews aiming at the identification of constraints to the full productivity of research systems.
- The design of action programs and strategies aimed at strengthening the system's management capacity.
- The provision of advice to NARS in the identification of viable solutions to specific constraints.
- Assistance to NARS in testing, adaptation and application of enhanced management concepts and methods that fit their specific circumstances.

Two things are clear from this: (1) The need for increasing specificity in what we do and how we go about it in our joint efforts of strengthening the management capacity of NARS, and (2) the need to focus clearly on specific components of the overall management process; those components, of course, constitute the key constraints.

This need for specificity is confirmed by our own experience, by requests for cooperation from client countries, and by events such as this Workshop. The clarity in focus of this Workshop exactly supports what I am saying. We need to be practical, focus on the real issues and concentrate on key constraints.

Under its research thrust — which supports the service and training functions — ISNAR focuses on the development of management concepts and tools. The kinds of activity involved concentrate on three objectives:

- The development of an enhanced knowledge base on the functions and constraints to NARS. We need a better understanding of the key constraints.

- The development of appropriate approaches, concepts and tools for research management — tools that will help us to overcome existing constraints.

- And finally, adapting improved methods and tools developed elsewhere to the specific needs and conditions of our partners.

I would like to stress the importance of this last point. Many useful concepts, approaches and management tools have been developed elsewhere. We need to adapt them to our specific needs and circumstances. Adaptation is necessary for it tends to be less costly than reinventing the wheel. This is one of the key arguments why at ISNAR we need a systematic research effort. Much of it is adaptive research. It is there to support, back stop and facilitate our other work in system building and training. Hence, the concept of research-based service.

Under its training thrust — which focuses on the build up of management capacities and skills — ISNAR will continue to work with its partners in three distinct but complementary efforts:

- A training effort — directed at the enhancement of management skills of individuals at various levels in the system.

- An institution building effort — directed at the build-up or strengthening of management training capacities at the national or regional levels.

- An effort to develop appropriate training materials for use in management training.

Obviously the long-term emphasis is on tool and facility development. Our training capacity is limited — needs and demands for training are enormous. We have to seek a multiplier effect whenever this is feasible. The most effective multiplier tends to be to create the conditions for good training in a decentralized way. I know this is easier said than done. It is a long-term proposition and will take a long time to accomplish. In the short run we shall have to do the training.

What are the conclusions, if any, that we can draw from this schematic look at ISNAR's evolving program structure? What are the guidelines for our program strategy, for our program contents? What does it tell us for the planning of our joint activities over the next years? I think a few points are emerging rather clearly. They should guide our thinking.

First, the need for increased specificity in our institution building efforts. We need to focus our attention on clearly identified issues and constraints in the areas of research organization and management.

Second, the need for selectivity and concentration of effort. We intend to focus on key constraints rather than spreading our resources too thinly. Here we need your guidance in selecting the key components in the management process that require priority attention.

Third, the need for program balance. We need to balance our efforts among the three thrusts mentioned. Over time, this balance is likely to

change — in response to changing needs and potentials of our partners. We must remember in this connection that the needs and potentials of our partners are the key factors that determine this balance. And, patterns of demand vary enormously with the state of institutional development of research systems. While the more advanced systems tend to seek collaboration in the areas of tool development, skill training and specific issues under the service concept, the less developed systems tend to require assistance in a broad range of areas, covering all three of our thrusts. They demand a broad range of products and services.

Fourth, and closely related to this point, we need some flexibility in responding to the demands from our partners. In practical terms this means that an institution like ISNAR has to develop different patterns of response and different modes of collaboration in addressing the varying needs of groups of clients. Collaboration with less advanced systems tends to develop on a one-by-one basis. Among the more advanced systems collaborative patterns such as this — our regional Workshop — tend to evolve. The emphasis shifts to patterns of joint action — often on the basis of networking arrangements. ISNAR's role and involvement then changes. We retract from being the doers to a more catalytic function. We then tend to concentrate on facilitating and backstopping such developments at national or regional levels, and on building linkages, where needed, with other institutions that have the potential to contribute.

My fifth and final point: The need for a rational division of labor among all those institutions that can contribute to our ultimate goal — the strengthening of NARS capacities. Let me briefly explain what I mean by this. We at ISNAR see ourselves as one partner in an emerging global system of research and development efforts, all contributing toward the goal of development. Partners in this system are: NARS, the key and central components of this global effort; the International Agricultural Research Centers (IARC) of the CGIAR; multilateral development assistance agencies, such as the Food and Agriculture Organization of the UN (FAO), United Nations Development Program (UNDP), The World Bank; bilateral donors; technical assistance agencies, such as Winrock; and many other sources of knowledge and expertise, such as the universities and specialized institutions. All those institutions form a loose partnership; and each contributes in accordance with its comparative advantage. To maximize benefits we obviously need to foster a rational division of labor, reduce duplication of effort and avoid competition. Again, this Workshop is a good illustration of how such division of labor can be organized.

Being a small organization, we at ISNAR are particularly aware of the benefits of well conceived collaboration. That is probably the reason why we keep on mentioning the many practical virtues of well structured networking arrangements that are organized on a horizontal basis among a group of equal partners.

This brings me to my last point. It concerns the question of our future program content — the choice of subjects for priority attention. This obviously is at the center of our strategy discussion in ISNAR.

I touched upon this subject earlier on.

A moment ago I argued for the need for specificity. I argued for concentration of efforts on specific constraints of key importance and I mentioned three areas considered of paramount importance: human resources management, resource allocation, and evaluation. All three have been the subjects of regional workshops in your area. Which other subjects or management components do we consider of similar importance and urgency?

All of us assembled here know well that in performing their functions NARS face a broad range of organizational and management issues.

My colleagues and I at ISNAR are determined to move ahead rather forcefully to come to grips with these issues, to develop a knowledge base on them, and to generate or to adapt the kinds of tools and concepts we talked about. We know that we need help on this, and we count on the collaboration of our partners. Quite clearly, we intend to draw heavily on the existing pool of knowledge that is available around the world.

A first important step was to develop a conceptual framework to guide our system building efforts and to improve our understanding about the functioning of NARS. We quickly found that successful systems are the result of a complex set of positive and mutually reinforcing interactions between three groups of factors: the policy environment, the system's organizational structure, and a set of essential processes in management.

The first two are clear; they do not require any comment. Both the policy environment — as a factor influencing the productivity of research systems — and the organizational structure are recognized as key variables with great potential influence on the success of a given system.

The third group — a set of essential management processes — needs explanation. That group is complex; it comprises nine management components:

- Planning, priority setting, and resource allocation — planning at the macro level.
- Research program formulation — programming at the micro level.
- Monitoring and evaluation.
- Human resources management — our topic in this Workshop.
- Management of financial resources.
- Management of physical resources — station and infrastructure development.
- Information management.
- Linkage management with other sources of knowledge and expertise, such as the IARCs, universities, and so forth — the upstream linkages.

- Linkage management with the users of technology diffusion systems and farmers — the downstream linkages.

To determine priorities among these eleven management components including policy environment and structure is not an easy task, but all are important. Any one can be a crucial constraint to the productivity of a system. And their weight is likely to vary among countries and over time.

Yet some guidance is needed for the allocation of scarce resources to priority areas. What are your views on needs and urgency?

I thank you for the opportunity to flag some broader issues and to share with you some of our thoughts on issues that concern us all and the people we work for — the farmers of our countries.

# Winrock International: A New Organization to Strengthen Agricultural Resources in Development Countries

A. COLIN McCLUNG

*Regional Representative, Asia  
Winrock International Institute for Agricultural Development*

I am honored to bring greetings on behalf of my colleagues at Winrock International and to comment on this important Workshop. Our President, Mr. Robert D. Havener, particularly asked me to give you his regards. Bob Havener had his first international assignment in Bangladesh and he comes back for a visit whenever possible.

I extend greetings not only to all our friends and colleagues at the Bangladesh Agricultural Research Council (BARC) and its constituent and associated institutions, but also to our friends from outside Bangladesh who have come to this Workshop. Regional meetings of this type are among the best ways for scientists and science administrators to learn from the experiences of others. I also would like to extend our congratulations and best wishes to Mr. Alexander von der Osten as he takes up his duties as Director General of the International Service for National Agricultural Research (ISNAR).

## **Winrock International and Human Resource Management**

When a regional meeting on evaluating research programs was held by BARC in October 1984, one of the agencies involved was the International Agricultural Development Service (IADS). Last July 1, IADS merged with two sister organizations to form Winrock International Institute for Agricultural Development. I would like to take this opportunity to describe why we decided to go into this merger, what we hope to accomplish by it, and to tell of our emerging program interests. This is appropriate on the occasion of this Workshop because one of the principal activities of our programs — both old and new — is human resource development. The deliberations of a group such as this are of particular interest to Winrock.

Your comments can provide invaluable guidance not only for our present reorganization but through time by assisting us to adjust to the needs of the countries with which we work. One thing is certain and that is that needs will change. If we keep tuned to the present and at the same time pick up signals regarding future needs and opportunities, we have a chance to remain a

useful entity in development and change in the decades ahead. If we fail to keep up with the times — and occasionally to lead the way — we may become prematurely obsolete.

The merging organizations, in addition to IADS, were the Agricultural Development Council (ADC) started in 1953 by Mr. John D. Rockefeller III, and the Winrock International Livestock Research and Training Center (WILRTC) started in 1975 with funds granted for charitable purposes by the late Governor of the State of Arkansas, Mr. Winthrop Rockefeller. The IADS program had focused on agricultural research and most of its expertise was related to crop production sciences. ADC was largely in the social sciences with an excellent track record in support of capacity-building for agricultural development in Asia. WILRTC, on the other hand, was established to focus on the animal sciences. It was obvious that a program of broader scope could result from merging the three units. But the three governing boards said from the start that they wanted the new organization to be substantially more than the sum of its parts, that there had to be some multiplier effect for the merger to be justified.

First of all, the merger was aimed at creating an institution that would be viable for the long term. No one spoke of perpetuity, but all of the principal decision-makers thought of it as functioning well into the next century. It would be dedicated to improving the human condition through development. To accomplish this it would need a secure financial support base. Endowment funding plus continuing public support would be needed. It would be a professional and nonprofit organization; it would be nongovernmental. Because of its private, nonprofit status, it would receive the benefit of special governmental sanctions granted by the laws of the United States. It would aim to have a small but highly qualified and experienced multidisciplinary staff. These staff members would associate themselves with other organizations and individuals to work towards common goals.

It would have some funds of its own and hence would be able to take initiatives and risks from time to time without waiting for donor agencies to recognize an opportunity and then to fund it. At the same time, it would seek joint funding from other sources, and would aim to be cooperative in the conduct of development programs, not competitive.

The organization would actively but selectively seek projects which it would implement on behalf of others. Some such funds would be grants to the organization itself and could enhance and expand initiatives undertaken with its endowment earnings. Others, probably much larger in the total level of funding, would come from contracts to carry out work being financed by grants or loans from major donors to the developing countries. Such work, when compatible with the organization's own program guidelines, can greatly increase its total capacity and impact. This approach to program funding means that Winrock can serve a bridging role, working across institutional and political boundaries.

Establishing and maintaining an appropriate balance between funding by endowment sources, by grant sources, or by contracts is important for the new organization. It needs to be sufficiently independent to always be able to say no to those projects which lie outside its capacities and interests or are seen as not well planned or potentially effective. It needs to have enough independence of means to at times go against conventional wisdom and to support work that may otherwise go unfunded. It should be able to sit on the side of the table with the developing countries. Above all, it should avoid having to take on projects simply to survive.

One of the distinguished members of the Board of the new Winrock is Dr. John Hannah, President Emeritus of Michigan State University and a former Administrator of the U.S. Agency for International Development (USAID). A member of the IADS Board, he was one of the early enthusiasts for the creation of the new organization. In a nutshell, he said, "We want to create an organization which can carry on the kind of work in agriculture that the great American foundations supported so strongly in the middle part of the 20th Century." He felt that this work, which is now mostly in the hands of governmental and international bodies, would always benefit by having an element — albeit modest in size — coming from the private, nonprofit, nongovernmental sector. It is a great challenge to try to live up to this vision.

Having described in broad terms the organizational and funding arrangements they expected the new organization to have, the merging Boards of Trustees went on to prepare an extremely broad legal charter. They deliberately made a sweeping statement of purpose which would give the management of Winrock the widest possible latitude in developing its program. The job we are now wrestling with calls for putting realistic limits to what we try to do. Even the prospectus of merger of Winrock was unrealistically broad for an initial program statement.

Yet as we examine the active on-going programs inherited from the three merger partners, the situation is much more manageable. All three had substantial interests in human resource development; this is and will continue to be a central theme of the new Winrock. All had substantial program interests in the management of renewal resources. Among the first actions taken by the new board were steps to strengthen the capacity of the organization to deal effectively with this important topic. Two other areas of program emphasis are (1) agricultural research management and (2) animal agriculture and farming systems. The first of these was high on the docket of IADS and the second was emphasized by WILRTC. Both areas will continue to be fostered by the new organization. In some of our discussions it has been pointed out that the management of agricultural research is in large degree a special case of human resource development, and that farming systems research fits reasonably well under the broader umbrella of renewal resource management. As the Winrock program takes shape these areas are expected to remain prominent.

## The Future

The prospectus of this Workshop started off by stating that "The number of people involved in agricultural research is expected to increase significantly in the next decade." No one will argue with that statement. During the next decade I believe we will see coming to early fruition a process that started over 20 years ago. Agricultural research in Asia will be coming of age.

Prior to the mid-1960s most governments of Asia placed agriculture on the back burner while they focused on developing their industrial sectors. After all, they reasoned, their farmers had for centuries been able to meet demand. Certainly there were problems from time to time, especially when the monsoon failed, but these were expected to be less serious as improved transportation and marketing facilities became available.

The food crises which started in the mid-1960s suddenly brought to the attention of national leaders around the world the precarious balance that existed in the food – population equation. No place was this more clearly noted and promptly acted upon than in Asia. In country after country basic decisions were made to up-grade and expand all phases of the agricultural support system. Agricultural research was no longer an abstract activity of interest only to the scientists who conducted it. It became the route to greater food security and more stable political conditions.

Fortunately, the world food situation is far better today. A recent article in *SCIENCE* magazine cited Food and Agriculture Organization of the UN (FAO) figures that world agricultural output rose 25% between 1972 and 1982. Farm output in the less developed countries rose 33%. In the developed countries it rose 18%. The per capita food supplies in Asia had risen by 10% during this period.

Fortunately, also, the political leaders have continued to support agricultural institutions, particularly those that relate to research activities. Some of us who were concerned with the problem in the 1960s were afraid that a few seasons of good results might cause some backsliding in research support, but generally that has not been the case. One reason this may be is that the agricultural scientists have become a more respected group whose contribution is recognized and whose voice is heard.

The next decade will certainly see substantial increases in the numbers of people engaged in agricultural research but more importantly, the level of professional qualifications within the group is on a sharply ascending curve. The education explosion which is taking place in Asia is more clearly evident in the agricultural research area than anywhere else. It is going to be a great challenge to those of you managing this burgeoning resource of human talent to maximize its productiveness in terms of agricultural output and in terms of knowledge. The subjects being presented and discussed in this Workshop are the right ones to be thinking about. Right decisions taken on them now will place you where you want to be ten years from now. It is an exciting period for researchers and research managers alike.

The coming of age of agricultural research in Asia is going to bring about some interesting realignments among the scientific communities of various countries. I trust that attention will be given to this matter even at this meeting. What was an appropriate and productive relationship ten years ago often is less so now, and what will be needed in 1996 will be quite different from what is needed today. To cite an example, in another ten years the need for long-term resident consultants will be largely a thing of the past for many Asian research systems. A few highly specialized scientists or experienced managers may be all that are needed or justified. Short-term consultancies may be on the rise but they will tend to be quite selective. Collegial relationships are to be expected between the scientific communities of Europe and North America and the emerging ones of Asia. Scientific exchanges will increasingly become a two-way street. We at Winrock are particularly interested in fostering this evolution.

The exchanges of agricultural scientific information that will take place in the coming years will be amid rapid changes in both how such information is handled and in the structure of other scientific communities. The emerging electronic data management systems will make the sharing of certain types of information via these new channels much more time- and cost-effective to scientists on both sides.

The nature and type of institutions housing the U.S. agricultural science and technology base has changed markedly over the last decade. Much of the research on biotechnology has been done outside the traditional system. While the Land Grant Universities continue to be dominant in agricultural sciences they are no longer the sole source of certain agricultural technology. For example, institutions such as Harvard University and the Massachusetts Institute of Technology (MIT) are deeply involved in biotechnology. Several quasi-public institutions (endowed, nonprofit research laboratories) have emerged as leaders in specific technologies. They tend to operate as specialized institutions, focusing on such areas as nitrogen fixation or genetic engineering. Most of them emphasize basic science but have varying amounts of technology development. Private, profit-seeking organizations have made substantial contributions in biotechnology and may be expected to be even more active in the coming years. National research systems need to be aware of these changes and be prepared to take advantage of them.

In summary, a constant vigil must be maintained in the continuing search for cost-effective avenues for scientific interchange. The ready access to a broad range of science of other countries allows national scientists to pick and choose among the many options in selecting those items that best fit into an appropriate mix for their region or country. Asian national research systems have much to gain and much to offer in these developments.

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## Theme Papers

# Keynote Address: Management of Human Resources in Agricultural Research

EKRAMUL AHSAN

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Bangladesh Agricultural Research Council*

Management of agricultural research involves all of the management tools and processes as in the case of the management of any other organization. *Management* may be defined as working with and through *individuals* and *groups* to accomplish goals of the organization.

The keywords in the definition of management are (1) individuals and groups, and (2) the accomplishment of goals. This implies that the human element in the organization is one of the most significant components in the accomplishment of its goals.

Managerial functions of planning, organizing, motivating and controlling are also relevant to management of any agricultural research organization or system. Organizing and motivating involves the management of human resources. From the functional point of view, *human resources* are considered to be the key issue for management of an organization.

*Planning* involves setting goals and objectives for the organization and developing *work-maps* showing how the goals and objectives of an organization are to be accomplished. *Organizing* involves bringing together resources — people, capital and equipment — in the most effective way to accomplish the goals.

Together with planning and organizing, motivation plays a large part in determining the level of performance of employees, which in turn influences how effectively the organizational goals will be met. This is relevant to the theme of this Workshop, i.e., management of human resources; and more specifically, to issues relating to managing human resources in agricultural research.

One of the basic prerequisites for a manager is his ability and judgement in working with and through people. This implies understanding of motivation and application of effective leadership, what is termed as the *human skill* of the manager. This ability of a manager has been rated as more vital than intelligence, knowledge and job skill. John D. Rockefeller, one of the great entrepreneurs, stated, "I will pay more for the ability to deal with people than any other ability under the sun".<sup>1</sup> This Workshop attempts to address the issues for human resources management in agricultural research, which calls for studying motive and behavior.

Behavior is basically goal-oriented, i.e., it is motivated by a desire to attain some goal. We should also recognize that the specific goal of an individual is not always consciously known by that person. The drives that motivate individual behavioral patterns are to a large extent subconscious and so not easily subject to examination and evaluation.

Motives are defined as needs, wants, drives and impulses within individuals. Motives are directed towards goals.

Another element for studying the subject of human resources management includes the hierarchy of needs which includes: physiological needs, safety and security, social needs (affiliation), esteem (recognition), and self-actualization.

With this conceptual framework of the elements and process of human resources management, I would like to refer to the manpower status in agricultural research in Bangladesh and some of the issues I consider significantly related to the efficient management of human resources. These issues include among others, quantity and quality of manpower, financing manpower training, and operational funds for research. According to the most recent manpower statistics, there are within the agricultural research system in Bangladesh altogether 4843 persons including scientific and technical personnel and support staff. The agricultural research system comprises the Bangladesh Agricultural Research Council (BARC) and its constituent institutes, the Bangladesh Agricultural Research Institute (BARI), Bangladesh Rice Research Institute (BRRI), Bangladesh Jute Research Institute (BJRI), and Bangladesh Institute of Nuclear Agriculture (BINA).

It may also be mentioned that the research institutes are short of manpower, the range being between 15 and 60% of the requirements of the respective institutes (Table 1). These requirement figures refer to the situations of the institutes about five years back; now it is even worse. Not only do these institutes need more manpower, all of them need to upgrade the skills and competence of their human resources. The agricultural research systems now desperately need both quantitative and qualitative improvement of the status of their manpower.

**Table 1. Manpower status in agricultural research systems, Bangladesh, 1983.**

Organization	Provision	In position	Gap (%)
BARC	185	146	21
BARI	3260	2786	15
BRRI	598	560	20
BJRI	1436	1220	15
BINA	331	131	60
<b>Total or average</b>	<b>5910</b>	<b>4843</b>	<b>18</b>

**Table 2. Total net operational cost in research institutes of agricultural research systems as percent of total allocation, 1975–1980.**

Year	BARC	BARI	BRRI	BJRI	BINA
1975–76	36.4	—	12.5	7.6	20.0
1976–77	30.5	18.3	13.3	5.1	31.8
1977–78	39.0	11.4	18.8	7.4	40.1
1978–79	39.0	9.0	18.0	6.8	35.2
1979–80	26.0	9.9	30.1	6.6	42.6

Basic physical infrastructure, quality manpower, operational resources, and flexibility in decision-making authority are elements of a conducive environment to get the most of the research systems.

Manpower development programs in agricultural research systems are primarily supported by grants and credits from various donor agencies. A study reveals that 16% of the external assistance was in the form of loans. Most of these external resources are used in physical facilities development and technical assistance through expatriate expert services. The most important area that needs more emphasis from external assistance is increased involvement in manpower development in agricultural research.

The study referred to above also reveals that more than 60% of the total allocation in agricultural research was provided for capital investment in physical structure. The allocation for operational costs in agricultural research was not adequate in proportion to the capital cost. There was an estimated shortfall of 36% in operational funds for the 1975–80 period (Table 2).

This is a situation which deserves due attention from the point of efficient management of human resources in agricultural research. A study reveals that the amount of funds available for operational costs in many agricultural research institutes has been inadequate to undertake meaningful research of national importance and to make best use of the equipment and other facilities.<sup>2</sup>

Imbalance in the hierarchial distribution of scientific personnel is a situation prevailing within the agricultural research system in Bangladesh. Certain program areas within the research system seriously suffer from inadequate human resources compared to some other program areas, thus creating an imbalance in multidisciplinary research. Example: plant breeders, soil scientists vis-a-vis social scientists.

The significant elements of the management of human resources in agricultural research in the Bangladesh context are:

- Recruitment systems and selection
- Remuneration (salary)
- Performance appraisal and evaluation
- Promotion opportunity and criteria

- Skill development, i.e., training
- Career development
- Job design, i.e., technology
- Values and expectations
- External forces, such as government rules

For efficient resource planning and management the necessary manpower data must be made available. So the first step in the process to meet the basic prerequisites has been the establishment of a scientific manpower database.

It is therefore the expectation of the organizers of this Workshop to discuss the BARC approach to the management of human resources in agricultural research. The working group activities are expected to provide hands-on experience with the computerized manpower database at the BARC Computer Centre, and to react to the procedure, format and software for the database with possible recommendations to improve the present system.

The Workshop program has been designed to provide a detailed description of the database and its salient features in terms of ease of updating the information, and the ability to monitor changes in the database. Each one of these elements could be the subject for two or three workshops like this. It will be rather unfair to try to elaborate all of these in this Workshop as we cannot do justice to the subject.

These issues may, however, come up for discussion and the participants will hopefully throw light on these based on the experience in their countries and their respective research organizations with which they have experience.

I would now like to focus on the objectives of this Workshop and draw your attention to its organization.

BARC in collaboration with the International Service for National Agricultural Research (ISNAR) has initiated a collaborative work on the management of human resources in agricultural research. The basic requirement is for effective human application of the manpower database for making management decisions.

In summary, I would like to refer again to the point that from a management function point of view, manpower planning and management are the key issues of an organization.

The management of human resources involves the study of motives and behavior. The hierarchy of needs is a fundamental concept of human resources management. The important elements of management, in the context of agricultural research manpower, are quantity and quality of manpower, financing manpower development programs, operational funds for research, and the imbalance in multidisciplinary teams. Manpower planning and management in the context of agricultural research in Bangladesh should be looked at and analyzed from the point of needs

assessment, recruitment systems and selection, salary, performance evaluation, awards and punishments, promotion issues, skills development, career development, job design, values, expectations, and external forces.

The agricultural research manpower database established at BARC is to be used in an attempt to test its appropriateness to make management decisions in relation to manpower planning and human resources development.

#### REFERENCES

1. Bergnen, Garret I. and William V. Honey. 1966. Page 3 *in* *Organizational Relation and Management Action*. McGraw-Hill Book Company, New York, N.Y.
2. Ahsan, Ekramul. 1981. Resource allocation to agricultural research in Bangladesh. Pages 129-136 *in* W.D. Daniels and B.L. Nestel, editors, *Resource allocation to agricultural research*. International Development Research Centre, Ottawa, Canada.

# Human Resources Planning for National Agricultural Research: A Management Exercise Based on Data from Thailand

BYRON T. MOOK

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*This paper is a case study exercise, a teaching method widely used in management training schools throughout the world. It illustrates some of the issues involved in human resources planning in a national agricultural research system.*

*The exercise is set in Thailand. The organizations described and the data presented are real. The study relates a problem which has to be solved. Unlike most classroom training exercises, there is no "correct" answer. Each participant in the Workshop was challenged to struggle with the data and to arrive at his or her individual "solution".*

*Within the context of the Workshop, participants were given 45 minutes to read the exercise, keeping these questions in mind:*

- *What exactly is the Director being asked to write?*
- *What are the main issues with which the Director has to deal?*
- *Which data will the Director find most useful?*
- *What are the three or four most important points which the Director will want to make in what he writes?*

*During the following 45 minutes the participants discussed the exercise in small groups, and sharpened their answers to these questions. There were hand calculators available to manipulate the hard data provided in the annexes.*

*The exercise concluded with more than an hour's plenary discussion under the leadership of Dr. Mook. Participants presented their assessments of the situation and examined alternative solutions.*

*The reader is invited to read this paper in the context of a case study, too, and to devise his or her solutions to these "real life" issues in the management of human resources in agricultural research.*

The Director of Personnel, Department of Agriculture, Royal Thai Government, sat in his office trying to decide what he should write to the Civil Service Commission (CSC).

Just before office closing time yesterday, a request had arrived from the CSC for a two-page summary of the likely graduate manpower situation in the Department in the year 1990. The CSC said that it wanted this summary in three days.

The Director thought that he knew of at least two reasons why the CSC was making this request. Both were urgent.

- The Government wanted to reduce public expenditures. The overall budget deficit was growing. Interest rates were high, and the Thai economy was slowing down. One way of attacking such financial problems was to reduce the number of new civil servants being hired.

- The Government also was concerned that many public organizations were becoming top-heavy. Hiring into *development-oriented* fields like agricultural research had been substantial in the late 1960s, 1970s, and early 1980s. Now those scientists who had been hired 5 to 20 years ago were all middle- and senior-level officials. Not only did more and more such officials mean higher salary bills, but too high a proportion of people at the middle and top ranks would almost certainly mean that organizational efficiency would suffer.

The Director realized that the manpower projections which the CSC wanted would be difficult to make. It wanted to know not only how many graduates there were likely to be in the Department by 1990, but also how this personnel would be distributed between different salary grades. The CSC request said that it regarded such a planning exercise as important for all government departments. A good manpower plan — it continued — could strengthen the case for maintaining or even raising current funding levels, as well as presenting the case for reform over such issues as salaries and careers.

The Director thought of the many considerations which he would have to take into account. How many graduates were there now on the payroll? In what salary grades were they? How many would have retired by 1990? How many new graduates would have been recruited? And so forth.

His most immediate problem, recognized right away, was where would he be able to get such data in the limited time available?

### **Personnel Records in the Department**

The Director was justifiably proud of the personnel records in the Department. For each graduate employee, the Records Section of the Personnel Division kept a bound book containing all relevant information on family background, education, in-career training, postings, salary changes, leaves, awards, disciplinary actions, and even military service.

The problem — the Director knew — was that he had no efficient means of aggregating these data. If he wanted to know something about a *particular individual*, the information was almost certainly available in his/her file. He could ask the head of the Records Section to bring that file to him. But if he wanted to know something about the *particular class* of persons — such as those with PhDs, or those in Grade Post Classification 7 (referred to as PC 7) — then the only way was to have the staff of the Records Section go through each and every file, one-by-one.

“The Department recruits individuals,” he thought, “but we are often called on to supply information on groups of people.”

In fact, one year ago, the Director had done an inventory of the graduate personnel in the Department. A data sheet had been designed on which had been tabulated basic educational and career information for each graduate. (See Annex 1.) Then clerical personnel from the Records Section had gone through each of the personal files by hand. The resulting data had been aggregated and computerized.

But now — the Director knew — even though this information was out-of-date, it was the best he had. He did not have time to gather new data on which to base his projections for the CSC. Furthermore, he himself did not have easy access to the computer on which the data had been entered.

### **Structure of the Department**

The Department of Agriculture was divided into twelve disciplinary-based divisions and six commodity-based institutes. The eighteen division and institute directors reported to three Deputy Directors General, who in turn reported to the Director General.

In late 1984, the total graduate staff strength of the Department was 1419 persons. (See Annex 2.)

A BSc or MSc entering the Department joined at Grade PC 3. (See Annex 3.) A PhD joined at PC 4. Promotion to PC 5 occurred almost automatically for all graduates. A BSc could expect to reach PC 5 within about ten years, an MSc within about five years, and a PhD within about three years. Promotion to PC 6 required passing a test.

In late 1984, 80% of the graduate staff members were in PC 4, PC 5, or PC 6. (See annex 4.)

### **Characteristics of Graduate Staff**

As the Director looked at the data on which he would have to base his projections, he was struck by the high percentage of women — 38% — among the graduate staff. The Director did not know of any other country which had such a high percentage of female agricultural research scientists and managers. Furthermore, many of these women were young — 50% were under 34 years of age compared with only 30% of the male graduates. Even in absolute terms, there were more women in the Department under 34 than men — 269 vs. 259. Fifty-one percent of the graduate recruits over the past nine years had been women.

“Some people feel that agricultural research is a job for men,” he thought. “But what are we to do when most of the best young men in Thailand choose to study engineering or medicine or business — and the top graduates in the universities in agriculture-related fields are women?”

The Director wondered what the implications of his figures might be for the future management of the Department. He had used the data which the Records Section had collected to calculate that 34% of the male graduates worked in research facilities outside of Bangkok, as compared to only 20% of the female graduates. He also had discovered that women graduates were over-represented in most of the divisions (i.e., more than 38%) and under-represented in all of the institutes.

A second characteristic of the graduate staff which caught the Director's attention as he looked at the data was their age distribution. (See Annex 5.) The retirement age in the Department was 60. Again, he wondered what the future management implications of the current distribution might be, particularly when he considered the close positive relationship which he saw between age and PC grade. For example:

- Fewer than 3% of the graduate staff under 29 were in PC 5.
- Fewer than 1% of the graduate staff under 35 were above PC 5.
- Fewer than 1% of the graduate staff under 40 were in PC 7.
- Only 2% of the graduate staff under 45 were in PC 7 or PC 8.
- More than 86% of the graduate staff in PC 7 and up were over 45.

The Director remembered that a young scientist had come to his office just last month to inquire about the speed at which he was being promoted. "Do we really have merit promotions when so few young people have risen to PC 6 and PC 7?" the man had asked. "Are so few young people really qualified to assume positions of scientific leadership?"

The Director had understood the man's point. At the same time, however, he had asked himself whether more rapid promotions of deserving younger scientists might not simply mean even more people in the middle and upper PC grades. If that happened, he feared, the graduate staff *pyramid* in the Department might begin to look like an *upside down pyramid*.

## Careers

One of the man's points had been that promotions in the Department seemed to be "almost automatic". The Director did not believe that such a statement was true. The official policy of the Government was that decisions about promotions were based primarily on a combination of merit and experience.

Nevertheless, he had asked the Records Section to collect salary and position data on a *sample* of 1039 graduate staff so that he would have some evidence on this issue. He wanted an answer to these questions:

- When an individual on one salary scale, e.g., PC 3, reaches the point at which his/her salary is the same as that of an individual at the bottom of the next salary grade, e.g., PC 4, how often does he/she move?

- If such moves are common, then is there a case that promotions are in fact “automatic”?

The Director thought of the example which the young man had given him: If someone joined the Department at the bottom salary point in PC 3, Baht 2765, and got one salary increment each year for the next five years, then he or she would be at the sixth salary point in PC 3 which is Baht 3745. (See Annex 6.) This amount — Baht 3745 — was also the bottom salary point in PC 4. Would he or she be promoted to PC 4 automatically?

The Director had sometimes heard this *crossover point* referred to as a *stagnation point*. In fact, he remembered that a senior scientist had once said to him that “If I remain on a particular salary scale after which I pass the crossover point, then I feel that I have missed my promotion ”

### Job Titles

As the Director continued to look at the data, he noticed the large number of persons who had the same job title. For example, 55% of the graduate staff were designated *agricultural technologist* and another 12% as *scientist*. The formal job descriptions which accompanied these designations were necessarily somewhat general.

The Director wondered what the relationship might be between job titles and careers. How important was it if people in different PC grades had the same job titles?

### Estimating Future Manpower Growth

As the Director thought of the task before him, he recognized that he would probably have to begin by deciding what variables were most important for estimating the numbers and characteristics of future graduate personnel in the Department. He decided on two:

- The annual net percentage increase in graduate personnel which the CSC was prepared to allow. He did not know if this figure was likely to be 2% or 1%, or even 0%. The official position this year was 2%, but he had heard rumors of lower figures in the future because of Government pressures for financial austerity.

- The *additional* number of graduate staff which the Department was going to be allowed to have — *on top of* the annual net percentage increase mentioned above — as a result of a special World Bank-funded National Agricultural Research Project (NARP). The project had a large training component. Substantial numbers of young Thai scientists were now abroad for postgraduate studies and would have to be employed by the Department when they returned. The target figure for additions of graduates to the Department for the NARP was 562. But the Director believed that the figure might be lower, perhaps 450 or even 350 graduates. Placements of trainees

abroad had been running somewhat behind what had been planned, and nominations of technicians to study for local BScs under the NARP were running considerably behind.

### **Conclusion**

As the Director thought about all these numbers, he wondered how he should start. What issues should he include in his short paper for the CSC? Which data should he use?

The issues were clearly important ones. The fact that the CSC wanted the paper in three days showed a sense of urgency. The Director suspected that whatever he wrote could become the basis for discussion and finally decision on:

- The number of people whom the Department would be allowed to recruit in the next five years.
- The qualifications of those recruits.
- The reform of promotion policies in the Department.
- The development of job descriptions for Department scientists and managers.

He wanted to have a first draft of his paper ready by that afternoon.

*What should he write?*

*Annex 1*

This is a reproduction of the Personal data sheet used by the Department of Agriculture of Thailand to maintain records on its professional employees.

PERSONAL DATA SHEET

01 - Personal File Number

\_\_\_\_ \_

02 - Name/Last Name

Name \_\_\_\_\_

Last Name \_\_\_\_\_

03 - Birth Year

\_\_\_\_ \_ Don't Know

04 - Sex

\_\_\_ Male

\_\_\_ Female

05 - Year of Joining Government Service

\_\_\_\_ \_ Don't Know

First Degree

06 - Institution

- 1 - Institute/College
- 2 - Thai University
- 3 - Foreign University
- 9 - Other \_\_\_\_\_
- 0 - Don't Know

07 - Year of Graduation

- \_\_\_\_\_
- 0 - Don't Know

08 - Subject

- 11 - Agriculture/Crops
- 12 - Agronomy
- 13 - Botany/Plants
- 14 - Horticulture
- 21 - Breeding/Genetics
- 22 - Physiology
- 23 - Seeds
- 31 - Pathology
- 32 - Entomology
- 33 - Nematology
- 34 - Zoology
- 35 - Weed Science
- 41 - Chemistry
- 42 - Soils
- 43 - Water Management
- 51 - Engineering/Architecture
- 52 - Food Science
- 61 - Administration/Management/Accounting/Banking
- 71 - Social Science/Economics/Statistics/Mathematics/  
Law/Education/Psychology/Mass Communications/Arts/  
Language/Library Science
- 99 - Other \_\_\_\_\_
- 00 - Don't Know



Entry Post - Page 1

13 - Year of Joining Agriculture Dept, Rice Dept, or DOA

\_\_\_ 0 - Don't Know

14 - Grade Then

\_\_\_ 03 - PC-3

\_\_\_ 10 - Grade 3

\_\_\_ 04 - PC-4

\_\_\_ 11 - Grade 2

\_\_\_ 05 - PC-5

\_\_\_ 12 - Grade 1

\_\_\_ 06 - PC-6

\_\_\_ 13 - Special

\_\_\_ 07 - PC-7

\_\_\_ 08 - PC-8

\_\_\_ 01 - Lower than grade 3

\_\_\_ 09 - PC-9

\_\_\_ 00 - Don't Know

15 - Division Then (if any)

\_\_\_ 31 - Botany and Weed Science

\_\_\_ 32 - Agricultural Chemistry

\_\_\_ 33 - Agricultural Engineering

\_\_\_ 34 - Agricultural Toxicology

\_\_\_ 35 - Plant Pathology and Microbiology

\_\_\_ 36 - Entomology and Zoology

\_\_\_ 37 - Soil Science

\_\_\_ 38 - Breeding and Genetics

\_\_\_ 39 - Technology

\_\_\_ 40 - Plant Industry

\_\_\_ 41 - Research and Experiments

\_\_\_ 42 - Rubber

\_\_\_ 43 - Sericulture

\_\_\_ 44 - Field Crops

\_\_\_ 45 - Rice

\_\_\_ 51 - Finance

\_\_\_ 52 - Programme Planning

\_\_\_ 53 - Personnel

\_\_\_ 54 - Office of the Secretary

\_\_\_ 71 - Agricultural Regulatory

\_\_\_ 72 - Extension and Dissemination

\_\_\_ 99 - Other

\_\_\_ 00 - Don't Know

Entry Post - Page 2

## 16 - Institute Then (if any)

- |   |  |
|---|--|
| <input type="checkbox"/> 1 - Field Crops  | <input type="checkbox"/> 5 - Sericulture     |
| <input type="checkbox"/> 2 - Rice         | <input type="checkbox"/> 6 - Farming Systems |
| <input type="checkbox"/> 3 - Horticulture | <input type="checkbox"/> 9 - Other           |
| <input type="checkbox"/> 4 - Rubber       | <input type="checkbox"/> 0 - Don't Know      |

## 17 - Position Then

- 11 - Executive
- 12 - Agronomist
- 21 - Agricultural Technologist
- 22 - Scientist
- 23 - Plant Pathologist
- 24 - Entomologist
- 25 - Zoologist
- 41 - Agricultural Engineer
- 42 - Mechanical, Civil, Survey Engineer or Architect
- 51 - Statistician
- 52 - Economist
- 53 - Planning and Policy Analyst
- 54 - Librarian
- 55 - Dissemination Technical Officer,  
Dissemination Clerk
- 56 - Training Officer
- 71 - Personnel Officer
- 72 - General Administrative Officer
- 73 - Legal Officer
- 74 - Financial Officer, Internal Auditor, Finance  
Accounting Management Officer
- 81 - Agricultural Management Officer
- 99 - Other
- 00 - Don't Know

## 18 - Place of Work

Amphur \_\_\_\_\_

Jungwat \_\_\_\_\_

Present Post - Page 1

19 - Year of this Appointment

\_\_\_ \_\_\_ \_\_\_ \_\_\_                      \_\_\_ 0 - Don't Know

20 - Grade Now

- \_\_\_ 03 - PC-3
- \_\_\_ 04 - PC-4
- \_\_\_ 05 - PC-5
- \_\_\_ 06 - PC-6
- \_\_\_ 07 - PC-7
- \_\_\_ 08 - PC-8
- \_\_\_ 09 - PC-9
- \_\_\_ 00 - Don't Know

21 - Division Now

- \_\_\_ 31 - Botany and Weed Science
- \_\_\_ 32 - Agricultural Chemistry
- \_\_\_ 33 - Agricultural Engineering
- \_\_\_ 34 - Agricultural Toxicology
- \_\_\_ 35 - Plant Pathology and Microbiology
- \_\_\_ 36 - Entomology and Zoology
- \_\_\_ 37 - Soil Science
- \_\_\_ 51 - Finance
- \_\_\_ 52 - Programme Planning
- \_\_\_ 53 - Personnel
- \_\_\_ 54 - Office of the Secretary
- \_\_\_ 71 - Agricultural Regulatory
- \_\_\_ 99 - Other
- \_\_\_ 00 - Don't Know

22 - Institute Now

- |                      |                         |
|----------------------|-------------------------|
| ___ 1 - Field Crops  | ___ 5 - Sericulture     |
| ___ 2 - Rice         | ___ 6 - Farming Systems |
| ___ 3 - Horticulture | ___ 9 - Other           |
| ___ 4 - Rubber       | ___ 0 - Don't Know      |

Present Post - Page 2

## 23 - Job Name Now

- 11 - Executive
- 21 - Agricultural Technologist
- 22 - Scientist
- 23 - Plant Pathologist
- 24 - Entomologist
- 25 - Zoologist
- 41 - Agricultural Engineer
- 42 - Mechanical, Civil, Survey Engineer or Architect
- 51 - Statistician
- 52 - Economist
- 53 - Planning and Policy Analyst
- 54 - Librarian
- 55 - Dissemination Technical Officer and Dissemination Clerk
- 71 - Personnel Officer
- 72 - General Administrative Officer
- 73 - Legal Officer
- 74 - Financial officer, Internal Auditor, Finance Accounting Systems Analyst, and Finance Accounting Management Officer
- 81 - Agricultural Management Officer
- 99 - Other
- 00 - Don't Know

## 24 - Place of Work

- Amphur
- Jungwat

*Annex 2*

## Distribution of Graduate Personnel by Division and Institute

Botany and Weed Science Division	64
Agricultural Chemistry Division	109
Agricultural Engineering Division	37
Plant Pathology and Microbiology Division	33
Entomology and Zoology Division	129
Soil Science Division	53
Finance Division	5
Programme Planning Division	32
Personnel Division	13
Agricultural Regulatory Division	70
Office of the Secretary	<u>3</u>
	548
Field Crops Institute	213
Rice Institute	243
Horticulture Institute	107
Rubber Institute	109
Sericulture Institute	45
Farming Systems Institute	<u>35</u>
	752
Unclear from Personal Files	<u>119</u>
Total	1419

*Annex 3*

## Salary Scales

	<u>PC-1</u>	<u>PC-2</u>	<u>PC-3</u>	<u>PC-4</u>	<u>PC-5</u>	<u>PC-6</u>	<u>PC-7</u>	<u>PC-8</u>	<u>PC-9</u>	<u>PC-10</u>	<u>PC-11</u>
20	3535										
19	3325										
18	3115										
17	2905										
16	2765										
15	2625										
14	2485	4685	5745	7285	9385						
13	2345	4425	5465	6935	8895	12535					
12	2205	4165	5205	6585	8475	11975					
11	2065	3955	4945	6305	8055	11415					
10	1950	3745	4685	6025	7635	10855	13095	14295	15575	16975	
9	1865	3535	4425	5745	7285	10365	12535	13695	14935	16275	17745
8	1780	3325	4165	5465	6935	9875	11975	13095	14295	15575	16975
7	1695	3115	3955	5205	6585	9385	11415	12535	13695	14935	16275
6	1620	2905	3745	4945	6305	8095	10855	11975	13095	14295	15575
5	1545	2765	3535	4685	6025	8475	10365	11415	12535	13695	14935
4	1470	2625	3325	4425	5745	8055	9875	10855	11975	13095	14295
3	1395	2485	3115	4165	5465	7635	9385	10365	11415	12535	13695
2	1325	2345	2905	3955	5205	7285	8895	9875	10855	11975	13095
1	1255	2205	2765	3745	4945	6935	8475	9385	10365	11415	12535

*Annex 4*

## Distribution of Graduate Personnel by Grade (Post Classification\*)

PC 3 (Post Classification 3)	97
PC 4	345
PC 5	391
PC 6	393
PC 7	167
PC 8	20
PC 9	4
PC 10	1
unknown	1
Total	<u>1419</u>

*Annex 5*

## Distribution of Graduate Personnel by Age

60 and over	8
55-59	29
50-54	100
45-49	132
40-44	237
35-39	385
30-34	342
25-29	175
under 25	11
Total	<u>1419</u>

## Annex 6

## Salary Points

Handwritten figure below printed figure = number of people at each salary point.

	<u>PC- 1</u>	<u>PC- 2</u>	<u>PC- 3</u>	<u>PC -4</u>	<u>PC- 5</u>	<u>PC- 6</u>	<u>PC- 7</u>	<u>PC- 8</u>	<u>PC- 9</u>	<u>PC-10</u>	<u>PC-11</u>
20	3535										
19	3325										
18	3115										
17	2905										
16	2765										
15	2625										
14	2485	4685	5745	7285	9385						
13	2345	4425	5465	6935	8895	12535					
12	2205	4165	5205	6585	8475	11975					
11	2065	3955	4945	6305	8055	11415					
10	1950	3745	4685	6025	7635	10855	13095	14295	15575	16975	
9	1865	3535	4425	5745	7285	10365	12535	13695	14935	16275	17745
8	1780	3325	4165	5465	6935	9875	11975	13095	14295	15575	16975
7	1695	3115	3955	5205	6565	9385	11415	12535	13695	14935	16275
6	1620	2905	3745	4945	6305	8895	10855	11975	13095	14295	15575
5	1545	2765	3535	4685	6025	8475	10365	11415	12535	13695	14935
4	1470	2625	3325	4425	5745	8055	9875	10855	11975	13095	14295
3	1395	2485	3115	4165	5465	7635	9385	10365	11415	12535	13695
2	1325	2345	2905	3955	5205	7285	8895	9875	10855	11975	13095
1	1255	2205	2765	3745	4945	6935	8475	9385	10365	11415	12535

*Annex 7*

## PC Grades and the Stagnation Point

When the Director looked at the numbers of people in each PC grade above what might be called the "stagnation point" (i.e. the point at which an individual's current salary level was equal to the lowest salary level in the next PC grade), he found the following . . .

	<i>Percent Above Stagnation Point</i>
PC 3	6
PC 4	8
PC 5	2
PC 6	24
PC 7	91

Even more striking, when he computed the numbers of people at this "stagnation point + 1" (that is, one more salary level), the figures became . . .

	<i>Percent Above Stag. Point + 1</i>
PC 3	2
PC 4	2
PC 5	1
PC 6	13
PC 7	84

# Manpower Planning and Development: Relationship to Work Planning

ALAN THOMAS

*Training Specialist  
The World Bank*

This paper is to highlight the linkages between manpower planning and development, and work planning in order to achieve the work objectives of agricultural research organizations. I will discuss some of the demands of the work and the needs required of the manpower resources, and will touch on some of the decisions which managers have to make. These will be illustrated by examples of current situations which the Bangladesh Agricultural Research Council (BARC) and other institutions in the national agricultural research system are facing to more effectively manage their human resources.

Management is concerned with making the best use of resources to achieve work objectives. This Workshop is focusing on human resources, which are a part of any work system. This system can be broken down into three main elements:

- The work or job to be done
- The organizations or institutes
- The skilled manpower available

This process is illustrated in the three annexes to this paper.

First, let us look at agricultural research work. The *National Agricultural Research Plan, 1984–1989*, listed eleven overall objectives with 66 approaches which are broken down into commodity and non-commodity areas. The 23 commodity areas have 324 detailed areas which can be further divided into an even greater number of projects and experiments. The time scale for research projects is quite variable. For example, in developing of crops it can range from five to eight years.

The work plan for agricultural research, therefore, is varied, specialized, detailed, covers a long time scale, and needs to be matched by the manpower resources.

Secondly, let us look at the organizations. In the national agricultural research system of Bangladesh there are eleven research institutes as well as the Bangladesh Agricultural University (BAU), Bangladesh Academy for Rural Development (BARD), Comilla, and the Bangladesh Rural Development Academy (BRDA), Bogra. These research institutes are not restricted to one site. For example, the Bangladesh Agricultural Research Institute

(BARI) has 27 regional and sub-stations. The Bangladesh Jute Research Institute (BJRI) has four research sub-stations, four seed farms, and 24 sub-centers.

The institutes are the means of organizing human resources to do the work. They are many, diverse and fragmented. All have to be staffed by scientists, technicians and administrators. All are below their establishment level in manpower at the present time which is a constraint on the amount of work that can be done in the immediate future.

In order to get the work done we have to plan for the manpower. This means we need to know a great deal about the manpower in order to manage it as an effective resource. This leads us to look at the third element, the manpower available.

Manpower planning is concerned with the skills of the personnel. This entails looking for the right types of skills, of the correct quality and quantity of skills, of having them in the right places at the right times, and in carrying out the right jobs.

There must be an inventory of the manpower in the organizations. At the most basic level this is a head count made at a particular time. A head count, however, will give only an outline of the manpower resource. The following questions need to be answered to obtain a clear picture of this resource:

How many people have we by \_\_\_\_\_ ?

- organization?
- department?
- sub-unit?
- location?
- salary grade?
- sex and marital status?
- age?
- length of service?
- present post?
- date of appointment?
- job function?
- qualifications obtained?
- training received, both short- and long-term?
- present training and what type?
- number of books and research papers published?

While this list is not exhaustive it gives an idea of the detail required to develop a full picture of the available manpower resource.

This is being done now by BARC to ensure that all the necessary data are available on individuals in the research system. The information on one organization is complete and is being collected on all the others. There are about 2000 scientists and over 3600 technical staff members. In addition, there are over 4300 administrative and other support personnel.

This information is never static; it is always changing because of the passage of time and the development of individuals. Therefore, it needs to be continually updated to be of use to management in manpower planning. Not only do we need information on manpower as it is at a particular time, but we must know what is happening to this resource on a regular basis.

This requires carrying out a manpower audit, which is a systematic examination of the manpower inventory. The audit describes, explains, comments upon, and investigates the manpower resources; it reveals through analysis the ratios and trends affecting the manpower situation. The audit seeks answers to questions such as:

- What are the numbers of starts and terminations of employment this year? last year? over the past few years?
- What is the age distribution?
- What is the distribution of academic qualifications?
- Do we have enough of the right types and quality of personnel in the pipeline?

By revealing gaps and movements, this audit can help management to decide what steps to take in managing its manpower resources.

Managers need foresight to determine the research work required in the next five years. This implies an even longer view of the needs of the manpower resources.

I said that the manpower situation is never static, it is always changing in some way. How do we keep it topped up? How do we improve its quality? What is the input to the manpower resource? There are two ways I want to mention: (1) recruiting and training of new staff, and (2) training of present staff leading to manpower development.

Let me illustrate this with a current example. The Bangladesh Livestock Research Institute (BLRI) was formed in the beginning of 1985. It is not yet up to strength. The scientists needed to staff it will require special qualifications. The work plan and manpower proposals for this were put forward in November 1985. These are some of the questions which management has under discussion:

- Are the plans what we require?
- How quickly can we recruit and train people?
- Can they be recruited quickly enough to start specialized advanced degree studies in 1986?
- Which courses can be taken locally? abroad?
- Where can they be taken abroad?
- What are the specific courses of studies to be followed?

This last question has been discussed over several months among BARC, BLRI and the universities.

Providing the right quantity of qualified staff members to BLRI is going to take several years. A minimum of five years will be needed if everything goes well. This illustrates the long time-scale and the "gestation period" which are necessary before an institute can be capable of tackling its full planned workload. It is a good example of the linkages between manpower planning, manpower development, and work output.

Let us look at another example, statistical training for agricultural research staff members. Some of the areas of statistical performance needing improvement in the agricultural research network are mathematical and statistical training, keeping up-to-date in methods, increasing the knowledge of designing field experiments, and improving the skills in interpretation of experimental results. Since 1982, five levels of courses have been offered in-country by BARC in cooperation with institutes at nine locations. A total of 18 courses have been run for over 290 participants. This has taken four years to build. Though this is only one aspect of the BARC training program, it illustrates the complications of managing a series of courses in which the participants come from nearly all institutions in the research system as well as from many outside organizations which are linked with the agricultural research program. There are different levels of expertise which can be attained from these courses, so it is necessary to identify different levels of expertise of trainers to run the courses.

Seventeen expatriate resource persons from six countries have contributed to the development of this training. Thirty-four potential local course leaders have been identified from BAU, BARI, BJRI, Bangladesh Rice Research Institute (BRRI), Bangladesh Agricultural Institute (BAI), and the University of Dhaka (DU) to run the courses and so institutionalize the training.

Managers who are concerned about improving the quality of their research experiments by improving statistical capabilities need to be able to identify their staff members who can benefit from the training. Therefore, they need to have a good idea about what courses are to be offered.

The stage has now been reached when it will be useful to add this information to the manpower inventory which is stored on the computer. Then we will be able to identify those persons who have completed each level of the courses and so help management to select those who still require this training. Whatever information is put into the computer still requires that management make critical judgements about what steps are appropriate to improve the quality and output of the research work.

Carrying out plans can be difficult.

The placement of students for advanced degree study abroad requires following time-consuming procedures both in Bangladesh and with the foreign universities. Sometimes this process means that a prospective student's entry in the academic program may be delayed for months; he or she may never go and thus the place is lost. It is common practice for the

potential student to leave his place of work in order to personally try to move his case through the various bureaucratic channels in order to meet the target dates for training abroad. This can take a month or more, during which time the researcher is not working on his project. This problem is being tackled but much work is yet to be done to improve the situation. It is an example that touches on the personal aspect of managing human resources and getting research work done.

Information which is collected and then stored and analyzed with the computer can help to put managers in a position to make effective decisions concerning manpower that will achieve both the work objectives and the individual's personal goals.

Whatever information on human resources that a manager receives from a computer to use in decision-making, he must not forget that he is dealing with the lives, careers, hopes and aspirations of individuals — most of whom want to do a good job of work. It is the managerial skills in handling situations which will always be most important.

The author acknowledges the contributions made to this paper by Mr. Ahmed Hussain, Director (Training), Bangladesh Agricultural Research Council, and Dr. James R. Dickey, Livestock Specialist, and Dr. A.K. Kaul, Crops Specialist, both of Winrock International Institute for Agricultural Development.

#### REFERENCES

- BARC (Bangladesh Agricultural Research Council). 1984. National Agricultural Research Plan, 1984-1989. Dhaka.
- Greene, Brook A. Statistical training for agricultural research. Agricultural Economics and Social Science paper 16, Bangladesh Agricultural Research Council, Dhaka.
- Lynch, James. 1968. Making manpower effective. School of Business, Ealing Technical College.
- SARC (South Asia Regional Cooperation). 1984. Inventory of agriculture experts in Bangladesh. Bangladesh Agricultural Research Council, Dhaka.

*Annex 1*

## Reconciling the Requirements of Work and Manpower

---

<i>What to do</i>	<i>Output</i>
1. We need to plan our work: What do we want to do? How much? Over what time span?	Work plan
2. This leads to a manpower inventory: What manpower do we have? What quality? quantity? Where is it?	Manpower inventory
3. This leads to asking: Do we have enough manpower to do the work? If yes, is it of the right quality? Do these persons need training?	Training plans for existing staff
4. If we do not have enough, can we recruit and train more of them?	Training plans for new staff
5. If we cannot recruit more people or enough people, we have to adjust our work plans to the manpower available.	Adjusted work plans to people available
6. What is happening and what will happen to our manpower? Is our present manpower balanced over different age ranges? Will too many people be retiring at one time?	Manpower audit
7. In order to achieve the work plans, we need to produce a plan for developing agreed categories of staff and other resources available, and showing any exceptional requirements.	Manpower plan (See Annex 2)

---

*Annex 2*

## Manpower Plan

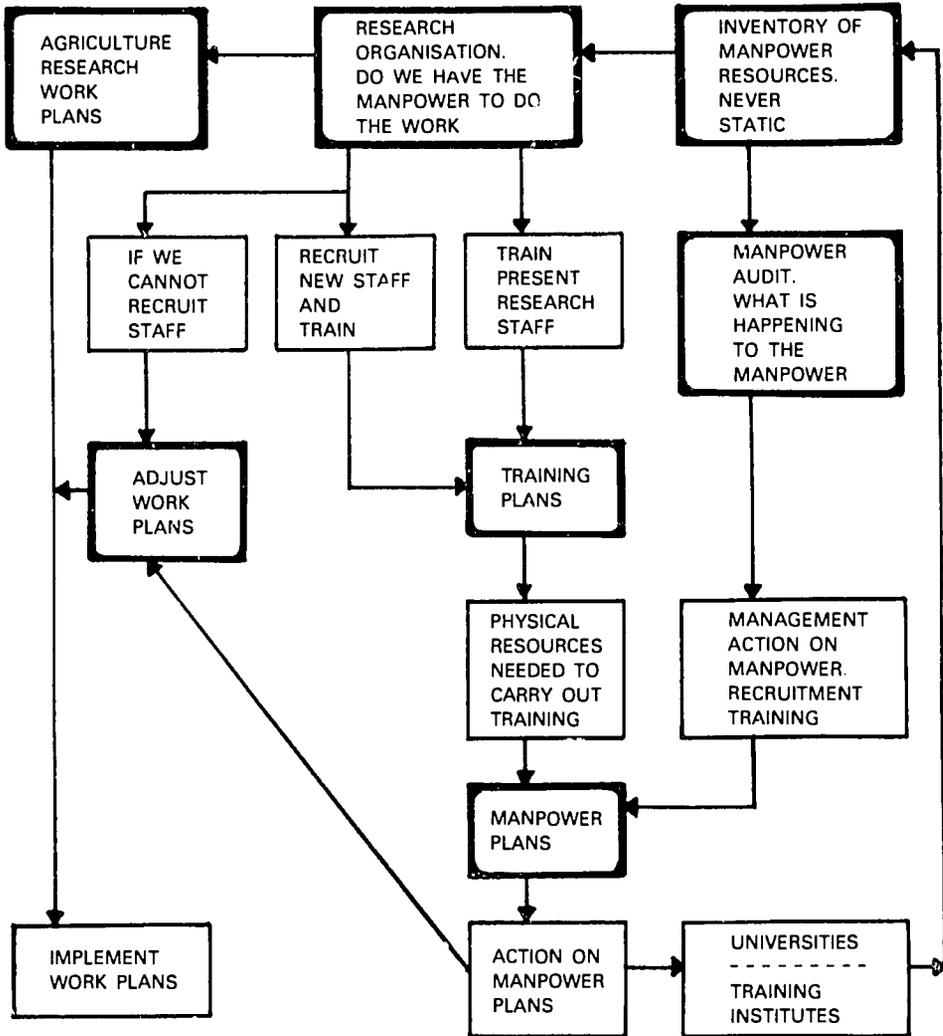
The manpower plan brings together the training plans, the money required or available, and the training resources available or needed to give management a comprehensive view of the way to develop the manpower to do the job or work plan in the coming time span. It may be illustrated by the following criteria to be considered when producing such a plan.

## Criteria to be Considered for a Manpower Plan

1. Start with the work plan for the research to be conducted for the next five years.
2. Show the staff available by discipline, qualifications, age, sex, place, and other needed data.
3. Show what staff is needed for research work.
4. Calculate the shortfall between items 2 — what is available — and 3 — what is needed. The result is the additional staff and/or qualifications required, i.e., the gaps in the manpower.
5. Show the training needs and plans of available staff to do the work planned.
6. Show the training plans for additional manpower.
7. Show the funding available and its allocation to training plans for available staff.
8. Show any funds which are available after allocation (see item 7) for available staff, and therefore are surplus or a shortfall. If there is a shortfall, show additional training needs which require funding.
9. Show the existing capabilities of universities for in-country degrees.
10. Show the existing capabilities of in-country short-term training facilities.
11. Show whether or not people are available to do the work, and whether or not the training and the work can be carried out together.
12. Refer to the needs for strengthening various facilities to carry out the plan; identify the areas.

Annex 3

Manpower Planning and Development: Relationship to Work Plans



# Using Microcomputers for Managing Human Resources: Lessons from AARD in Indonesia

RALPH H. RETZLAFF

*Project Specialist/Training Coordinator (AARD/Indonesia)  
Winrock International Institute for Agricultural Development*

Many problems confronted the leadership of Indonesia's Agency for Agricultural Research and Development (AARD) at the time of its founding. The shortage of scientific and technical manpower was the most acute. In 1975 there were only 80 scientists at the national level in all fields of scientific research for every one million Indonesians. The number of agricultural scientists was even lower. This was due to the fact that higher education in agriculture only began in 1974 with the establishment of the graduate school at the Bogor Agricultural University (Institut Pertanian, Bogor). In 1975, at the scientist level in AARD there were 7 PhDs, 26 MScs, and 413 BScs or the equivalent.

On the other hand, agricultural research in Indonesia started more than one hundred years ago. When AARD was established in 1975, it inherited 13 research institutes previously located in various units of the Ministry of Agriculture. Practically all of the researchers in those institutes in the pre-independence period were expatriates, mostly Dutch, who left after Indonesia secured independence.

At present, in early 1986, there are 129 PhDs, 235 MScs, and 1008 BScs. At the technician and farm assistant level the growth for this period has been from 3599 in 1975 to 5428 at present. In addition there are 157 PhD candidates and 285 MSc candidates in training at universities in Indonesia and abroad. Current targets for manpower development in AARD by 1994-95 call for 726 PhDs, 1285 MScs, and 1625 BScs at duty post or in training.

The growth of scientific manpower during the past decade from 7 to 129 PhDs and 26 to 235 MScs resulted from a calculated decision to send out the best young scientists who were ready for training. The primary criteria for selection was their ability and potential to fulfill the requirements of postgraduate programs. After a decade of rapid growth, AARD began to take stock of the distribution of scientists across the range of scientific disciplines necessary to fulfill the staffing requirements of its research programs. It also looked at the pattern of distribution of scientists among its 33 units. AARD recognized the need for systematic manpower development planning to complete the staffing of its research institutes. It also was

concerned about its capability to monitor the study programs of staff members now away for study. It had to make optimum use of scarce financial resources.

In order to do these things it became evident that AARD needed to develop management information systems that would enable it to rapidly cross-classify and analyze available information in a variety of formats, with speed, accuracy, and considerable flexibility. Within the past three years this has led AARD into the use of microcomputers for virtually all aspects of its activities, not only human resource development.

What I will describe in the remainder of this presentation is a personal account from the perspective of the training section of the Project Implementation Unit (PIU). This unit was set up to assist the AARD in the implementation of a major institution building project — National Agricultural Research Project—Phase II which is jointly funded by the Government of Indonesia and The World Bank. I will also comment briefly on how the use of microcomputers in AARD has spread from the human resource development program to all aspects of current activity.

In February 1983 I joined the PIU. My assignment was to assist the training section. The loan credit agreement provided for the training in-country and overseas of 120 PhDs and 500 MSes. In addition, we were responsible for the continuing administration of training programs for 75 PhDs, 81 MSes, and 4 BSEs who were already at their study posts during the NAR-I and continued into NAR-II. Our total staff size was very small. The overseas component is assisted by backstopping services in the Human Resources Development Division of Winrock International Institute for Agricultural Development. The local training component is backstopped by other elements of the PIU, i.e., finance.

Within a few weeks of my arrival in Bogor I realized that we were confronted by a task which seriously challenged our efforts at efficient and effective management. In the middle of 1983 we had more than 396 AARD staff at study posts in post-baccalaureate degree programs. We were responsible for initiating each year a minimum of 70 new trainees at universities within Indonesia and 30 at universities overseas. In fact, since the implementation of this phase of the NAR-II program began a year after the original target starting date in the appraisal document, it was viewed as being behind schedule. We were under substantial pressure from both AARD and The World Bank to accelerate our placement efforts. This was particularly difficult in the overseas program, since we generally make multiple applications for each candidate, normally to from three to five universities.

For every AARD staff member involved, either at study post or awaiting placement, there are literally dozens of pieces of information, each of which must be monitored very carefully. The failure to include the correct certificate of language proficiency or a properly validated transcript, can invalidate an application. Similarly, lack of adequate attention to each single aspect of a

student's on-going training program, whether it be their current grades, their research proposal, or any of a number of matters, can have serious negative consequences. It must also be recognized that actions or responses must take place within a very short time. Thus, the monitoring system must be comprehensive, susceptible to constant updating, and with very slight margin for error.

To summarize briefly, we had a small staff, an information flow that was very large, an urgent demand for results, and very little room for error. In addition we were faced with frequent, short notice requests for information in a wide variety of formats to assist in answering questions which were put to the PIU by our superiors.

The first problem we faced as we tried to improve our capability was in justifying the purchase and use of a microcomputer. Neither I, nor any of my colleagues was a trained computer specialist. For some people who have never used microcomputers, they tend to seem like threatening things. We got all sorts of questions. "It is expensive, can't you just use filing cards?" "How can you use these machines if you don't know programming and other computer science matters?" Gradually, we were able to persuade those who made the decisions. We did it in large part by taking away the mystery of the computer, its *black box* character.

A computer is really like several other standard office machines — but all in the same container.

- It is like a memory typewriter on which you can make corrections.
- It is like a desk calculator on which you can do many sums, rapidly and correctly.
- It is a rapid sorting device on which you can organize data to your liking.

It is this, and of course much more. But it certainly is not a magic box, although we soon found our superiors thought we could produce miracles in very short spaces of time.

Our first machine was a standard IBM personal computer. Nothing fancy. It had a modest memory (it had 256KB RAM with two diskette drives). I became the first pupil in an "each-one-teach-one system." I was very apprehensive. We had one colleague who was familiar with personal computers (PC). He became our outside, part-time consultant. It took me several days to realize that a mistake on the keyboard was not going to blow the whole thing up. The worst that could happen was that I would lose the data on my disk if the power failed and I had not taken certain proper precautions. No problem: it just meant I had to work an extra hour or so. We soon learned how to save data at periodic intervals.

After the machine was purchased, our first decision was what kind of software to get. What is software? The machines, by definition, are hardware. Software means the programs — sets of instructions — put onto a small

floppy disk, about 5½ inches in diameter. These programs enable you to use the computer in various special ways. There are many types of software programs. Some are called word processing, if you want to use the computer as a typewriter. Some are called spreadsheets, if you want to enter data on rows and columns and manipulate that information. We decided on two programs initially, a spreadsheet program to use for putting our training data into tables and monitoring formats; and a word processing program for the written parts of our reports, as well as for correspondence. The spreadsheet program is called *LOTUS 1, 2, 3 version 1.A* and the first word processing program was *WORDSTAR version 1.1*. We now use a newer word processing program called *WORDSTAR 2000* which we find much easier to use. Since then we have purchased one other software package, *DATAEASE*. It allows you to enter data as if you were writing on an individual file. Then you can automatically produce reports based upon data in hundreds of files. The data can be numerical information, as well as written text-type data, such as names of units, disciplines and universities.

To summarize, our initial steps were to justify the use of a machine, decide on software, then start to practice. We had no large scale plan. Quite honestly we were not too certain where we were headed or would wind up. Within a few weeks, we were able to start producing modest data tables which allowed us to summarize our information. Then the hard part began, and it had nothing to do with the computers.

Basically our problems could be divided into two categories. One set had to do with our information. For this I will use the term *database*. The other set of problems had to do with the use of our end product. What sort of tables were needed for what purposes? Which ones were needed continuously, and which ones on a one time basis? I will call this aspect the *demand* side.

The information we were responsible for was scattered in hundreds of individual files in our office. For some special aspects it was in many different offices. Improving the timeliness of our data was a problem. We had to keep it current and up-to-date. Before installing the microcomputer, every time a special report was called for it required a massive effort. We had to cull through our own files, extract the relevant data, organize and tabulate it, and compute the percentages, or whatever manipulations were needed. Sometimes this took quite a while. By the time the tables were produced the data were out-of-date. Shortly after I arrived I remember seeing one such table. It was as wide and almost as tall as a standard door. It was done with multi-colored pencils. It tried to summarize just about every available piece of information about one group of our training fellows. It had taken more than two months to produce and already was badly out-of-date. It could not be manipulated to answer questions which had not been anticipated when the format had first been devised.

Besides timeliness, a second consideration we faced was being certain (1) that the data was correct, and (2) that we had all the data we needed. Sometimes names did not match, starting dates had been changed, or study

locations had shifted. There were endless possibilities of changes. Chances for errors could go unrecognized until some critical moment. Gradually, using the *LOTUS 1, 2, 3* program we developed a system for classifying a selected amount of our most important information about every fellow in the entire system, from those who had completed training to those who have yet to start. By an experimental process we learned what to include and what to leave out. We now have one main database and several specialized ones. I will discuss these and other formats in more detail at the end of this presentation.

This is not a one time process. You do not create a database which is perfect from the outset. Rather, it is a matter of trial and error. Within certain technical limits of given software programs, personal computers are ideal for this process of adapting and adjusting.

Let me switch now to the matter of what I have called the demand side, because it is most relevant at this point.

Who uses your reports and analyses? Obviously each of us does within our own units, but there is much more to it than that. All of us are part of administrative systems. There are people above us in the hierarchy, as well as in parallel and subordinate units — in our own as well as other organizations — who are potential users of the information and analysis we generate. The fancy term for this is *management information systems*. Based upon my experience in AARD, I like to discuss the demand for management information systems in terms of what I call “a bowl of salted peanuts” approach. Have you ever invited friends to your house and set out a bowl of salted nuts? How many have been able to stop after eating just one nut?

We found that putting our reports into the administrative system was a bit like serving someone a bowl of salted nuts. When we gave our first printout to the head of our unit he did not know quite what to make of it. He accepted it politely, placed it in his briefcase, and took it home to study. The next morning I received a phone call, “Can you present the data so that it can show features A and B; and also organize it in ways X and Y?” “Yes sir, how soon would you like it?” Within that short time we had a confirmed convert. He has never looked back. Last week he attended a special computer course for senior managers which AARD now runs. He, and his superiors, make it clear to us what they need. It is in effect a *demand driven system* — then we try to match their needs with outputs. Of course we prepare alternative formats, new ideas, and new ways of looking at things and solving problems in anticipation of their demands. But it is part of an iterative process — back and forth between user and supplier — so that we stay in close touch. Our goal is to make certain that our output is related to the issues and problems in the system as seen by the people who have to make the decisions.

Permit me to pull together a few points which are critical in illustrating our success to date. First, we started small. We did not start out with a predefined master system which we then sought to force everyone else to

accept. Our initial problem was just improving the quality of our own data. We were involved in finding ways to make sense of it and present it to our immediate superiors.

Second, the development of our system was an interactive process — back and forth — between user and supplier.

Third, it was primarily demand driven. If the decision makers in the system could not and did not use our output, then it had a very limited value.

Even the somewhat complex forms we use for manpower development planning are basically improvements and adaptations of previous forms. We have altered them to yield better answers to urgent problems faced by AARD's Manpower Development Committee. Let me give you an example of a question we get. "If we project an increase of X PhDs in Unit A from 1990 to 1995, what will it mean for our required output of MScs and our recruitment of new entry level scientific staff? Also what will it do to our overall funding projections?" Doing this simultaneously for 23 Research Institutes, five Research Coordinating Centers, two Research Centers, two Service Centers and the AARD Secretariat might sound complex. Actually, once the system is in place it is a matter of minutes for data entry and seconds for computation.

Having stressed the points which have been a key to understanding our ability to win relatively widespread acceptance for our computer-based management information systems, I must add one further point. It is evident to me that the AARD is now poised to begin to systematize and expand its entire network of management information systems. Legitimacy and capability are no longer questions. The situation within the AARD has now moved to a qualitatively different threshold. Now the issues are effectiveness and efficiency. As I noted previously, one week ago my own Director and a number of other senior staff were attending courses on the use of microcomputers. They are not going to become computer specialists. What they are learning is the potential uses of a number of different software packages. Staff at other levels are learning to use them. Thus the senior managers will be in a much better position to specify their needs and instruct those who will do the day-to-day work on our machines.

Our Center for Agricultural Data and Processing — AARD's computer center — has developed a number of training programs for the use of software available for word processing, spreadsheets, database management, file and report systems, scheduling and planning. These are for senior- and middle-level staff as well as operational personnel who will do the main input and monitoring work. Even our Director General has attended the senior level managers' course.

Two units in AARD's Secretariat, which are closely linked to our own work on training, are now in the process of installing software programs to assist in their activities. The Personnel Division of the Secretariat is installing a database monitoring system for all personnel records throughout the

AARD. This is being done with the use of the *DATAEASE* program. Essentially, a file in the computer's memory is created for each employee using a standardized format with pre-coded categories. Once entered this data can be presented in a variety of reports. For example, you may require a list of all employees working in the system on a given commodity plus a sub list of those who are within a given number of years of retirement, showing their disciplines, degrees, and status as research workers. *DATAEASE* will give you that and much more. So will *D-BASE III*, another popular program requiring a bit more sophistication on microcomputer use.

The Research Programming Division of the Secretariat is now installing an Agricultural Research Projects Information System (ARPIIS). Both at the research program and research project level a substantial number of variables — from financial data, disciplines and personnel, and research objectives — are placed in what is best described as a file system. Again, the *DATAEASE* program is being used.

There is a lot of hard work involved in this, let there be no mistake about that. There is trial and error, and moments of anguish when a power failure or a foolish command to the computer wipes out part of the data. But AARD is now firmly convinced of the variety of important roles microcomputers can play at the senior management level, at the level of its research units, and in project implementation units such as ours.

A decade or so ago, when investing in computers meant purchasing a main frame — an IBM 1620 or the later 360 — and surrounding it with a set of *high priests* called *applications programmers*, the investment was substantial and a bad decision could have catastrophic consequences. Now it is possible to start small with a modest initial investment. You can then experiment on arrangements. Our first machine was a simple IBM PC, with the most routine configuration. It cost us US\$5,000. Within a year, we purchased a second machine with an expansion unit and a larger memory capacity. That machine and two printers cost us about US\$12,000. The remarkable thing is that less than 1½ years later we have just purchased a third more powerful machine for less than either of the first two. It was manufactured in Japan and Taiwan and assembled, in part, in Indonesia. It is a copy of an IBM PC AT with an 80286 memory chip, 20 MB installed memory (expandable to 40 MB), 1020 KB RAM, one high density diskette drive with a 1.2 MB capacity (very useful in backing up databases for safety purposes), and one regular diskette drive for the standard 360 KB floppy diskettes, plus a color monitor (which is needed for graphics work) and a printer. I list this information to make the point that this system, which is much more powerful and useful than our second machine, cost only Rp. 4,000,000 (less than US\$4,000) in Jakarta as compared to US\$5,000 and US\$12,000 for the earlier machines. Prices are tumbling and are likely to go down even further.

A major challenge AARD faces is standardization. Many of our overseas training fellows find it possible to buy, or in a few cases assemble on their own, microcomputers which they bring back. It is critical that any organiza-

tion contemplating the use of microcomputers decide fairly early on the type of system they intend to develop and then standardize on it. AARD's decision has been on *IBM compatible* equipment. An important factor in that decision has been the range of software program packages which are available. A related factor has to be included, namely access to after-sales service. The price on some compatibles is attractive, but the question is can the machine be maintained and serviced after sales?

## REFERENCES

- Affandi, A. 1985. The rice revolution in Indonesia: The Indonesia experience in increasing rice production. Pages 27-39 in *Education for agriculture*. International Rice Research Institute, Los Banos, Philippines.
- Baharsyah, Syarifuddin. 1981. Development strategy for agricultural research manpower in Indonesia. Pages 165-176 in D. Daniels and B. Nestel, editors, *Resource allocation to agricultural research*. International Development Research Centre, Ottawa, Canada.
- Manwan, I. 1985. Research and training at the Agency for Agricultural Research and Development in Indonesia. Pages 101-108 in *Impact of science on rice*. International Rice Research Institute, Los Banos, Philippines.
- Ministry of Agriculture, Republic of Indonesia. 1980. *Five years of agricultural research and development for Indonesia, 1976-1980*. Agency for Agricultural Research and Development, Jakarta, Indonesia.
- Ministry of Agriculture, Republic of Indonesia. 1985. *This is the Agency for Agricultural Research and Development (AARD)*. The National Library for Agricultural Sciences, Bogor, Indonesia.
- Satari, G. 1985. Cooperative research: New dimensions in Indonesia. Pages 223-231 in *Education for agriculture*. International Rice Research Institute, Los Banos, Philippines.

# Development of the BARC Database on Agricultural Research Manpower in Bangladesh

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The number of agricultural research personnel in Bangladesh has increased at a rapid rate during the last decade. We now have about 1500 scientists working at the Bangladesh Agricultural Research Council (BARC) and its constituent institutes, as compared with about one-third that number ten years ago. The Bangladesh Agricultural Research Institute (BARI) alone employs about 600 scientists.

As a result of such expansion, a major management challenge both for BARC and for each institute is to maintain complete and up-to-date information about its personnel. Why is such information important? First, BARC and the institutes need to plan for future recruitment. Second, they need to administer training programs in Bangladesh and abroad. And third, they need to be able to contribute good data upon request to national manpower inventories and plans. BARC is continually being asked for information about agricultural research personnel by both government ministries and international agencies.

Now the question arises as to how such information can be collected and maintained? Up until now, we have usually kept important information about each individual in his or her personal file. We are beginning to experience two problems with such a management method.

- The longer an individual works, the thicker and thicker his personal file becomes. The result is that it is often hard to find precisely the information one is looking for when one wants it.

- The more personnel there are in agricultural research, the more personal files there must be. The result is that it is increasingly difficult to aggregate data on particular categories of employees; for example, those people who have degrees in entomology, or those people who have been abroad for training in the last three years.

One possible way of trying to deal with these problems has been for each institute to maintain a card file of employees, with each card containing the basic and most commonly used information on each staff member. Some institutes have experimented with this procedure, but the more cards there

are the more difficult they are to sort, as mentioned above. And, frequent changes in an employee's qualifications, training, and career necessitate continual erasures.

### **Actions and Objectives**

At the beginning of 1985, BARC made a decision to attempt to deal with these problems by creating a national database on agricultural research personnel. It further decided that this database should be organized and maintained on one of the new IBM personal computers which it and the institutes have available.

The first step in this process has been to collect basic data on scientists now working in the Bangladesh agricultural research system. These data have been of three main types: biographical, educational, and career. The expectation is that information on actual research being done will be added later.

BARC is still in the early stages of this work. To date, the following tasks have been undertaken:

- Development of agreement on the types of personnel data to be collected.
- Development of a data management format on an IBM personal computer (see Annex 1).
- Initial data collection at the Bangladesh Rice Research Institute (BRRI) and BARI.

In this Workshop, we want to evaluate what has been accomplished. We want you to see the database in operation on a microcomputer. Most important, we want your suggestions and comments as to how both the data and the management and use of those data can be improved.

Our hope is that these data can be a management resource not only for BARC, but also for each of the institutes.

### **What is a Database?**

*Database* is really nothing more than a fancy term for *file*. If you keep an address book — in which you write names, addresses, and telephone numbers — then you are already managing a database. When you want to find the address or telephone number of someone in your book, you usually look under his or her last name. In computer terms, you are *searching the database by last name*.

Another kind of database is a *card file*, as noted above. Let us suppose that we are keeping basic information on agricultural research personnel in such a file. We have a box. In the box are many cards. Usually we have one card per individual. Whenever we want to find out something about a

particular person, we find his or her card. If we want to find out something about a particular category of persons — for example, all persons with PhDs — we go through the box and pull out the cards of all persons with such degrees.

A microcomputer can manage such a file or *database* much more easily. It has three particular advantages:

1. **Ease of updating a single record.** Suppose an individual is promoted from Senior Scientific Officer (SSO) to Principal Scientific Officer (PSO). With a card file database, one finds the appropriate card, erases *SSO* and writes in *PSO*. After many such erasures and changes, one may have to make a whole new card. With a computer database, however, one can much more quickly find the *card* — called a *record* — then simply type *PSO* over *SSO*, and there is never a need for copying everything over again.

2. **Ability to identify all people with one or more characteristics.** Suppose one wishes to identify all scientists who have been abroad for short-term training. With a card file database, one will have to go through the whole box and pull out each appropriate card. With a microcomputer, one can find all such persons in a matter of seconds and can print a list of their names, for example, in three to four minutes.

3. **Ability to create tables showing certain characteristics of that sub-sample.** Let us continue with the above example. Suppose that we now wish to know several other things about those people who have been abroad. What scientific fields do they represent? When did they go? Who paid for their training? With a card file database, we would have to draw a table by hand to display such information. But, with a microcomputer we can print such a table in a very short time.

### What is Involved in Creating a Database?

1. **Decision as to the kinds of information which should be included.** We want to have enough, but not too much. Most importantly, we want everything which is included to be of direct use to BARC and the institutes. Annex 1 is a copy of the database format as it now stands. Do you think that there is too much information or too little? Are there items which have been left out? Are there items included which you do not see any particular use for?

2. **Decision as to appropriate software for the microcomputer.** *Software* is simply another word for the instruction given to the computer. Five to ten years ago, one usually had to write one's own software; that is, one had to be a *programmer* or to hire a programmer. But now — fortunately for all of us — we can buy software which is already written. We simply have to plug it in and it runs.

For a database of the kind which is being discussed in this Workshop, the software which is used must have three characteristics: (1) powerful enough to perform the operations required, (2) flexible enough to allow the format of

the database to be changed as and when circumstances dictate, and (3) easy to use. This last criterion is particularly important because all of us want to be able to use the database *ourselves* as an aid in the management of human resources in our particular organizations.

The BARC Computer Centre now has 14 IBM personal micro-computers. To manage our human resources database on these micros, BARC has selected two very simple pieces of software: *Filing Assistant* and *Reporting Assistant*.

3. **Collection of the data.** It was decided earlier that individual scientists would be approached directly for information about themselves. The alternative was to depend on personal files which are often difficult to work with and sometimes unreliable.

As a result, 143 scientists at BRRI have been interviewed to collect basic information about their education and careers. These BRRI data will be used during this Workshop. We also have interviewed about 160 scientists at BARI, and have sent data collection forms to another 400. Following this Workshop — on the basis of your suggestions and recommendations — data collection in other organizations will begin.

### Maintenance of a Database

1. **Keeping information up-to-date.** The data in any database must be kept current. If the information in it gets old, then clearly the usefulness of the database decreases. Information on human resources in an organization is always changing. Employees are continually improving their formal qualifications, attending short-term training courses, being promoted and transferred, and so forth.

How can the information in our database best be kept current? Two suggestions have been made:

- Assign one individual in each institute to keep track of all changes in personnel data. This individual would be responsible for collecting such information, and — after each institute gets its own microcomputer — for maintaining the institute's database on human resources.

- Send a computer printout to each employee each year containing his or her data as now stored in the database. He or she would then be asked to fill in blank spaces and to enter any changes which have occurred in the last year. Such a procedure has the advantage of being both simple and relatively cheap. The challenge in it is in the development of incentives so that each person will actually send back his or her completed form.

2. **Placing the database close to its users.** It is expected that the institutes themselves will eventually become major users of the database. The plan is that some of the micros now at BARC will be placed at the institutes for both scientific and management purposes. This database will fall into the latter category.

3. **Organizing a central database.** BARC will have primary responsibility for the development of such a database, in keeping with its mandate to plan and coordinate agricultural research in Bangladesh. As has been implied at several points in the course of this paper, however, the whole can be only as good as the parts.

BARC and the institutes must work together to put the management of our human resources on a more systematic basis. The development and use of the database is one major step in that direction.

#### **Specific Questions for this Workshop**

- Is the current *format* for the database appropriate?
- What are the best means for *collecting* data?
- What are the best means for *updating* data?

*Annex 1*

Format for Human Resources Database  
Bangladesh Agricultural Research Council

file update:		specialisation 1:	
last update:		specialisation 2:	
last name:		highest degree:	
first names:		university:	
father's name:		subject:	
home district:		present position:	
birthday:		date appointed:	
sex:	marital status:	institute:	
date entered service:		division:	
		place of posting:	
		salary:	
total career books:		articles - last 12 months:	
total career journal articles:		papers - last 12 months:	
total career scientific papers:			
total publications:			
current research:			
2nd highest degree:	yr-2:	3rd highest degree:	yr-3:
university-2:		university-3:	
subject-2:		subject-3:	
in training now?:	degree:	most recent training:	
where:		institute-r:	
field:		duration-r (weeks):	ryear:
started:	completion:	funding-r:	
funding:			
2nd recent training:		3rd recent training:	
institute-2r:		institute-3r:	
duration-2r (weeks):	2ryear:	duration-3r (weeks):	3ryear:
funding-2r:		funding-3r:	
4th recent training:		5th recent training:	
institute-4r:		institute-5r:	
duration-4r (weeks):	4ryear:	duration-5r (weeks):	5ryear:
funding-4r:		funding-5r:	
total # trainings:			
previous position:		2nd previous position:	
date appointed-p:		date appointed-2p:	
institute-p:		institute-2p:	
place-p:		place-2p:	
3rd previous position:		4th previous position:	
date appointed-3p:		date appointed-4p:	
institute-3p:		institute-4p:	
place-3p:		place-4p:	
5th previous position:		6th previous position:	
date appointed-5p:		date appointed-6p:	
institute-5p:		institute-6p:	
place-5p:		place-6p:	
permanent address:			
present address:			

# Future Directions in the Management of Human Resources Within the Bangladesh Agricultural Research System

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In my keynote address I tried to pinpoint some selected issues which in my judgement are directly related to efficiency in human resources management in the context of the agricultural research system in Bangladesh. I would like to refer back to those to determine the future direction of management of human resources within the system. They are the following:

- Quantity and quality of manpower. These issues include review and analysis of the utilization of available trained manpower as well as meeting the requirement of additional personnel.
- Financing manpower training. These issues are proportionate allocations for manpower development — emphasis in the past was investment in physical infrastructure of research institutes.
- Operational funds for research. These issues include utilization of research facilities with full utilization of research manpower.
- Imbalance in the hierarchial distribution of scientific personnel among different disciplines and program areas.
  - Imbalance in manpower development planning.
  - Recruitment systems and selection procedures.
  - Remuneration, salary and other financial incentives.
  - Performance appraisal and evaluation.
  - Promotion opportunity and criteria.
  - Skill development.
  - Career development, such as an Agricultural Research Service.
  - Job design, i.e., technology.
  - Values and expectations.
- External forces. Government regulations, donor requirements, and so forth.

Ideally, we should review and analyze each one of the above items which in one way or an other influences the management of human resources. Unfortunately it was not possible to go into a detailed review of those issues and thus be able to put forward the suggested changes in the overall system as future directions towards improvements in human resource management.

Nevertheless, I consider these important issues which at present are unfavorable elements which should be taken care of for improvement in the management of human resources. Some issues directly touch upon the governmental procedures, formalities and regulations, and are rather difficult to change in the short run. There are other issues, however, which can be significantly improved at our level.

We recognize the fact that at present there is no well organized personnel data file available. Whatever records we may get at the various institutes are in different forms and so not compatible to any standard analysis. Priority activities in the future should refer to intensive efforts towards completion of the human resources database for all research institutes and its continuous updating.

On the general issues of human resources management, unfortunately, we are unable at this moment to specify future directions because of the characteristics of the issues described earlier. We may, however, talk in more specific and rather definite terms about this Workshop and the future directions of activities on the subject of a computerized databank.

The recommendations of this Workshop will provide directions for future action on this subject. I have mentioned earlier that we have initiated a project on the preparation of a manpower inventory for the agricultural research system in Bangladesh in collaboration with the International Service for National Agricultural Research (ISNAR). We have so far been able to prepare the computerized inventory of scientific manpower for only one research institute, the Bangladesh Rice Research Institute (BRRI). We would like to continue this collaborative project with ISNAR to complete the computerized manpower inventory for all other research institutes. We have initiated the work at the Bangladesh Agricultural Research Institute (BARI). The interest and participation of the research institutes are necessary prerequisites in order to efficiently complete the work.

We have to develop the capabilities of these institutes in the computerization of various activities, including inventory management. This can be accomplished under the following short- and long-term measures:

- Training of database managers (selected staff of the research institutes) on computer applications to manpower inventory for management decisions.
- Making hardware (microcomputers) and software available to these institutes, particularly for those where there are no microcomputers compatible to the BARC computer system. Institutes planning to procure microcomputers should consider compatibility of their hardware with that of BARC.

We have to remember that manpower database management is only one of the many applications of microcomputers. Other issues relevant to the management of human resources include the following:

- Recruitment planning

- Training planning, monitoring, and review
- Career planning

At BARC we shall organize short courses on the orientation and appreciation of computer applications for management purposes. Heads of research institutes together with identified resource persons from each of those institutes will be invited to take part. The distribution of micro-computers to the research institutions will be conditional to the participation of the heads of research institutes in these courses and to follow-up training of the resource persons.

# Working Groups

## Objectives, Activities, and Recommendations

Individual participation was an important feature of the Workshop, especially in the working group meetings. It was in these smaller sessions that the participants had opportunities to put into practice the ideas and concepts that were presented in the theme papers.

Each participant was assigned to one of four working groups; each group was led by a senior Bangladeshi research administrator and was assisted by a resource person from the BARC Computer Centre. Both the leader and the resource person were familiar with the BARC database on human resources. Each group was provided with an IBM PC portable and a printer. Using this equipment, each group had available an almost instant supply of data as it was sought to answer various management questions. The groups met three times during the Workshop.

### **Introduction to the BARC Manpower Database**

The first meeting was an introduction to the BARC database on the microcomputer (See Annex I, Page 71). Are the items included the most useful ones? Are some items included which should NOT be there? Have some items been left out which SHOULD be included?

The procedures for data collection created a lot of interest. Where are most of the data, in personal files at the research institutes or in the minds of the individuals concerned? Participants agreed that most information could be gotten from individuals by means of interviews. They wondered whether questionnaires would be very effective, and they did not believe that most personal files were accurate or up-to-date.

How should the information in the database be kept current? Once again, participants felt that individuals themselves should be responsible for reporting changes. Since an interview with each individual each year is impossible, updating will have to depend on questionnaires. An important management challenge is to give individuals incentives to complete and return such questionnaires.

### **Using the BARC Manpower Database**

The second working group session was an exercise using the IBM PCs to solve human resources problems in a research institute. For this exercise, participants were asked to think of themselves as members of a high-level committee charged with making recommendations regarding the recruitment needs and degree training requirements over the next 20 years of the Bangladesh Rice Research Institute (BRRI).

Specifically, they were asked to recommend whether BRR1 should emphasize recruitment and training in some scientific fields more than others. In developing their recommendations, they were asked to pay particular attention to these questions:

- Retirements by the end of the year 2005. Are any scientific fields over- or under-represented among the individuals who will be retiring?
- Training. Are the academic qualifications of scientists in different fields comparable, or do some fields have higher proportions of PhDs and MScs?
- Career structure. Do some fields have higher proportions of PSOs and SSOs?
- Sex. Do some fields have higher proportions of women?

The recommendations of each committee were to be supported by empirical data. The participants were urged to use no more than 5 or 6 variables from the database to analyze the questions. For example: birthday, sex, highest degree, subject, present position, and perhaps salary.

Again in this exercise, there was no "correct" solution to the problem though the analyses of the four working groups turned out to be remarkably similar. Participants became aware of the potential of microcomputers for organizing and manipulating human resources data, and therefore of the role which such hardware can play in strengthening management.

### **Recommendations of the Workshop Participants**

The third working group session was devoted to compiling recommendations about ways in which the BARC database on human resources could be strengthened. This part of the assignment was aided by computer technology, too. Each group had its recommendations put in the computer — using a word processor program — just as they were being made. Within less than two hours the computer operators had corrected the texts and printed enough hard copies for each participant to have his own for reference during the Closing Session.

The recommendations of the four working groups are summarized below:

#### **1. On the Database for Human Resources**

The establishment of a computerized manpower database should be given top priority.

- The objectives of this database should be clearly defined so that appropriate data can be collected and appropriate database management procedures can be developed.

The preliminary data collection format presented at the Workshop should be modified to include information on the following:

- Division and/or class of each degree
- Post-doctoral training, teaching experience, and consultancies

- Memberships/fellowships in professional societies
- Awards and achievements
- Numbers of scientific papers published in Bangladesh and numbers published abroad.

Information for initial inclusion in the database should be collected by means of interviews and/or questionnaires. Directors General and Directors of research organizations should be responsible for ensuring that the appropriate information is collected on time.

Information in the database should be updated annually. Directors General and Directors should be responsible for ensuring that information on each individual whom they supervise is reviewed and brought up-to-date each year.

Each major research organization should have a microcomputer available on which it can maintain and update information on its own personnel. A national database on agricultural research personnel — which can be used for country-wide manpower and training planning — should be maintained by the BARC.

Financial resources for managing the database should be provided by the BARC initially. But as microcomputers become established within the various research organizations, the responsibility for maintaining and updating information should be shared by the BARC and the organizations themselves.

Appropriate procedures for regulating access to the database should be developed. Certain categories of information should be “confidential”. One management option is that the overall database be broken into several sub-databases with different degrees of confidentiality and access.

## 2. On General Issues of Human Resources Management

- There should be no age restriction for professional and academic advancement, including degree training.
- Incentives and awards should be established to reward outstanding performance and assignment to hardship posts.
- Procedures should be developed for *in-situ* promotions.
- A national “agricultural research service” should be established.

### Organization and Resources for the Working Groups

The high level of participation and overall effectiveness of the working groups were due to the thoughtful preparations and leadership for these sessions. Dr. Byron T. Mook of the International Service for National

Agricultural Research and Mr. Akhter Ahmed of BARC planned the sessions. The work group leaders were:

Dr. S. Alam  
Director (Administration)  
Bangladesh Rice Research Institute  
Dr. Md. Ameerul Islam  
Director (T & C)  
Bangladesh Agricultural Research Institute  
Dr. M.M. Mia  
Director  
Bangladesh Institute of Nuclear Agriculture  
Mr. Ahmed Hussain  
Director (Training)  
Bangladesh Agricultural Research Council

The resource persons were:

Mr. Mohbub Ahmed  
Programmer  
Bangladesh Agricultural Research Council  
Mr. Abeed Hossain Chowdhury  
Scientific Officer  
Bangladesh Agricultural Research Institute  
Mr. Nasir Uddin Ahmed  
Data Encoder  
Bangladesh Agricultural Research Council  
Mrs. Mahbuba Khanam  
Computer Programmer  
Bangladesh Agricultural Research Council

The computer adviser for the Workshop was Mr. M.R. Talukder, Computer Consultant, BARC.

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## Country Papers

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## Management of Human Resources in Agricultural Research in Bhutan

NAMGEY NIDUP

*Officiating Deputy Secretary  
Ministry of Agriculture and Forestry  
Bhutan*

Bhutan is a landlocked country of 46,500 sq km. About 90% of its 1.2 million people are mainly dependent on agriculture. Bhutan has been traditionally self-sufficient in food grains; at one time it was an exporter to Tibet. With population growth, increased consumption, and the emergence of non-farming communities, it has become necessary to import food grains to supplement local cereal production.

Rice and maize are the major food grains grown in the country. Rice production is limited to the southern rainfed regions and the irrigated areas in the inner valleys. Maize is grown on dry lands at low and intermediate elevations. Wheat, barley and buckwheat are grown in northern areas not suitable for rice or maize. Potatoes, apples, oranges, cardamom, soybeans, pulses and fruits have been recently introduced as cash crops for both local consumption and export. This cultivation has increased sharply because of its profitability and low susceptibility to unfavorable weather. In some pockets of the country, farmers have turned from cultivation of food grains to cash crops.

### **Organizational Setting**

The Ministry of Agriculture and Forestry was created in March 1985 to direct, integrate and coordinate the activities of four closely related departments: Agriculture, Animal Husbandry, Forestry, and the Food Corporation of Bhutan. Previously, Forestry was under the Ministry of Trade Industries and Forests, and the other three were a part of the Ministry of Development along with education and health departments.

### **Agricultural Research**

There is no single national research institution within the Ministry. The individual departments have institutions that provide training and conduct research in their fields. Agricultural research used to be undertaken on stations of the Department of Agriculture, but in 1969 these were redesignated as commercial farms emphasizing seed production. Only very recently has there been a renewed interest in undertaking agricultural research.

Bondey Farm at Paro is the best developed government farm. Its functions include the manufacture of agricultural machinery and implements, production and packaging of vegetable seeds, rice seed production, and processing and packaging of fruit and mushrooms for local sale and export. A tissue culture laboratory has been constructed to produce disease-free planting materials. Limited rice and wheat research is undertaken. The Bondey Farm is also an important extension and training center for the district.

The government is in the process of developing the Centre for Agricultural Research and Development (CARD) at Wangdiphodrang as the country's main rice research station. It now conducts some rice, wheat and barley research, primarily varietal trials of the International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Center (CIMMYT). Some fertility studies have been undertaken recently, and a soil analysis laboratory is planned.

The National Potato Program is to support Bhutan's major export crop. Technical assistance has been provided by the International Potato Center (CIP) since 1981, and financial support given by the Helvetas (Swiss Aid) since 1982. The objectives of the applied research segment of the potato program are to (1) identify better varieties, (2) determine productivity constraints, (3) improve production technologies, (4) undertake research to improve farmer-level storage, and (5) conduct on-farm research trials.

### **Need for Agricultural Research in Bhutan**

There is greater demand for food grains and other food items as a result of gradual development in the country and its growth in population. These needs can be met either by increasing local production or by importation. Local production cannot be increased by bringing more land under cultivation as there is only a limited supply available. The best choice is improving the yields on existing cultivable land through effective use of fertilizers, improved varieties of seeds, improved cultivation methods, plant protection measures, and the mechanization of farming operations.

The major shift in strategy towards increasing the intensity of cultivation and improving yields emphasizes the importance of research to develop new ideas, techniques and methodologies, and better varieties of seeds and plants. Determination of those cultural practices best suited for various agro-climatic conditions, analysis of specific area soil composition, assessment of water levels and of fertilizer requirements, and disease and pest controls are some of the important research areas which need to be thoroughly investigated for production to be increased to the desired level.

There is an urgent need to build a comprehensive research organization to tackle the country's basic agricultural problems. A single research institute, however well-equipped and staffed, cannot meet the requirements due to the wide range of agro-climatic conditions in the country. There is justification

for one central research institute with three sub-stations at different climatic zones having adequate facilities for conducting fundamental and applied research in the fields of genetics and plant breeding, agronomy, horticulture, plant pathology, soil science, and so forth.

### **Problems in Agricultural Research**

A major constraint to reaching the national goal of economic self-sufficiency is the lack of the desired level of manpower. In agriculture, like other sectors, there is an acute shortage of trained, experienced and qualified manpower, particularly in research. Few of the available national graduates opt for agriculture jobs as the majority of the postings involve considerable field work in isolated places in all weather conditions. This is coupled with the fact there are better promotion opportunities in administrative positions. Few graduates join agriculture due to competition from other sectors. And, few of the candidates meet the appropriate entry qualifications in science and mathematics.

### **Actions to Strengthen Agricultural Research**

The Research Division of the Ministry will need to be organizationally and technically strengthened. There are serious gaps in knowledge about crops now grown on a large scale and on mixed farming enterprises. Agronomic investigations on possible new crops need to be initiated at research stations which are located in the environments for which these crops are suited.

Development work and testing are needed on power, animal draught, and mechanical equipment appropriate for small-holder farming and village-based agro-processing. A soils laboratory and a soil survey capability are needed to support the agronomic programs and to assist in determining the locations of the zonal sub-stations. Crop protection services are being developed under a European Economic Community (EEC) program.

Priority is being given to recruit the required staff for agricultural research at the professional officer level and at the middle and lower levels. This will require technical assistance in terms of consultants, resource personnel, training, study tours, seminars and conferences, and external assistance for the establishment of the necessary infrastructure and purchase of equipment. A research team led by a chief research officer is needed to develop a realistic research program in consultation with the Departments of Agriculture, Animal Husbandry and Forestry in soils and land use. A basic minimum of above average Bhutanese research officers should receive appropriate graduate and post-graduate training to ensure continuity in the program.

There has been no emphasis to date on the proper management of human resources in agricultural research as there were hardly any individuals assigned to research on a full-time basis. As research is gaining importance as

a critical part of the development process, there is recognition of the need to make optimum utilization of human resources in agricultural research. The limited number of trained and competent research people need to be managed effectively and efficiently to enhance the positive and significant achievement of the desired results. The Ministry of Agriculture and Forestry will ensure that from now onwards the proper management of manpower in agricultural research will receive the adequate attention of all concerned.

### **Conclusion**

The major problem of agricultural research in Bhutan is the acute shortage of trained manpower, thus there is urgent need to develop and upgrade the capabilities of the Bhutanese people. Our nationals must receive multidisciplinary training at certificate, diploma, graduate and postgraduate levels. Essential equipment must be obtained and the services of short-term consultants and resource persons made available to advise on the establishment of a comprehensive national agricultural research institute with suitable sub-stations at different climatic zones. To accomplish these goals the government must seek funding assistance from international agencies and through bilateral agreements with other institutions and sources.

# Management of Human Resources in Agricultural Research: Indian Efforts and Experiences

K.V. RAMAN

*Director  
National Academy of Agricultural Research Management  
India*

The Indian agricultural research system operates on a two-tier basis. The major responsibility for the execution of teaching, research and extension programs in agriculture rests with the State Governments as directed by the Indian Constitution. However, the Central Government assists the States with both resources and personnel for these activities. The Indian Council of Agricultural Research (ICAR) has the primary function of coordinating the teaching and research activities at the national level. ICAR has 40 research institutes, 4 project directorates, 71 coordinated research projects, and 7 national research centers. A few more institutions are being set up during the Seventh Plan period. (See Figures 1 and 2.)

The country has 23 agricultural universities. There is at least one in each state, with states like Maharashtra, Uttar Pradesh and Bihar having more. The agricultural universities, established since 1960 on the Land Grant University pattern of the USA, have primary responsibilities for teaching, research and first line extension (extension education) at the state level.

## **Agricultural Research Service and the Research Management Personnel**

ICAR is one of the largest agricultural research organizations in the world in terms of the number of its qualified scientists. Since science and education are creative activities, they require men and women of integrity, dedication, scholarship and an attitude of mind that is attuned to service and excellence. In 1975, ICAR introduced an All India Service for its scientists known as the Agricultural Research Service. This enables young scientists entering a research career to get the highest salaries possible in public service without changing his or her field of specialization and without shifting to managerial and administrative posts merely to get a better salary. Opportunities for career advancement through a system of assessment, irrespective of the occurrence of vacancies, is one of the features of the Service. It enables each scientist to compete with his or her own past rather than with colleagues and co-workers. Horizontal and vertical mobility are possible in the System. The Service, therefore, fosters cooperation in place of unhealthy competition

and promotes an outlook where solving a specific field problem through interdisciplinary teamwork is regarded as the primary goal of research rather than the worship of a discipline or the publication of papers.

Research management posts, which are at the ICAR Headquarters and the Institutes, are filled on a tenurial basis. Upon the completion of the term, the scientist returns to a matching position in research.

The objectives of the Service are (1) to generate a scientific culture and opportunity for continuous professional growth and life-long specialization without any constraints, and (2) to promote individual and collective initiative for improving the productivity of research. The Service provides an effective system of career planning, management and advancement. The Service is designed to replace a posting-centered system with a scientist-centered system of manpower utilization.

### Manpower in Agricultural Research

The Agricultural Research Service system in ICAR has 6327 scientists. It has been proposed this be revised to 6480 after providing for some small reserves. There are also 97 research management positions. The scientists are supported by a technical services staff of 7325 persons (Table 1).

The agricultural universities have a staff strength of 24,000 scientists engaged in teaching, research and extension activities. These scientists are assisted by about 4800 technical grade persons. The manpower in agricultural research is, therefore, very large. There is an urgent and imminent need for channeling the work of this large scientific force to attain optimum levels of productivity.

### Institutional Structures for Providing Manpower Requirements of Agricultural Research

The 23 agricultural universities provide both undergraduate and post-graduate education in agriculture, horticulture, veterinary science, agricultural engineering, home science, fisheries and related disciplines, all of which come under the broad area of agriculture (Table 2).

**Table 1. Manpower in the Agricultural Research Service in India.**

	Indian Council of Agricultural Research	Universities and State Governments (estimated)
Scientists	6480	24000
Research managers	97	500
Technicians (only technically qualified graduates)	3381	4800

**Table 2. Output of graduates from various agricultural professional institutions.**

Discipline	Number of colleges	Admission capacity	
		Undergraduate	Postgraduate
Agriculture (including horticulture)	49	5490	2506
Veterinary science	22	1600	450
Agricultural engineering	10	530	200
Home science	11	670	115
Fisheries	5	150	55
Dairy technology	6	160	200
Agricultural marketing and cooperation	2	75	0
Forestry	1	50	12
Sericulture	1	30	0
Food technology	1	50	na

In addition, there are two major national institutes under the ICAR, the Indian Agricultural Research Institute at Delhi and the Indian Veterinary Research Institute at Izatnagar. They have deemed-to-be university status and admit students for advanced postgraduate training. About 5% of Indian students get postgraduate training in foreign countries, then return to their home country for employment in agricultural research and teaching.

### **Management of Human Resources: Indian Efforts and Experiences**

A general shortage of indigenous scientific manpower places a major constraint on the development of effective national resource programs in most developing countries. A particularly serious problem is the insufficient availability of competent agricultural scientists who are eminently trained in their subject matter areas. Such persons should provide leadership for mission- and goal-oriented programs in addition to being sensitive to the broader environmental, social and economic implications of their work. Inadequacies of training resulting from deficiencies in curricula, faculty, and infrastructure facilities are reflected in the final output of these institutions. Institutional training at the degree-granting level does not prepare one to function effectively as a research scientist in project, financial and personnel management.

The key to increased agricultural production and prosperity lies in appropriate management of resources: financial and human. The importance of the training and orientation of research managers and development administrators is being keenly felt now more than ever in order to improve their understanding of the problems facing modern agriculture and to build the planning capabilities at all levels of agricultural development administration. Productivity is a major concern since it determines the well-being of the

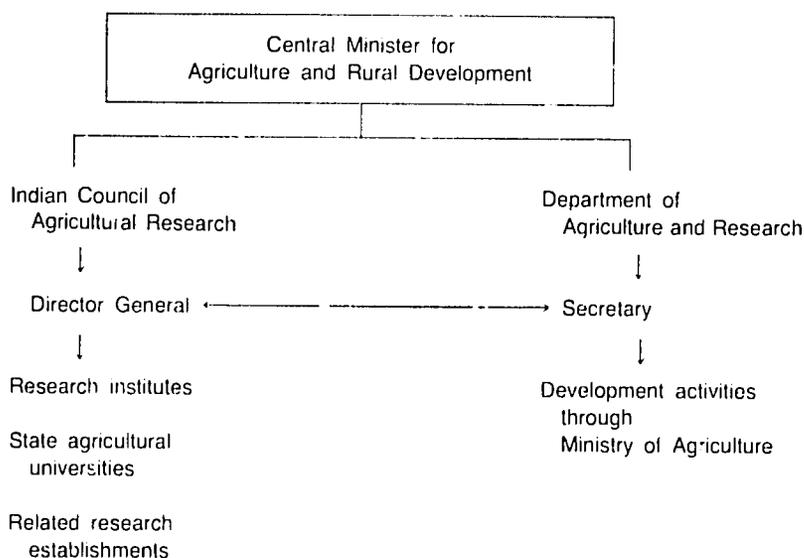
organizations and their members which comprise the system. The level of productivity depends upon the execution of certain managerial functions which members of the organization have to perform.

Scientists need orientation to the organized scientific methods of identifying project priorities, formulation, implementation, monitoring and evaluation. Senior scientists require training in institution building, organizational development, problem analysis, and decision making. Young scientists should understand the scientific approaches to idea generation, group dynamics, and teamwork while effectively managing creativity and motivation. Principles underlying the development of interdisciplinary and multi-disciplinary research projects need to be identified. While the academic training that scientists receive at the universities gives them the necessary base for research in their subject matter areas, neither the subject matter training nor on-job training in these areas provides them the necessary skills to develop into excellent research managers.

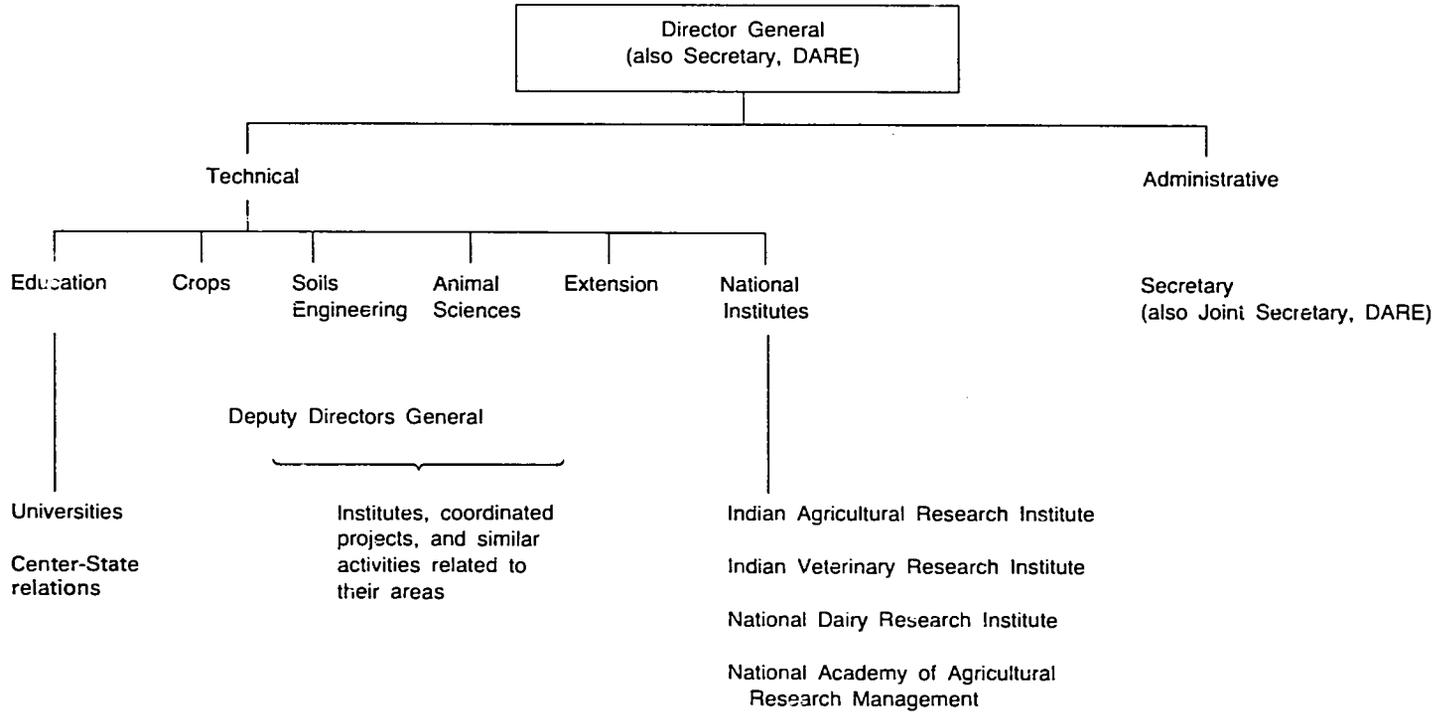
### Role of National Academy of Agricultural Research Management

The National Academy of Agricultural Research Management (NAARM) at Hyderabad was specifically set up to train young scientists entering a career in agricultural research and to prepare them to become research scientists and managers. The Academy also conducts several capsule courses for senior scientists at various levels (Annex 1).

*Figure 1*  
Organization of Agricultural Research in India.



*Figure 2*  
 Organization of the Indian Council of Agricultural Research.



The basic objectives of this national level training institute are broadly summarized as follows:

1. To organize foundation courses for new entrants of S-I cadre to the Agricultural Research Service of ICAR.
2. To organize and develop training programs in agricultural research management to senior- and middle-level scientists at ICAR institutes.
3. To organize seminars, conferences and workshops on all aspects relating to agricultural research management.
4. To build up high quality resource material in the subject of agricultural research management based on actual field experience.
5. To undertake systematic reviews and the study of management problems of ICAR research institutes, agricultural universities, and agricultural research projects and systems.
6. To provide organization, liaison and coordination of international cooperation programs in agricultural research management.
7. To plan, organize and conduct training programs, workshops and seminars in educational technology, curriculum development, and structured learning for the faculties of the agricultural universities and ICAR institutes.
8. To be a repository of ideas and information, both national and international, in the field of agricultural research management and education, and serve as a clearinghouse for the dissemination and utilization of such information to the clientele institutions.

To fulfill these objectives, the institution is organized into six functional units:

- Agricultural Research Systems and Policies
- Educational Systems and Technology
- Transfer of Technology Systems and Policies
- Project Management
- Human Resource Development
- Information and Documentation Services

These functional units are supported by a group of centralized services which include farm services, agro-technology demonstration blocks, production and publications, and administration and accounts.

### **Training Programs**

The Academy has been planning, organizing and conducting various types of training programs to meet the needs of the clientele groups working at different levels of management in the agricultural research and development organizations. Three main clientele have been identified for training purposes: junior, middle and senior.

**Courses for junior level agricultural scientists and development workers.**

A Foundation Course and an Orientation Course have been designed and are being offered for junior level agricultural scientists and development workers.

*Foundation Course.* The Foundation Course is for scientists recruited to the Agricultural Research Service by ICAR. It is one of the regular courses offered by the Academy and has these objectives:

1. To develop an awareness of the background of the rural setting, rural socio-economic system, and the role of agriculture in national development.
2. To develop an understanding of integrated rural development in the country with special reference to agricultural development.
3. (a) To get an insight into the objectives, structure and organization of ICAR, and (b) to understand how ICAR discharges its responsibilities of coordination of research, higher education and training in the fields of agriculture, animal husbandry and fisheries.
4. To give an orientation to the Agricultural Research Service.
5. To get an insight into research policy and the management of agricultural research.
6. To provide training in some of the necessary basic skills required in agricultural research.

The duration of the course is five months. The trainees begin with six weeks training at the Academy on the basics of agricultural research management. Then they spend about two months at a regional research station of a national agricultural research project or in ICAR institutes where they receive practical training in project identification and formulation, and develop an appreciation for rural life and the environment. They return to the Academy for a further six weeks in which they get training in areas that will help them to become better research workers. During the training program they are exposed mainly to the subjects like agricultural research management, project management, organizational behavior, communication and transfer of technology, administrative rules and procedures, and practical classes on audio-visual aids, photography, research project formulation, indexing, and so forth.

*Orientation Course.* An Orientation Course in Agricultural Research Management of one month duration is conducted for scientists promoted to the S-1 grade and who are working in ICAR institutes. The objectives are for the participants:

1. To discuss and become acquainted with the issues relating to the agricultural research management process.
2. To become equipped and acquainted with the techniques to do the work better as researchers.
3. To be instilled with the philosophy of living, thinking and working together.

The topics of this course cover the management process, research project management, quantitative techniques, organizational behavior, management information systems, and transfer of technology.

**Courses for middle- and senior-level scientists.** Increasingly, national agricultural production requires that the agricultural scientists should organize and orient their efforts to rapid achievement of national goals, to use problem-centered rather than discipline-oriented approaches to agricultural research, and to take the initiative in arranging cooperation with all other agencies concerned with agricultural development. Agricultural research should be seen in a developmental framework of including basic and applied investigations aimed at the entire process of development and widespread dissemination of appropriate technologies.

The Academy is organizing this Course on Agricultural Research Management to increase the effectiveness of each participant in his present position and to prepare him for greater managerial responsibilities by appraising him of the various aspects of research project management techniques and behavioral skills. The course is based on the linkages between two groups of inter-related functions, i.e., those of the agricultural research institutions and those of a research manager.

The course covers the topics of the agricultural research management process, project planning, project selection, monitoring and evaluation, problem analysis, human behavior in the research organization, and organizational communication.

The Academy is developing a suitable course for middle-level scientists in response to their training needs.

**Summer Institute.** The Academy organizes Summer Institutes for the benefit of the faculty members of the agricultural universities and ICAR institutes. In 1985, a Summer Institute on Agricultural Research Management was organized to expose the teachers of agricultural universities to the principles of project management. They were also instructed in the principles of educational technology and methods of developing a course. The participants developed a course on agricultural research management which can be offered at the postgraduate level.

The Academy is planning to conduct two Summer Institutes in 1986 — one for scientists in agriculture research project management and the other for teachers on educational technology.

**Workshops and seminars.** The units of the Academy undertake research studies on various aspects of management. The materials developed from these studies, which may form a case report, are the basis for specific theme-oriented workshops and seminars. These case reports later become valuable teaching materials.

**Consultancy services.** The Academy organizes national consultations on important problems relating to agricultural education and research. These results are published in a periodic series of papers that will be useful in developing national policies.

The Academy has been providing consultancy services from time to time to agricultural universities and ICAR institutes either for upgrading the skills of their scientists or for undertaking, monitoring and evaluating programs.

**Publications.** The Academy issues the following publications:

- *Agricultural Research Management Abstracts*, an abstracting journal covering over 200 periodicals dealing with various aspects of agricultural research management.

- *Green and Glory*, a laboratory house-journal published by the trainees in the various programs.

- *NAARM News*, a quarterly newsletter outlining various programs undertaken by the Academy.

- *NAARM Alumni News*, a biannual newsletter of the NAARM Alumni Association.

- Nonperiodical publications such as *Readings in Management*.

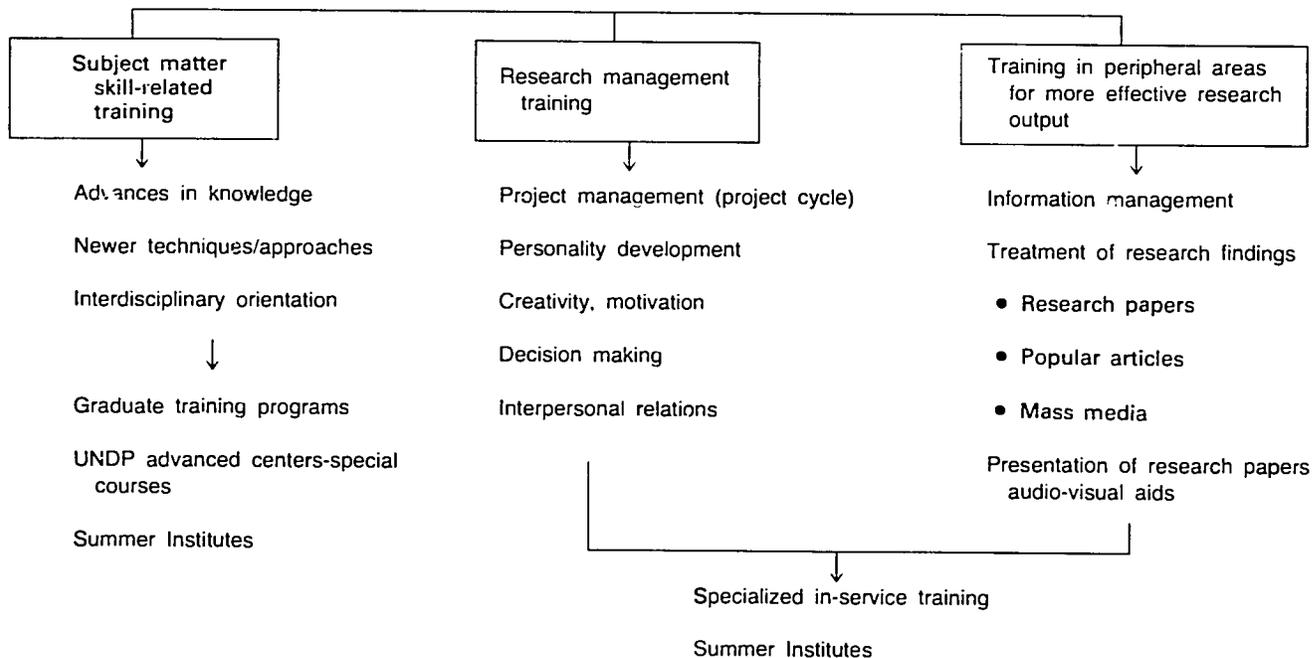
- Proceedings of workshops, seminars and symposia held at the Academy.

- Lecture notes and reading materials developed for specific training programs.

The National Academy of Agricultural Research Management functions with a wide mandate. It is a novel, vibrant and emerging institution with a visionary outlook which has a dynamic approach and pragmatic policies with realistic expectations. It functions with a zest, zealously and commitment to purpose to fulfill the mandate of the Indian Council of Agricultural Research as the major national coordinating body for agricultural research and education, and thus fulfill the national aspiration for better management of science and agriculture.

*Annex 1*  
Role of the National Academy of Agricultural Research Management.

**Training for Development of Human Resources**



# Training and Development of Research Scientists in the Malaysian Agricultural Research and Development Institute

AHMAD SHAFRI MAN

*Deputy Director General (Administration)  
Malaysian Agricultural Research and Development Institute*

The Malaysian Agricultural Research and Development Institute (MARDI) was set up as a statutory authority to fulfill the need for a centralized research system in agriculture. It is to generate new technologies to help the government in modernizing the agricultural sector of the country and to improve the income of the farmers. It became operational in 1971, two years after the Parliamentary Act was passed. The delay was due to a limited number of trained agricultural research scientists because of the lack of opportunities for postgraduate training. In 1969 there were only three Agricultural Officers having doctorate degrees and 11 with masters degrees serving in the Department of Agriculture (which was then responsible for agricultural research). The other personnel had only bachelors degrees which is the minimum entry requirement.

Under this scenario MARDI had to embark on a training program (1) to ensure a supply of potential scientists for recruitment and (2) to retain them with the organization. This is why training activities were accorded a high priority.

Training and development programs were started in 1971 with a substantial financial allocation, but could not be effectively implemented due to:

- A limited number of suitable candidates who were interested in agricultural research.
- Not many scientists could be spared for postgraduate studies without disrupting the on-going research projects.

However, in the last 15 years, MARDI has been quite successful in its manpower development in spite of the initial difficulties.

## **Organizational Structure and Research Program**

The function of MARDI is to conduct scientific, technical, economic and social research with respect to production, utilization and processing of all crops (except rubber and oil palm) and livestock. Its role as a catalyst is vital as agriculture remains the mainstay of the country. Although Malaysia emphasizes manufacturing in its development strategy, the economy is still

dominated by agriculture which contributes 25% to the total output, 40% to total employment, and 35% to the export earnings of the country. Agriculture supports the development of other sectors, particularly manufacturing, by providing sources as well as the markets necessary for expansion.

The National Agricultural Policy (NAP), officially launched in 1984, requires greater research effort to meet the objective of maximizing income from agriculture through efficient utilization of the country's resources and revitalizing the sector's contribution to overall economic development. The organization of MARDI was reviewed in light of the NAP. A restructuring of its programs took into consideration the requirements for research and development for priority commodities outlined in the policy: rice, cocoa, coconut, fruits, tobacco, livestock, vegetables, pepper, ornamentals, and other potential crops. Emphasis is also given for research in food technology, biotechnology, agricultural engineering, and the specialized areas in problem soils, farming systems, environmental control, and transfer of technology in agriculture.

MARDI's research programs are based on a problem-solving, multi-disciplinary and location-specific approach. This requires teamwork in identifying and solving the problems within the production systems of various commodities. The ultimate purpose is recommending suitable technology packages to be adopted by the farmers. The programs and activities are implemented by ten divisions:

- Rice Research Division
- Cocoa/Coconut Research Division
- Tobacco Research Division
- Fruits Research Division
- Miscellaneous Crops Research Division
- Livestock Research Division
- Central Research Laboratory (plant science, crop protection, biotechnology, agricultural engineering, and soil science)
- Food Technology Research Division
- Techno-Economic and Social Studies Division
- Technology Promotion Division

### **Staff Structure and Requirements**

The Research Divisions are the functional units of the Institute. They are headed by Directors who are assisted by a number of Program Coordinators responsible for the coordination and controlling of scientists in carrying out research activities within the programs. A scientist may be assigned to a number of research programs and projects within his specialization or experience. Each scientist is normally supported by an Assistant Research Officer and/or a number of Research Assistants at a working ratio of 1:1:2.

The basic minimum requirement for appointment to the position of Research Scientist (RS) is an honors degree in agriculture or other sciences related to agriculture from a recognized university. An Assistant Research Officer (ARO) needs to have at least a diploma in agriculture or equivalent qualification. The minimum qualification for a Research Assistant (RA) is a Certificate of Agriculture from a vocational training institute. Currently, MARDI has a complement of 448 RSs, 301 AROs and 813 RAs.

### **Training Needs**

An assessment is important to provide an objective analysis of an organization's training requirements so as to enable the management to draw up a training policy in developing its manpower for present and future needs. It is an essential requirement for the effective development of an organization's human resources. A training needs analysis should be done (1) at the organizational level to determine the requirements of training of all categories of staff and (2) at the individual level to determine the skills and knowledge required for the job. The assessment of the training needs in MARDI is done through (a) job description analysis, (b) research project and program planning and review, (c) annual personnel appraisal and counselling, (d) training needs survey, and (e) manpower planning.

The information gathered through these exercises helps to provide inputs in determining the programs for short-term (short courses and training attachments) and long-term (MSc/PhD) training.

The Training and Development Branch of the administration was created to gather information on training requirements in order to formulate an appropriate training policy and plan of action. It is responsible for implementing action plans and to review the effectiveness of training activities in meeting the objectives of the organization.

### **Training Policy**

The effectiveness of the Institute in discharging its functions depends very much on the capability and capacity of its research scientists in planning and implementing research programs and projects to solve the problems of the farming community. To a large extent, the performances of research scientists are subject to the level of their skills, knowledge and experience in their areas of specialization. Training programs play an important role in developing and maintaining research scientists as a vital factor in a research organization.

MARDI has full responsibility in the development of its scientists, thus accords this a very high priority. Opportunities will continue to be provided for them to acquire higher levels of training in various fields of specialization and problem areas as required by approved research programs.

Research scientists should possess at least a masters degree in science to be effective in their job. Ample training opportunities also will be given for scientists to pursue PhD studies, particularly in new areas of specialization.

In order for research scientists to keep abreast of the latest advancements of the technology in agriculture, MARDI will facilitate their participation in short courses, training attachments, seminars, conferences and other scientific meetings.

The objectives of the training program of MARDI for research scientists are:

- To ensure that scientists are aware of the function, policies, and programs and activities of MARDI, and their role and responsibility in implementation of them.
- To provide training in research management and further specialization in preparing scientists for future career development.
- To promote loyalty, morale, dedication and motivation of the scientists.

### **Training Programs and Activities**

MARDI provides both pre-service and in-service training programs for the development of its research scientists.

**Pre-service training.** This program is to enable MARDI to create a pool of potential candidates for appointment as research scientists. It provides for a three to four year basic degree training at local universities in various fields such as agriculture and basic sciences (biology, genetics, zoology), agricultural engineering, food technology, animal science, statistics, and computer science. Previously, candidates were also sent overseas for basic degree training.

The selected candidates are from among the AROs who have proven their capability. They are given opportunities for basic degree training which provides a venue for scientifically inclined junior officers to become future research scientists. Since the number of vacancies for research scientist posts continues to decline, this pre-service training will be gradually reduced.

**In-service training.** A major part of the training activities of MARDI centers on research scientists who are already within the establishment. The program includes:

*Induction and orientation.* This is to introduce newly appointed scientists to the function, policy, structure and objectives of MARDI and its research programs. Through this session, they become aware of their roles as research scientists of an Institute which is a government agency, and of their responsibilities in their respective divisions or areas of research.

The induction and orientation training takes place within the first six months of the appointment and includes orientation programs, field visits, and on-job attachment.

By the end of the training session, scientists should be familiar with the external and internal environments in which they operate and the expectations on their performance.

*Advance/further training.* This training is to further upgrade the skills and knowledge of the scientists in various scientific disciplines related to their areas of work. Further training and specialization is important among the scientists because (1) they apply scientific methods and knowledge in work contacts that often require originality of thought and sound technical judgement, and (2) they must have a broad scientific approach plus expertise in their area of specialization to contribute to the multidisciplinary teamwork.

This training comes in two forms: formal postgraduate training for MSc and PhD degrees, and short courses and training attachments.

For the postgraduate training program to be of benefit, the research scientists must first be exposed to their jobs so as to appreciate the requirements and the problems related to the research project in the commodity or problem area in which they are assigned. New scientists must be confirmed in their appointments and in service for two to three years before they are given postgraduate training awards. On completion of MSc studies, scientists are required to work three years before they are allowed to continue with a PhD program. This condition is necessary to ensure that their thesis project and discipline of studies are relevant to their work.

Because of the limited facilities at local universities, scientists usually are sent overseas for their postgraduate training. However, they are encouraged to do it at home when adequate facilities are available. Overseas postgraduate training is not without its problems, particularly in ensuring that the proposed thesis research projects fall in line with the scientists' area of work. To solve this it has been arranged with overseas universities that MARDI scientists undertake their research projects locally, and that their research activities at the Institute be used as their thesis work. By so doing, postgraduate training upgrades the level of knowledge and specialization besides providing research results that are relevant to MARDI for immediate use. The thesis projects must be finished in not more than three years.

Short courses and training attachments also are important in upgrading knowledge and specializations. Scientists are required to attend courses relevant to their jobs that are organized by established overseas training centers. As some specialized training is not conducted on a regular basis, arrangements are made with renowned research centers or overseas universities for attaching our scientists on short periods. Even though no structured courses are provided, this type of program provides eminent senior scientists who can supervise our scientists for better exposure in their areas of work or specialization.

*Refresher training and re-training.* With the rapid developments in science and technology, new research methods and techniques are continuously being introduced. Without refresher courses and re-training, the knowledge of scientists will become obsolete and thus reduce their effectiveness and productivity. Refresher training is given to update the skills.

knowledge and specializations in areas that need advanced knowledge. Normally, scientists are given the opportunity for refresher training two years after completion of their postgraduate training.

The changes in the emphasis and priority in research direction — particularly in commodity or discipline of research — require the Institute to adjust its program. The scientists may be assigned to new jobs for which they have very little knowledge. They obviously need re-training.

*Seminars, symposiums and workshops.* Participation in professional and scientific meetings such as seminars, symposiums and workshops — held locally or overseas — provides opportunities for scientists to exchange ideas on the latest developments of technology and scientific findings. The Institute provides travel awards for scientists to take part in these meetings at which they are encouraged to present papers based on their research work.

The Institute also uses opportunities provided by foreign sponsors for our scientists to take part in overseas scientific meetings. The participation in such meetings broadens the scientists' outlook and exposure and so enhances their capability and productivity.

*Research management training.* Scientists appointed to management positions are sometimes handicapped because they are not exposed to management training. Research managers responsible for the effective utilization of human and physical resources should be equipped with the tools of management to lead and motivate the scientists working under them, and to use resources effectively for productive research.

Management training is given high priority for research managers. Through this program, scientists are exposed to the management techniques and concepts that should be employed in the working environment. This training is done either as an in-house program or by sending research managers to participate in programs organized by outside training institutions.

### **Financial Allocation And Training Facilities**

The strong commitment of MARDI toward training and development of scientists is reflected in the great sums of money that have been allocated for this purpose in its annual budgets since 1971. A large number of scholarships, grants, and travel awards were given to scientists to pursue various short- and long-term courses of studies and to take part in conferences. Under training scholarships and grants, scientists receive travel and transportation, subsistence and family allowances, book and apparatus allowances, tuition fees, health insurance, and other related expenses.

Scientists on study leave for all types of courses given by MARDI as part of the training program are entitled to full pay while they are absent from their duties.

However, they are required to sign a contract which ensures they will continue to serve the Institute for an agreed period upon completion of the training program:

<i>Type of Course</i>	<i>Contract Period</i>
Doctorate	7 years
Masterate	5 years
Short courses not less than 6 months	2 years
Short courses less than 6 months	1 year

### Progress of the Training Program

Almost all scientists who are serving the Institute have benefited from the training program. In many cases, a scientist's entire program from basic degree up to PhD has been financed by the Institute. In 15 years the Institute has spent more than M\$30 million (about US\$12 million) for staff training and development, and 80% of that allocation has been for the training of research scientists. MARDI provided 643 scholarships for bachelors, masters and doctoral degrees at local and overseas universities, and issued 361 training awards for overseas short courses (Table 1).

As a result of our training program, there are 448 research scientists currently working in various fields of research in MARDI, while 64 have earned PhD degrees, 250 masters, and 134 bachelors degrees. Thirty-one

**Table 1: Financial allocation and number of scholarships awarded by MARDI under the staff training program.**

Year	Financial allocation	PhD	MSc	BSc	Short courses
1971	M\$ 176,428	0	0	0	0
1972	642,336	2	18	41	2
1973	1,630,727	4	25	37	1
1974	1,761,909	2	15	60	0
1975	1,547,661	4	6	32	4
1976	2,085,985	28	22	54	14
1977	2,560,729	14	40	20	15
1978	2,814,288	28	16	4	30
1979	2,557,994	10	16	0	52
1980	2,837,197	12	10	5	61
1981	2,452,793	11	15	5	61
1982	2,373,026	5	11	5	32
1983	2,087,389	6	11	6	21
1984	2,997,106	4	9	5	43
1985	1,865,851	7	13	5	25
<b>TOTAL</b>	<b>M\$30,391,409</b>	<b>137</b>	<b>227</b>	<b>279</b>	<b>361</b>

officers are currently overseas training for PhD degrees and 26 at the masters degree level.

### **Conclusion**

This paper highlights the program and activities of the Institute in the training and development of its scientific manpower to meet the needs of agricultural research. The scientists, being the most important element in determining our effectiveness and productivity, receive various forms and processes of training to upgrade their skills and knowledge in their areas of specialization. The training program will continue to be planned and implemented to keep our scientists abreast with the advancements of science and technology in agriculture to enable them to generate relevant research findings to benefit the farming community.

# Managing Human Resources for Agricultural Research in Nepal

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Prior to the planned development era, it was understood there was no need to develop a cadre capable for managing the vast agricultural development process. During the Rana regime efforts towards managing human resources were limited. There were a few agricultural research activities such as the introduction of exotic plant varieties and animal breeds and testing their suitability to the Nepalese environment. The need to go for agricultural research activities was realized during the late 1950s. This obviously led to thinking of managing human resources in the agricultural development process.

The process of agricultural development is not simple. The resources required are so diverse in nature. The whole process gets motion by having agricultural research as one of the major areas of concern.

Agricultural research activities date back to the end of the Rana regime. An office called Krishi Parishad (Agricultural Council) was formed to expand agricultural research and extension activities. This was a precursor to the Department of Agriculture which was established in 1952. However, the manpower required at that time was very minimal.

The century-old importance of cereal grain and cash crops dictated that human resources be used primarily to cover those areas. Later horticulture, livestock and fisheries research followed. This resulted in managing human resources in agricultural research on a bigger scale.

As the national agricultural research system of Nepal enters 1986, it is composed of some 700 high-level personnel along with some 3000 medium- and low-level personnel. The research work falls mainly under the Ministry of Agriculture although the Ministry of Forests and Soil Conservation, Ministry of Water Resources and Tribhuvan University are also engaged in agricultural research (See Table 1).

## **Research Activities Under the Ministry of Agriculture**

The Ministry of Agriculture is responsible for agricultural research in crops, livestock, fisheries, horticulture, cropping systems, agricultural economics and socio-economics.

**Table 1. Agricultural research manpower availability in Nepal.**

Research agencies	PhD	MSc	BSc	Total
Department of Agriculture				
Disciplinary divisions	2	40	48	90
Commodity programs (crops)	3	20	28	51
Agricultural stations and farms	0	30	55	85
Horticulture	3	15	53	71
Fisheries	0	25	32	57
Livestock Division	1	11	9	21
Livestock farms	0	3	19	22
Department of Food and Agricultural Marketing Services	2	13	0	15
Central Food Research Laboratory	1	38	4	43
Agricultural Project Service Centre		not available		105
Forestry Survey and Research Office		not available		24
Department of Medicinal Plants		not available		106
<b>Total</b>				<b>690</b>

**Crops, horticulture and fisheries research.** The recently formed National Agricultural Research Coordination Council is the main coordinating body through which the research activities are approved and from where the results are recommended for wide use. The National Agricultural Research Service Center (NARSC), under the Department of Agriculture, conducts crop research activities through eight disciplinary divisions such as agronomy, plant pathology, entomology, and agricultural botany. It coordinates with about 20 agricultural stations located in diverse physio-graphic environments. Different disciplinary divisions and agriculture stations and farms cooperate to gain research experience on nine national commodity development programs in which rice, maize, wheat, oilseeds, pulses, sugarcane and other cash crops are included. Horticulture research activities are conducted through the Fruit Development Division, Kirtipur Kathmandu, Vegetable Development Division and Potato Development Program, Kathmandu, and the Citrus Development Program, Dhankuta. In addition there are 25 farms located at various physio-graphic environments to provide research services for horticultural crops. Fisheries research activity is conducted through the Fisheries Development Division. There are 12 fish development centers widely dispersed throughout the country.

**Department of Livestock Development and Animal Health.** The Department includes the Central Livestock Research and Development Centre, Veterinary Division, and Biological Products Division along with four livestock development farms, three sheep farms, three poultry breeding and hatchery farms, one goat farm, and two yak farms.

**Central Food Research Laboratory.** The Central Food Research Laboratory of the Ministry has been involved for more than two decades in research activities related to food and nutrition, quality control and standardization, processing, grain testing, and food testing.

**Agricultural Projects Service Centre.** This is one of the important semi-autonomous research agencies under the Ministry of Agriculture. It provides socio-economic research services to the country, primarily in studies and project formulation and evaluation.

### **Status of Manpower Availability**

There has been a steady development in both the quantity and quality of manpower over the last few years, especially in crop development. There are growing opportunities for technical staff to go for higher training and degrees in agriculture. The credit for this goes to various projects which have shown interest in manpower development. It is not easy to accurately assess the present status of research manpower and to separate it from the total manpower. This is because research activities are mixed with development support activities. The Institute of Agriculture and Animal Sciences has been producing agricultural graduates since 1979-80. Each year the three campuses produce about 100 diploma-level and 885 certificate-level graduates. The Institute of Forestry established at Hetuda is planning to produce about 40 graduates every year.

Short- and long-term training programs are also made available by various bilateral and multilateral development organizations and other funding agencies and institutes.

It appears that manpower availability would not be a constraint in executing research and technology development programs. The main issue is the effective utilization and management of existing manpower for successful implementation of research and technology development programs.

### **Department of Food and Agriculture Marketing Services**

As a result of continuous efforts, the traditional agriculture has been modified to some extent by the investment and inputs for research on crops, horticultural plantations, livestock and fisheries. This has helped to gather momentum for agricultural prosperity in Nepal. However, it was soon realized that real success could only be achieved when the post-production processes in agriculture were properly managed. The transferring of agriculture from traditional to transitional to a modern phase would be possible if the marketing component was endorsed as a strategy for agricultural development. This strategy should also include research education and extension activities. Markets and marketing research were to provide fine tuning in the overall agricultural research program in the country. Therefore, the Department of Food and Agricultural Marketing Services (DFAMS) was created in 1971.

**Current status of manpower.** As in other agricultural research organizations during recent years, the DFAMS has experienced steady improvement in both the quality and quantity of its manpower. The increasing role of the socio-economic aspects of agricultural development has led the Department to be one of the primary agencies furnishing relevant information and pursuing appropriate policy decisions in the Ministry of Agriculture.

**Employment.** The recruitment of personnel is done by the Public Service Commission, an autonomous governmental body. Terms of reference for positions are established as service class or sub-class so that provisions can be met to employ subject matter specialists. However, the objectives of the terms of reference and the employee selected may not always tally. It is rather obvious and natural that while a specialist is a permanent employee, the long-term objectives set should have some dynamism.

**Personnel management development.** Research activities are mixed with development support activities. If appropriate in-service training is provided, the staff members involved may be fit for a set objective.

The Department assumes great responsibility for training and education of manpower both within and outside the country, thus staff members may change the way the set objectives are likely to move. The Department has gained substantial experience in this regard since 1971 and is aware of maintaining a policy of matching the right person to the right job.

The updating of staff quality through training and higher study arrangements abroad are made when opportunities are obtained. However, in practice these conditions are not applicable for all.

**Promotion.** The general rules of promotion are matched by motivation, academic performance, and the capability to stay and work. The motivation to work better is controversial under the present method of secret evaluation of staff. However, the DFAMS has nothing to do with this issue as such rules are implemented under the Civil Service Act. On the other hand, experience suggests that frankness is an alternative approach to evaluating staff in secrecy as there are frequent pressures for the boss to manipulate the marks.

**Motivation.** The following are usually recognized criteria of staff motivation: (1) Recognition of the employee's qualifications and progress. (2) Prospects of a better future with due recognition for a good job. (3) There is a high degree of freedom of expression of problems and solutions.

By governmental rules, the DFAMS is not supposed to play a significant role in providing truly adequate salary increases and an unbiased selection of candidates for promotion.

**Use of human resources.** This refers to the employee's performance in terms of productivity. Making the best use of human resources includes proper job descriptions, remuneration and fringe benefits, motivation, welfare, and so forth.

While the Department cannot change the basic norms of employment payment and provision of facilities, it does have responsibility for making the best use of available human resources. The Department is usually interested to see that jobs are specified and the work load is appropriately distributed. The management of human resources has taken on development-oriented dimensions which will guide future activities of the Department.

# Managing the Human Resources in Agricultural Research in Pakistan

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Pakistan is an agricultural country. It has vast human and natural resources which are important for agricultural production. This production system must be continuously backed by an alert and dynamic research system fully oriented to facing the numerous and complex challenges that crop up. There are many problems and constraints to building an efficient national agricultural research system in Pakistan, but the single greatest impediment is the shortage of trained manpower.

The main object of agricultural research is to produce new knowledge and to develop new technology for the benefit of farmers through systematic investigation in a well planned and integrated manner. The quality of research is dependent on the quality of the trained manpower. Therefore, the development of scientific manpower, para-scientific staff, and research managers is an imperative need for an efficient and viable agricultural research system.

Research efforts in Pakistan are highly fragmented. There are six ministries in the Federal Government and about eight departments in the provinces which are involved in administering agricultural research. There are 83 federal and provincial institutions performing research (Table 1). This does not include those in the private sector.

There are many institutions operating under the Federal Government. These are indicated below along with their appropriate governmental division and the organization coordinating their activities.

• Agricultural Research Division, Pakistan Agricultural Research Council (PARC):

- National Agricultural Research Center, Islamabad
- Arid Zone Research Institute, Quetta
- Cereal Diseases Research Institute, Islamabad
- Pest Management Research Institute, Karachi
- Southern Zone Agricultural Research Institute, Sujawal
- Plant Introduction Center, Karachi
- Hill Agricultural Research Station, Kaghan
- Karakoram Agricultural Research Station, Gilgit

**Table 1. Institutions in agricultural research in Paki-tan.**

Research emphasis	Institutions		
	Federal	Provincial	Total
Plant sciences			
Plant production	9	17	26
Plant protection	8	1	9
Natural resources			
Soil, irrigation and drainage	3	2	5
Forestry	1	3	4
Agricultural machinery	1	1	2
Animal sciences			
Animal production	0	16	16
Veterinary	0	2	2
Poultry	0	2	2
Fisheries	0	2	2
Zoological survey	1	0	1
Education			
Universities	0	3	3
Colleges	0	3	3
Training institutes	0	4	4
Social sciences	1	3	4
Totals	24	59	83

- Food and Agriculture Division, Pakistan Central Cotton Committee:
  - Cotton Research Institute, Multan
  - Cotton Research Institute, Sakrand
  - Institute of Cotton Research and Technology, Karachi
  - Pakistan Forest Research Institute, Peshawar
  - Soil Survey of Pakistan, Lahore
  - Department of Marine Fisheries, Karachi
- Science and Technology Division, Irrigation Drainage and Flood Control Research Council:
  - Drainage and Reclamation Institute of Pakistan, Hyderabad
- President/CMLA's Secretariat, Pakistan Atomic Energy Commission:
  - Nuclear Institute for Agriculture and Biology, Faisalabad
  - Nuclear Institute for Food and Agriculture, Tarnab, Peshawar
  - Atomic Energy Agricultural Research Center, Tandojam
- Commerce Division, Pakistan Tobacco Board:
  - Tobacco Research Station, Manshehra
  - Tobacco Research Station, Okar
  - Tobacco Research Station, Khanghari, Mardan

• Ministry of Water and Power, Water and Power Development Authority:

Water Quality and Soils Monitoring Directorate, Lahore  
Mona Reclamation Experimental Project, Bhalwal

There is an overall shortage of trained manpower for agricultural research in the country. Many of the institutes are not properly developed and have a negligible number of trained personnel and other facilities to undertake any kind of research. The agricultural universities, which are responsible for the training and development of scientific manpower, are short of trained staff for their postgraduate teaching programs. There is a shortage of persons with demonstrated capabilities to provide group leadership. Table 2 indicates the manpower supply available to the research system in recent years.

Although the total of trained personnel has gradually increased, there are still gaps and imbalances in various sub-sectors. This is because until recently agricultural research in Pakistan has been predominately crop-oriented with insufficient attention paid to other sub-sectors. This lopsided development of the scientific manpower is illustrated in Table 3.

The most significant change in recent years is the reorganization of the Pakistan Agricultural Research Council (PARC) as an apex body for agricultural research at the national level. PARC has been granted autonomous status to discharge its responsibilities which have been greatly enlarged through a Presidential Order. The organization is under an eminent scientist who is not only the Chief Executive of the Council but who is at the same time a Federal Secretary in charge of the Agricultural Research Division. Under its revised charter, the Council is responsible for the national level development of scientific manpower in agriculture and its allied subjects. Since 1979 there have been several long- and short-term measures to increase the number and improve the quality of agricultural research workers.

### Talent Pool

PARC had 78 scientists on its staff when it was granted autonomous status in March 1979. A Talent Pool was created in that year to reduce the acute shortage of trained manpower for national programs. Talented young scientists are recruited through nationwide open competition on the basis of

**Table 2. Trained manpower in agricultural research in Pakistan, 1977-84.**

	1977-78	1980-81	1983-84
PhD degree	233	221	299
MSc degree	1405	1538	2181
BSc degree/DVM	1196	754	952
Totals	2834	2513	3432

Source: National Agricultural Research Plan.

**Table 3. Academic qualifications and disciplines of agricultural research personnel in Pakistan.**

Academic disciplines	Academic degrees			
	PhD	MSc/MPhil	BSc/DVM	Total
Agronomy	21	269	108	398
Entomology	34	172	37	243
Plant breeding and genetics	46	318	83	447
Plant pathology	18	119	14	151
Horticulture	8	118	50	176
Forestry and range management	3	41	23	67
Soil sciences	23	253	60	336
Food technology	6	63	9	78
Agricultural economics	14	94	26	134
Farm machinery	6	16	34	56
Veterinary sciences	31	196	311	538
Basic sciences	20	278	88	386
Others	69	244	109	422
Totals	299	2181	952	3432

their academic qualifications and experience. These scientists are generally inducted as junior and mid-level researchers and designated as Scientific Officers (SO) and Senior Scientific Officers (SSO) in BPS-17 and 18 grades. Professionals with demonstrated capabilities also can be recruited under this

**Table 4. Criteria for recruitment in the Talent Pool for agricultural research in Pakistan.**

Position	Qualifications	Research experience	Publications
Scientific Officer (SO)	MSc/MSc (Hons.) 2 first and 2 second divisions	Preferable	Not required
Senior Scientific Officer (SSO)	MSc/MSc (Hons.) with 3 first divisions	5 years post-MSc	3
	or MSc (Foreign)/MPhil	3 years post-MSc/ MPhil	3
	or PhD	Not required	Desirable
Principal Scientific Officer (PSO)	MSc (Foreign)/MPhil At least 3 first divisions	7 years post-MSc/ MPhil	5
	or PhD	5 years post-PhD	3
Chief Scientific Officer (CSO)	PhD	15 years post-MSc including 7 years post-PhD Proven ability of leadership	Essential

scheme in senior positions at BPS-19 and 20 as Principal Scientific Officers (PSO) and Chief Scientific Officers (CSO). The parameters for recruitment in the Talent Pool are shown in Table 4.

Talent Pool positions are advertised in the national press and copies of the announcements are sent to agricultural universities, research institutions and other organizations. All applications are thoroughly scrutinized. Those who meet the criteria are called to take a written test in the subject matter, general awareness, Islamic ideology, and Pakistan studies. Another paper in the English language is required of those going abroad for academic study. Those candidates who qualify at the written test then have to appear before a Selection Committee of subject matter specialists. This Committee thoroughly probes each candidate's insight of the subject matter, his motivation, and the clarity of his vision toward his work plan. PARC has inducted 147 scientists in various positions besides those for project posts (Table 5).

The distribution of the scientists recruited through various agricultural research fields and disciplines is given in Table 6.

The scheme aims at building a critical mass of 1000 to 1500 scientists for the national programs within 10 to 15 years. The services of the Talent Pool scientists also can be made available to provincial institutions upon request for their secondment. The persons recruited are given 2 to 3 years training at the National Agricultural Research Centre (NARC) of PARC and are entitled to training abroad depending on their performance. The philosophy is to groom young scientists into useful professionals.

## Training

At about the time the Talent Pool was introduced, institutional changes were made in PARC for the management of manpower training. A training

**Table 5. Scientists inducted in the Talent Pool for agricultural research in Pakistan, 1979-84.**

Year	Positions				Total
	CSO	PSO	SSO	SO	
1979-80	0	0	7	19	26
1980-81	0	0	5	20	25
1981-82	2	5	8	28	43
1982-83	3	4	7	12	26
1983-84	2	1	4	20	27
Totals	7	10	31	99	147

**Table 6. Recruitment of scientists by fields and disciplines.**

Subject	SSO	SO
Plant protection, plant pathology, entomology	9	17
Range management and forestry, watershed management, ecology	0	8
Irrigation and water management	1	12
Agricultural chemistry, biochemistry, analytical chemistry, soil science, inorganic chemistry	4	16
Agricultural engineering	0	8
Animal production	1	16
Animal breeding	0	4
Statistics	1	2
Agricultural economics	2	6
Rural sociology	0	6
Agricultural extension/education	0	5
Fisheries	0	3
Poultry science	0	6
Food technology	1	4
Agronomy/crop production	4	13
Animal health	3	10
Plant breeding and genetics, cytogenetics	3	20
Horticulture, floriculture	3	5
Zoology, botany, microbiology	4	27
Totals	36	188

cell was set up early in 1979 which has now grown into a full fledged directorate exclusively responsible for the management and development of scientific manpower. It is headed by a Director who has an assistant and four support staff. There are three Deputy Directors, one each for overseas training, short-term training, and local training. Each of these has two support staff members.

The main programs developed and being pursued by the Training Directorate are as follows:

- Postgraduate studies leading to MSc and PhD degrees at national universities and other centers of higher learning.
- Postgraduate studies leading to MSc and PhD degrees in overseas universities and institutions.
- Undergraduate training program for agricultural education in less-developed areas of the country.
- Short-term practical training programs
- Post-doctoral training programs

**Table 7. Requirements for overseas graduate study.**

Program	Qualifications	Experience	Publications
PhD (foreign and inland)	At least two I classes between high school certificate to MSc with no III division Candidates with MPhil and MS from a foreign university preferred	3 years research or teaching experience in relevant field	3
MSc (foreign)	At least two I classes between high school certificate and MSc with no III division	2 years research or teaching experience in relevant field	2
MSc (inland)	Good academic record with I class in degree examination	2 years experience; relaxable for candidates with two or more I classes	—

- Summer trainee programs
- In-service training programs

**Overseas degree programs.** A high standard of selection has been prescribed for postgraduate studies overseas so entry is limited to persons with high intelligence and a good education. The requirements for this program are in Table 7.

The selection procedure for overseas training resembles that for the Talent Pool except that the candidates must qualify in an additional paper in the English language. The persons selected for the MSc or PhD program are given an intensive English language course of 6 to 8 weeks at NARC to prepare them for the Test of English as a Foreign Language (TOEFL). It is taught by qualified English language teachers, and sometimes by expatriates supplied by the U.S. Information Service or the British Council. Proficiency in English as demonstrated by a high TOEFL score is a condition for admission in universities in America, Britain, and Down Under.

The academic program of each trainee is developed by a subject matter specialist who identifies the major and minor subjects for the candidate, and the thesis research topic in the foreign university. The university is selected by the Director or the National Coordinator. The program is approved by the member of the respective PARC Technical Division. An important feature of the program is that the trainees are required to do their course work in foreign universities but their thesis research is done in Pakistan on a topic relevant to national needs under a local supervisor who is appointed with the agreement of the major professor. The major professor can visit the student to supervise this work and discuss it with his local counterpart. After completion of his research work, the trainee goes back to his foreign university for a semester to defend his dissertation and complete any remaining course work. The placement of the trainees in foreign universities is arranged by the Food and Agriculture Organization of the UN (FAO) on behalf of PARC.

The Training Directorate monitors and evaluates the progress of each trainee in consultation with the Director, National Coordinator, and Member. A close link is maintained directly with the trainee and through FAO. Almost 200 persons have been sponsored so far by PARC for training leading to graduate degrees at overseas universities (Table 8).

Almost the total financial support to Pakistan for this overseas training has come through projects funded by the U.S. Agency for International Development (USAID), International Development Association (IDA), and other international donors. The investment in manpower development so far has been to the tune of 70 million Pakistan rupees (US\$4.3 million).

**Inland training.** Studying in foreign universities is extremely useful and necessary, but training in national universities and centers of higher learning also is important. The Council is, therefore, encouraging more persons to pursue their postgraduate studies at national universities, especially in those fields which have strong national faculties and the necessary facilities to impart quality training. In recent years more than 100 persons have been awarded scholarships by PARC for degree programs in national universities (Table 9).

To enhance training at the doctoral level, PARC is assisting the agricultural universities in the training of 15 persons for PhDs in fields and disciplines to be mutually agreed upon. PARC also provides deserving students doing postgraduate programs with operating costs for their thesis research on topics relevant to national priorities.

**Training for less developed areas.** Another important step taken by PARC is the introduction of an undergraduate program for agricultural education for the less developed areas of the country. The candidates are selected through open competition for undergraduate training leading to their first degree in agriculture, veterinary medicine, engineering, animal husbandry or forestry. The program will go a long way in creating manpower that is much needed for the developmental activities in these areas.

**Table 8. Overseas postgraduate training sponsored by PARC.**

Division	Foreign training		
	MSc	PhD	Diploma
Crop Sciences	58	50	1
Animal sciences	22	12	0
Natural resources	11	9	1
Social sciences	12	5	1
<b>Totals</b>	<b>103</b>	<b>76</b>	<b>3</b>

**Table 9. In-country postgraduate training sponsored by PARC.**

Division	In-country training		
	BSc	MSc	PhD
Crop sciences	13	32	1
Animal sciences	0	39	0
Natural resources	0	13	0
Social sciences	0	9	0
Totals	13	93	1

**Short-term training.** Short-term nondegree training is available to PARC under its foreign aid projects besides those offered by foreign governments, international agencies, and institutions with which the Council has established technical and scientific collaboration like the International Center for Maize and Wheat Improvement (CIMMYT), the International Rice Research Institute (IRRI), the International Center for Agricultural Research in the Dry Areas (ICARDA), and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). These centers have provided some of the best training to our scientists in wheat, rice, maize, oilseeds and pulses. While mid-level researchers are sent abroad for short-term training, the senior-level scientists are exposed to international workshops, seminars and study tours abroad in which they develop fruitful contacts and share experiences on the latest innovations in agriculture. PARC has been sending an average of more than 60 scientists abroad annually from all over the country to international workshops and seminars. A total of 202 persons have taken part in short-term training abroad, of whom 169 were in crop sciences, 15 in animal sciences, 8 in natural resources, and 10 in social science.

**In-service training.** PARC recently established a Training Institute at NARC to provide theoretical as well as practical training to scientists in selected areas such as crop production, weed control, biotechnology, integrated pest management, dryland farming, and farm machinery. These courses of short duration are developed by national coordinators to give classroom instruction, group discussions, and laboratory and field experiments. Some of these courses are organized in collaboration with the international agricultural research centers and other donor agencies with eminent national and international experts as instructors. Fifty-five courses were offered by the Training Institute over the past three years (Table 10).

**Summer trainees.** Another scheme is in the offing to have students who have completed the first year of their MSc program in agricultural science to work during the two months of summer vacation on research projects at the NARC. It is contemplated that a batch of 25 to 30 students will be collected for the first year. Each student will be assigned to a research program under

the supervision of a National Coordinator. The trainee will be required to submit a report within two weeks after the completion of his internship. During the July–August period of the internship the trainee will be paid Rs. 1000 per month (US\$61.50) plus Rs. 200 (US\$12.30) for travel. They will be lodged free of charge at the NARC hostel.

**Pre-service training.** PARC soon will introduce a regular pre-service training program. The details are being finalized. The first course for about 20 trainees will start in September this year and continue for 10 to 12 months.

### Salary and Fringe Benefits

Although PARC is an autonomous body, its salary structure is linked with the National Pay Scales. Therefore it is difficult to attract and retain talented persons for research positions. Many organizations, particularly in the private sector, offer much better salary and fringe benefit packages to agricultural graduates. The PARC has made a strong proposal for a better pay package, qualification pay, and research allowances. This is under consideration by the Government.

Under the present operating rules, PARC provides certain incentives to attract talent and retain these persons in the system. These incentives include advance increments at the entry point, subsidized housing, transport, and medical facilities. The scientists are encouraged to strive for outstanding performance through grants of honoraria and merit awards. Authors of quality research articles are awarded Rs. 200 (US\$ 12.30) for each paper published in the *PARC Research Journal*. It may be worthwhile to mention that the President of Pakistan has instituted the Dr. Borlaug Medal for Agricultural Research to be conferred on a Pakistani scientist making a notable achievement in the field of agricultural science. The medal is accompanied by a cash grant of such size as may be determined by the President upon the recommendation of a selection committee.

The pay, allowances and other perquisites admissible to various categories of scientists at the entry point are given in Table 11.

**Table 10. Courses offered by Training Institute, NARC, 1983–85**

Year	Number of courses	Participants		
		Federal	Provincial	Total
1983	12	96	366	462
1984	21	241	249	490
1985	22	687	262	949
Totals	55	1024	877	1901

**Table 11. Salary and related benefits of agricultural scientists at entry point.**

	Grade			
	BPS-17	BPS-18	BPS-19	BPS-20
Base pay	Rs. 1600	Rs. 2100	Rs. 3200	Rs. 3800
House rent (a 45% of base)	720	945	1440	1710
Indexation	203	210	320	380
Conveyance allowance	150	150	150	150
<b>Totals</b>	<b>Rs. 2673</b>	<b>Rs. 3405</b>	<b>Rs. 5110</b>	<b>Rs. 6040</b>
Medical	Rs. 3150	Rs. 4140	Rs. 4140	Rs. 4140
Housing subsidy				
Unmarried officers	Rs. 1532	Rs. 1725	Rs. 1725	Rs. 1725
Married officers	Rs. 2200	Rs. 2200	Rs. 3000	Rs. 3750

PARC has established a set of criteria for granting advance increments for its personnel which are described in Table 12.

### Career Planning

A system of career planning and development has been prepared by PARC. The young scientists are inducted into the Talent Pool and assigned to work with a nationally coordinated program. Their work is evaluated regularly by the National Coordinator and the concerned Member, and reported to the Chairman of PARC. A scientist can be promoted to the next higher grade within a period of five years depending upon his performance. A scientist in the Talent Pool has a chance for moving up in his field of specialization to a position in the highest grade. The conditions for promotion to various scientific positions are indicated in Table 13.

**Table 12. Criteria for granting advance increments.**

	Scientific Officer	Senior Scientific Officer
Throughout first class up to MSc	3 advance increments	2 increments (if not PhD)
3 first classes up to MSc	2 advance increments	1 increment (if not PhD)
First class in MSc only	1 advance increment	No requirement
Postgraduate teaching and research experience	1 increment for each completed year with maximum of 3 increments	
Postgraduate teaching and research experience between MSc and PhD	1 increment for every 2 completed years with maximum of 3 increments	
Post-doctoral teaching and research experience	1 increment for each completed year	
Experience of scientific administration	1 increment for every 2 years of experience	

**Table 13. Conditions for promotion of scientific personnel in PARC.**

Post	Research experience	Publications
Senior Scientific Officer	5 years with 2 years at a hardship station	3
Principal Scientific Officer	7 years as SSO or 12 years as SO	7
Chief Scientific Officer	5 years as PSO or 17 years as SO and SSO	10

Although PARC is still building up its own manpower, it has not put an embargo on scientists to prevent them from applying for jobs elsewhere. A system has been established under which scientists in various categories may apply for jobs in non-PARC institutions twice a year.

As stated earlier, training is intimately linked with career development. The young scientists in the Talent Pool, after having done 2 to 3 years initial training under a national coordinated program, are entitled to training abroad depending on their performance. Their knowledge is kept up-to-date through in-service training at NARC and abroad. This gives them the skills needed for performing tasks requiring progressively higher responsibilities. The senior scientists are provided maximum opportunities for participation in international seminars, workshops and study tours, and also post-doctoral work at centers of excellence in other countries.

### Manpower Planning

Manpower planning has an important bearing upon the agricultural research potential but in the past was given no attention. This resulted in an overall shortage of trained manpower and created gaps and imbalances in various sub-sectors of agriculture. Training programs were prepared on an ad hoc basis to use the funds provided under bilateral programs. Training needs and the role of agricultural universities in meeting such needs were not determined in the context of national priorities. There was no systematic collation of manpower statistics except for occasional ad hoc surveys. A serious effort was made last year to collect manpower statistics and to review the past trends in national agricultural research. This was done in collaboration with an FAO team of experts which assisted PARC in formulating a National Agricultural Research Plan. It is estimated that to achieve the proposed expansion in manpower, the number of scientists should be raised to 5575 in 1988-89 from the 3432 level of 1983-84. This estimate is based on the present level of staff at post or sanctioned and the likely expansion in line with the financial provisions in the Sixth Five Year Plan. The growth in the number of scientists in the future years also takes into consideration an annual 5% rate of retirements and resignations.

The salient points in the National Agricultural Research Plan concerning manpower recruitment and training are as follows:

1. There has been an improvement in the manpower position since 1980-81. The deterioration in manpower levels between 1977-78 and 1980-81 has been reversed.
2. There has been a steady improvement in the qualifications of the staff in post. Recruitment to the PARC Talent Pool is behind schedule due to a lack of suitable candidates.
3. There has been exceptional growth in the number of sanctioned posts in the last three years. The annual growth rate has been 13.7% compared to 10.0% for posts filled. As a result, the proportion of vacancies has increased.
4. Baluchistan, Sind and the North West Frontier Province require assistance in their manpower development.
5. Overall growth of science manpower for the next five years will be determined by the financial resources provided by the Federal Government. The Sixth Five Year Plan indicates that an expansion of around 10% will be needed to meet commitments. Such an expansion should increase the number of scientists in position from 3431 in 1983-84 to 5575 in 1988-89.
6. The universities will steadily expand the supply of science graduates through 1990. The number of agricultural science postgraduates appears to be on the low side. The total of 528 MSeS and PhDs in 1983 is expected to rise to 1067 in 1990. This is not great enough to supply the demand for extension, research, Agricultural Development Bank, and the private sector. The agricultural sector should recruit more widely in the basic sciences and provide, if necessary, conversion courses to agricultural science. In addition, conditions of employment in the provincial governments need to be adjusted to accommodate these graduates.
7. PARC and the provincial governments need to work out a plan for accelerated recruitment of high-level manpower in order to provide the future management expertise required in agricultural science.

The awareness of computer use has been growing in Pakistan for about two decades. Many organizations are now using this technology, particularly microcomputers. PARC recently set up a Computer Section with 21 computers in use, including: one aiM-16-1MB, one aiM-86-MB RAM, one IBM-PC-AT-512 KB RAM, two IBM-PC-128 KB RAM, four Wang PC-512 KB RAM, and twelve Apple I and III-128 KB RAM.

However, there is a general lack of trained professionals available in this field. At present the section is manned by a small group of trained persons comprising two systems analysts, two programmers, one junior executive, and four keypunch operators.

The computer program in PARC is still in its formative stages. Nevertheless, there is great potential for this technology to be increasingly used in research management and training. A modest beginning has already been made. The following software and applications of the computers are being used: payroll accounting system for PARC, personnel information system, agricultural statistical data bank, CRISP (Current Research Information System for Pakistan), experimental design for statistical analyses, library system, AGRIS, CARIS, MSTAT, Word-tar, and farm management.

# Current Status and Activities in Human Resources Management of the Department of Agriculture, Thailand

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Although Thailand has achieved advances in industrialization, agriculture is still the dominant sector in the economic structure of the country. During 1973–77 the agricultural sector accounted for approximately 30% of the gross domestic production while manufacturing and trade contributed only about 18% each. Agriculture accounts for more than 70% of the people employed. In 1979, crops accounted for about 64% of the total export earnings. Clearly, crop exports provide the major source of foreign exchange needed for the manufacturing sector in Thailand.

Development of the agricultural sector is the responsibility of the Ministry of Agriculture and Cooperatives. One of the major development programs for agriculture is in the field of research. The Ministry has assigned the Department of Agriculture (DOA) the responsibility to carry out most of the research related to national agricultural production, although agricultural research is carried out by several governmental agencies. The DOA is involved in a broad range of basic and technical service research including plant breeding, agricultural chemistry, agricultural engineering, soil and plant nutrition, plant protection, farming systems, and sericulture. Responsibilities for some specific commodities have been delegated or assumed by other ministries, departments and agencies.

The DOA was last reorganized in 1972 when it was merged with the rice department. Extension activities were separated to form the Department of Agricultural Extension.

The shift from expansion of the cultivated areas to a more intensive and diversified rainfed agriculture has made the government aware of the need to expand and strengthen its agricultural research programs. As a first step, the Government has reorganized and decentralized its crop production research under DOA. The Government has asked The World Bank for financial assistance to support its projects and the acquisition of facilities. The project is called the National Agricultural Research Project (NARP). The loan program was designed to begin in 1978. The entire project was divided into six years for physical development of civil works and other facilities, and eight

*Figure 1*  
 Organization of the Department of Agriculture, Thailand.

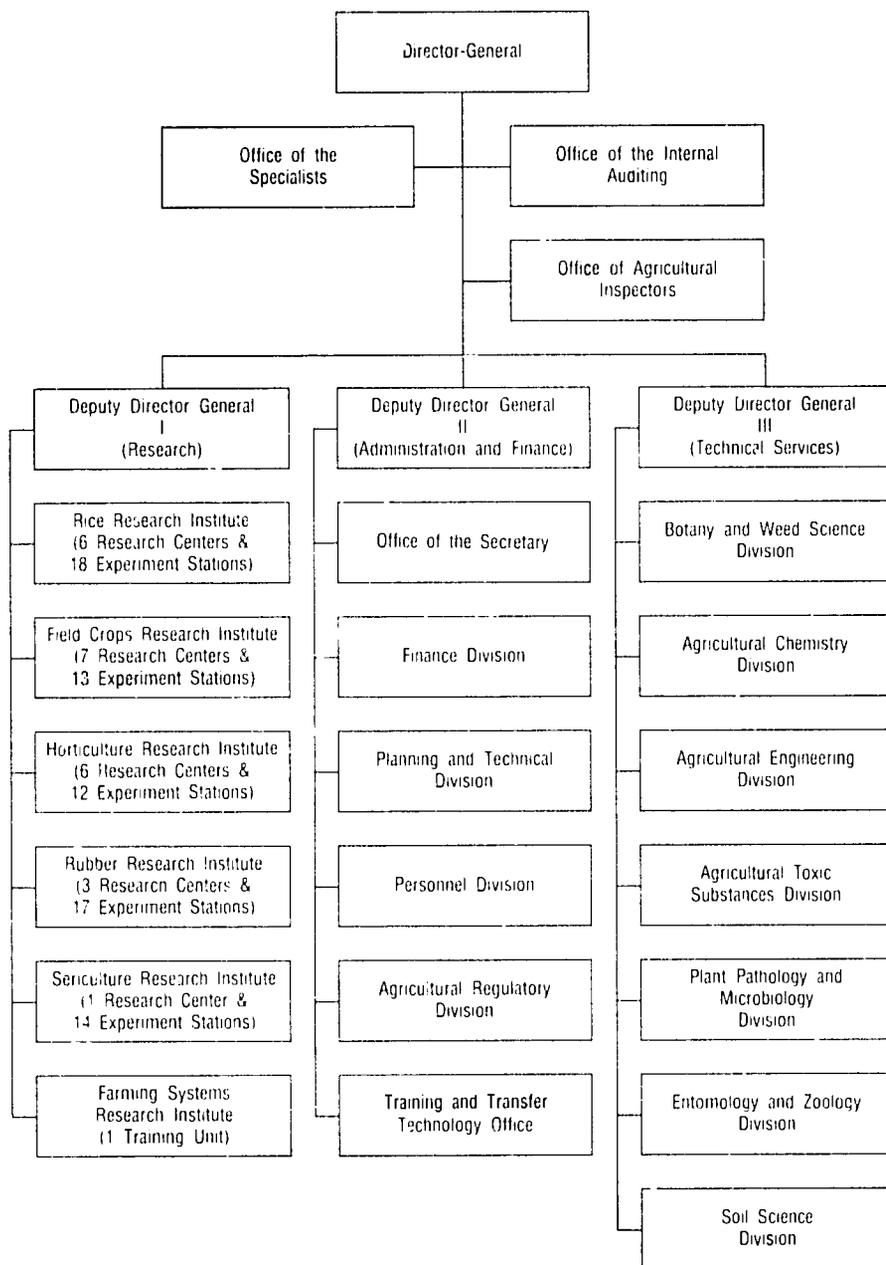


Figure 2

Position Classifications of Department of Agriculture Personnel at Central and Provincial Centers.

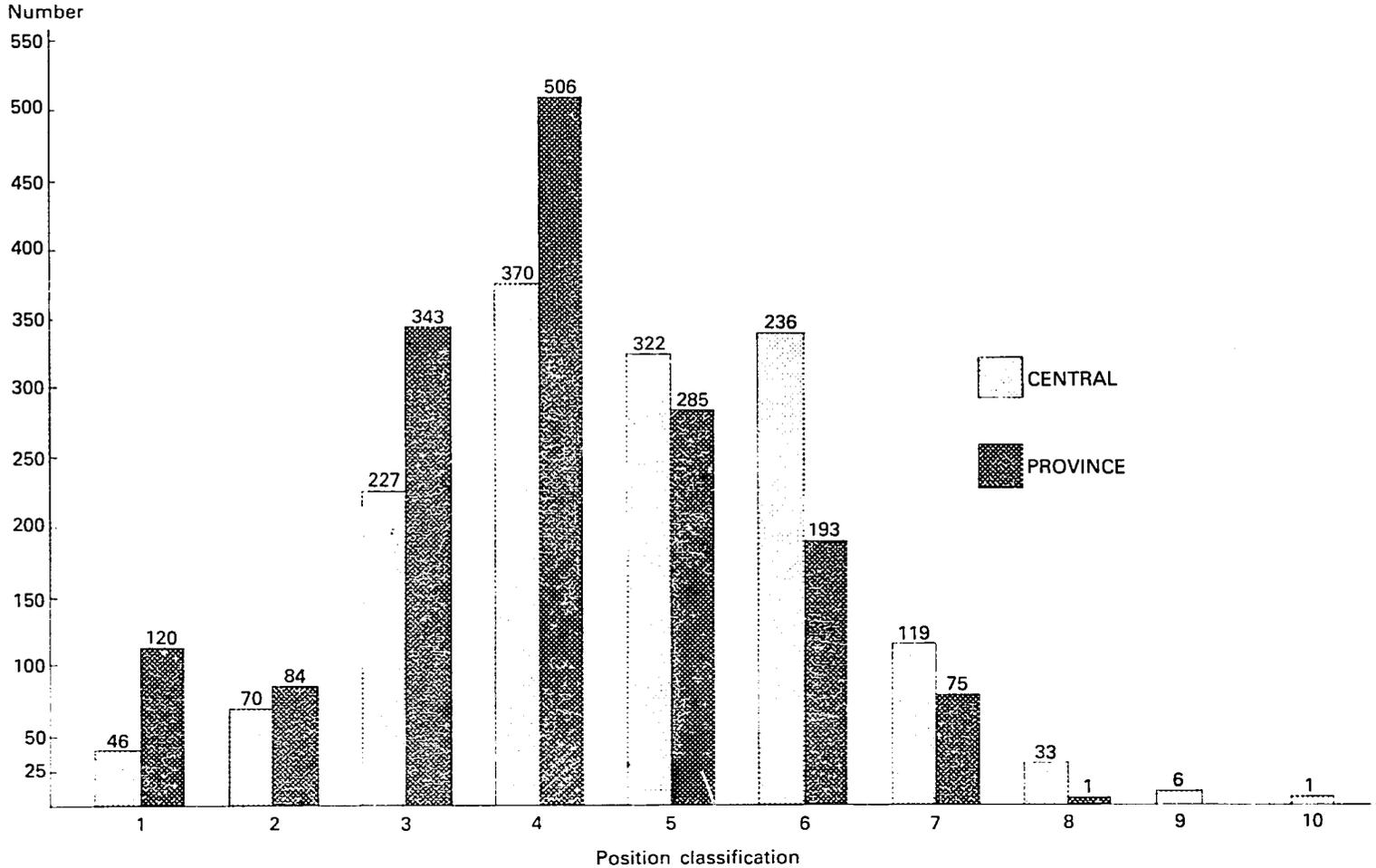
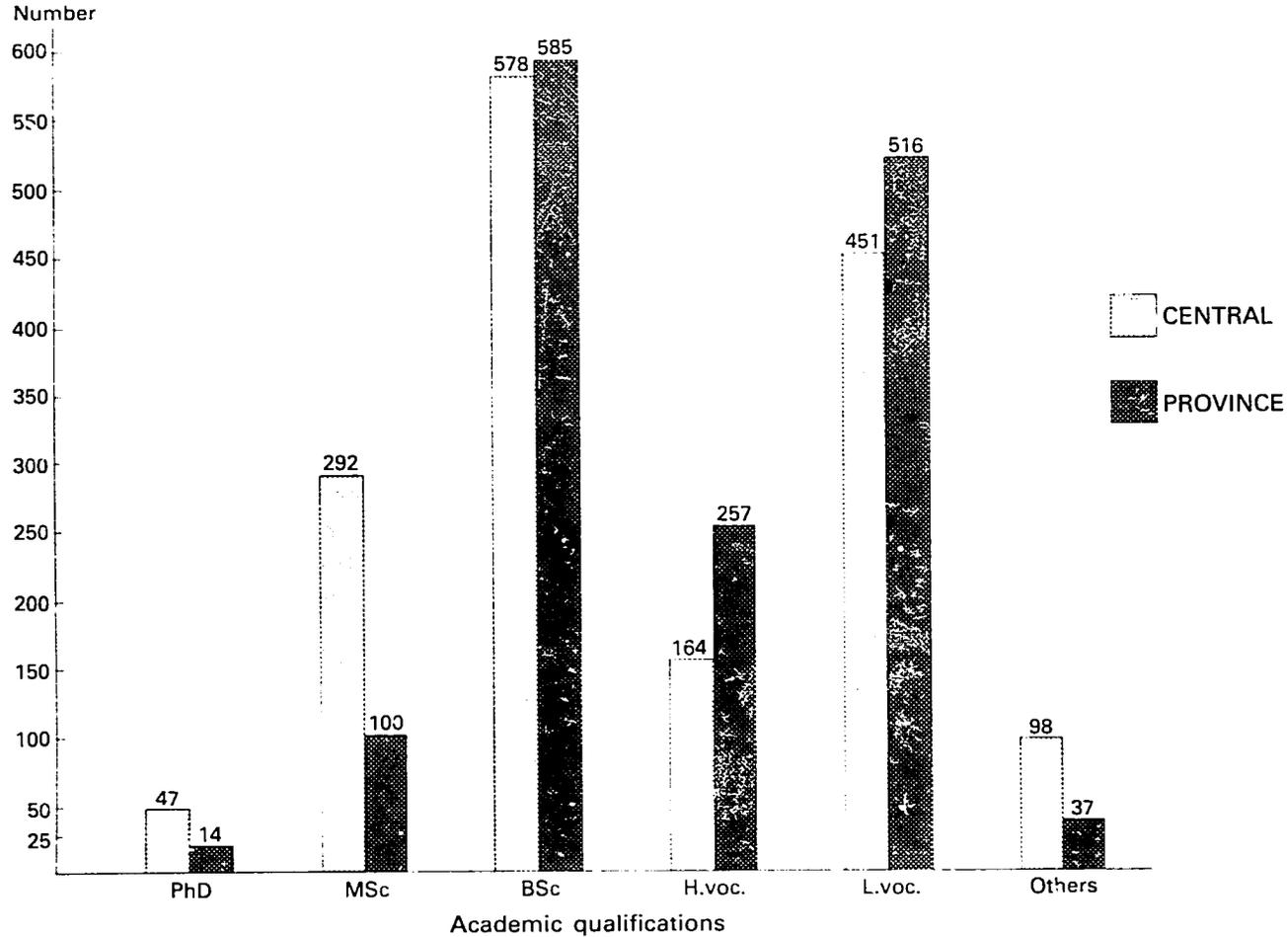


Figure 3  
Academic Qualifications of Department of Agriculture Personnel at Central and Provincial Centers.



years for staff development (from March 1981 to February 1987). To meet the objectives of NARP, DOA has adopted a new multidisciplinary research structure consisting of six institutes and 19 national research centers (Figure 1).

The two objectives of the project are:

- To strengthen the capacity and capability of DOA to implement the National Agricultural Program.
- To provide relevant technology through crop farming systems which will be disseminated by the agricultural extension services to the farmers.

The project seeks to achieve these objectives by providing staff fellowships, consultants, facilities, equipment, materials and supplies in supporting the DOA research operations.

DOA now has three Deputy Directors General with direct responsibility for research, technical services, and administrative services.

In line with the manpower development (see Figures 2, 3 and 4), the implementation of the program includes:

1. The creation of approximately 580 additional agricultural research posts.
2. An increase in the DOA's administrative and support capabilities at both the headquarters and the research centers.
3. Upgrading the qualifications of DOA staff through departmental training programs and fellowships.

The Australian support to the NARP has contributed most of the research and training for DOA staff. This training program gives particular attention to overseas MS degrees. A combined cause work research project or masters is being offered at the University of Western Australia, aimed at meeting the special needs of the DOA students. The goal is to achieve relevance in training and maintaining high academic standards so as to produce independent scientists who will be able to identify and solve farmers' problems which are amenable to research. Their thesis projects will be based on field experimentation with tropical crops, often with cooperative access to the regional research resources of the Western Australia Department of Agriculture. With the Australian postgraduate training, particular attention also will be given to the DOA students' English proficiency and cultural adjustment. This is to assist those students drawn from the many DOA field stations where there is little or no opportunity for practice of the English language. Some PhD fellowships will be offered in Australia and Thailand, particularly at Kasetsart University. Scholarships for masters degrees within Thailand will be offered in a number of universities. Candidates for postgraduate fellowships are selected from existing staff members who agree to accept assignments at field stations. New employees serve about one year with DOA before becoming eligible for a postgraduate fellowship.

Candidates need a BSc to qualify for an MSc fellowship and an MSc to qualify for a PhD fellowship.

Additional scholarships are being offered for DOA field staff who work as assistants at different research stations. One group will be for bachelors degrees and another for diplomas at agricultural institutes and colleges located throughout Thailand.

Short-term fellowships are also available so DOA scientists can undertake special training on projects either within the region or overseas. A major project to be undertaken in the initial years is training of directors of research for the regional centers. Training for other directors of institutes and technical divisions is also arranged. The fellowships schedule is shown in Table 1.

The Personnel Department Sub-Division of the Personnel Division has responsibility for the DOA training program. It conducts in-service training courses and inducts new employees into the Department of Agriculture. While providing training officers to conduct the courses, it also arranges for guest lectures from within the Department and maintains liaison with other government organizations which operate training seminars.

In summary, the Department of Agriculture, operating under the NARP, is taking all possible means to solve the staff shortage within the regional research centers. These measures are:

- Double increments as an incentive for staff posted outside Bangkok.
- Providing necessary non-salary benefits.
- Promotion of improved relationships and cooperation between the central research offices and the provincial centers.
- Assisting on research planning and management.
- Recruitment of new research staff members.

*Figure 4*  
**Position Classifications and Academic Qualifications of Department of Agriculture Personnel  
 at Central and Provincial Centers, February 1986.**

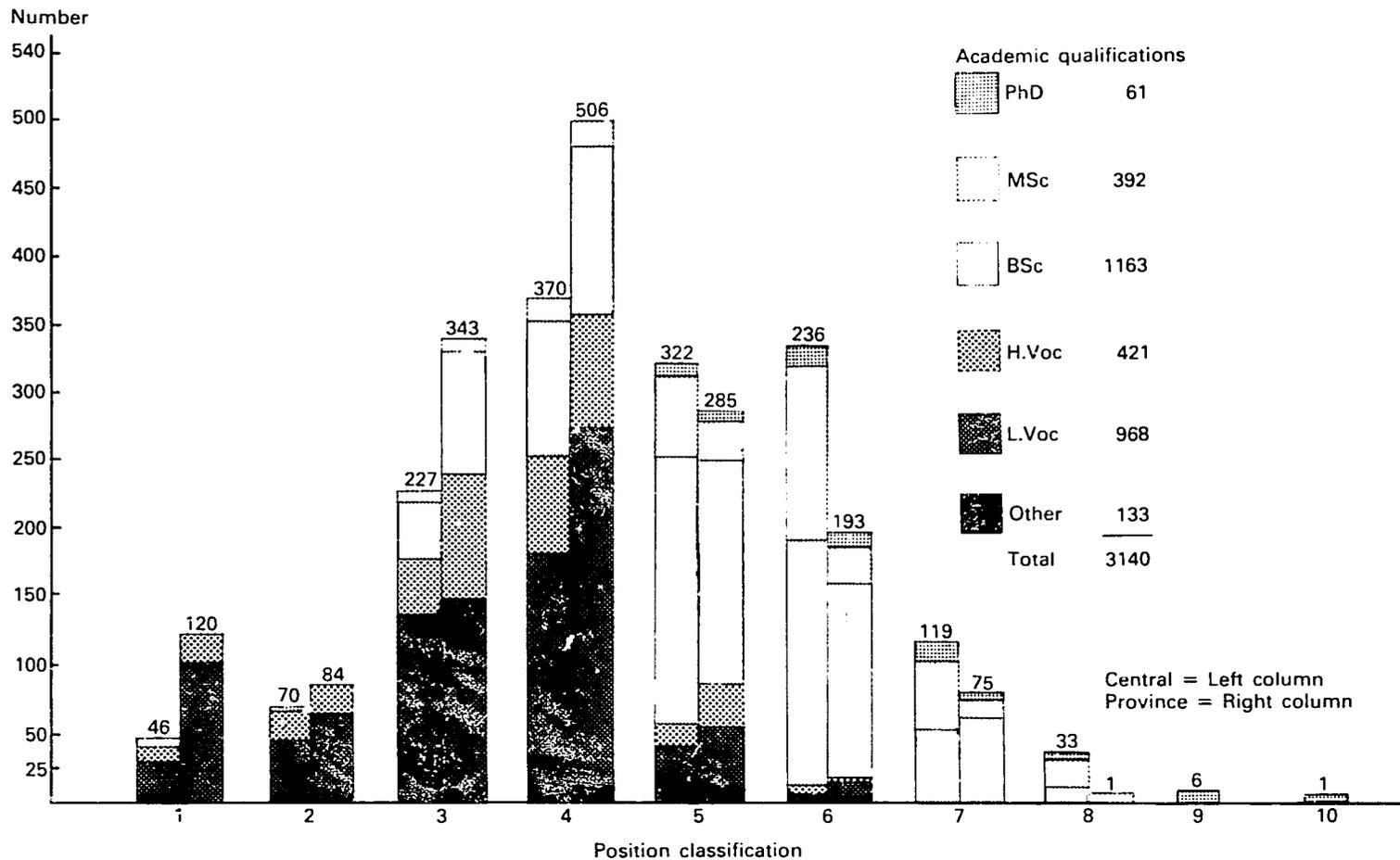


Table 1. Fellowships schedule arranged by the Australian contribution to the National Agricultural Research Project.

	1982	1983	1984	1985	1986	1987	1988	Total
Research divisions:								
PhD overseas/joint	3	2	4	7	6	6	0	28
MSc overseas/joint	8	10	9	9	13	10	10	69
MSc in-country	7	5	6	11	14	12	0	55
BSc in-country	10	8	9	11	6	0	0	44
Dip in-country	13	17	18	17	23	20	20	128
Total	41	42	46	55	62	48	30	324
Administrative Service Division:								
PhD overseas					1	1	0	2
MSc in-country					1	0	0	1
MA in-country					3	2	0	5
BA in-country					9	8	0	17
Dip in-country					4	0	0	4
Total					18	11	0	29
Total fellowships								353

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*Ford Foundation*  
Charles Bailey

*International Service for National  
Agricultural Research*  
Byron T. Mook  
Alexander von der Osten

*Malaysian Agricultural Research and  
Development Institute*  
Ahmad Shafri Man

*Ministry of Agriculture and Forestry, Bhutan*  
Namegy Nidup

*National Academy of Agricultural Research  
Management, India*  
K.V. Raman

*Pakistan Agricultural Research Council*  
M.H. Rizvi

*Soi' Resource Development Institute*  
Mostafizur Rahman

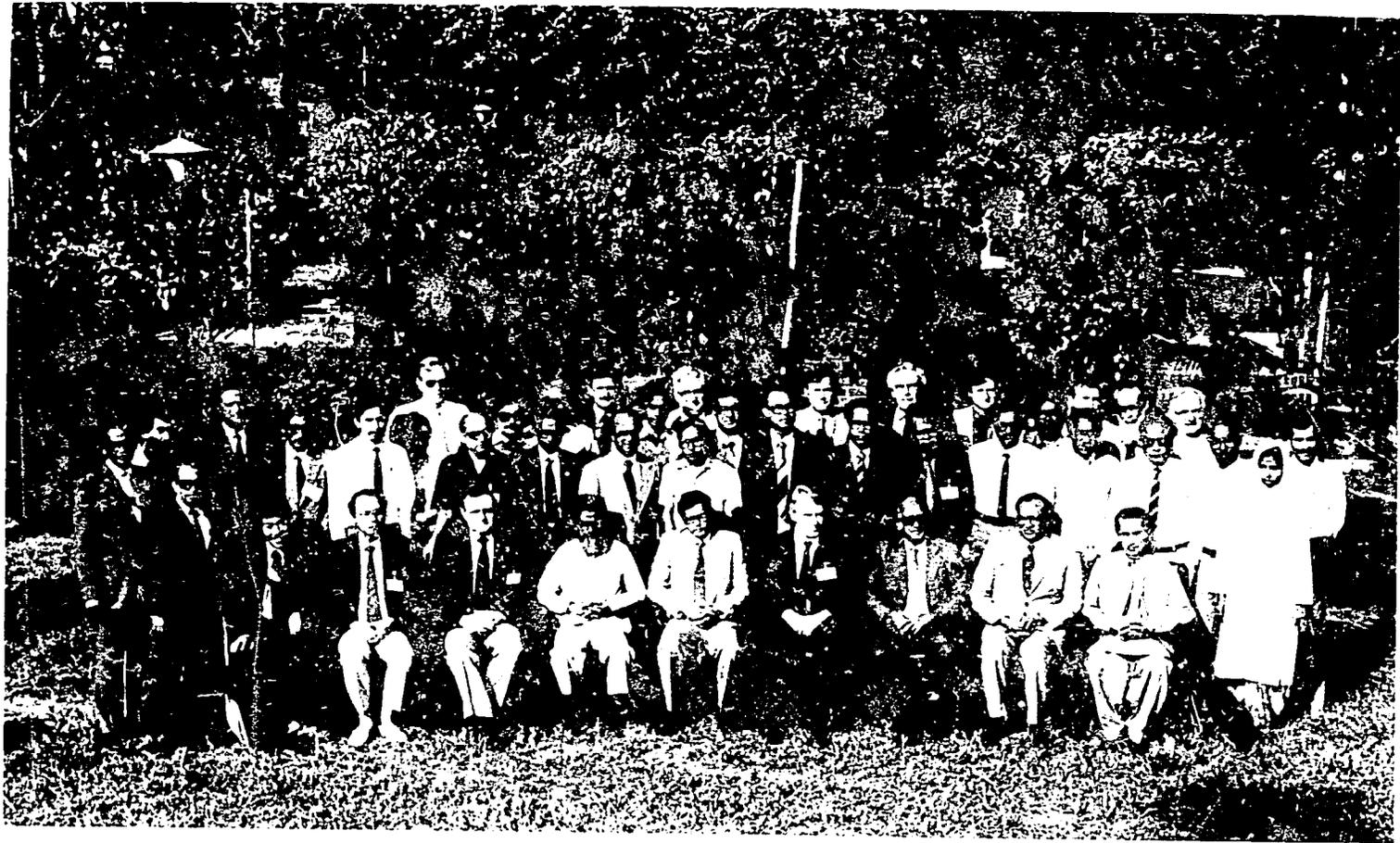
*Sugarcane Research and Training Institute,  
Bangladesh*  
Md. Yasin Ali

*U.S. Agency for International Development*  
H. Patrick Peterson  
Kevin A. Rushing

*Winrock International Institute for  
Agricultural Development*  
David M. Daugherty

G.J. Gill  
Brook A. Greene  
Theodore Hutchcroft  
A. Colin McCung  
Wayne Miller  
Ralph H. Retzlaff  
Gerard Rixhon

*World Bank*  
Walter Kock  
Alan Thomas

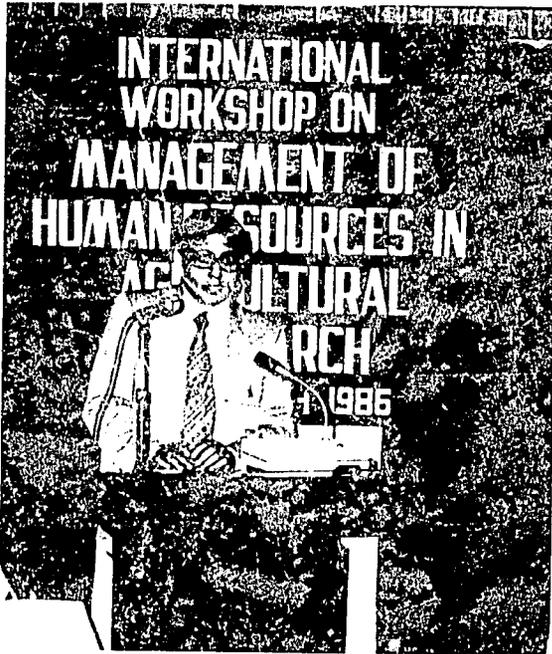




The Inaugural Address for the Workshop was given by the Minister for Agriculture of Bangladesh, Major General M.A. Munim (left). The Welcome Address was presented by Dr. Ekramul Ahsan, Chairman of BARC (center). Mr. S.A. Mahmood, Secretary, Ministry of Agriculture, presided over the opening session.

Photographs by Sarkar Sallahuddin, Scientific Officer, NALDOC/BARC.

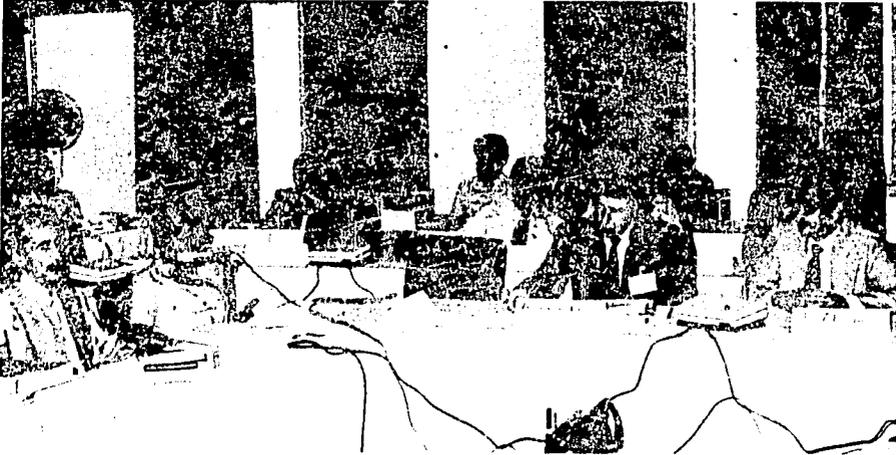
Front row: Yadab Deb Pant, *Nepal*; Namgey Nidup, *Bhutan*; Anan Vattanatangum, *Thailand*; David M. Daugherty, *Winrock/BARC*; A.K.M. Aminul Haque, *BAU*; Ekramul Ahsan, *BARC*; Alexander von der Osten, *ISNAR*; S. D. Chaudhuri, *Consultant*; K.V. Raman, *India*; and M. H. Rizvi, *Pakistan*. Second row: M.M. Mia, *BINA*; Ahmad Shafri Man, *Malaysia*; A.N.M. Shamsul Huda, *DAE*; Abu Yousuff, *BARI*; Md. Abeer Hossain Chowdhury, *BARI*; Salena Begum, *BARC*; Abdul Mannan Chowdhury, *BARC*; M.M. Rahman, *BARI*; M.S.U. Chowdhury, *BARC*; Shamsul Alam, *BRRI*; Kamal Uddin Ahmad, *BARC*; M.A. Quddus, *BARC*; Md. Yasin Ali, *SRTI*; Md. Monirul Islam, *BAU*; M. Hazrat Ali, *BAU*; Mafizur Rahman Bhuiya, *BLRI*; Abdul Quasem, *BARI*; Mrs. Mahloba Khanam, *BARC*; and Mahbub Ahmed, *BARC*. Third row: Theodore Hatcheroff, *Winrock/BARC*; Akhter Ahmed, *BARC*; Md. Ameerul Islam, *BARI*; Kevin A. Rushing, *USAID*; Nasir Uddin Ahmed, *BARC*; Ralph H. Retzlaff, *Winrock/AARD*; Ahmed Hussain, *BARC*; Byron T. Mook, *ISNAR*; Alan Thomas, *World Bank/BARC*; Douglas Clements, *CIDA*; Md. Habibur Rahman, *BARI*; G.J. Gill, *Winrock/BARC*; Quazi Md. Fazlur Rahim, *Consultant*; and Gerard Rixhon, *Winrock/Asia Regional Office*.



The Keynote Address was given by Dr. Ekramul Ahsan, Chairman of BARC. He also presented a major paper describing some of the future directions in the management of human resources within the Bangladesh agricultural research system.

Distinguished guests from government, international agencies, and the research system took part in the Inaugural Session of the Workshop along with participants of Bhutan, India, Malaysia, Nepal, Pakistan, Thailand and Bangladesh.

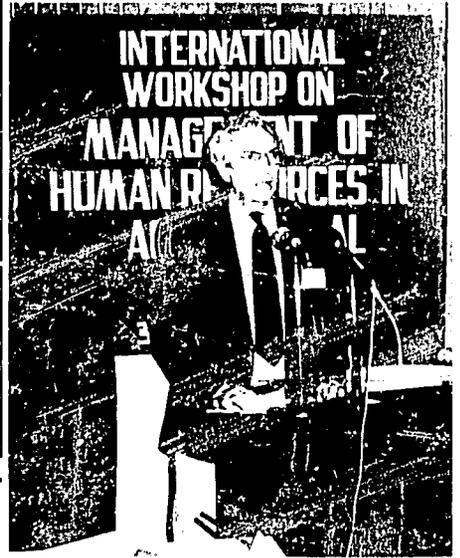




Mr. M.H. Rizvi (left), Secretary of the Pakistan Agricultural Research Council, presented a point during discussion of one of the country papers. Seated next to him were (left to right) Dr. Shamsul Alam, Director (Administration), BARRI; Mr. Alexander von der Osten, Director General, ISNAR; and Dr. Ekramul Ahsan, Chairman, BARC.

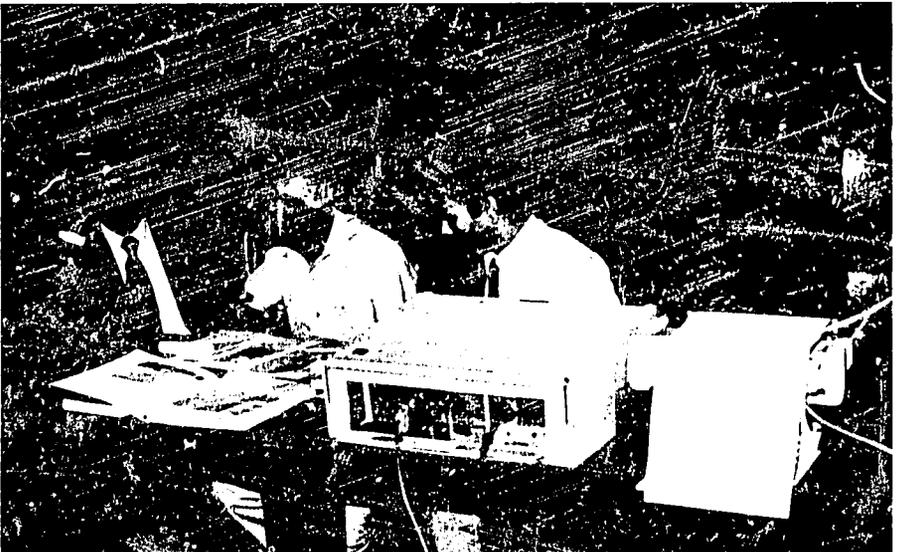
Papers were presented on the plans in human resources management of two of the Workshop co-sponsors. Mr. Alexander von der Osten (left), Director General, spoke of new opportunities for the International Service for National Agricultural Research, and Dr. A. Colin McClung, Regional Representative, Asia, described the program framework of the new Winrock International Institute for Agricultural Development.





Dr. Ralph H. Retzlaff (above) of Winrock/AARD told how microcomputers have quickly become adopted in the research management process in Indonesia. Mr. Alan Thomas, World Bank BARC, presented the fundamentals of integrating manpower resources into the work plan.

Dr. Md. Ameurul Islam (center), Director (I & C), BARI, was leader of one of the Workshop working groups which used microcomputers to solve problems relating to manpower resources in agricultural research. Mr. Md. Abeer Hossain Chowdhury (right), Scientific Officer, BARI, was a computer resource person to the working group. A member of this group was Mr. M.A. Quddus, Member-Director (Planning and Evaluation), BARC.



# International Workshop on Management of Human Resources in Agricultural Research

## Program

### Monday, March 3

- 9:00 am Inaugural Session. Auditorium.  
Welcome — Dr. Ekramul Ahsan, Chairman-in-Charge, Bangladesh Agricultural Research Council.  
Inaugural Address — Major General M.A. Munim, Minister for Agriculture.  
Chairman's Address — Mr. S.A. Mahmood, Secretary, Ministry of Agriculture.
- 10:00 am Tea Break.
- 10:30 am Plenary Session I. Conference Room.  
Chairman — Dr. S.D. Chaudhuri.  
Remarks — Mr. Alexander von der Osten, Director General, International Service for National Agricultural Research.  
Remarks — Dr. A. Colin McClung, Regional Representative, Asia, Winrock International Institute for Agricultural Development.  
Keynote Address — Dr. Ekramul Ahsan, Chairman-in-Charge, Bangladesh Agricultural Research Council.
- 12:30 pm Lunch.
- 2:00 pm Plenary Session II. Conference Room.  
Chairman — Dr. A.K.M. Aminul Haque, Vice Chancellor, Bangladesh Agricultural University.  
Human Resources Planning for National Agricultural Research: A Management Exercise Based on Data from Thailand — Dr. Byron T. Mook, Senior Research Officer, International Service for National Agricultural Research.
- 6:30 pm Dinner. South Ballroom, Dhaka Sheraton Hotel.  
Hosted by International Service for National Agricultural Research and Winrock International Institute for Agricultural Development.

**Tuesday, March 4**

- 8:30 am Official Photograph. Front entrance.
- 9:00 am Plenary Session III. Conference Room.  
 Chairman — Dr. M.M. Rahman, Director General, Bangladesh Agricultural Research Institute.  
 Reports of the Management of Human Resources in National Agricultural Research Systems.  
 Pakistan — Mr. M.H. Rizvi, Secretary, Pakistan Agricultural Research Council.  
 Malaysia — Mr. Ahmad Shafri bin Man, Deputy Director General (Administration), Malaysian Agricultural Research and Development Institute.  
 Manpower Planning and Development: Relationship to Work Planning — Mr. Alan Thomas, Training Specialist, World Bank.  
 Introduction to the BARC Data Base on Agricultural Research Manpower — Mr. Akhter Ahmed, Senior Scientific Officer, Bangladesh Agricultural Research Council.
- 10:45 am Tea Break.
- 11:15 am Working Group Session I. Auditorium.
- 12:30 pm Lunch.
- 2:00 pm Plenary Session IV. Conference Room.  
 Chairman — Mr. Shahidul Islam, Director General, Department of Agriculture Extension, Ministry of Agriculture.  
 Reports of the Management of Human Resources in National Agricultural Research Systems.  
 India — Dr. K. V. Raman, Director, National Academy of Agricultural Research Management.  
 Bhutan — Mr. Namgye Nidup, Officiating Deputy Secretary, Ministry of Agriculture and Forestry.  
 Using a Microcomputer for Managing Training Programs: Lessons from AARD Indonesia — Dr. Ralph H. Retzlaff, Project Supervisor/ Training Coordinator, Winrock International Institute for Agricultural Development, Bogor, Indonesia.
- 3:45 pm Tea Break.
- 4:00 pm Working Group Session II. Auditorium.  
 Using a Microcomputer for Planning Recruitment and Training: An Exercise Based on Data from the Bangladesh Rice Research Institute — Dr. Byron T. Mook, Senior Research Officer, International Service for National Agricultural Research.
- 7:00 pm Dinner, Ballroom, Purbari Hotel.  
 Hosted by Bangladesh Agricultural Research Council.

**Wednesday, March 5**

- 9:00 am Plenary Session V. Conference Room.  
Chairman — Dr. Ayubur Rahman, Director General, Bangladesh Jute Research Institute.  
Reports on the Management of Human Resources in National Agricultural Research Systems.  
Thailand — Mr. Anan Vattanatangum, Chief of Training and Transfer Technology Office, Department of Agriculture.  
Nepal — Mr. Yadab Deb Pant, Agricultural Economist, Department of Food and Agriculture Marketing Service, Ministry of Agriculture.  
Future Directions in Management of Human Resources Within the Bangladesh Agricultural Research System — Dr. Ekramul Ahsan, Chairman-in-Charge, Bangladesh Agricultural Research Council.
- 10:30 am Tea Break.
- 11:00 am Working Group Session III. Auditorium.  
Preparation of Recommendations Regarding the Management of Human Resources for Agricultural Research in Bangladesh.
- 12:30 pm Lunch.
- 2:00 pm Closing Session. Conference Room.  
Chairman — Dr. S. D. Chaudhuri.  
Reports of the Working Groups.  
Discussion of the Working Group Reports — Dr. Ekramul Ahsan, Chairman-in-Charge, Bangladesh Agricultural Research Council; and Mr. Ahmad Shafri bin Man, Deputy Director General (Administration), Malaysian Agricultural Research and Development Institute.  
Concluding Remarks.  
Dr. Byron T. Mook, Senior Research Officer, International Service for National Agricultural Research.  
Dr. David M. Daugherty, Project Supervisor/Adviser, Winrock International Institute for Agricultural Development.  
Dr. Ekramul Ahsan, Chairman-in-Charge, Bangladesh Agricultural Research Council.