Report of a Workshop

SACCAR/ISNAR REGIONAL WORKSHOP ON HUMAN RESOURCE MANAGEMENT IN NATIONAL AGRICULTURAL RESEARCH SYSTEMS

isnar

SACCAR
Southern African Centre For Cooperation In Agricultural Research

The International Service for National Agricultural Research (ISNAR) began operating at its headquarters in The Hague, Netherlands, on September 1, 1980. It was established by the Consultative Group on International Agricultural Research (CGIAR), on the basis of recommendations from an international task force, for the purpose of assisting governments of developing countries to strengthen their agricultural research. It is a non-profit autonomous agency, international in character, and non-political in management, staffing, and operations.

Of the thirteen centers in the CGIAR network, ISNAR is the only one that focuses primarily on national agricultural research issues. It provides advice to governments, upon request, on research policy, organization, and management issues, thus complementing the activities of other assistance agencies.

ISNAR has active advisory service, research, and training programs.

ISNAR is supported by a number of the members of CGIAR, an informal group of approximately 43 donors, including countries, development banks, international organizations, and foundations.

Proceedings of the
SACCAR/ISNAR Regional Workshop on Human Resource Management in National Agricultural Research Systems

Harare, Zimbabwe
2-6 May 1989

Edited by

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AGENDA

SACCAR/ISNAR REGIONAL WORKSHOP ON HUMAN RESOURCE MANAGEMENT IN NATIONAL AGRICULTURAL RESEARCH SYSTEMS

Harare, Zimbabwe
2-6 May 1989

Tuesday, 2 May 1989

08.30 – 09.00	Welcome and Opening SACCAR Human Resource Development Perspectives *Dennis Wanchinga*
09.00 – 09.20	SACCAR Agricultural Research Management Training Project – Overview *Luka Abe*
09.20 – 10.00	Film – ISNAR – Discussion
10.00 – 10.30	Break
10.30 – 11.00	Key Elements of Human Resource Management *Paul Marcotte*
11.00 – 12.00	Establishing Priorities – Small Groups
12.00 – 12.30	Plenary Discussion on Priorities
12.30 – 14.00	Lunch
14.00 – 14.30	Overview of Strategic Human Resource Planning *Luka Abe*
14.30 – 15.15	Developing a Human Resource Plan for NARS *Paul Bennell*
15.15 – 15.45	Break
15.45 – 16.30	Staffing Requirements and Staffing Pyramid for the Tanzania National Agricultural and Livestock Research System: A Case Study *Jesse Mende*
16.30 – 17.00	Discussion
17.00 – 17.10	What is Special about Human Resource Management in NARS? *Paul Bennell*

Wednesday, 3 May 1989

08.30 – 09.00	Recruitment and Selection *Paul Marcotte*
09.00 – 09.30	Recruitment and Selection of Staff in the Department of Agricultural Research, Malawi *E. M. Ntokotha*
09.30 – 10.00	Recruitment and Selection Discussion
10.00 – 10.30	Break
10.30 – 11.00	Socialization

11.00 – 12.00	Training and Development *Luka Abe*
12.00 – 12.15	Introduction to Job Evaluation *Paul Bennell*
12.15 – 13.45	Lunch
13.45 – 14.15	Reading the Case
14.15 – 15.00	Prepare Case – Small Groups
15.00 – 15.30	Plenary Discussion
15.30 – 16.00	Break
16.00 – 16.30	Human Assets Framework
16.30 – 17.00	Open Discussion

Thursday, 4 May 1989

08.30 – 09.00	Introduction to Organizational Behavior *Paul Marcotte*
09.00 – 10.00	Management of Research Teams in NARS: The Zambian Experience *L. P. Singogo*
10.00 – 10.30	Break
10.30 – 11.30	Research Team in Maldano Case – Small Groups
11.30 – 12.30	Plenary Discussion
12.30 – 14.00	Lunch
14.00 – 17.00	Leadership, Motivation, and Delegation *Alice Zinyemba*

Friday, 2 May 1989

08.30 – 09.30	Conflict Management *Alice Zinyemba/Paul Marcotte*
09.30 – 10.30	Career Development *Paul Marcotte*
10.30 – 12.30	Free period/Lunch
13.30 – 14.30	Performance Appraisal *Paul Bennell*
14.30 – 15.00	Break
15.00 – 17.00	Country Report Presentation

Saturday, 6 May 1989

08.30 – 09.30	Principles to Practice – Reflection on Action Plan
09.30 – 10.00	Planning for the Future
10.00 – 10.30	Evaluation
10.30 – 11.00	Certificates/Official Closing

Agenda

2-6 May 1989

Monomatapa Hotel, Harare, Zimbabwe

Tuesday	Wednesday	Thursday	Friday	Saturday
Official Opening SACCAR – Training Objectives DW ISNAR – Regional Overview LOA Assessment of Participant Expectations ISNAR – Overview Paper – Essential Elements of HRM PM	Recruitment/Selection – Recruiting Techniques – Selection Criteria PM Case—The Reality of a SADCC Country Recruitment and Selection Process EN Discussion Leaders PM/EN Socialization into an Organization – Assimilating New or Returning Staff LOA Discussion Leader LOA	Career Development – The Organization Plan—Staffing – The Individual Career Path PM Case—The Tanzania Staffing Pyramid Discussion Leader JM Human Assets Assessment – Methods for Identifying Individual Needs and Constraints PM	Team Building Case—Maldano PB Case—The Zambia On-Farm Client-Oriented Research Program LS	Action Plan – Principles to Practice – The Creation of Individual Country Plans of Action PM
– Overview of Strategic Human Resource Planning LOA – Developing a Human Resource Plan for NARS PB Case—Strategy Discussion Leader JM	Training/Development LOA Creative Solutions PM	Organizational Behavior – Situational Leadership Mini-Case 1 – Motivation – Conflict Management – Management Typology Mini-Case 2 PM Movie: Motivation	Performance Management/ Reward System – Compensation – Performance Appraisal and Evaluation PB Discussion—Creation of Criteria for Assessment PB	Evaluation/Planning LOA **CLOSING**

KEY: LOA =Luka O. Abe, Project Coordinator, ISNAR.
PM =Paul Marcotte Visiting Research Fellow, ISNAR.
PB =Paul Bennell, Consultant, ISNAR.
DMW =Dennis M. Wanghinga, Manpower and Training Officer, SACCAR.
JM =Jesse Mende, Senior Agricultural Training Officer, Tanzania.
EN =Enock M. Ntokotha, Principal Agricultural Research Officer, Malawi.
LS =Lingston Singogo, ARPT National Coordinator, Zambia.

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Canadian International Development Agency (CIDA)

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Dr. Paul Marcotte
Research Fellow

Foreword

The development of highly qualified researchers is the most significant aspect of institution building for national agricultural research systems (NARS), and the NARS in the Southern African Development Coordinating Conference (SADCC) countries are no exception. In addition to their research roles, these individuals may also be expected to take on management and leadership responsibilities, an especially challenging task when the emphasis is on high productivity, and when criticism is often levelled at the manner in which that research is conducted.

Most NARS attribute poor output to a lack of financial support or physical facilities for conducting research, but these are not always the limiting factors. Problems such as these are often solved by the creativity, innovation, and vision of the managers, researchers, and leaders of the system.

The quality of the human capital of a NARS is determined by the way NARS managers are able to manipulate key elements in the management of human resources: a clear human resource plan designed to implement organizational strategies; recruitment and selection of new employees; training; career advancement; evaluation; conflict resolution; and motivation.

This workshop was intended to highlight human resource management in the SADCC NARS and to provide a forum where NARS managers and leaders could discuss differences, suggest ways to improve practices, and share their own experiences. To this aim, managers were invited to prepare papers on issues in human resource management within their own NARS, so some of the reports contained here elaborate practices in the NARS; others deal with more general aspects of human resource management.

We are pleased to fully document the workshop here and hope that these papers will help launch national initiatives.

We are indebted to the NARS managers who took time from their busy schedules to prepare the country reports; and their committed and enthusiastic participation in the workshop was instrumental in its success.

Luka Abe
Coordinator
Southern African Agricultural Research Management Training Project
ISNAR

As always, it is a privilege and a pleasure to work with managers of agricultural research systems in the SADCC area. I was particularly pleased with this event because it combined material from an international workshop sponsored by ISNAR with papers, cases, and presentations prepared by local experts. That the workshop received an excellent evaluation is a testimonial not to any individual or organization; rather, it is an indication that the no-formula approach adopted in conducting this workshop provided a forum for debate of theoretical orientations, tempered by cases developed by NARS managers from their wide-ranging experiences. Thus, the appreciation expressed by the participants was, in fact, appreciation for the format and for themselves, as they freely exchanged and debated information from real-life situations in the management of human resources.

I would like to take the opportunity to thank the participants for the workshop. This was an excellent example of development and exchange of management skills through the ISNAR-NARS partnership. I look forward to the next opportunity to assist in this process.

Paul Marcotte
Convener
Human Resource Management Working Group
ISNAR

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VI. Career Development

VII. Human Assets Framework

VIII. Performance Management

Appendix

I

Introduction

PROSPECTUS

SACCAR/ISNAR Regional Workshop on Human Resource Management in National Agricultural Research Systems (NARS)

2-6 May 1989

Monomatapa Hotel, Harare, Zimbabwe.

Theme: *To improve the capacity of NARS managers for efficient and effective management of human capital*

Introduction

1. Human resource development in national agricultural research systems (NARS) constitutes the foundation of long-term, sustainable agricultural research. To undertake productive research leading to increased national development, NARS depend heavily on available high-calibre expertise. Many of the NARS in the countries of the Southern African Development Coordinating Conference (SADCC) are young and inexperienced and thus need to strengthen their capacity in order to achieve their country's potential. On the human resource dimension, the overall concern is to ensure continuity and an adequate supply of appropriately trained professionals for the research enterprise.

2. The SADCC NARS are in a state of change and are struggling with problems that contribute to wasted human and financial resources. These problems include unclear research priorities, overlapping activities, inadequate coordination within research programs, a young but enthusiastic mid-level professional staff requiring more experienced professional support, inappropriate size and complex organizations (given their limited resources), and overall, inadequate resources to support program goals. The task at hand for research managers is to incorporate the tools and techniques of research management into their daily activities, for a more efficient and less wasteful system.

3. In tackling these problems, NARS place a high premium on human resource development to generate high-calibre staff. In recognizing human capital as a vital input, the Southern African Centre for Cooperation in Agricultural Research (SACCAR) convened a workshop in August 1988 on manpower planning and development for agriculture (including agricultural research) and natural resources in SADCC. At this workshop, the present and future profiles of manpower needs in SADCC countries were reviewed, including some aspects of the process of manpower planning, problems of recruitment, and utilization and retention of staff at NARS. In the meantime, SADCC has also commissioned a diagnostic survey to determine factors affecting research output, which is expected to be completed soon.

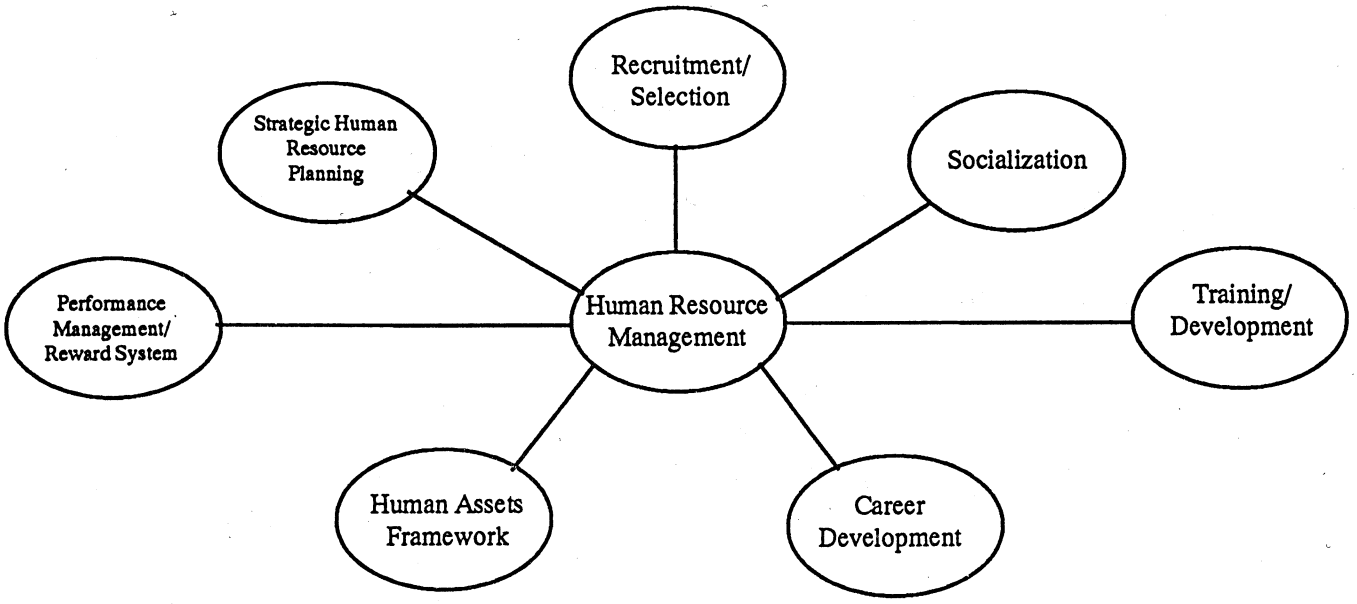
Purpose

4. The workshop will focus on the key elements of human resource management that play a crucial role in the research output of some SADCC NARS. In the course of its systems reviews, the International Service for National Agricultural Research (ISNAR) has identified some areas as being critical in human resource management.

   These include information systems for strategic human resource planning; recruitment, selection, and career planning; human resource training and development; a human assets framework; and performance management (as diagrammed on the next page). Emphasis will be placed on these topics. Others will be dealt with as a means of capturing the state of the art in human resource management.

Content

5. The workshop agenda is shown in the schedule. Sessions will address the critical areas identified above. Each session will introduce an element of human resource management and outline the tasks that com-



that element. Each of these overviews will then be developed in the context of the SADCC region with papers written by local practitioners and discussions focused on the reality of the SADCC region versus the concept.

Management Topic	Description
Strategic Human Resource Planning	This is the process by which an organization addresses the long-term, fundamental requirements for human resources of the institution and its constituent research enterprises, and the process by which it maintains a balance of these strategic considerations against pressure for short-term performance.
Recruitment/ Selection	This is the process by which organizations obtain employees with the right skills, training, and motivation and by which individuals obtain positions that fulfill their personal needs and aspirations.
Socialization	This is the process by which new or returning staff are assimilated into the institutional culture to be effective members of the organization.
Training/ Development	Training is a relatively formal and structured activity in which management improves the ability of individuals to perform their jobs effectively. It may be formal classroom instruction to simulate work situations or on-the-job training.
Career Development	This refers to the creation of job sequences for employees that take advantage of present skills and develop new skills simultaneously so that there is clear, logical development of careers and full advantage is taken of an individual's potential.
Human Assets Framework	This is a method that enables managers and supervisors to identify a worker's individual needs and to manage workers according to these needs.
Performance Management	This is the set of activities by which an organization identifies accepted behavior and provides incentives for that behavior. The incentives may be both monetary and nonmonetary. These activities also control disincentives or rewards for nonperformance of a behavior.

6. A synopsis of each management topic is provided below. The specific topics to be discussed in each session are identified in the attached workshop schedule.

Expected Outcomes

7. The outcomes expected from this workshop are as follows:

- enhancement in the understanding and appreciation for some concepts of human resource management;
- better appreciation of problems in human resource management in the SADCC region;
- establishment and consolidation of a network of human resource practitioners in SADCC;
- an exchange of information and methods of problem solving in human resource management.

Participants

8. The workshop is designed for both mid- and senior-level research managers and practitioners in human resource management (HRM), such as directors of research, training officers, personnel officers, and administrative officers responsible for the HRM functions described above. Participants should have the responsibility of articulating and implementing HRM policies in their NARS. Participants will be invited from SADCC countries. The workshop will be conducted in English.

Resource Team and Materials

9. It is expected that ISNAR will contribute to the workshop by providing resource persons and materials developed by them in this vital field. ISNAR training materials, based on long experience in advisory service, research, and training with NARS, will be used as background resource materials.

   Case studies from the region will be used to augment the ISNAR material. The resource team will therefore comprise a mix of ISNAR specialists and practitioners of HRM in SADCC.

Methods

10. The sessions will be interactive, using lectures, selected case studies, group discussions (plenary and small), and working group presentations.

Logistic Arrangements

11. Venue — The workshop will be held at Monomatapa Hotel, 54 Park Lane, P.O. Box 2445, Harare, Zimbabwe. Telex: 4337, telephone: 263 704501.

    Accommodations — Participants will be accommodated at the Monomatapa Hotel.

    Transportation — International and local transportation will be arranged by SACCAR.

    Daily Subsistence Allowance — Hotel and meals and/or per diem will be paid by SACCAR.

Date

12. The workshop is scheduled to begin on 2 May and to end on 6 May. Participants are expected to arrive on 1 May and depart on 7 May.

Contact

13. Correspondence should be directed to Dr. Dennis M. Wanchinga, Manpower and Training Officer, SACCAR, P.O. Box 00108, Gaborone, Botswana. Telex: 2752 sacar bd.

WELCOMING ADDRESS

Dennis M. Wanchinga

Distinguished Participants
and Workshop Resource Persons:

Let me, on behalf of the Director of SACCAR, extend our warm welcome to you all, to this SACCAR/ISNAR Workshop on Human Resource Management in NARS.

Distinguished participants, let me, with your permission, update you on the events that led to the development of SACCAR's current manpower development initiatives.

As you are aware, when SADCC was formally launched in April 1980 (in Lusaka), all member states were assigned sectoral areas that they were to co-ordinate. Botswana was given agricultural research, animal disease control, and livestock development. Manpower development was given to Swaziland.

However, by early 1987, the Sectoral Council of Ministers of Agriculture and National Resources had decided to transfer the mandate of agricultural manpower development from Swaziland to Botswana. This was in recognition of the close relationship between agricultural research and training and the necessity to achieve a critical mass of the human resource base for agricultural research, training, extension, and agricultural production.

The broadened mandate of SACCAR included mainly professional training in agriculture and natural resources, especially at postgraduate levels. SACCAR was asked to develop a regional blueprint to phase out all overseas BSc training as soon as possible.

SACCAR immediately realized that in order to develop a coherent path to fulfill the objectives of the new mandate, it needed regional input. A meeting was, therefore, organized for heads of the faculties of agriculture, forestry, and veterinary medicine and some directors of agricultural research in SADCC in February (25-27) 1987 in Harare, Zimbabwe.

Among the several recommendations made at that meeting was that SACCAR should explore the possibilities and mechanisms of mobilizing donor assistance for strengthening departments in the region to offer postgraduate training on a regional basis at least at the MSc level, and to identify additional resources required for postgraduate training in terms of staff, equipment, and other needs.

The immediate outcome of that meeting was the SACCAR/GTZ Project on Strengthening Faculties of Agriculture in SADCC, which is now one of the 14 regional programs that are on-going or planned. The project aims at strengthening crop science (at the University of Zambia), animal science (at Bunda College of Agriculture in Malawi), agricultural economics (at the University of Zimbabwe), and agricultural engineering with emphasis on land use (at Sokoine University of Agriculture, Tanzania).

Many of you will further recall that in August 1988, SACCAR organized a workshop in Maseru on Manpower Planning and Development for Agriculture and National Resources. At that workshop, present manpower levels and future profiles in NARS were discussed, and several recommendations were made regarding manpower development issues in the SADCC region. There were two immediate outcomes of that workshop: first, it led to the development, by a consultancy team, of a concept paper on manpower development in SADCC. This initiative was later followed up by a World Bank/SACCAR mission comprised of several donor representatives and some representatives of the SADCC region. The mission's report has outlined major proposals, which at this very minute, are being discussed in Lome, Togo. It is hoped that various manpower development initiatives will emerge from that work.

At the Maseru Workshop it was also recognized that proper management of the human resource base in agriculture was an important area. That concept was based on the important realization that human resource development in NARS constitutes the foundation of long-term and sustainable agricultural research. A further realization was that striving to achieve a critical mass of agricultural scientists and trainers was in itself only half the story. At SACCAR we believe that it is essential that a high-calibre human resource base,

like any other development resource, should be properly managed and retained. This workshop, therefore, will focus on the key elements of human resource management that play a crucial role in research output of our SADCC NARS.

Efforts at good management and staff retention are evidenced by, among other things, low attrition rates and the presence of a congenial and rewarding scientific or academic environment in an institution. We believe that significant and sustainable scientific and academic endeavors in agriculture can only take place in such an environment.

It is in recognition of this that SACCAR, in conjunction with ISNAR, organized this training workshop on human resource management in SADCC NARS. ISNAR is one of the international centers under the Consultative Group on International Agricultural Research (CGIAR) which are working with SACCAR in meeting its research and training objectives. As many of you are aware, ISNAR is the executing agency for a SACCAR regional project on Agricultural Research Management In-Service Training.

These consultations and workshops are evidence of the high premium that SACCAR places on human resource development, in particular, the generation, proper utilisation, and retention of high-calibre personnel.

I need not go into the details of these programs. In the brown folder that has been distributed, you will find a paper I presented in Arusha, Tanzania, in July 1987 at a workshop on Training for Agricultural Research and Development in Eastern and Southern Africa. The paper outlines SACCAR's activities and the role of the international agricultural research centers in meeting these objectives.

In conclusion, I should perhaps add that SACCAR has several expectations from this workshop. In particular, we are hoping that the participants will come out of this workshop with a deeper appreciation of the elements for skillful management of human resources in their respective institutions. We are also hopeful that the workshop will provide an opportunity for the renewal of old acquaintances, and for the establishment of new professional contacts.

Finally, let me, on behalf of the Director of SACCAR, express our gratitude to the Government of Zimbabwe for its continued commitment to the broader SADCC Program of Action, and in particular for allowing this workshop to take place here. Our thanks also go to our cooperating partners who have continued to make significant contributions to SACCAR's activities; other thanks go to our resource persons from ISNAR and the SADCC region who have come a long way to work with us.

SACCAR and ISNAR staff have worked hard to make this training workshop possible. Please, bear with us — for any inconveniences you may have experienced in the course of your travel, although we have received no reports to this effect.

We look forward to a fruitful week and hope that our colleagues from the SADCC region will find this to be a rewarding experience.

Thank you

WORKING TO STRENGTHEN NARS: ISNAR'S STRATEGY AND PROGRAM*

A. von der Osten

ISNAR's Role and Function in the Global Research System

In most developing countries, overall economic and social development is based on technological progress in agriculture. To achieve sustained progress in the agricultural sector, we need three key ingredients: appropriate technology, supporting policies, and strong institutional capacity. Many kinds of institutions worldwide work on these ingredients. They work at three levels: international, regional, and national. The IARCs of the CGIAR are an important component of this evolving system. They complement efforts at the national and regional levels.

This global system is highly dynamic. The process of technology generation is evolving rapidly — involving new actors, new scientific opportunities, and new forms of collaboration. In this global effort, the national agricultural research systems (NARS) of developing countries play the central role. Others can help, but NARS must lead the process of generating and adapting the technology required. They identify the problems and must take the lead in solving them. Advances in agricultural production are unlikely without strong NARS. The ultimate success of the entire system depends to a large extent on their strength and productivity.

Recognizing the importance of strong national research capacities, the founders of the CGIAR system adopted institution building as an integral component of their strategy, which was threefold: First, responding to the urgent needs of NARS in developing countries, the commodity centers of the CGIAR concentrated on generating new technologies — thus acting as a short-term substitute for weak NARS. This bought time for the national systems to equip themselves for the new tasks facing them.

Second, the centers complemented their technology-generation efforts by training NARS scientists. Training, along with collaborative research, has contributed enormously to the build-up of scientific capacity in the NARS.

Third, to complement the efforts of the centers, they created ISNAR as the system's focal point for systematic institution-building efforts.

Thus, while helping NARS respond to their immediate tasks, the CGIAR system also helps them build their own research capacity. Today, institution-building is an explicit objective of the CGIAR. It captures roughly 2.5% of the system's total core resources.

NARS Needs in Institution Building

NARS are taking up the challenge. They are assuming a greater share in overall responsibility for technology generation. To be strong and productive institutions, they require a solid scientific base and strong capacity in the areas of research policy, organization, and management.

As we have found through working with some 40 NARS over a six-year period, NARS are facing considerable problems in all three areas. They need assistance, and they ask for it.

Based on this experience and careful analysis, we concluded that ISNAR should concentrate its efforts on these three areas — thus complementing other efforts in the global system of helping NARS. This is the basis of our strategy — the strategy of a client-oriented service organization.

Translating that strategy into a program of action was a major challenge. We faced three tasks in our strategic planning effort:

- defining our long-term goal;
- translating NARS needs into a viable agenda for action;

*This is a condensation of a presentation by Director General Alexander von der Osten at International Centers Week, Washington, DC, 26-30 October 1987.

- organizing the program accordingly — in practice, that meant defining the specific products and services NARS need and organizing our program to meet those needs.

Let me tell you that strategic planning in a young organization is an exciting exercise. We found the process as useful as the product.

ISNAR's Goal

Our goal is "to assist developing countries to improve the effectiveness and efficiency of their national agricultural research systems through enhanced capacity in the areas of research policy, organization, and management."

The Critical Factors for Building Strong NARS

We concluded that NARS need to perform 12 essential functions. These 12 functions determine the productivity of NARS and are the critical factors of success. They are the target of our effort.

I shall briefly list the 12 critical factors and then explore three of them in just enough detail to give you a flavor of their complexity, of their potential impact on NARS productivity, and of the challenge they imply for us at ISNAR.

The Policy Context of Agricultural Research

1. Creating and maintaining positive interactions between national development policy and agricultural research.

2. Formulating appropriate agricultural research policies — which includes setting research priorities, allocating resources, and developing long-term plans.

Structure and Organization of Agricultural Research

3. Building a structure and organization conducive to productive research.

4. Developing effective linkages between research and policymakers.

5. Building strong linkages between research, the country's technology-transfer system, and the users.

6. Developing and using close linkages between NARS and external sources of knowledge and collaboration, such as universities, specialized institutions, and the CGIAR centers.

Management of Agricultural Research

7. Formulating programs and program budgeting.

8. Monitoring and evaluating research programs.

9. Managing information.

10. *Developing and managing human resources.*

11. Developing and using physical resources.

12. Mobilizing and managing financial resources.

Let me expand a bit on three of these factors.

Example: Formulating research policy: priority setting, resource allocation, and long-term planning (Factor 2)

The benefits of sound planning and priority setting are widely accepted by research leaders. Yet, realistic research strategies and plans are still scarce in the NARS of the developing world. A well-conceived national research strategy provides the framework for growth and evolution of the system. It defines the mission, provides orientation, and gives direction to program development.

If this understanding of the system's role and its expected contribution to national development is shared by research leaders and policymakers, the strategic plan becomes a powerful tool in mobilizing support. It will help build national commitment to agricultural research, and it will help raise the level of investment in research.

As a group, developing countries increased their research spending substantially over the last decade. For the period 1980-85, the average level was 0.94% of agricultural GDP — up from 0.69% for the period 1970-74. The level reached in the developed world is 2.17% — up from 1.61%.

Many developing countries have not reached the recommended target level of 1% to 2%. Many governments pay lip service to the idea but continue to rely heavily on external funding and overuse the options of easy money — which introduces more problems than we can talk about here.

Sound planning at the next level — operational planning — is equally important. It is the basis for strong programs. We often find, in the absence of clearly formulated strategies and plans, that research programs risk fragmentation, lack continuity, and have weak linkages to national priorities and development objectives.

Such programs are vulnerable to external pressures. Donor priorities may dominate or seriously distort the country's overall research agenda. This need not be; experience shows that donors are willing to integrate their assistance into the framework of a national research plan — when one exists. One thing is clear from our experience: the basis for any meaningful dialogue with donors is the existence of a sound research plan.

A well-articulated plan also helps in integrating efforts at the national level. Building a critical mass of scientists around the most critical problems is a priority for any system. It is essential for productivity and impact. It is a particular challenge for younger, smaller systems.

Rational priority setting is rare. Yet, NARS need clear choices to guide the allocation of their scarce resources. Long wish lists must be replaced by well-argued priorities. Hard decisions must be taken to match priorities with available resources.

The challenge for ISNAR: to assist NARS in their planning and priority-setting efforts and to work on the improvement of tools and guidelines that will allow them to perform these functions more effectively. We are working on both objectives.

Example: Linkages between NARS, technology-transfer systems, and users (Factor 5)

The importance of effective linkages between research and both its clients and the technology-transfer system is clear — whether we call it extension or something else. We know of the impact of those linkages on the relevance of research output and on the adoption of technology. And yet, in many of our system reviews we find that there are problems. The flow of communication is ineffective, often not truly two-way:

- The communication of research problems from the farm level to research is inadequate.
- The transfer process is less that satisfactory in getting solutions/technologies to farmers.
- Feedback mechanisms do not function properly to get messages back to research.

The result is irrelevant products of research and nonadoption of research solutions.

The challenge for ISNAR: to gain a better understanding of linkage functions and their organizational and management implications for research systems, and to develop practical guidelines for improving the interaction.

Repeated requests from NARS have encouraged us to move ahead with two challenging research projects in this area — generously supported by the Italian and German governments.

The first, which is nearing completion, has focused on analyzing and synthesizing the experiences of nine NARS conducting on-farm adaptive research. The product will be a set of practical guidelines for research managers on organizing and managing on-farm research.

The second study, on linkages between research and technology-transfer systems, began this year. Again, the objective is to develop practical guidelines for strengthening the link, based on a systematic analysis of country situations.

Example: The development and management of human resources (Factor 10)

This is the greatest challenge facing NARS. The task is complex. First and foremost, they need to develop a cadre of experienced scientists. Once critical mass is reached, they need to retain and effectively utilize those scientists. The ultimate objective: high productivity of the system's human capital.

In all developing regions, NARS have undertaken a massive effort to build up their scientific staff. Progress is good and systems have grown substantially. Over the last decade Latin American systems have grown by almost 60%, African systems by just under 50%, and Asian systems by roughly 35%. Yet, numbers by themselves mean little. They give no indication of productivity.

In qualitative terms, there is also progress. The number of researchers holding postgraduate degrees has increased in absolute terms. Notwithstanding this development, the proportion of researchers holding postgraduate degrees is now only 48% of total scientific staff — on a world average.

Moreover, staff are often young and inexperienced. The need for additional training is obvious. The CGIAR, among others, is doing a lot in this area, but not nearly enough in relation to the massive needs of NARS.

Retention is an important concern for many NARS. Attrition rates are high. In the absence of career incentives, qualified scientists are attracted by better opportunities elsewhere. Closely related is the issue of motivating staff — providing incentives for high levels of performance. Part of this challenge is for NARS to provide the proper setting for productive work.

Most agricultural research in the developing world is conducted by the public sector. But we know that large public-sector bureaucracies do not normally provide the best organizational environment for productive research institutions. Research systems need a minimum of managerial flexibility. The task: to design management systems that provide that flexibility within existing structures.

Another key factor determining the productivity of scientific staff is the adequacy of operating funds. In general, rapid growth in staffing has not been accompanied by similar growth in funding. Overall budgets have grown, but considerably less than staff. This has seriously distorted the resource mix of many systems. The effect of such unbalanced growth: an excessive share of total resources is allocated

for salary payments. The support per scientist declines. Funds available for operating costs have fallen seriously — to levels as low as 5% in a number of cases. The result of this distortion is obvious: low productivity of the system's most precious resource — its scientific staff.

The challenge for ISNAR: to assist NARS in developing sound policies for building, retaining, and utilizing a cadre of productive scientists.

The ISNAR Program

Our program has three thrusts targeted at the three components of NARS that require strengthening:

1. More efficient and effective systems — our advisory service program is targeted at this objective. Advisory service to NARS is our central thrust. The effort is aimed at system building.

2. Improved management concepts and tools — our research program is targeted primarily at this objective.

3. More effective managers — this is the objective of our training program.

The three programs are interdependent and mutually supportive. We see them as one integrated effort aimed at enhancing the productivity of NARS.

Advisory service to NARS. In our collaboration with NARS — under the advisory service program — we tend to follow a three-stage process. The sequence is diagnosis (or constraint analysis), planning, and implementation.

A word on ISNAR's role in implementation: it is obvious that we need to follow up on recommendations made in the earlier stages of our collaboration. It is equally obvious that ISNAR itself does not implement. What we do is assist NARS in an advisory or facilitating role. We do not assume direct management responsibility in the execution of system-building projects. We follow the principle of self-help and leave the initiative to the NARS.

Research. Our research program has two main functions: the development of management tools for use by NARS and the build-up of a knowledge base on how NARS function — in support of the advisory service and training programs. It is applied research, with the focus on problem solving. Most of our research is collaborative, conducted in close association with NARS.

Training. Our training program complements the other two and aims at strengthening the management capabilities of NARS leaders and scientists. It also aims at contributing to the build-up of national or regional training capacity.

To date, we have held 48 training courses and workshops, attended by 1732 NARS managers or program leaders. As our service to NARS becomes more specific, the emphasis of our training effort shifts to national and regional events.

Working with NARS — Collaboration in System Building

ISNAR began in an active mode. Its field of activity was new, and the discipline of agricultural research management was young. Learning by doing was the concept we used. The primary vehicle for doing this was broad-based system reviews. They were ISNAR's main product in the early years. They served a dual purpose: individually, they were the natural first step in collaborating with a NARS. Collectively, they helped us build the knowledge base that ISNAR needs for doing its job.

So far, 34 system reviews have been carried out. Over time, their proportion in our total activities has decreased considerably, but they continue to be the logical first step in the collaborative process. They fulfill an important function. But what follows after the review is even more important.

Planning is an area of heavy demand and intensive ISNAR involvement. To date we have collaborated in some 32 planning exercises — at varying levels of intensity and depth. NARS leaders realize that planning is essential for their system-building efforts. From the perspective of donors, a solid plan provides the framework for sound projects and for rational investment decisions.

Implementation — or more precisely, collaboration with NARS in their system-building efforts — is an area of growth in our program. The range of assistance we are asked to provide is broad. Any of the 12 critical factors may be involved; often it is a mix of several.

More advanced systems tend to require specialized advice on specific issues or factors. The focus is narrow. ISNAR's main contribution is assistance in providing better tools and training. The time frame is short to medium term.

Collaboration with younger systems follows a different pattern. Their needs are broad. Collaboration is intensive and covers the whole spectrum of system building. The time frame is long term.

So far we have worked with 14 countries in the implementation of system-building efforts.

Conclusion

Finally, I wish to emphasize three points:

First, institution-building is the business of nationals. We collaborate and contribute. We do not claim credit for im-

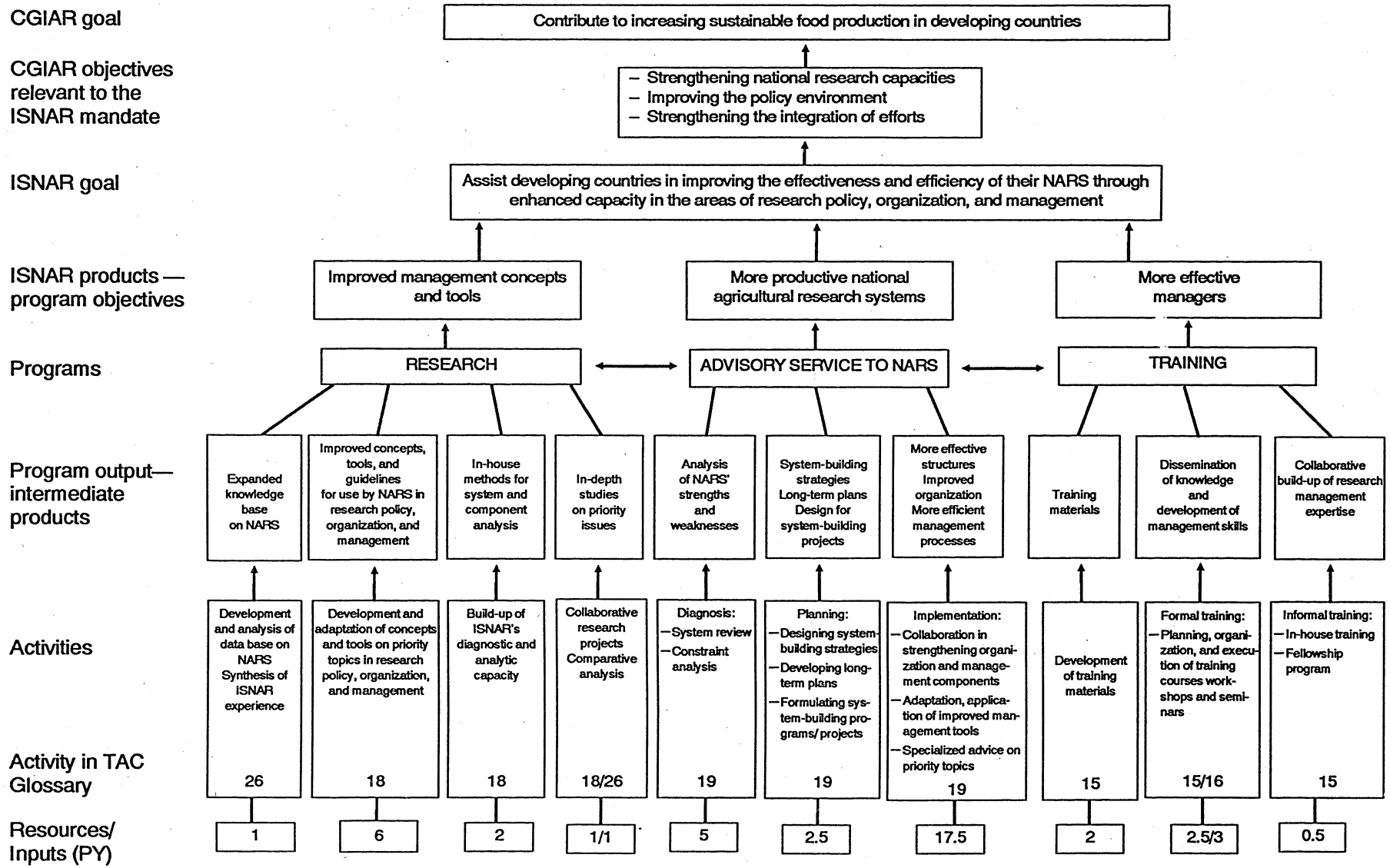
pact, but we do take pride in being associated with progress.

Second, institution building is a long-term process. The ultimate objective is systems that are equipped to provide technological support for the modernization of the country's agriculture.

Third, institution building is incremental. Change occurs in steps.

The task is challenging: to work as partners with NARS, assisting their efforts to raise their own productivity. The task is complex: the organization and management of NARS is a young and developing discipline.

Demand is great: well beyond our capacity to respond. This has two important implications. First, our role is often catalytic. Given our small size in relation to NARS needs, we must mobilize capabilities and resources elsewhere, bringing them to bear on NARS needs in our mandate area. This implies close collaboration with a broad range of institutions, including donor agencies. The second implication of this great and growing demand is the need within ISNAR for sound planning, priority setting, and resource allocation.



Integration of ISNAR's Program and Its Relation to the CGIAR Goal

TRAINING FOR AGRICULTURAL RESEARCH AND DEVELOPMENT IN EASTERN AND SOUTHERN AFRICA: SACCAR'S ROLE IN AGRICULTURAL RESEARCH AND TRAINING*

Dennis M. Wanchinga

Introduction

The Southern African Center for Cooperation in Agricultural Research (SACCAR) was formed in 1984 as a unit of the Southern African Development Coordination Conference (SADCC) to serve member countries. Its aim is to coordinate agricultural research and training in the region. The overall objectives of SACCAR are

- to promote and disseminate available technology;
- to promote and implement studies of problems common to member states and initiate cooperative research projects to overcome them;
- to generate new technologies needed by farmers to raise the productivity of food and nonfood crops, livestock, fisheries, and forestry through regional collaborative projects;
- to strengthen national agricultural research systems (NARS) and their research capabilities;
- to promote the rapid and continuous provision, exchange, and utilization of scientific and technical information;
- to provide such regional support services and functions as may be necessary to assist and inform national and regional research activities.

SACCAR has recognized that substantial long-term investments in agricultural research are required in order to lay the foundation for a science-based agriculture and to diversify SADCC's agricultural economy. However, this investment must be accompanied by long-term investments in human resource development and in building the training capacity of the universities in the SADCC region.

The stock of human capital in scientific fields in Africa in 1980 was about one-fourth that of the scientific strength of Asia in 1970 (measured in number of researchers per million individuals in the general population). In 1984, 26% of all professional staff in research, extension, agricultural training schools, and faculties of agriculture in SADCC states were expatriates. The annual cost of expatriate advisers is between US$ 80,000 and US$ 150,000 per person. The cost of training for an MSc or PhD degree ranges between US$ 30,000 (in Europe) and US$ 80,000 (in North America). Cooperating partners have avoided long-term investments in basic science research and in building the capacity for postgraduate training in universities in the SADCC region. Current funding for SACCAR's manpower and training programs is derived from grants given to SACCAR by SADCC member states, along with CIDA, NORAD, USAID, ODA, and FRG. Recent developments suggest a new interest among these donors in graduate education in the region.

Strategies for Promoting Agricultural Research Capability

Strategies to promote agricultural research capability should

- (as a short-term strategy) promote improved staff in national agricultural research systems and in regional programs through training workshops, seminars, and short-term training courses;
- encourage careers in agriculture by fostering upgraded education at preuniversity levels through appropriate institutions;
- foster creation of "centers of excellence" in strategic research fields, which would act as focal points for achieving a high-level research capability;
- promote a regionally coordinated high-level training program.

Current Activities Related to Manpower Development

To achieve the strategies listed above, SACCAR has undertaken the following activities:

- improving existing staff in national agricultural research systems and regional programs through workshops and conferences and awarding grands for travel, study, and research;
- encouraging careers in agriculture by fostering upgraded education at preuniversity levels through appropriate institutions;
- fostering creation of "centers of excellence" in strategic research fields which would act as focal points for achieving high-level research capability;
- assessing natural and human resources for agricultural development, research reviews, reports, and related information.

Staff Improvement

Workshops and conferences. Several workshops and conferences have been planned to take place between 1985 and 1989. It is anticipated that approximately 450 person weeks will be devoted to workshops and conferences during the five-year period (1985-89). Between November 1985 and June 1987, six workshops and seminars have been conducted and three more are planned for the remainder of 1987.

Travel grants. About 120 travel grants are expected to be approved between 1985 and 1989. Participants are becoming more aware of these grants as they realize the importance of traveling and of learning through the experiences of colleagues and senior researchers in the region.

Meeting Manpower Needs in the SADCC Region

Research grants. Between 1985 and 1989, through the Manpower and Training Office, SACCAR will award 90 research grants of US$10,000 each to young agricultural scientists in the SADCC region. These grants are to enable them to carry out research in areas of importance to their countries and the region as a whole. Research grants are supported by funds provided by the Swedish Agency for Research Cooperation (SAREC). The grants are announced in SACCAR's newsletter six months before the application deadline. At least three reviewers determine the suitability of each research proposal.

Study grants. About 30 person-months have been earmarked for special studies. Two areas for special studies already identified are (1) the potential for irrigation in SADCC countries and (2) requirements for strengthening manpower output from faculties of agriculture, forestry, and veterinary medicine for agricultural research, training, and extension in the SADCC region.

In its efforts to improve existing staff in national agricultural research systems and regional programs, SACCAR shall also encourage, and sometimes run, regional training programs for research managers, station managers, trainers, extension directors, and specialist scientists.

Upgrading Education

SACCAR will implement the strategy of encouraging careers in agriculture in liaison with SADCC's Regional Training Council (RTC) in Swaziland and the faculties of agriculture, forestry, and veterinary medicine in SADCC countries. SACCAR will continue to provide fora for identifying regional training needs and generating ideas for implementing them. The workshop on the Role of Faculties of Agriculture, Forestry and Veterinary Medicine in Meeting Manpower Needs for Agricultural Research, Training, and Extension (held 23-27 February 1987) was one such forum.

It is hoped that SACCAR, through specialized consultancies and in conjunction with faculties of agriculture, forestry, and veterinary medicine, will develop a comprehensive regional strategy for agricultural manpower development in the SADCC region. In addition, SACCAR will encourage the distribution of information to schools to encourage young people to take up careers in agriculture, an important long-term strategy that needs to be recognized early in all national and regional programs.

Centers of Excellence

To establish centers of excellence to strengthen the region's research capability, SACCAR will identify a few disciplines that are pivotal to most regional and national programs. Such areas may include plant breeding, crop protection (weeds, pathology, entomology), irrigation, and agroindustry. Institutions within the regions will be encouraged to become centers for specialized postgraduate training in identified areas, with provisions for specialized training for technicians. An efficient agricultural extension service cannot be built using agricultural graduates alone. Effective application of research findings and new agricultural technology at the grassroots level depends on a strong cadre of technically trained, intermediate-level personnel. SACCAR will provide fora to promote these ideas.

Assessment of Natural and Human Resources

Regional and national plans for agricultural research and development, including production targets, will be compiled. Such assessments are essential to the process of planning national and regional research. Building up a useful database also depends on the objectivity and expertise of the sources of information. The Manpower and Training Program will establish and maintain a network of profes-

sional staff and key consultants in the region who can act as resource persons for specific resource assessments in the SADCC countries. The database will be updated every two years. A full assessment of agricultural research resources will be initiated in Angola.

A network of consultants will thus help to critically examine, review, and synthesize the information produced by SADCC member states, including information from individual researchers. The database is an important facility which will play an important role in identifying regional training needs as well as the strengths and weaknesses of training institutions in the region.

The Role of International Agricultural Research Centers

SADCC countries have recognized the important role of International Agricultural Research Centers (IARCs) in generating technologies that farmers can use to increase food production. These centers also play an important role in developing human resources for research because they have unique resources. However, if the IARCs are to be successfully involved in SADCC training programs in agriculture, forestry, and veterinary medicine, they must recognize the training needs of each of the participating states.

The basic theme for the involvement of the IARCs in the research and training activities of SADCC regional programs is the sustainable development of the initiatives. IARCs should have deliberate policies for strengthening the research capacities of the national research systems as a short-term objective, with a long-term goal of strengthening the training capacity of the training institutions on which the NARS depend.

SACCAR is collaborating with several IARCs in meeting manpower needs for research and training. This collaboration has taken various forms, and its roots are embedded in SACCAR's role as a management entity for SADCC's regional programs. About eight regional agricultural projects are either planned or on-going, with a large training component. IARCs are involved in these regional efforts by direct mandate, as executing agencies, through consultancies or as training centers.

Direct mandate to train. The International Service for National Agricultural Research (ISNAR), for example, has been mandated to carry out an in-service training program in SADCC on behalf of SACCAR. The program is on agricultural research management for strengthening the management capability of NARS.

As executing agencies for regional programs. ICRISAT, CIAT, and IITA, for example, are executing agencies (on behalf of SACCAR) of SADCC's regional programs in sorghum and millet, the bean component of the grain legume program (GLIP), and the GLIP's cowpea component, respectively.

Executing agencies have a responsibility to develop a regionally balanced training program to enhance the research capabilities of the NARS for the commodity that has been mandated to them. Training activities under these programs run from technician training programs up to postgraduate training. Under the sorghum and millet program, executed by ICRISAT, about 30 scientists are to be trained at MSc and PhD levels to strengthen national research systems.

Through consultancies. Prior to the formulation of a regional project, it is often necessary to commission consultants to carry out an informed assessment of the problem to establish the needs of the project. These initiatives often involve representatives of the IARCs. For example, a joint SACCAR/CGIAR team has just undertaken a regional assessment of the needs for a proposed CGIAR initiative for maize-based farming systems in SADCC. Regional training needs related to maize-based farming systems were identified in the NARS.

IARCs as training centers. SACCAR has recognized the great training resources that exist at the IARCs operating in the region. Scientists seeking on-the-job training and higher degrees within the scope of SADCC regional programs executed by the IARCs are encouraged, through the appropriate training mechanisms, to benefit wherever possible from the unique expertise that exists at the IARCs.

Conclusion

There is great potential for SACCAR and the IARCs to work together to strengthen the manpower resource base for agricultural research and training in the SADCC countries. The directors of agricultural research and some deans of faculties of agriculture in the region, who constitute the board of SACCAR, are responsible for identifying and focusing on priority areas for collaboration between SACCAR and the IARCs. These board members are aware of the potential impact of this partnership on both the regional and national SADCC programs.

THE MANAGEMENT OF A REGIONAL TRAINING PROJECT: THE SACCAR/ISNAR SOUTHERN AFRICAN AGRICULTURAL RESEARCH MANAGEMENT TRAINING PROJECT

Luka O. Abe

Introduction

The Southern African Development Coordination Conference (SADCC), launched in April 1980, is comprised of the countries of Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, and Zimbabwe. Though formed out of a practical desire to develop collective economic self-reliance among member states, it soon channeled its interest into agricultural research cooperation. This interest was precipitated by the persistent drought of the 1970s and '80s which drastically reduced agricultural production in many of the countries. The population of the region is currently estimated at 70 million and projected to rise to 100 million by the year 2000. Up to 80 percent of the population and the labor force in the member states is dependent on agriculture for employment and income; agriculture, therefore, plays a central role in the economy of these nations.

The Southern African Centre for Cooperation in Agricultural Research, (SACCAR), the brainchild of the Government of the Republic of Botswana, was formed in 1984 with a mandate to undertake agricultural research coordination in the SADCC region.

The overall objectives of SACCAR are

- to promote and disseminate information on available technology among the NARS of SADCC member states;
- to promote and implement studies of problems common to all or several SADCC member states and to initiate cooperative research to overcome these problems;
- to generate new technologies needed by farmers to raise the productivity of food and nonfood crops, livestock, fisheries, and forestry through rational collaborative projects and intercountry liaison;
- to strengthen national agricultural research systems and capabilities through human research development.

SACCAR currently operates 11 collaborative research networks which include

- the Sorghum and Millet Improvement Program — with ICRISAT;
- the Sorghum and Millet Utilization Project — with Zimbabwe;
- the Grain Legume Improvement Program — with CIAT and ICRISAT;
- the Land and Water Management Project — in Botswana;
- Agroforestry — with ICRAF;
- the Maize and Wheat Improvement Network — with CIMMYT;
- the Gene Bank Project with the Nordic countries;
- a Network of Farm Power and Equipment for Smallholder and Large-scale Farms;
- Livestock Improvement Program (LIP);
- the Regional Vegetable Research Program;
- Agricultural Research Management Training Project — with ISNAR as the executing agency.

These research networks show the scope and opportunities for working with various organizations, apart from the NARS, for the enrichment of the knowledge base in agricultural research management in the region. We shall explore this aspect later in our discussion.

Description of the Project

The project objectives are stated as follows:

- to foster human resource development in agricultural research management;
- to strengthen the capacity of national research leaders to plan, program, budget, execute, and monitor research programs of relevance to national development goals;
- to build the skills of mid-level research administrators in the management of agricultural research activities;
- to work towards building a base for sustained capacity in management training for agricultural research within the region;
- to reinforce the exchange of information among SADCC scientists and administrators on issues related to the management of regional and national agricultural research programs.

Profile of the NARS in the Region

As stated earlier, the region has a population estimated at 70 million for all nine countries. In total, there are just a few more than 830 agricultural researchers in the area (see table 5 for details). A closer look at the NARS shows that they are vastly different in their research requirements, and they are at varying stages of development. Table 1 summarizes categories of NARS in the region — their levels of institutional development and management capacities. These characteristics have implications for our strategy for training in each of the categories.

ISNAR's Role in the Project

As the executing agency for the project, ISNAR's responsibilities include technical and logistical coordination of training events; identification of resource persons; maintenance of an information dissemination system (which initially involves the creation of a library of pedagogic materials, case studies, exercises, and relevant literature, both at ISNAR and at the SACCAR Secretariat); preparation and submission of periodic reports to donors, SACCAR Secretariat, and other interested parties; and follow-up of training with NARS. SACCAR is responsible for some aspects of the technical coordination of events.

Table 1. SADCC NARS Institutional Development and Management Capacities

Country	Size (No. of Scientists)	Inst. Dev.	Management
Tanzania	Large (>320 researchers)	Low	Low efficiency* Low effectiveness**
Zimbabwe & Malawi	Medium (>120)	Medium	Low efficiency Moderate effectiveness
Zambia	Medium (>100)	Low	Low efficiency Low effectiveness
Botswana, Lesotho, Swaziland	Small (<20)	Low	Low efficiency Moderate effectiveness
Angola, Mozambique	Small (>10<60)	Low	Low efficiency Low effectiveness

*Efficiency = capacity of a NARS to maximize output from resources available to it.
**Effectiveness = capacity of a NARS to provide relevant technology.

Project Activities

The workplan for the project is shown in figure 1. The project started in September 1986 and will run until 1990. The basic activities include planning visits used to assess training needs and working up the logistics of workshops and curriculum development, which is a continuous process. A total of 19 training events have been planned for the project — the larger NARS of Malawi, Tanzania, Zambia, and Zimbabwe will each have four training events, while the smaller NARS of Botswana, Lesotho, and Swaziland will be grouped together for one regional course. Mozambique and Angola will also have only one event in the four-year period. In the third year of the project (1989), a regional seminar for policymakers from the four NARS will be held. It is also planned that a SACCAR representative, possibly the manpower and training officer, will travel to Francophone West Africa to visit the AGIR project and to exchange experiences on the two projects.

Activities	1986	1987	1988	1989	1990
1. Project Start-up	* Sept.				
2. Planning Visits & Consultations (Training-Need Assessment)	——	——	——	——	——
3. Information Dissemination	——	——	——	——	——
4. Curriculum and training materials development	——	——	——	——	——
5. Training					
– National Management Improvement Program (Malawi, Tanzania, Zambia, Zimbabwe)		w w w	w w w w	w w w w w	w w w w w
– Workshops					
Botswana, Lesotho,				w	
Swaziland				w	
Angola/Mozambique					
Seminar for Policymakers				w	
6. CDA Program Exchange*					
7. Monitoring & Evaluation		r r r r	r r r r	r r r r	r r r r

Key: —— continuous process
w = workshop
r = quarterly report

Figure 1. Project workplan, 1986 - 1990

Training-Need Assessment

ISNAR's involvement with NARS in the African region spans a number of years of advisory service, research, and training activities with the NARS. Since 1982, under the donor association, Cooperation for Development in Africa (CDA), ISNAR undertook a program on strengthening the management of agricultural research in Africa, which focused on staff development for the African NARS. Under this project, ISNAR conducted a field study to determine specific management development needs in African agricultural research, undertook the preparation and testing of training materials in agricultural research management, and also conducted a series of management training workshops.

From the experience in the first phase, it was established that there was a strong and urgent need for agricultural research management as a building strategy for NARS training institutions, but as it was not feasible to cover all of sub-Saharan Africa, attention was focused on the subregion under SADCC described earlier.

Training-Need Identification

In this project, training needs are first determined using the training-need indicator shown in table 2. This is a joint activity of SACCAR, ISNAR, and most important of all, the NARS. To cite an exampie, recently Tanzania requested that in their second national workshop, emphasis should be placed on strategic and research master planning, as the system is to undergo a major restructuring and reorganization. In responding to the request, we designed a training module that spanned topics on research planning, programming, priority setting, human resource management, management and supervisory leadership, teamwork, etc., in agricultural research. As most of the senior and middle-level research managers had little or no experience in research planning, the workshop afforded an excellent opportunity, through simulation exercises, interaction, and the use of case studies in working group sessions, to prime them for this task. We are informed that many who have been selected to serve on the national task force for the master planning experience attended our workshop.

Another training indicator has been identified in the area of communications in the Zambia NARS, and the project is responding by convening a regional workshop to train trainers in communication techniques, focusing on scientific and technical report writing. It seems the need is pervasive in the region and each NARS will need to build its own capacity to train its staff in this area. The Zimbabwe NARS is in the process of consolidating its research at the program level and therefore wishes to adopt a nationally coordinated research program approach. It is hoped this project will re-

Table 2. Training-Need Indicators

1. **Organizational Plans**
   (Research Strategy, or Manpower Development and Training Plans)
   - Projected changes in mandate (or objectives) and research priorities
   - Changes in structure and organization

2. **Employee Records**
   - Staff turnover
   - Low performance ratings
   - Career paths and plans

3. **Research Operations**
   - Acquisition of new research equipment, techniques, or methodologies
   - Fluctuations in research output
   - Performance appraisals

4. **Staff Selection Policy**
   - Qualifications of staff at functional levels
   - Experience and training background of staff

5. **Morale Factors**
   - Personnel friction
   - Conflicts
   - Poor leadership

6. **Job Knowledge**
   - Technical aspects
   - Administrative aspects
   - Supervisory aspects

7. **Communication Facilities**
   - Poor written and oral communications
   - Poor flow of information up and down

8. **Supervision**
   - Lack of clarity in work assignments
   - Planning and scheduling
   - Improper resolution of conflict

spond to this proposed change by organizing a workshop or seminar on the management of nationally coordinated research programs. Such a workshop could necessarily use the experience of Malawi NARS in this area through a case study presentation.

It is important to note that the assessment of training needs is a continuous and vital process, and by using the indicators as early-warning systems, NARS should respond in a timely and appropriate way. A significant function of the project coordinator is to monitor these requirements. This is sometimes done through planning visits, as indicated in the work plan.

Training Areas

After training needs have been assessed, the problem of what type of training to deliver arises. As a rule, the training areas selected link directly to the goals and objectives of the research managers and of the NARS as an organization. The approach is intended to give results in the most cost-effective and productive way to the NARS, ISNAR, and SACCAR.

Figure 2 depicts the training process used in planning and delivery of the events.

All the training areas and the modules designed to achieve the training emphasize the following: reinforcement of fundamental agricultural research management skills; the enhancement of individual excellence, that is, how individuals can work better and be assured greater responsibility, thereby ameliorating their opportunity to achieve individual excellence; how to improve program productivity by using state-of-the-art concepts on which a sound foundation in agricultural research management can be built; and finally, using innovative training techniques, such as the integration of action-oriented methodologies — simulation, case study approaches, problem solving, etc. — that are exciting and involve everyone.

In table 3, we present some priority training areas and their levels of importance in designing training modules for the different levels of management in NARS. Most of the topics are drawn from ISNAR's 12 critical factors.

Once needs are identified, a prospectus is prepared and circulated to prospective participants selected by the NARS.

Evaluation

Evaluation of the project is done at several levels. First, it starts at the level of training-need assessment (called *ex ante evaluation*), the process stated above, to enable us to target the training. In this project, the training module has utilized a workshop mode. The second level of evaluation is at the delivery of the workshop. Workshop participants and resource persons assist the project coordinator in evaluating the workshop, emphasizing the extent to which the learning and behavioral objectives of the workshop have

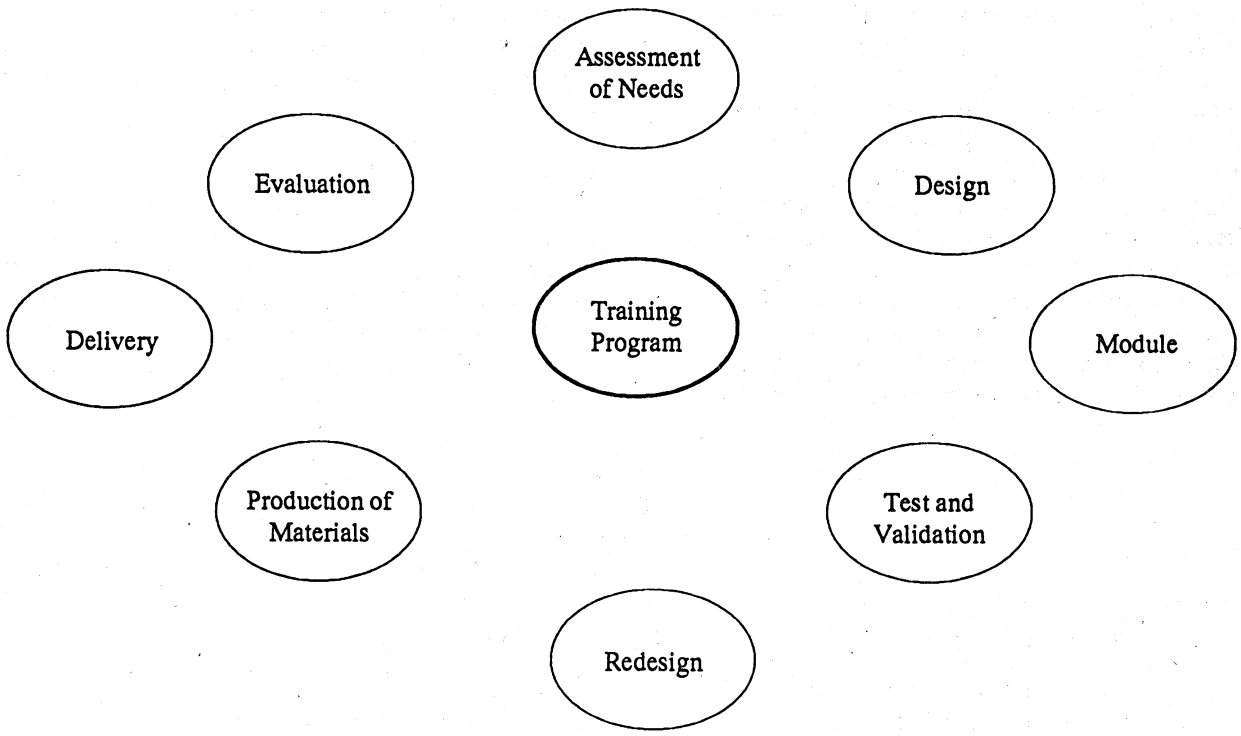


Figure 2. Training cycle for design and delivery of an event

Table 3. Areas of Focus for Training of Research Managers in NARS

	MANAGERIAL LEVELS[1]		
Training Areas	Policymakers	Senior Research Managers	Middle-Level Research Managers
– Development Policy	XXX	XX	X
– Planning and Priority Setting	XXX	XX	X
– Organization and Structure of NARS	XXX	XX	XX
– Linkages to Extension and Farmers	X	XXX	XXX
– Linkages to Knowledge Sources		XXX	XX
– Program Formulation and Budgeting	X	XXX	XXX
– Monitoring and Evaluation	X	XXX	XXX
– Management Information Systems	X	XXX	XXX
– Human Resource Management	X	XXX	XXX
– Financial Resource Management	X	XXX	X
– Physical Resource Management	X	XX	XXX
– Management and Supervisory Leadership	XX	XXX	XXX

Key: XXX = Must Know (Priority 1)
XX = Should Know (Priority 2)
X = Nice to Know (Priority 3)

1. **Policymakers** — Board of Governors, Agricultural Research Council members, planners, executive officers in the NARS — permanent or principal secretaries, etc., responsible for policy and establishing long-range objectives of NARS.
Senior Research Managers — Senior managers and executives of the system, e.g., directors general/directors, their department and assistants — those responsible for overseeing implementation of policies.
Mid-Level Research Managers — Research coordinators, station heads — those responsible for supervising research operations at research stations, laboratories, institutes, etc.

been achieved, the relevance and usefulness of the topics covered to participants of the workshop, etc.

This information is made available to resource persons and also used in planning and designing subsequent training events. The third level is a follow-up evaluation, shown in figure 3. In order to ensure a lasting impact in the NARS, the transfer of managerial and practical skills and knowledge must be completed. This is usually done through repeated reinforcement of these skills. In the scheme shown, further personal contact, liaison with former participants, and help in the practical application of these skills guarantee this transfer. For instance in Zimbabwe, ISNAR's involvement in advisory service to the NARS (where a local task force of research managers work hand in hand in a diagnostic review or on planning, etc.) will facilitate this process.

A second example is Tanzania, where it is expected that ISNAR staff will join a task force of local and international consultants for research master planning. The use of local resource persons drawn from former participants at similar workshops in the NARS ensures continued interest and development of personal capacity. The follow-up scheme therefore assists in consolidating knowledge and skills.

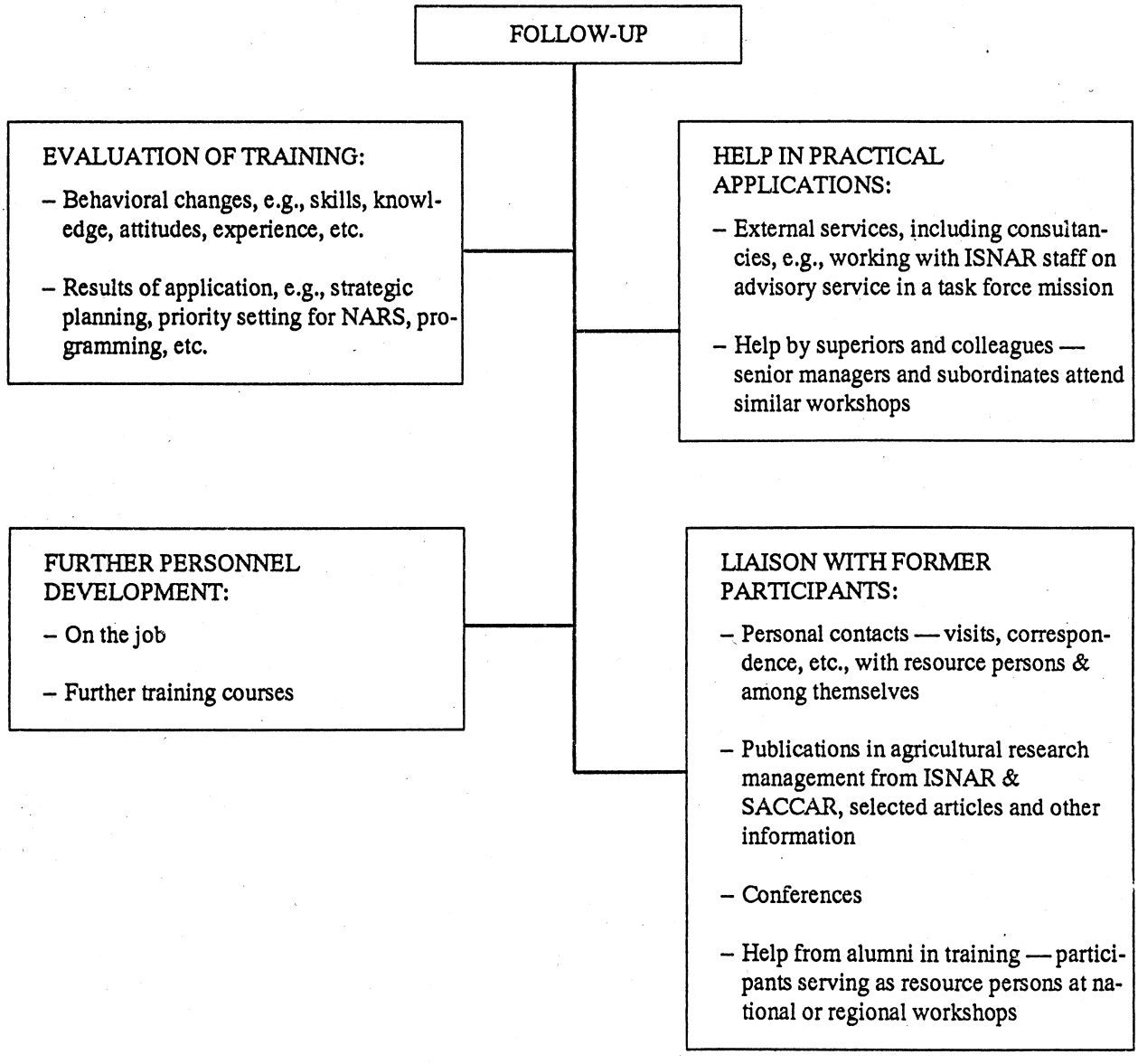


Figure 3. Follow-up scheme of participants at SACCAR/ISNAR agricultural research management training project for NARS in SADCC countries

SOURCE: Adapted from M. Kubr. 1985. An Introductory Course in Teaching and Training Methods for Management Development. ILO, Geneva.

At the project level this is done through submission of quarterly reports to donors and to SACCAR and ISNAR management, along with mid-term and end-of-project evaluations.

Assessment of Outcome of an Event

Often, when we organize training, we get more immersed in the process and may neglect to assess the outcome at each of the steps that assure the quality of the training and client satisfaction. It is therefore vital that for any event, outcomes be clearly identified and tested to ensure that they meet the following criteria: the extent to which we hope the task can be accomplished, clarity and specificity, verifiability — the quality of training materials, probability of success and input, how realistic the outcome is in relation to our resources or target group, how realistic the time frame for the outcome is. In doing this, we ensure the success of the training. Table 4 gives a checklist of activities that constitute key elements or outcomes of a training event that can be used in planning or implementing training.

Achievements

To date, training has been offered to 243 research managers in seven of the nine SADCC countries. Table 5 shows the breakdown of participants by country.

The eight training events in the region have generated a large amount of training materials: country-specific case materials developed by indigenous resource persons, videotapes of lectures on monitoring and evaluation, problem solving, research station management, strategic planning in Malawi, and others on aspects of organizational behavior, e.g., delegation, motivation, leadership styles, etc.

Resource persons for the training events have been drawn from ISNAR, the NARS in the region (including the universities), and national or regional management training institutions. The project is building a pool of trainers which will ultimately form a core of trainers for the region. This can be viewed as a step towards institutionalization of agricultural research management training in the region.

Table 4. Degree of Success

Activity (Outcome)	Accomplishment	Clear, Specific	Verifiable	Realistic	Substantive Impact	Values	Time Frame
1. Promotion (publicizing, informing NARS of availability of training)							
2. Response to NARS request							
3. Needs assessment							
4. Negotiation with NARS (e.g., on funding, context, division of labor)							
5. Prospectus							
6. Coordination of development of materials							
7. Coordination of training teams							
8. Adoption of agenda							
9. Logistics (tickets, per diem, accommodation, recreation)							
10. Presentation of training materials (pedagogy, context, document)							
11. Evaluation							
12. Certificates							
13. Follow-up plans & implementation, etc.							

NOTE: Training outcomes and determination of the capacity with which the outcomes may be achieved. A scoring system is used. Low scores will give an indication of the need for further action.
The outcomes represent key considerations in planning and implementation to ensure client acceptance and satisfaction.

Table 5. Training Output, 1978-88

Country	Population (1985) in '000s	Approximate size of NARS (total no. of scientists)*	Number of Participants 1987	1988	Total
Angola	8,756	28			
Botswana	1,034	61		4	4
Lesotho	1,515	18		11	11
Malawi	7,044	120	34	34	68
Mozambique	13,791	15			
Swaziland	758	15		6	6
Tanzania	22,242	320	18	42	60
Zambia	6,640	110	33	29	62
Zimbabwe	8,406	150		32	32
Total	70,186	837	85	158	243

SOURCE: ISNAR Database (in press) and the World Bank Atlas (1987).
*Total is for professional staff with BSc degree or above.

The workshops have brought national universities (especially faculties of agriculture and veterinary medicine) closer to the national agricultural research institutes by providing a forum for looking at each other from various perspectives and fostering opportunities for better cooperation on managing research resources. These interests were powerfully manifested in the workshops in Tanzania, Malawi, Zambia, and the BLS countries (especially Swaziland).

Lessons Learned

We need to develop suitable training materials. At ISNAR, efforts are being made to convert research and other types of materials into training instruments. Development of materials will involve an integrated process of literature search, state-of-the-art review, writing, rewriting, and synthesis of a variety of activities which validate the materials to ensure that prospective users will have a good understanding of the application of the concepts to their own situations. We recognize that development of good training materials is both a time-consuming and labor-intensive process.

In particular, participant evaluation of the workshops has clearly shown that materials based on case study approaches, role playing, simulation, and fieldwork, all of which emphasize concept application, are most preferred. This further underscores the need to relate the content of materials to the professional responsibilities of the research managers.

Furthermore, we have realized that in order to rapidly multiply training materials, the project should consider training persons to write cases. The need for case materials suited to the region has become even more apparent in the workshops already completed. Selected persons, representing NARS in the region, could be trained in case study methodology and assigned topics to research and prepare cases before testing them in the various workshops in the region.

Video technology has also been used to supplement and complement training materials, and participants have greatly appreciated this as it provides both relaxation and easy learning. The use of both commercially produced videotapes and materials taped at workshops will be promoted for blending with other materials to form an integrated system.

Even as we contemplate an intensive drive to develop materials at ISNAR, one quickly realizes the paucity of talent to undertake this task. Development of materials will undoubtedly require people with an interest in and understanding of the skills required for designing, writing, editing, typing, and reproducing the materials. Present staff at ISNAR are already overstretched.

We have further confirmed that these countries have specific training needs. Therefore, we have to tailor, modify, and adapt materials to suit the dynamic character of their NARS management. We need to further refine our needs assessment, making it more sensitive to the specific needs of the NARS.

We have also learned that there is the danger of losing our competitive edge in the region unless we continuously review our client needs and redesign and develop suitable materials to meet their needs in a timely way. There are other agencies (e.g., Winrock International, USDA/OICD, FAMESA, and ESAMI, etc.) that are operating in the region and would quickly step in to fill any gaps. However, where ISNAR has no comparative advantage, collaboration with other agencies is very much encouraged.

Our deliberate policy of involvement of indigenous persons to serve as facilitators at the workshops has helped us evaluate the potential capacity of the region to take charge of the project for a long-term sustained effort. The contributions from these people have been good and have not compro-

mised the quality of the training; in fact, it has generated very positive support and accorded a high level of legitimacy to the project at the national levels.

According to training requirements identified through interaction with NARS managers, there is a need to teach general management principles and aspects of human and conceptual skills. This is because most of the mid- to senior-level research managers have not had any prior training in basic management principles, since they come from strictly biological science backgrounds. These subjects have been taught by the resource staff of national management training institutes and supported by ISNAR staff. The significance of this is the close collaborative arrangement forged between ISNAR and these institutes. Examples of this are the Institute of Development Management (IDM), which has a regional mandate for management training in Botswana, Lesotho, and Swaziland; the Zimbabwe Institute of Public Administration and Management (ZIPAM); and the Institute of Development Management in Tanzania, etc.

The management of linkage and collaborative mechanisms of NARS with CGIAR institutes and other development agencies is a problem in many NARS. Though not directly within the purview of this project, it is necessary to address these issues since they sometimes gravely affect the running of a NARS, particularly where donor-supported projects are larger than national ones.

This project is being supported over a four-year period from 1986 to 1990. It is now at the midway point. It has already made tremendous gains in this initial phase to create better understanding of agricultural research management problems among some research managers in SADCC NARS. The training offered has mostly been of the overview type and will continue in this way for some of the NARS. It is hoped that in subsequent phases, with better understanding of the NARS and development of materials (e.g., case studies, etc.) the project will get into more problem-solving approaches.

Conclusion

Finally, NARS need to work continuously toward developing a strong culture in agricultural research management best suited to their environment. At present, the NARS are faced with the difficult task of managing culture changes, including consciousness-raising among NARS policymakers and managers for the need to increase productivity to generate appropriate technology for the farmer. This may mean adopting new work strategies, improving the scientific and research environment by challenging existing norms, improving the reward system for research, improving teamwork, and providing better research management tools and skills to the managers.

Managing culture change is imperative for the NARS if they are to meet the challenge posed by their countries for increased agricultural productivity. The process is viewed as continuous, requiring large investments in vital resources of time, money, and human capital. Through training interventions, this project is making an invaluable contribution to this process.

HUMAN RESOURCE MANAGEMENT FOR AGRICULTURAL RESEARCH: OVERVIEW AND ISSUES

Paul Bennell and Larry Zuidema

Introduction

People are the most important resource for national agricultural research — the human resources of a research organization are the primary means by which it achieves its objectives. Productive agricultural research systems, therefore, require effective planning and management of professional researchers and their support personnel. The objective of this document is to assist agricultural research program managers and administrators at all levels in developing the knowledge and skills needed to maximize the effective productivity of these specialized human resources.

The policies and practices required for managing human resources in agricultural research institutions differ in important respects from those required for other types of public- and private-sector institutions. Most notably, agricultural research is highly skill-intensive, requiring the recruitment of specialists and the provision of continuous professional development. Agricultural researchers carry out a complex array of activities with generally unpredictable outcomes. This, plus the fact that several disciplines and subdisciplines are involved, complicates the planning and management of human resources and the development of an effective information system.

Agricultural researchers themselves have unique occupational needs and characteristics that have important implications for management. Potentially creative individuals, they are said to have especially high expectations for job fulfillment and need considerable autonomy in determining and carrying out their research activities. One important responsibility of agricultural research managers, therefore, is to insure that the organization retains and effectively utilizes human resources with the specific skills, attitudes, and motivations that will allow the organizational objectives to be attained as efficiently as possible.

This document provides an overview and identifies some important issues relating to human resource management for agricultural research. Most of the material in the document is equally applicable to individual research institutions and well-coordinated national agricultural research systems (NARS).

There are two sections in this document. Section I focuses specifically on five *human resource management tasks* for agricultural research which can be defined as follows:

1. *Planning* involves the determination of the types, amounts, and availability of human resource skills required for the attainment of predetermined program objectives and tasks over a specified time period in the most cost-effective manner.

2. *Staffing* involves developing the job descriptions, policies, and practices that relate to recruitment, selection, assimilation, and deployment of personnel.

3. *Development* involves the continuous improvement of the capacities of research personnel through formal education, specialized and on-the-job training, and participation in professional meetings.

4. *Compensation* relates to the structure of grades, promotion policies, and salary and nonsalary rewards, which influence the motivation and performance of researchers and support staff.

5. *Evaluation* includes performance planning, appraisal, and counseling, which are critical to the effective management of human resources.

Section II focuses on *organizational behavior factors* relating to researcher motivation and interpersonal and intergroup behavior. The latter includes management issues such as leadership, team building, effective communication, and conflict management.

The appendices provide practical guidelines and sample documents for NARS managers and personnel directors. Other ISNAR documents provide NARS managers and ad-

ministrators with an understanding of the rationale for and utilization of information for human resource management, including a human resource information system (HRIS).

Section I — Human Resource Management Tasks

Human resources can be described as a subsystem within a larger organizational system. The human resource system within a national agricultural research institute or system includes the quantity and quality of its research staff and the organizational framework governing its behavior.

This section reviews the tasks required to plan and manage a human resource system for agricultural research. Figure 1 illustrates the planning and management process for a human resource system. It shows an iterative process that begins with three inputs: research objectives, available operating resources, and the current state of human resources. The manager first measures the available human resources against research objectives. Then, decisions are made in the planning stage to modify the human resources within the available operating resources, so that the research objectives can be met. Management decisions are made and then implemented in the areas of staffing, development, compensation, and evaluation. At the end of the management cycle, the human resource system reflects the changes that have resulted from management decisions. The modified stock of human resources becomes an input into the next planning cycle.

1. Planning

Human resource planning involves the analysis and determination of the types, amounts, and availability of personnel required for the efficient and effective attainment of organizational and program objectives. This activity allows research managers to assess where their organizations are and where they should be going in terms of human resource availability and utilization. The main products of this planning activity are realistic strategic and operational plans. The longer-term strategic plan may include, for example, strengthening the training capacity of the institution or proposing changes in personnel policies to appropriately reward research staff. The operational plan may include changes in personnel recruitment levels, redeployment of staff, or implementing a performance planning and appraisal system.

Human resource planning has not been a rigorous activity of many NARS, particularly those that are young and experiencing rapid growth in a relatively short time. Several of the factors that contribute to a lack of comprehensive human resources planning are (1) a low level of overall program planning for the NARS, (2) a lack of control over personnel recruitment, (3) excessive program and personnel fragmentation due to the nature of the system or to heavy reliance on donor projects, (4) rigid civil service regulations which reduce options for personnel deployment and rewards, (5) limited human resource planning expertise, (6) an inadequate human resource information system, and (7) heavy reliance on donor funding for staff development.

Human resource planning is integral to the overall program planning process. The primary reference points for human resource planning and utilization are organizational goals and objectives as well as research program plans and priorities. It is essential, therefore, for research managers to be able to relate information about current and future staff to current and future commodity, regional, and/or discipline-oriented research programs. This link between human resource planning and program planning provides the basis for an effective and comprehensive research program that relates resources to national agricultural development goals.

It is important at early stages of the human resource planning process to make current and future assessments of the capacity of the research organization to effectively absorb, utilize, and manage projected levels of staff. The following are some of the factors that affect the utilization and, therefore, productivity of agricultural researchers. These factors are likely to modify the projections of the requirements discussed above.

- *Training capacity* within, or readily available to, the organization for researchers who must be trained on the job by experienced and competent researchers.
- *Opportunities* for university training for young, qualified staff on whom the organization depends for future program leadership. Of particular importance is the continued development and availability of basic research skills in addition to disciplinary expertise.
- *Management capacity* for staff direction, supervision, and monitoring. This includes management at the station, division/department, and program levels.
- *Support assistance* from technical and other support personnel. The number and quality of these personnel influence the number of researchers who can be employed effectively. While needs vary considerably for different disciplines, a common overall relationship for many NARS is two technicians and three to four support persons for each researcher.
- *Funds for operational expenditures* is a major determinant of the numbers and kinds of researchers who can be employed effectively. Funds for operations and support personnel represent the total recurrent resources available per researcher. It is often said in developed countries that no more than 70 percent of recurrent research expenses should be for personnel. However, in developing countries where salaries are low relative to

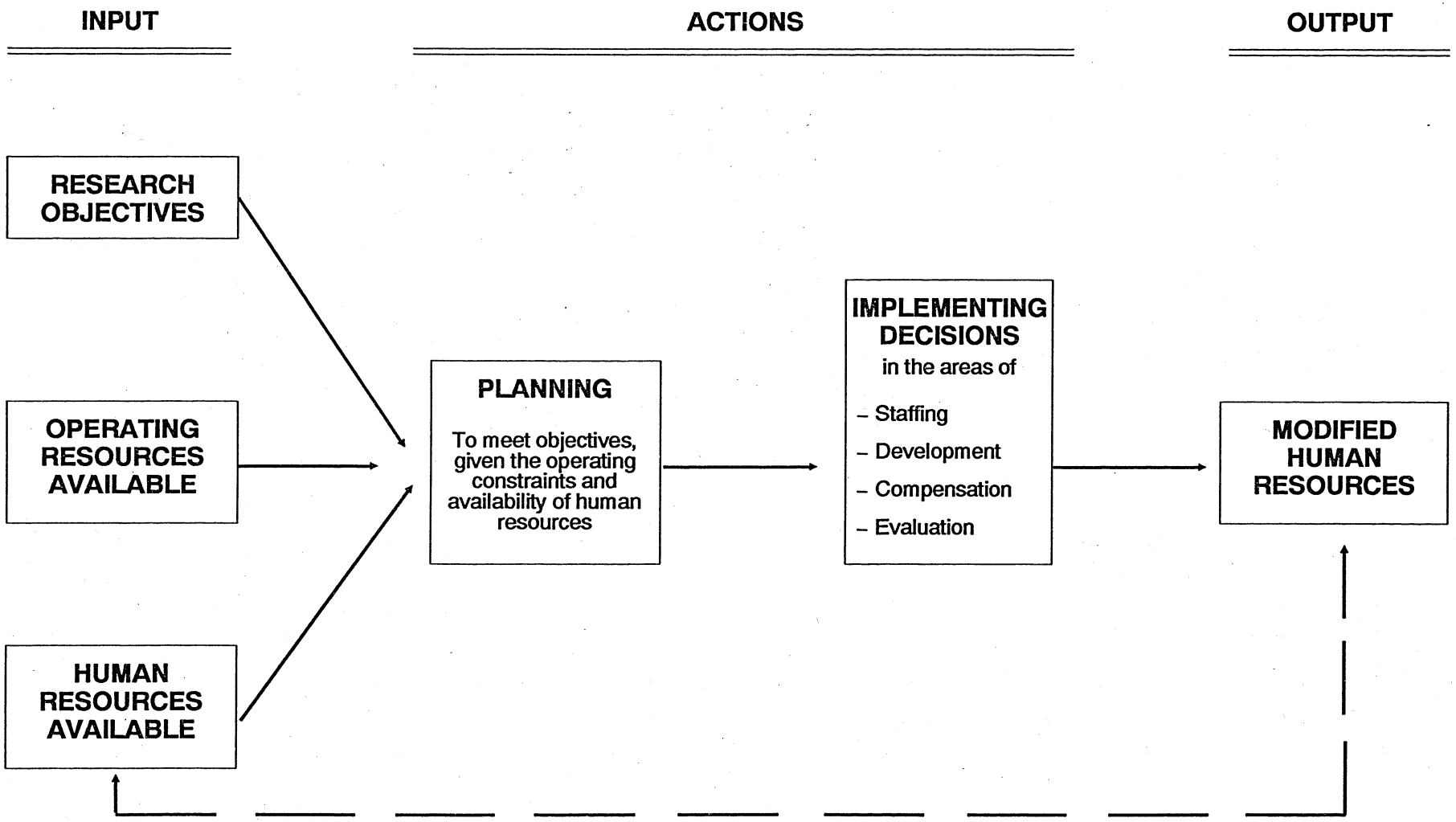


Figure 1. Human resource management process

those in developed countries, but many operating expenses are priced on an international basis (e.g., imported fertilizers), such a ratio may be misleading. Under these circumstances, it would be more appropriate to establish a minimum average budget per researcher.

- *Adequate facilities* for agricultural research endeavors that require specialized laboratories or other facilities. Coordination of staff recruitment and development of facilities is essential.

Assessment of these factors and their relevance to human resource requirements is crucial both for effective planning for the future and for understanding current management problems. Planned expansion of the level of staffing in a NARS may need to be deferred until these factors become adequate for effective utilization of staff.

The human resource planning process includes three interrelated activities:

- analysis of human resource requirements (demand);
- assessment of the availability of human resources (supply);
- matching requirements to availability.

How these planning activities contribute to the development of a human resource strategy for a NARS is described below. This planning process can be facilitated by an effective human resource information system (HRIS), which is discussed in other ISNAR documents.

Analysis of Human Resource Requirements

Determining human resource requirements constitutes the "demand" side of human resource planning. Ideally, estimates of human resource requirements are derived on the basis of carefully formulated national research strategies and program objectives. Effective human resource planning, therefore, is fully dependent upon the planning and programming of agricultural research activities. In other words, research managers can utilize a planning process to determine personnel needs only if they first know what they want to accomplish.

The research program should normally constitute the basic unit of research planning at all levels (institution, department, and project). Research managers, in conjunction with planners and budget authorities, determine the optimal allocation of all resources among the various possible agricultural research programs. Full consideration needs to be given to overall national and agricultural development objectives and the likely level of resources available in the future. When this is accomplished, more detailed planning is undertaken in order to allocate these resources to activities within research programs. This phase of operational planning is known as *programming*.

For human resources, the research planner first determines the optimal composition of skills and disciplines for each agricultural research program/project over a specified time period. This activity, called *task analysis*, also includes determining the requirements and substitution possibilities of support personnel for different sets of tasks. A considerable amount of experience and informed judgment on the part of research managers is required for task analysis.

The tasks to be performed are defined by the research program. Tasks are aggregated into jobs with job classifications and descriptions, which may be similar for several positions (one for each staff member) in the organization. The organizational structure gives definition to the positions in relation to each other and to career possibilities in the institution.

As a research institution grows and develops, it becomes more important to analyze and define the tasks that need to be performed by the four types of personnel: researchers, administrators and managers, technical support staff, and nontechnical support staff. Task and job analysis allows the institution to (1) periodically review and redefine positions in relation to program objectives, (2) develop job classification systems, (3) establish specific recruitment targets, (4) establish appropriate schemes of service, and (5) evaluate performance against established criteria. See appendix 1 to this paper for details on the content of a job analysis.

The core personnel of a NARS are its professional researchers. A basic measure of the current and potential capability for future research in a NARS, therefore, is the level of education and training of its researchers. Preliminary data from 79 developing countries included in the ISNAR Agricultural Research Indicator Series Database show that an average of 12 percent of NARS researchers have a PhD degree, 35 percent have an MSc degree, and 53 percent have a BS degree (or their respective equivalents). Given the fact that individuals working on postgraduate degrees receive training in research methods, higher percentages of MSc and PhD staff would be necessary to effectively strengthen most NARS.

Technical support personnel in agricultural research organizations are composed of distinct groups: field technicians, laboratory technicians, station/farm managers, and support services (statisticians, information officers, librarians, computer specialists, etc.). They are responsible for carrying out the bulk of the activities undertaken by agricultural research organizations. It is important, therefore, to analyze tasks, provide appropriate career structures, and set performance standards for each of the separate types of technical support personnel. This process facilitates the determination of appropriate levels of technical support personnel re-

quired for researchers in various disciplines and at various levels in the system.

An emerging and important group of research staff are those who are involved in the process of technology transfer. These may include on-farm research technicians, subject-matter specialists, and research-extension liaison staff. In many cases, these staff are affiliated with extension institutions. However, NARS are increasingly recognizing the value of such staff, and new positions are being defined within NARS to facilitate the technology transfer process. The numbers, placement, and position classifications of such staff are important issues for consideration by planners who are determining the future manpower requirements of a NARS.

Once these factors and considerations have been taken into account, it is then possible to derive approximate net requirements for human resources by category of research personnel, location, discipline, and program area. Before defining the manpower plan, however, it is necessary to review the availability (supply) of research personnel and then match human resource requirements to availability (discussed in the next two sections). The final stage of the process involves determining the absorptive capacity of the institution or system.

Availability Assessment of Human Resources

In addition to determining human resource requirements and organizational absorptive capacity, the human resource planning process also entails an assessment of the types and range of skills that are currently available and are likely to be available in the future. This constitutes the "supply" side of human resource planning.

A quantitative and qualitative inventory of currently available agricultural research personnel in the NARS is the point of departure for assessing the availability of human resources. This inventory provides information about the characteristics of the current staff of the research organization for (1) qualifications, including highest degree obtained, special training undertaken, and professional work experience; (2) allocation of staff in terms of crop, research program, discipline, function, and position; and (3) location of staff in terms of research center, on-farm/on-station, and region of the country.

An analysis of the human resource inventory, particularly over time, (1) permits the diagnosis of the manpower strengths and weaknesses of the research organization, (2) assists in the process of projecting availabilty in the future, and (3) provides a basis for staff development planning with educational institutions and donors. Other ISNAR publications on information systems provide details about data requirements, analysis, and presentation for a human resource inventory.

Some NARS regularly experience high vacancy rates, particularly for researcher positions. While this may reflect either a shortage of qualified persons to fill approved positions or rapid turnover of staff, it may also be related to the lack of allocated funds for these positions. In any case, it is important to assess the reasons behind each vacancy as part of the process of determining availability of staff for future appointments.

The future availability to a NARS of researcher and management skills depends on three primary factors:

1. *Upgrading and redeployment of existing personnel.* In most cases, existing research personnel comprise the bulk of human resources that will be available in the future. The previously referenced inventory of all personnel employed by the agricultural research system provides basic data. Detailed information on staff training and on current and previous work experience and activities is particularly useful here. Personnel policies (which involve performance planning and assessment, reward merit, and promote internal mobility and training) facilitate the process of upgrading and redeployment to meet program needs.

2. *Recruitment of new personnel.* Researchers come not only from educational institutions, but also from the relevant national and international labor markets. Of particular importance is an assessment of the quantity and quality of all levels of trained agriculturists coming out of national technical schools, colleges, and universities currently and projected into the future. A thorough review would include an assessment of demand from competing employers. Another recruitment factor to assess is the general mobility of professionals within a country, considering political and cultural factors and civil service regulations.

3. *Attrition of personnel.* Attrition may come from retirements, deaths, resignations, and dismissals. Attrition levels plus estimated net growth of research personnel determine recruitment levels. The main component of attrition in many young NARS is voluntary resignations which reflect both external labor markets and the conditions of service within the research organization. In general, current trends in and levels of annual rates of attrition among different types of research personnel constitute the starting point for estimating probable rates of attrition in the future. To the extent that conditions of service are perceived to have improved relative to other potential employers, for example, future attrition rates would be expected to drop. As conditions change in related labor markets, attrition rates may be affected positively or negatively.

   High levels of demand for individuals with practical field and laboratory skills can make attrition of high-

quality technical support staff high. Since research activities depend heavily on these personnel, analysis of recruitment, utilization, and attrition among these categories is important.

Matching Requirements to Availability

The final stage of the human resource planning process involves matching the estimates of requirements for specific skills with the probable availability of those skills from both internal and external sources. The planning process ultimately yields detailed information on the desired number of staff by skill level (experience) and specialization. Comparison of desired staff with existing staff determines the net addition to personnel. The net addition, combined with estimates of attrition, determines desired recruitment levels. The lower the estimated net growth, the more directly recruitment will correspond to attrition (i.e., replacement only). Conversely, the lower the attrition rate, the more directly recruitment will correspond to net growth. Where NARS are experiencing periods of consolidation rather than continued rapid growth, policies designed to reduce attrition will also reduce recruitment requirements.

In some exceptional cases, all proposed skill requirements can be satisfied; more typically, there will be shortfalls in selected categories of staff and disciplines. In some instances, these can be overcome by a reallocation of staff or changes in staff assignments in specific subject areas and/or recruitment of foreign research personnel. It is then possible to specify target projections for net additions and (using estimates of future attrition) for gross recruitment to each category of personnel and area of research specialization (discipline) for the duration of the planning period.

2. Staffing

The planning activities described above result in overall estimates of the numbers of staff required and likely to be available for the research program as projected to some future period. Through the process of staffing, the research manager builds upon the information generated in the planning process about specific tasks to be performed and the specific positions required. The research manager then seeks to operationalize plans by defining in detail *job descriptions* and specific *recruitment targets* for various categories of staff. The recruitment process includes the attraction, selection, and assimilation of new staff into the institution. A final staffing concern for research managers is the placement or *deployment of staff* within the organization in relation to location, linkages with other staff, and program priorities. This section focuses on these three elements of staffing.

Defining Positions

Full job descriptions identify the job in the organization, describe its purpose and activities, specify responsibilities and performance standards in detail, and list minimum and desirable qualifications for the job. The job description of an agricultural researcher would normally emphasize the following aspects of job performance (adapted from Arnon 1968):

- inititative in recognizing new research opportunities and in proposing and preparing research projects;
- responsiveness to problems suggested by program leaders, extension workers, and farmers;
- cooperation in research teams where researcher competence is needed;
- supervision of other research staff and support staff;
- training of research and support personnel;
- familiarity with professional literature and interest in broader scientific subjects;
- planning, designing, and conducting experiments, including the collection of background information;
- analysis of results and determination of significance and conclusions;
- presentation of research results in a timely fashion in the form of a report or paper for publication;
- communication of results to other scientists, extension workers, and farmers by the most appropriate media.

Job descriptions and classification systems (titles and grades) should be different for and responsive to the needs of administrators, researchers, technical staff, and support staff. For example, career ladders, incentive systems, and task expectations are much different for these different groups, and this needs to be clearly reflected in the job descriptions. Researcher classification systems normally provide for continued opportunities for advancement and recognize education, experience, and performance. Job descriptions are relatively flexible to allow for the creativity and initiative expected of professional researchers.

Recruiting Staff

The recruitment process depends upon the development of job descriptions, assurances that the position will be approved, and financial support from the appropriate authorities (often outside the research institution). The process is likely to be influenced or entirely controlled by central government regulations. In some cases, governments have recognized the special nature of research and provided separate conditions and recruitment regulations for scientists. In other cases, it is possible to obtain exemptions from normal

regulations in order to facilitate the hiring of appropriate staff.

Ideally, a research organization should be in a position to control the number and types of personnel who are recruited. The recruitment process, then, is an outcome of the planning process and involves the matching of carefully formulated research programs with available and required numbers of qualified researchers and support staff. A rational recruitment plan must be related to the organization's capacity to provide effective training and supervision of new staff.

An initial step in the process of recruitment is the attraction of high-quality researchers who provide creativity, intellectual rigor, and long-term commitment for agricultural research. The ability to attract well-qualified staff is influenced by their availability within the country, competition in the labor market, and conditions of service within the institution. This may require that the research institution develop specific strategies, policies, and procedures to promote recruitment according to the staffing plan. For example, close working relationships with the staffs of universities and training institutions can often be developed. These relationships may include scholarships for promising students, collaborative research projects involving faculty and their postgraduate students, and work-study schemes. Also, it is possible to consider recruitment of staff from basic science and social science backgrounds for selective positions in the institution.

Experience and research have shown that it is possible to develop a profile for a productive researcher. Characteristics include (1) highly qualified for the job, (2) highly motivated to performance, (3) positive orientation to job, (4) demonstrated maturity, and (5) effective interaction with others (adapted from Ranftl 1978: 93-96). Many of these characteristics are intrinsic to the individual and best handled in the recruitment process. Others are subject to improvement through management decisions and policies. Management interventions such as training can be utilized for improving the productivity of those identified as having high potential for creativity, originality, initiative, and technique. This profile approach to recruitment implies that quality input has a high predictive value in determining quality and valuable output.

The selection of candidates may be based on a variety of instruments and techniques which collectively provide a sufficiently accurate indication of the likely job performance of each individual candidate. Objective information comes from academic records, civil service examinations, and specialist examinations administered by the agricultural research institution. Subjective information will come from references, interviews, and the descriptive materials and publications submitted by the candidates. The involvement and comments of research personnel possessing the necessary technical competence will improve the selection process. Future evaluations of actual job performance can be used to assess the effectiveness of earlier staff selection procedures.

The assimilation or induction of recruited staff into the institution is an important and often neglected part of staffing. The productivity and efficiency of staff is improved at a faster pace if the institution recognizes the need of new staff for information about (1) specific and detailed job expectations, (2) criteria and procedures for performance evaluation, (3) purpose and program of the unit in which they are placed, (4) the culture and doctrine of the institution, and (5) relationships and linkages with other relevant organizations (like extension). Deployment of new staff in teams with mature researchers can facilitate the process of assimilation.

Deploying Staff

The manner in which researchers and technical staff are deployed, both within the hierarchy of the organization and at a physical location, will influence the productivity of the NARS. Many of the basic decisions about deployment are made during the planning process. The topic is treated here since managers implement plans and are often in the position of making the final decisions on deployment at any point in time.

It is extremely important to develop and maintain a "critical mass" of researchers in terms of specialization, program size, and geographic location — this permits effective inter- and intradisciplinary interaction among professional staff. With increasing decentralization of some research systems, staff interactions and collaboration associated with "critical mass" are increasingly important. Strategies for deploying on-farm research teams is of particular concern to many NARS.

It is essential that young researchers be deployed in such a manner that they receive close supervision. When there is a shortage of appropriately skilled and experienced researchers to perform this role, trainee researchers may need to be deployed in groups for more formalized in-service training. Supervisors and experienced staff may need to be trained to facilitate the early development of new staff.

Research staff must be carefully deployed in relation to research program objectives. This means that data on numbers and disciplines of full-time-equivalent staff should be maintained by priority programs, whether defined by commodity, region, or other program-related focus. If research priorities define target client groups, it is important to deploy staff accordingly. The mix of disciplines of researchers will be determined over time by the specific problems encountered and the ability to "borrow" technology.

Depending on the structure and organization of the NARS, it may be necessary for research managers to facilitate the interaction and cooperation of researchers among national bureaucracies, autonomous institutions, and universities. This is possible if the institutions involved have identified and articulated their respective roles and, therefore, the responsibilities of their staff. Where institutions have specific responsibilities for functions in a system that is developing agricultural technology, it is particularly important that they be able to develop effective and legitimized modes of collaboration and cooperation. Linkage/interface mechanisms between organizations may be vital to staff performance in meeting program objectives.

Issues of deployment relating to personal satisfaction and special compensation of staff posted in remote locations are handled in the section on compensation.

3. Development

To become and remain productive, an agricultural researcher requires both formal and on-the-job training. Agricultural research activities are, by their very nature, highly skill-intensive, and many of these skills are initially acquired by formal academic training. However, if agricultural research personnel are to maintain up-to-date knowledge and skills in their area of specialization and, thereby, to be able to continue to undertake high-quality research throughout their careers, training must be received on a periodic basis.

This apprentice-to-professional researcher development activity is characterized by rather specific training needs at various stages of a researcher's career. Three modes of training for agricultural researchers can be identified: (1) apprenticeship, (2) formal degree training, and (3) professional development.

Apprenticeship

As an apprentice, a new agricultural researcher ideally would receive structured, intensive on-the-job training under the supervision of an experienced researcher. The purpose of this apprenticeship period is to acquire and adapt relevant skills and knowledge to the program needs of the institution and, equally important, to encourage the formation of appropriate attitudes and commitments for a productive career in agricultural research.

During the apprenticeship period, it is normal for the new researcher to attend short, intensive training courses to improve knowledge and skills. Since many NARS are small in size, these courses must often be organized on a regional basis involving both national and international research institutions. The apprenticeship period may last from two to three years, after which the trainee acquires professional status as an agricultural researcher. In some cases, however, formal degree training early in the researcher's career is considered to be part of apprenticeship training.

Formal Postgraduate Training

It is essential for NARS to have a substantial core of staff with postgraduate degree training involving research. If not acquired before entry into the agricultural research institution, opportunities for postgraduate studies may be made available to young researchers early in their careers — after a period of apprenticeship. While postgraduate degree training is essential for most trainee agricultural researchers, it is not a substitute for on-the-job training. For example, the necessary skills and attitudes needed for collaboration with farmers are acquired primarily by working intensively with farmers themselves. On-the-job training prior to postgraduate study is preferred, since it helps provide a relevant context for specialization in the degree program.

Postgraduate degree training within the country is preferable in fields where standards are adequate, since the relevance of the training is potentially high. In many cases, NARS have developed strong relationships with universities in order to influence the content of this training and to collaborate in the research required for the degree. In a few countries, NARS have initiated and established their own postgraduate degree programs, often with at least the nominal participation of a university.

As a result of the limited postgraduate training capacity in the main agricultural science disciplines in many countries, however, large numbers of agricultural researchers with postgraduate degrees have attended overseas universities. In planning for staff to enroll in postgraduate programs abroad, it is important that NARS managers be aware of and deal with several critical issues:

- *Relevance.* Postgraduate programs in developed countries may lack relevance for students who wish to work in tropical environments. Similarly, research theses and dissertations may be on topics that are of little direct or indirect value to research priority areas of the NARS.

- *Specialization.* A sound scientific education is necessary to prepare researchers to face future problems. However, staff with narrow specializations may not be suitable for research programs in the many situations where broader-based knowledge is required. This, then, can eventually reduce the capacity of the organization to understand and deal with priority agricultural problems. A high degree of specialization involving sophisticated equipment and large teams of support personnel may be inappropriate to the country's research needs and may be difficult to support over time.

- *Diversification.* To prevent "inbreeding" of human resources in a NARS and to widen the methodology base, several educational institutions should be used for degree study. This point was made by one NARS manager as follows: "Ideally, students should be sent

to as many countries and universities as possible so that in the end a weakness from one institution will be complemented by a strength from another."

- *Selection and sequencing.* Projects, seniority, and other factors often influence the timing and selection process. However, research managers need to view degree training and develop training plans in the context of overall organizational development and program goals. Persons selected for overseas degree training opportunities would normally be those with excellent qualifications, commitment, and promising careers in agricultural research (the selection would be merit based). Ideally, researchers would begin advanced degree training after an apprenticeship period, but before mid-career.

- *Duration and cost.* Agricultural researchers have typically had to spend relatively long periods overseas in order to obtain their postgraduate degrees (a mininum of two years at the master's level and another two to four years at the doctoral level). The duration is even greater when instruction is in a foreign language or when students have had to repeat courses as remedial or preparatory training. The cost of overseas postgraduate training is also an increasingly important issue. In recent years, total annual costs have been in excess of US$ 20,000 at most universities in Europe and North America.

- *Reentry.* The process of reentry and readjustment to culture, environment, family, and job is often underestimated. NARS managers must recognize this process and develop reorientation activities to facilitate the assimilation of trained staff returning to the institution. One NARS manager states, "The issue of reentry after a period of study overseas is never taken seriously; and yet, it is important because it could lead to wasting of resources when officers conduct research of little practical importance."

Recognition of these problems with overseas postgraduate training has led to improvements and alternatives in recent years. Some research institutions have developed "special relationships" with one or more overseas universities involving links with teaching and research personnel and, thereby, providing the basis for more effective and relevant training. Provisions have been made by donors, universities, and research institutions for some degree candidates to return to their national research organizations in order to collect data for dissertations and theses on priority research topics. Another approach is where the student completes some of the required coursework at an overseas university and the remainder, including the dissertation or thesis, at a local or regional university. In the longer term, this strengthens regional and national postgraduate training capacity while at the same time it responds to issues of cost, relevance, and over-specialization.

Professional Development

Appropriate training opportunities throughout the agricultural researcher's career are necessary not only for maintaining technical and scientific competence, but also for sustaining motivation and productivity. Through these opportunities, agricultural researchers (especially those who work in small groups and are geographically isolated) are able to maintain essential contact with other researchers and with the international scientific community in general. The need for specially arranged contacts with other researchers becomes increasingly important as the researcher gains in experience and maturity.

This in-career training may take a variety of forms, ranging from more formal and structured events (such as national and international short courses, conferences, seminars, workshops, and professional meetings) to more informal activities (such as study tours, special assignments, and contact visits to other research institutions). Each has its strengths and weaknesses, depending on the objectives and needs of the individual. It is important that research managers meet with researchers periodically to assess needs and plan or identify in-career, professional activities to meet these needs utilizing the most effective forms of training possible. Ideally, planning for professional development is part of an overall NARS planning process and occurs during the performance planning and appraisal process (see section 5).

The two most important criteria for decisions about researcher involvement in professional development activities are the priority goals and objectives of the research program and the specific needs of the researcher in responding to these priorities over time. Practical considerations in making the decision include the availability of financial support (particularly for international activities), the ability to launch appropriate training activities within the country (relevant where needs are specific and highly technical), and overall staff workloads. With the increased availability of international short courses and donor support for international training in some countries, research managers need to develop the capacity for careful planning and evaluate the utility of these opportunities for their institution. This will avoid distortions in staff development caused by well-intentioned but uncoordinated outside influences.

Researchers with current or planned substantive management responsibilities should receive both general and specialized management training in order to develop appropriate skills and commitments. Agricultural research is relatively management-intensive with typically 10 to 15 percent of researchers having significant management responsibility. Research managers are often young, with limited research experience. Also, they tend to be the most tal-

ented researchers, who, in the absence of a "dual-track" career structure, are forced upwards into management positions. As a consequence, many are ambivalent and unsure about their roles as managers. Few NARS managers have received any formal training in either general management or agricultural research management. Hence, well-designed and carefully targeted management training programs will help considerably in creating a more competent, professional cadre of agricultural research managers.

4. Compensation

Compensation schemes (also referred to as conditions of service) relate to the structure of grades and positions, promotion policies, and salary and nonsalary rewards. The retention, motivation, and performance of well-trained agricultural research staff depend critically on compensation policies and procedures. While agricultural research managers are not always in a position to make effective changes in policies and procedures for compensation of research staff, several options for improvement may be within the legal and policy framework of NARS.

A number of common problems can be identified in relation to grading, promotion, and reward structures for agricultural researchers. These problems stem from the fact that most agricultural researchers are subject to the same terms and conditions of employment that apply to all other professionals employed in the civil service. Public-sector compensation policies and practices are of central importance to all governments, both economically and politically. Civil service and finance units are often reluctant to make even minor changes unless there are compelling arguments for treating agricultural researchers differently from other groups.

For many NARS, strategies for improving productivity may not be successful unless there is significant improvement in compensation for researchers and key categories of support personnel. Salaries and other benefits must be competitive with other professionals in the public sector as well as (ideally) with those in the private sector. This is not only true for apprentices in the early stages of their careers, but also for experienced research personnel.

Most civil service systems have promotion policies that favor seniority over merit. The absence of regular, objective assessments of on-the-job performance in determining financial rewards has been a major factor in stifling motivation. In many cases, this results in continued high rates of attrition of young promising staff and seriously impedes efforts to build up cadres of experienced and productive researchers and technicians. The value of investments in human resource planning and training is considerably reduced under these circumstances.

Studies of NARS have shown that there often is only a relatively small income differential between starting salaries and the highest attainable salary levels (usually the latter is less than 2.5 times the former). Often there are only a limited number of major promotion opportunities during the career of a researcher, and existing promotions are generally not associated with significant increases in income. In some organizations, researchers reach the highest attainable grade and salary level relatively early in their careers and have limited prospects for further advancement unless they become managers.

Guidelines

In order to provide attractive career opportunities for agricultural researchers, a well-designed grade, promotion, and payment system should have the following characteristics:

- *Compensation policies* that are simple in concept and design. It is important that policies be easily understood by all employees and be implemented by management in a straightforward manner.

- *Grades and salaries* that are based on (1) detailed job analysis and evaluations to determine the "size of the job" according to skill, knowledge, and responsibility requirements, and (2) national salary and compensation surveys of similar jobs and occupations (where compensation includes other than direct salary, it is important to evaluate the magnitude of these nonsalary benefits for comparative purposes).

- *Job titles* that allow both colleagues and outsiders to readily identify the seniority, position, and, hopefully, competence of the individual. More important, they should give the researcher a clear sense of career progression. Appendix 2 provides a sample grading scheme showing titles and responsibilities over a career of an agricultural researcher.

- *Promotion and financial incentives* that are provided throughout the entire career of the researcher. This implies the existence of regular opportunities for promotion and significant percentage increases in compensation.

- *Promotion criteria* and requirements that are well specified and place primary emphasis on demonstrated job performance. Where appropriate, adequate recognition is given to the attainment of job-relevant qualifications. Seniority criteria generally play a limited role, and promotions do not depend on the availability of vacancies in any grade category or job level.

- *Accelerated advancement* possibilities provided for specially competent and highly motivated researchers who have made exceptionally valuable contributions to research programs. Without this flexibility, it is likely

that such "star performers," who normally play such important roles in scientific research, will leave to take up more attractive employment opportunities elsewhere.

- *An income growth curve* that corresponds to the underlying relationship between the experience of researchers and the level and rate of growth of individual productivity. Normally, this curve will rise relatively slowly at the outset of the research career, more rapidly once the professional apprenticeship period is completed, and more slowly again during the latter career stages. Appendix 3 provides sample grades and salary indexes that utilize this principle.

- *Dual-career ladders* that are designed to provide able scientists who wish to remain in mainstream research with the opportunity to attain the status and salary levels of senior management.

- *Teaching and consultancy assignments* for mature scientists within a policy framework specifying the amount of time and relationship to normal responsibilities. However, employees are not, as a rule, permitted to engage in regular (part-time) income-earning activities outside of their normal employment. Such activities often give rise to conflicts of interest and tend to adversely affect the amount of time and commitment researchers devote to their work.

Implementation Possibilities

Since civil service systems can impose constraints on the development of desirable compensation schemes for agricultural researchers, NARS may consider the following alternative possibilities to improve the situation:

- *Organizational autonomy.* In a few cases, NARS or parts of NARS have been able to become sufficiently autonomous to devise their own personnel policies, including compensation schemes. In recent years, some have become semiautonomous foundations.

- *Researcher classification system.* In several countries, a special classification and compensation scheme has been established for all scientists, built around several of the above guidelines. This enables researchers to remain in regular government agencies while recognizing the factors needed to retain and motivate them for agricultural research. The results of salary surveys of other professional and technical groups in the public and private sectors is then used to present the case for across-the-board increases in salaries and benefits for researchers and support personnel.

- *Selective policy changes.* Another approach is to focus on making selective changes to existing grading, promotion, and salary policies, some of which would have only limited cost implications. This approach may include improvements in evaluation procedures, extended salary scales, dual-track career structures for researchers and research managers, improved salary and nonsalary allowances and fringe benefits, awards for exceptional performance, and a modified grading structure.

Nonsalary Benefits

In addition to salaries, NARS provide research staff with many other payments and nonmonetary benefits. Payments are often made for per diem allowances, transportation, housing, education of children, etc. Also, government policies often directly provide health benefits, retirement (pension) plans, and life insurance. While these policies may be established for all civil service personnel, their application is often conditioned by the circumstances of the NARS and donor-funded projects. In some cases, NARS have been able to obtain exceptions to civil service policies to respond to their own unique circumstances.

The very nature of much agricultural research requires residence in rural areas, often in relatively remote locations. This poses a serious problem for research managers in their attempts to provide incentives to motivate researchers who may, by virtue of education and acquired status, prefer to live in or near a metropolitan area. To address this problem, it may be necessary to provide adequate housing, transportation, medical facilities, and schooling for children, as well as recreational opportunities. Given the prospective difficulties in making available some of the amenities cited above (e.g., medical care and schooling), it may be necessary to reward those scientists working in remote locations with disproportionately greater training and promotion opportunities. Further, it may be necessary to implement a long-term staff rotation scheme, both to ensure adequate staffing for remote field stations and to ensure that the experience at such stations is part of the career development of each researcher. Care should be taken to minimize problems of program discontinuity in any rotation scheme.

Where salaries and normal benefits are not sufficient to attract and retain high-quality researchers, special forms of compensation are often devised or applied. These range from liberal interpretations of per diem policies to the provision of honoraria for involvement in research projects. These payments may be necessary and are useful where the civil service system emphasizes seniority instead of merit and as a selective means of encouraging and rewarding productivity. Under some circumstances, these payments have the potential for abuse and may encourage the proliferation of marginal, low-quality research activities. It is important that such policies be managed carefully and reviewed often for impact on the quality of the research output.

Another mechanism, which would both motivate staff and improve the quality of performance, is the introduction of a system of limited supplements, bonuses, or special awards based on exceptional performance alone. The system would need to include specific performance criteria that would not discriminate against staff in any discipline or function.

5. Evaluation

Effective human resource management requires periodic staff evaluations. This is normally accomplished through the establishment of an appropriately designed performance planning and appraisal system. In practice, evaluating the performance of technical and other support staff has been more common and acceptable than evaluating researchers and administrators. There is a natural reluctance on the part of researchers to allow administrators or peers (particularly those from other disciplines) to pass judgment on qualitative or quantitative aspects of their work. Despite this, there is growing acceptance of the need for an effective performance planning and appraisal system for agricultural researchers. As one NARS manager declares, "Absence of regular assessment of on-the-job performance in determining financial rewards has stifled motivation alright, but the result has been not so much high rates of attrition of staff (usually there is no alternative employer), but a general malaise or apathy."

Measures of Performance

Quantitative measures of performance for agricultural researchers are difficult to establish and maintain. This is due to the range of activity from basic to applied to adaptive research as well as to the characteristics of output from the various disciplines. This is further complicated by the fact that a researcher's actual performance may be influenced as much by available resources and facilities and the reward and promotion systems as it is by the individual's ability and output.

The most common measure of performance of reseachers is publication in professional journals where, in some cases, the more senior the staff, the more publications are required. However, this may not be entirely appropriate for those involved in important adaptive research activities. In the extreme, excessive reliance on "scientific" publications may effectively direct research output away from meeting the critical needs of the farmers the system is designed to serve. Other quantitative measures of performance may include reports issued, recommendations made and accepted by client groups, and number of projects in which the researcher is engaged. All fall short of providing meaningful and appropriate measures of researcher performance.

Because agricultural research is relatively nonrepetitive, requires creativity, and has unpredictable outcomes, the evaluation of researcher productivity is better suited to qualitative assessment. The beginning point for this is the program plan and the corresponding work plan for the researcher. It is important that personal goals be compatible with organizational goals. Once this is done, tasks can be defined and a reasonable time frame established for their completion. At the time of annual performance reviews, research managers can review output with respect to time involved, task requirements, use of effective research techniques, problems/errors, impact, etc. Over time, NARS managers can establish and communicate a set of expectations for researchers that will be understood throughout the organization.

Performance Planning and Appraisal

Performance planning for the researcher is analogous at the individual level to the organization's macro-level program planning activities. Similarly, performance appraisal is a component of program monitoring and evaluation.

Performance planning involves (1) prior and periodic elaboration of individual goals to be achieved in relation to program goals and (2) establishing criteria for measuring specific aspects of researcher goal achievements.

Performance appraisal involves a periodic and mutual assessment of actual performance in relation to desired (planned) performance. It offers the opportunity to review researcher, management, and organizational factors that may influence staff performance.

Well-designed personnel performance planning and appraisal systems serve the needs of both the organization and the individual employee. From a management perspective, a personnel appraisal system provides essential information for planning the future use of human resources. The system forms the basis for informed decisions about future training activities and about the allocation of financial and other rewards to employees. With regard to the individual employee, a well-designed and implemented personnel appraisal system is of decisive importance in maintaining and improving motivation. It provides regular feedback information on job performance, indicates how performance might be improved in the future, and generally creates a favorable environment in which individuals are able to discuss their personal growth and development in the organization. A sample form for performance appraisal is shown in appendix 4 at the end of this paper.

The following are characteristics of effective performance planning and appraisal systems:

- *Specific and accurate.* Effective performance planning and appraisal systems are based on clearly speci-fied and measurable performance standards and indicators. Only those activities that are important for successful job performance are taken into account. Other charac-

teristics, most notably the personality traits of the individual that are irrelevant to job performance, are excluded from consideration. Similarly, only the actual work done is to be evaluated, not the potential for work yet to be done. The starting point of the process is mutual agreement by management and the employee on the employee's job description and on performance goals to be achieved. The different aspects of job performance are clearly delineated, separately assessed, and then combined using a common weighting system.

- *Reliable and consistent.* Once appraisal techniques and methods are determined, effective appraisals produce consistent measurements of performance both among individuals and over time. Appraisals typically rely on both objective and subjective performance ratings. The need for reliability and consistency becomes greater as dependence on subjective estimates of performance is increased.

- *Practical and simple.* It is important that the appraisals be kept as simple and practical as possible, with a minimum of paperwork. Personnel appraisal systems can quickly become overly elaborate and complicated. When this happens, both management and employees face considerable difficulties in understanding the concepts and procedures involved, and the whole process becomes time consuming and prone to breakdowns.

- *Regular and routine.* Personnel appraisals, undertaken on a regularly scheduled basis, usually satisfy both management and individual needs. In practice, effective communication is unlikely to be maintained unless formal appraisals are completed at least once a year. For effective management, informal day-to-day contacts and interactions are also used for feedback on progress of staff towards individual and program goals.

- *Participatory and open.* Effective systems of personnel planning and appraisal are based on a high level of direct participation by employees in the appraisal process. This normally takes the form of appraisal interviews with superiors who have the best direct knowledge of the employee's past performance. Past perfomance is discussed in a frank and open manner, and goals for future work, as well as strategies for performance improvement, are established. Such a system is dependent upon a high level of acceptance by employees. There are some situations where comments from the individual's own colleagues and indirect feedback from client groups can be helpful in the appraisal process.

- *Integrated with rewards.* Personnel performance planning and appraisal systems are most effective when job performance is closely linked to individual rewards. Without such an association the appraisal process becomes of marginal value and importance to both management and employees.

- *Relevant and responsive.* Performance planning, appraisal, and rewards for the individual must be directly related to the program plans and objectives of the NARS. For example, if program goals require more client orientation, individual plans and evaluation criteria need to be responsive in terms of research activities, procedures, and locations. In such a case, the performance plans and reward structure would encourage publications for extension workers, and personnel policies would provide sufficient incentives for living and working in remote locations.

High levels of responsibility and commitment throughout the management hierarchy are necessary for personnel planning and appraisal systems to be effective. In practice, many managers are reluctant to be critical of colleagues as subordinates in a merit-based system. Consequently, there are often strong tendencies toward excessive leniency in rating employees and/or excessive bunching of evaluation ratings within a narrow range of values.

Managers can be taught to evaluate personnel performance. Critical skills include the ability to (1) be an "active listener," (2) empathize and communicate effectively with subordinates, (3) be supportive rather than excessively critical, and (4) develop short- and long-term plans for individual improvement. In general, appraisal systems are most effective where managers have a basic understanding of researcher motivation and the socio-psychological aspects of job behavior and performance.

An effective performance planning and appraisal system requires a capacity for employee counseling. Continuous interaction between the researcher and program managers will facilitate performance consistent with program goals and norms within the institution. Where there are difficulties in reconciling program and individual goals and problems arise between researchers, counseling by someone other than a supervisor may be required. NARS are well served to identify a senior person who can serve to resolve conflicts and assist staff in achieving job satisfaction.

SECTION II — ORGANIZATIONAL BEHAVIOR FACTORS

A primary task of research managers at all levels is to create the appropriate policy, technical, and social environment within their organization — one that facilitates the effective and efficient performance of research personnel within a NARS. Performance is normally viewed as effective if it corresponds to and achieves organizational objectives. It is efficient if it achieves the highest research output possible from the combination of resources and knowledge at its disposal. An understanding of the social structure of

the research system and the values of the researchers is basic to the task of improving personnel and organizational performance.

As stated in the section on evaluation, the performance of agricultural research personnel is sometimes difficult to define and certainly difficult to measure. Managers who understand the factors that motivate their research personnel to improve their performance will be in a good position to influence and improve the overall productivity of the organization. Management for research and development activities requires a balance between flexibility to encourage creativity and direction to ensure that organizational and program goals and objectives are served.

Researcher performance can be improved by the effective execution of the five management tasks described in the previous section. There are, in addition, several organizational behavior factors that influence researcher performance and that research managers can develop and improve their capabilities to handle. The first is understanding researcher motivation. The second is managing interpersonal and group behavior through effective leadership, team building, improved communication, and conflict management.

1. Researcher Motivation

What motivates agricultural researchers varies from culture to culture and from organization to organization. There are, however, some concepts that are useful for review and evaluation by all NARS managers, since they are common across cultures and organizations. Many of these concepts are embodied in the Maslow theory of human needs and the Herzberg theory on motivation. Maslow's theory states that individuals will behave in such a manner as to meet a hierarchy of needs from the basic to the more complex. According to the theory, the order of human needs is as follows: physiological (survival), security (safety), belongingness, self-esteem, and self-actualization.

Herzberg's theory looks at motivation from the standpoint of job *context* (environmental factors) which may cause dissatisfaction and job *content* which relates to the satisfaction of research personnel. The former, called "hygiene factors," includes company policy and administration, supervision, working conditions, interpersonal relationships, money, status, job security, and effects of the job on a researcher's personal life. The latter, called "motivators," includes achievement, recognition, work itself, responsibility, advancement, and professional growth. Within a NARS, it is important for managers to evaluate the importance of these satisfiers and dissatisfiers in order to improve the performance of human resources.

Based on past and current research, there are several important motivational requirements that influence the behavior and performance of agricultural research personnel. These may be placed in the following categories for consideration and appropriate action by NARS managers: personal, administrative, professional, and organizational. Each of these motivational requirements or factors can be assessed for both importance and adequacy within the research organization.

- *Personal.* Personal motivation factors for agricultural researchers combine the human needs defined by Maslow as physiological (survival) and security (safety), and the environmental factors discussed by Herzberg. For the most part, personal factors are considered to be dissatisfiers or demotivators. In other words, if they are not adequate, they have a very negative impact on performance. Included are
    - job security;
    - sufficient financial support for self and family;
    - equitable financial and status rewards;
    - suitable living conditions.
- *Administrative.* The motivational factors considered to be administrative relate to the support required to successfully and satisfactorily complete a research activity. These may be considered to be maintenance factors in that they are neither strong dissatisfiers nor satisfiers. Included in this category are
    - operating supplies and services;
    - equipment and tools;
    - transportation;
    - experimental land;
    - amount and quality of technical staff;
    - amount and quality of labor;
    - scientific literature/library;
    - advice from experimental researchers.
- *Professional.* The professional motivation factors for agricultural researchers are a combination of Maslow's self-actualization needs and Herzberg's motivators. These factors are viewed as satisfiers or positive motivators for agricultural researchers. Included are the following:
    - freedom to choose research problems on which to work;

- opportunity for professional advancement;
- promotion based on merit;
- scientific recognition;
- opportunity for advanced education;
- contact with other scientists;
- freedom to publish research results;
- utilization of research results;
- opportunity to train subordinates.

- *Organizational.* In addition to personal, administrative, and professional motivation factors, scientists have expectations of the organization and of management that influence their performance and behavior. These are also motivational factors and may include
  - scientifically trained management;
  - management with a reputation for scientific achievement;
  - organization with a reputation for scientific achievement.

How agricultural researchers perceive the relative importance of various motivational factors is critical to their performance. It is possible for NARS managers to assess both the importance and adequacy of motivational factors within their organization through surveys, staff consultations, and performance appraisals. ISNAR is currently initiating research to explore this important management area in more depth.

2. Interpersonal and Group Behavior

The relationships among agricultural researchers, individually and in groups, require careful management for effective individual and organizational performance. Inter- and intradepartmental cooperation is required to handle the breadth of disciplines for even a single research problem as well as for engaging the various support services and managing the diverse functions of the research process. To influence interpersonal and group behavior, managers need to understand leadership, team building, improved communications, and conflict management.

Leadership

Agricultural research organizations require a style of leadership and management that allows a diverse group of highly trained and potentially creative individuals to work individually and together to achieve organizational goals and objectives. The style of leadership of a NARS and its various administrative and program units is dependent upon factors relating to the manager (personality, confidence, values, motivations), the researchers (motivation, education, experience, commitment, understanding of organizational goals), and the organization itself (mandate, resources, responsiveness, place in society). Many of these factors can be addressed by NARS managers to improve researcher and, thereby, organizational performance.

Few agricultural research managers have received training in management. In many cases, they are in their positions by virtue of their excellent research and, therefore, have the full respect of their colleagues. This is an important and necessary requisite for effective research management, but management skills are also required. Management training is available for the development of both functional and process-oriented skills. One of the most important of the process-oriented skills is the ability to manage/lead in an atmosphere that places high values on collegiality and creativity. Such leadership requires a balance between highly directive, authoritative approaches and entirely nondirective, "hands-off" approaches. While different situations may, in fact, require different approaches on the part of research managers, a participatory approach, with a concern for both the researcher and the task to be performed, has been found to be the most effective.

Research managers can learn much about their own leadership styles and the perceptions of others about these styles through the self-assessment exercises now available in agricultural research training programs.

Team Building

The building and management of team-oriented activities to meet program objectives has always been an important activity of agricultural research managers. In recent years, however, NARS have given greater attention to client-oriented, farming systems, and problem-oriented research. This has focused the attention of research managers on the need to build effective, multidisciplinary teams of researchers in projects involving multiple locations. In some cases, these teams have included professionals from other agencies, such as extension, and from primary client groups, such as farmers.

The performance of researchers in a team requires careful and effective management. This includes a clear specification of the tasks required of each team member, a common understanding of the objectives of the activity, a legitimization of the activity, and a reward system that encourages teamwork. The ability to manage interpersonal conflicts and develop group cohesiveness is essential to achieving an effective level of performance from researchers in team activities.

Communication

Many NARS now have communication units that perform a variety of communication tasks, including public relations, internal communications, and the transfer of research results to client groups and funding agencies. The performance of researchers is dependent on a flow of information from external knowledge sources (including client groups), between and among discipline groups, and between and among themselves, managers, and support personnel.

Communication within a NARS can be difficult because of the high degree of specialization of researchers, the value placed on individual thought and creativity, and the degree of autonomy often granted to units in the research organization. While it is obvious that communication cannot be left to chance, excessive communication can be time consuming and expensive. Managers can encourage informal communication through such mechanisms as periodic social events, sports activities, dining and recreation rooms, and professionally oriented field trips. Formal communication can occur through regular staff meetings with agendas, research teams, limited committee activities, publications (newsletters, annual reports, and circulated research reports), and periodic research reviews.

The development of interpersonal communication skills is essential for NARS managers to obtain the optimal performance of agricultural researchers. Training programs exist to facilitate the development and utilization of these skills.

Conflict Management

Agricultural research organizations are not immune to conflict. In fact, the diffusion of authority, the diverse character of the staff, and the nature of the research process itself all contribute to the potential for serious conflict within a research organization. Achieving good performance from research personnel requires (1) the acceptance of conflict as inevitable within an organization, (2) a good understanding of types of conflict situations, and (3) the management skills to respond appropriately.

The experience of a NARS manager in Africa leads him to conclude, "Some research managers find it very uncomfortable to deal with conflicts. In such situations, there is little or no teamwork and a minimum of communication of staff at all levels. There is also a tendancy for backbiting and berating of other researchers, especially the weak ones. If the conflict situation goes on for too long, the whole institution falls into disarray, and the removal of the institute head is inevitable."

A modest amount of conflict can be healthy and functional for a research organization, since it may offer opportunities for exploring new concepts and for dealing with underlying factors contributing to poor performance. If conflict is viewed as inevitable rather than avoidable, it can be used as a catalyst for positive change in the organization. Conversely, if conflict is suppressed, it can lead to negative behavior on the part of research staff and can reduce the opportunities for creative responses.

There are several types of situations where personnel conflict can occur. The first type is where the objectives of the researcher and the organization do not coincide. The second type is where there are challenges of authority at any level. The third type relates to the problems between classifications of personnel, e.g., researchers and technical support staff. The fourth type is where horizontally related groups such as departments have problems because of task or resource interdependence. A fifth type is where research personnel have problems with external groups such as clients and political groups. And, finally, there may be conflicts that are related to differences in personalities.

In dealing with conflict, managers need to define the problem carefully before deciding on an appropriate strategy for a response. Four types of conflict management strategies have been identified (Arnold and Feldman 1986: 225): avoidance, defusion, containment, and confrontation. An example of an avoidance strategy is ignoring the problem when it appears to be a trivial issue. Imposing a solution when decisive action appears to be warranted may also be an avoidance strategy. Smoothing over a tough situation before it becomes more difficult is an example of a defusion strategy. An example of a containment strategy is where a manager bargains with the conflicting parties, given the fact that several acceptable solutions may be available. One might employ a confrontation strategy by redesigning the organization to improve the coordination of research efforts. While none of these strategies is necessarily wrong, it is possible to employ the wrong strategy for the conflict at hand.

Experience and judgment are important in conflict management. Through effective leadership and good communication with research staff, NARS managers can use conflict to the advantage of the organization. Creating a dynamic and open climate for researchers will help reduce the potential negative aspects of conflict situations. In dealing with conflict, the importance of understanding the factors that motivate research staff in a NARS cannot be understated.

References

Arnold, Hugh J. and Fedlman, Daniel C. 1986. Organizational Behavior. New York: McGraw Hill Book Co.

Arnon, I. 1968. Organization and Administration of Agricultural Research. Amsterdam: Elswier.

Ranftl, Robert M. 1978. R&D Productivity. Los Angeles, CA: Hughes Aircraft Co.

APPENDIX 1
Major Components of a Complete Job Analysis for Agricultural Research Staff

1. Job title, work location, and salary range
2. Experience, training, and education requirements
3. Training required after employee is hired
4. Previous jobs in the organization likely to qualify employee for this job
5. Future jobs for which employee may qualify by successful performance
6. Analytical, technical, and behavioral skill requirements
   - kinds of equipment to be operated (e.g., computer)
   - interpersonal skills (e.g., communicating with farmers)
   - technical knowledge (e.g., genetics for plant breeding)
   - technical skills (e.g., statistical analysis)
   - physical skills (e.g., walking 5 kilometers per day)
7. Performance standards for each type of skill, including frequency of use and level of expertise required
8. Working conditions relating to travel, stress, safety, etc.
9. Role relations: Who evaluates? Who supervises? Who provides information, supplies, and other services? Who receives information and reports on work?
10. Decision-making authority: time span, magnitude, and review procedures

SOURCE: Adapted from U.S. Training and Employment Service. 1972. Handbook for Analyzing Jobs. Washington, DC: US Government Printing Office.

APPENDIX 2
Sample Grading Scheme for Agricultural Researchers

Professional Grade	Requirements
Assistant Researcher	Recognized first-degree professional qualification. High potential to undertake research with appropriate attitudes and intellectual competence.
Researcher I	Successful completion of 4- to 5-year professional apprenticeship as assistant researcher involving structured on-the-job training and supervision, and completion of master's level postgraduate degree training.
Researcher II	Normally a minimum of 5 years of service as Researcher I. Demonstrated ability to undertake, with appropriate supervision, good-quality and relevant agricultural research.
Senior Researcher	Normally a minimum of 5 years of service as Researcher II. Consistent performance as a mature, productive researcher able to train and supervise junior colleagues. Acquisition of relevant PhD degree training would normally assure promotion to this grade.
Principal Researcher	Normally a minimum of 5 years of service as a Senior Researcher. Recognized specialist with a national and international reputation and a record of extensive original research. Above-average performance.
Chief Researcher	Normally a minimum of 5 years of service as a Principal Researcher. Exceptional qualities as a researcher with an outstanding publications record and clear evidence of research impact on agricultural productivity.

APPENDIX 3
Sample Grades and Salary Indexes for Agricultural Researchers

Years of Service	Grade	Index	Annual Increase
1	Assistant Researcher	199	—
2		103	3.0
3		106	3.0
4		109	3.0
5		112	3.0
6	Researcher I	123	10.0
7		128	4.0
8		133	4.0
9		139	4.0
10		144	4.0
11	Researcher II	158	10.0
12		168	6.0
13		178	6.0
14		189	6.0
15		200	6.0
16	Senior Researcher	220	10.0
17		229	4.0
18		238	4.0
19		247	4.0
20		257	4.0
21	Principal Researcher	283	5.0
22		290	2.5
23		297	2.5
24		305	2.5
25		312	2.5
26	Chief Researcher	321	3.0
27		326	1.5
28		331	1.5
29		335	1.5
30		341	1.5

APPENDIX 4
Performance Appraisal Form

Name _____

Department/Station _____

I. REPORT ON QUALITIES AND PERFORMANCE

A. Scientific and Research

1. SCIENTIFIC INTEGRITY

Outstanding for integrity in his/her research	1 ☐
Maintains a high standard of honesty in research	2 ☐
Generally reliable scientifically	3 ☐
His/her scientific integrity leaves something to be desired	4 ☐
Unreliable scientifically	5 ☐

2. ORIGINALITY AND INITIATIVE

Always full of good research ideas	1 ☐
Usually makes a valuable contribution	2 ☐
His/her solutions are usually adequate	3 ☐
Seldom takes constructive action	4 ☐
Fails to respond to a new situation	5 ☐

3. SCIENTIFIC KNOWLEDGE AND ATTAINMENT

Exceptionally wide, thorough, and up to date	1 ☐
Considerable breadth or depth of knowledge	2 ☐
Sound within his/her field	3 ☐
Narrow or out of date	4 ☐
Inadequate	5 ☐

4. OUTPUT

Outstanding in the amount of work he/she does	1 ☐
Gets through a great deal of work	2 ☐
Output satisfactory	3 ☐
Does rather less than expected	4 ☐
Output regularly insufficient	5 ☐

5. INTERPRETATION OF DATA

Exceptionally good use of data and results	1 ☐
No difficulty in reaching good conclusions	2 ☐
Uses data satisfactorily	3 ☐
Not good at interpreting results	4 ☐
Fails to use data effectively	5 ☐

6. PUBLICATIONS

Outstanding in prompt and excellent publication of work	1 ☐
Maintains a high standard of publication	2 ☐
Publications of good quality	3 ☐
Written work just good enough to get by	4 ☐
Inaccurate and slow in publishing	5 ☐

B. Personal

7. PERSONAL RELATIONS

Retains highest regard and respect of all	1 ☐
Is generally well regarded and respected	2 ☐
Gets on reasonably well with others	3 ☐
Not very easy to get along with	4 ☐
Very difficult person	5 ☐

8. RESPONSIBILITY AND RELIABILITY

Accepts responsibility at all times; distinguished for reliability	1 ☐
Very willing to accept responsibility; highly reliable	2 ☐
Accepts responsibility as it comes; generally sound	3 ☐
Inclined to refer matters he/she could decide; not too reliable	4 ☐
Avoids taking responsibility; unreliable or careless	5 ☐

9. QUALITY OF ORAL EXPRESSION

Exceptionally effective	1 ☐
Clear and convincing	2 ☐
Expresses him/herself adequately	3 ☐
Not an effective speaker	4 ☐
Cannot express him/herself clearly	5 ☐

10. JUDGMENT AND DISCRETION

Displays exceptional wisdom, foresight, and discretion	1 ☐
Always sensible and discreet	2 ☐
Handles most situations adequately	3 ☐
Tends to be indiscreet or erratic in judgment	4 ☐
Judgment is faulty	5 ☐

C. Administrative

11. Leadership

A natural leader; always inspires subordinates	1 ☐
Inspires others and manages staff very well	2 ☐
Exercises adequate control over staff	3 ☐
Does not inspire subordinates or control them well	4 ☐
A follower	5 ☐

12. Organizing ability

A brilliant organizer	1 ☐
Very effective in organizing work	2 ☐
Plans and directs work satisfactorily	3 ☐
An indifferent organizer	4 ☐
Has no organizing ability	5 ☐

13. Ability to deal with finances and facilities

Distinguished for ability to handle resources	1 ☐
Manages finances and facilities very well	2 ☐
Adequate in resource use	3 ☐
Indifferent in dealing with money and facilities	4 ☐
Poor at dealing with money and facilities	5 ☐

D. Conduct and Punctuality

Satisfactory . . . . . ☐
If not, explain under "Other Observations."

II. OVERALL ASSESSMENT OF PERFORMANCE IN PRESENT POST

Outstanding in all respects . . . . . .1 ☐
Very able and effective . . . . . .2 ☐
Competent . . . . . .3 ☐
Not fully up to standard . . . . . .4 ☐
Unsatisfactory . . . . . .5 ☐

III. OVERALL ASSESSMENT OF FUTURE POTENTIAL

Likely to stand out in higher grade . . . . . .1 ☐
Well fitted for immediate promotion . . . . . .2 ☐
Now ready for promotion . . . . . .3 ☐
Likely to qualify for promotion in time . . . . . .4 ☐
Unlikely to qualify for a higher grade . . . . . .5 ☐

IV. REPORTING OFFICER'S OTHER OBSERVATIONS AND CERTIFICATE

Note any comments not already covered.

In my opinion, the ratings of the officer are as stated.

Signature_____ Date_____

V. COUNTERSIGNING OFFICER'S OTHER OBSERVATIONS AND CERTIFICATE

Note any general comments. If you disagree with any rating by the reporting officer, please indicate which you consider correct by marking the appropriate box in the category with an x and initialing it.
In my opinion, the ratings are correct, subject to any amending entries or remarks that I have made and initialed.

Signature_____ Date_____

Appendix 5
An Agricultural Research Management Perspective on Human Resource Information Systems

Larry Zuidema

Introduction

This paper is designed to be complementary to the ISNAR working paper Human Resource Management for Agricultural Research: Overview and Issues. The purpose is to provide managers of agricultural research institutions and systems with an understanding of how information about and related to human resources can be made useful and accessible for planning and implementing agricultural research programs.

Organized, accessible information about and related to human resources can be a major contributor to management decisions. Effective information systems describe the state of human resources in the research system and what changes take place over time. The manager uses human resource information together with the accumulated knowledge and wisdom, the perceptions and opinions of staff, the reactions of clientele, and organizational policies to make effective management decisions.

A distinction is made here between information about human resources and other information related to human resources. Information *about* human resources describes their characteristics and utilization in the system. This can be organized as a component of a management information system (MIS) and is often referred to as a human resource information system (HRIS). Information related to human resources describes the internal and external environments within which researchers function and about which policies and procedures can be made. An example of this related information is a list of training opportunities for research staff.

This paper focuses on the development and use of an HRIS for program management, i.e., for analytical rather than purely administrative purposes. Other organized information related to human resources which can be effectively utilized along with an HRIS is also identified and briefly described. The topics of this document are the rationale for an HRIS, organization of information, outputs, sources of information, managing information, computers and software, information for human resource management (HRM) tasks, and a summary.

1. Rationale

Many NARS have grown rapidly in the past decade in both size and scope of activity. In such a situation, it is essential that the structures and tools of human resource management be adequate for the tasks that must be perform. One very useful tool for agricultural research managers is an organized information system.

The effective management of human resources for agricultural research requires the continuous availability of relevant information in a usable form as well as a process for data analysis. An information system can be designed to provide managers with a comprehensive understanding of the current situation relating to research personnel. It can also be designed to make projections into the future. Such a system will contribute substantially to the research manager's ability to deal with each of the five areas delineated in the overview and issues paper: planning, staffing, development, compensation, and evaluation of human resources.

The basic rationale for an HRIS and the maintenance of related information for human resource management is to improve the decision-making capability of research managers to serve the goals, objectives, and program plans of the NARS. An HRIS, therefore, becomes an integral part of the processes of strategic planning, programming, monitoring, and evaluation of a NARS.

An HRIS is usually designed to be utilized by all levels of management, including agriculture ministries, agricultural research institutes or councils, research stations, and in some cases, research programs. The HRIS provides information that responds to questions about human resources in relation to projected program activities. Outputs of the system contribute to: recruitment plans, training plans, work plans, and decisions on redeployment, compensation, promotions, and staff motivation.

2. Organization of Information

The HRIS is a collection of related pieces of data about current research staff. For use in management decision making, data are drawn from the data base, organized, com-

bined, and reported in ways that inform the manager about the state of human resources in the system.

An HRIS can be defined as "an integrated data base of pertinent information on people and positions that can aid managers in evaluating the present status of the human resources in their organization, formulating objectives for activities relevant to human resources, and evaluating the success of those activities at a future date" (Casio and Awad 1981: 583). The primary focus of an HRIS is to assist managers in ensuring that research objectives are met. However, the HRIS can be designed to be compatible with routine administrative tasks like salary administration as well.

The most comprehensive use of an HRIS is for information about researchers employed by the agricultural research organization. However, an HRIS should also include information about technical support staff upon whom researchers depend to perform vital research tasks. Much of the personnel data requirements will be the same for every individual. This will include personal background information, basic data on education and work experience, training undertaken, ongoing research activities, work performance, and remuneration.

A research manager needs more information than that contained in an HRIS. Some related information useful for human resource management is external to a NARS (e.g., training opportunities abroad and lists of potential recruits nearing completion of their degrees), and special efforts may be required to get this information. Some information is external to the human resource system but internal to the NARS (e.g., budget resources and program plans). Whether or not one uses a computer-based system, it is desirable to develop these files of external data to be compatible with internal HRIS data files for improved management decisions. For example, one could match specific training needs with training opportunities and quickly develop a training plan for some period in the future.

Other organized information may be developed for the following purposes:

1. *Recruitment*—Information about sources of new staff, including lists of those nearing completion of postgraduate degrees, can be organized for recruitment purposes.

2. *Training opportunities*—A listing of opportunities for specialized training, internally and externally, facilitates the matching of program needs and qualified staff with opportunities.

3. *Motivation and behavior survey*—Information from nonattributable surveys, such as for motivation and behavior of researchers, is maintained in a separate data base. This keeps the information anonymous and comparable from one time period to another.

3. Outputs of an HRIS

In creating an HRIS, a research manager first defines the desired output of the system, i.e., the reports and summaries needed for specific management purposes. Some of the reports an agricultural research manager would want to have from an HRIS include the following:

Human Resource Inventory

This is a report of the quantitative and qualitative characteristics of current research staff of the research unit or system. The inputs are primarily biographical data about research staff. The report consists of a series of tables that describe the human resource numbers, quality, and output for each of the units in a system. These would include cross-tabulations relating to staff education, discipline, age, years of service, position, publications, etc.

Human Resource Flows

This is a report of the status of human resources from one point in time to another. The information is based on the output of the inventory but is at a level of analysis that enables the manager to review the dynamics of the system. Using this information, it is possible to project future trends for human resources in the system. Statistics generated in this report include attrition rates, turnover rates, and other changes in the characteristics of human resources over time (such as improvements in numbers with postgraduate degrees).

Human Resource Deployment

This is a report about the deployment and utilization of human resources in relation to the organization and its research program objectives. Tables would show time allocations for each unit in the system for the following categories: functional responsibility (management, research, teaching, trainee, etc.), type of research (basic, strategic, applied, adaptive), commodity focus of research, location in the system, etc.

Training Assessment

This is a periodic report of short- and long-term training (ongoing and completed) for research staff in the system. The summary allows the training effort (which can be substantial in any newly developing NARS) to be monitored. The report may also include information about the training needs of individual staff in the future, derived from performance appraisals or management reports. It would show numbers of staff involved in degree training by discipline and/or unit, person-days of short-term training by unit, etc. The assessment summaries would contribute to training plans for the future.

Researcher Performance Report

A report about researcher output is necessary to assess progress towards research objectives and to prepare general and annual research reports. Output is not always easy to measure, but publications of various types remain a fairly reliable indicator of output. Quantitative data on researcher performance (e.g., from a point system) can be obtained from performance appraisal documents and can be summarized and analyzed for each unit in the system.

Compensation Review

Summary reports relating to staff salaries and allowances, grades and steps, and promotions are important for effective human resource management. Much of these data may be confidential, so it is usually necessary to restrict access. The tables of information useful to a manager include those that show numbers of research staff in each grade and step, rates of promotion, costs of various components of compensation schemes, and relationships between various characteristics of researchers and their salary levels. This information contributes to planning and policy decisions designed to retain promising and effective researchers.

Motivation Factors

The HRIS will not contain information on researcher motivation, since it usually is not attributed to individuals. Survey data can be summarized in a separate data base, however, to show what factors are most critical in motivating staff, what problems management may address to increase researcher job satisfaction and performance, and how researchers feel about management decisions. This is an area for increased attention by many NARS managers.

4. Sources of Information

In practice, many NARS already have human resource data available in the form of personnel files for each individual employee. If the data are aggregated and organized, they are often only in a form required for administrative purposes like salary administration. Some of these data, however, can become the beginning of an HRIS. Conversely, an HRIS designed for NARS management/analytical purposes can also be functional for some routine administrative purposes and to meet some of the information requirements of other supporting agencies like civil service, budget, and national development units.

Several sources of data and organized information may be utilized for an HRIS. The basic data for an HRIS may initially come from central administrative records of personnel. Those data that cannot be collected easily or reliably in this manner can be obtained directly from the individual employees themselves with a questionnaire. This would be administered to all current personnel as part of the process of establishing the information system and, subsequently, to all new personnel when they join the organization.

It will be necessary to define a procedure for the annual update of the data base at a time when the output can be used for strategic planning purposes. Some data can be updated continually as part of the process of keeping good administrative records. For other data, research staff will need to complete an annual update form. The best timing for an annual update is prior to the performance review, when the data can also be used as information for appraisal purposes.

5. Managing Information

Ideally, an HRIS is a component of a larger management information system (MIS) which includes data on program, budget, and facilities, as well as personnel. Given the importance of human resources in a NARS and the fact that some organized data already exist in personnel files, the development of a comprehensive MIS may well start with a focus on personnel. The need to relate personnel to program activities, financial considerations, and the availability of facilities will create the environment for the eventual development of a full MIS.

The creation of a formal information system is often stimulated by the need to provide reports to an external agency or donor for a very specific purpose like the management of trainees. The availability of special funds for information management activities for such a specific purpose provides an ideal opportunity to develop and implement a more comprehensive system that will serve the routine needs of a NARS.

Difficulties in establishing and maintaining an HRIS are likely to occur in situations where a NARS is a loosely coordinated system of institutes, centers, and universities. In such cases, where the normal reporting requirements and employment conditions and practices may vary considerably between organizations, an agricultural research council or other coordinating unit may be charged with maintaining the system. A means of standardizing and accessing data would then need to be developed.

Management support and long-term commitment are essential for ensuring the effective institutionalization of an HRIS. One critical component of this support is the designation of a high-level manager to the function of human resource management, either part- or full-time. Once such support and commitment are in place, the most important task is to appoint and train the individual(s) who will have the responsibility of developing (where appropriate), maintaining, and operating the information system. The actual design of the system is best developed collaboratively by senior managers and information/computer specialists.

For larger agricultural research organizations, the development and improvement of a human resource information

system should be done in stages, e.g., starting with one institute or program unit. This will permit the testing of a computer-based system on a small scale, should a computer be utilized for the HRIS.

An effective HRIS will require not only a high-level manager, but also an appropriate location in the organizational structure. While the existing structure may provide few options for any one NARS, the range of options for many would include a staff office under the director general, an office within the planning unit, a separate HRIS or MIS unit, or an office within the data processing unit, the socio-economic unit, or the personnel office. One basic decision is whether to locate the system with data providers or data users. While data providers must be part of the process, it is recommended that the operation be housed with data users. This would suggest that the management of an HRIS should be with the planning unit or a staff office of the director general. In any case, an HRIS needs a firm and respectable home in a NARS.

6. Computers and Software

Although an HRIS does not need to be computer-based, computers increase the speed and range of data access. A computer-based information system for human resource management can be created and maintained using modern and relatively inexpensive microcomputers and software packages. Such a system can be used to store large volumes of data both for analytical/planning and for administrative purposes. Effective systems are designed to meet well-defined management objectives, allow for data to be readily retrieved and analyzed, and be updated regularly.

Software

Commercial software tools that are available for maintaining and analyzing data fall into three main categories: statistical, spreadsheet, and data base management.

1. *Statistical* software is used primarily for storage and analysis of numerical information. Results of the statistical analyses are reported in tables, graphs, and standard statistical formats. Some packages can produce graphic displays of data such as box-plots and scatter diagrams.

2. *Spreadsheet* software allows easy mathematical manipulation of information that can be represented in a tabular format. The data are stored in rows and columns, much like an accountant's worksheet. Formulas that describe the relationships between the data elements are incorporated into the spreadsheet. When a piece of data is changed, all the other data elements linked to it change as well. Spreadsheets are ideal in situations where quick calculations for "what-if" analyses are required. In a human resource information system, for example, a spreadsheet could be used to determine the effect on total research expenditures of increasing the number of researchers in a certain field.

3. *Data base management* software stores related pieces of data in separate records, or sets of unique data. A computer data base stores personnel data, for example, in a format similar to physical personnel files. Each individual file folder containing data about one person corresponds to a record in the computer data base. Every record contains the same pieces of information: name, birthdate, academic specialty, etc. The complete data base is the set of all the individual records.

   Computer-based data base management systems allow data to be selected from the data base for manipulation and analysis. For example, a human resource planner could extract information about discipline specialties and relate that to research program areas. The kinds of analysis possible using a computer-based data base are usually only limited by the information that has been put into the system.

Organization of Data

Research managers perform many tasks related to human resource management. Payroll, training, and recruitment, for example, are three separate management functions, each generating and using different sets of human resource data. Information used by one subgroup within the larger human resource management system is related to information used by another because it all refers to a single employee. In a computerized system, different subsets of information can be stored in separate data base files, related to the other files in the system by an employee's name or identification code.

Developing a system of separate but related files has several advantages over a system where one file contains the full set of data. Access to data is faster, more efficient, and easier to control. Access to salary information, for example, often must be restricted. Controlling access to data sets or files within a system is easier than controlling access to fields within a file.

Creating a System

There are two basic steps involved in creating a computer-based information system:

1. Specify the goals of the information system.

2. Define the data structure.

Once these two steps are completed, appropriate hardware and software can be selected and the system can be put into operation.

Determining the goals of the information system is an important process that is often done poorly or not at all. Clarifying the purpose of the system in the beginning can ensure that expectations are realistic and can prevent wasted time, money, and frustration. In defining the overall purpose of the system, a manager identifies general problems for which an information system could be useful. The next step is to develop a set of questions whose answers will address the general problems, being as specific as possible. At this point, it is possible to decide what aggregate information is needed to answer each of the questions and to specify the information needed about individual researchers. At the end of this process, a research manager would have a set of questions to be answered and a description of the kinds of information that will provide answers to those questions.

7. Information for Human Resource Management Tasks

This section identifies the relevant questions for managers for each of the task areas identified in the HRM paper. For many of these questions, the following are indicated: (1) information requirements, (2) information sources, (3) potential information summaries from an HRIS, and (4) the organized reports to which an HRIS can make a substantial contribution.

Planning

One primary use of organized information about and related to human resources is for planning, whether annually for programs or at strategic times for policy-making. Once plans are made and accepted, implementation decisions may require even more detailed information. While planning occurs for all HRM tasks, it is a task in itself and one that focuses on the broad issues with which NARS managers must deal. Relevant questions for broad-based planning are

1. What are the tasks that need to be performed and/or expected outputs to meet program plans/requirements?

   Program-related information is absolutely essential for effective human resource planning. Program plans must be adapted and combined with information generated from an HRIS for appropriate analysis. For example, it is necessary to disaggregate commodity plans into the tasks and activities that need to be performed in order to place the plans in a human resource context. One of the products of this exercise is a task or job analysis that can later be used for recruitment purposes.

2. What resource constraints affect the utilization of human resources to meet the program requirements?

   These constraints may involve physical facilities, financial resources, transportation possibilities, organizational structures, civil service positions and policies, etc. If an MIS is already employed, this information may be readily available. To be useful with HRIS data, the constraints must be expressed in terms of their impact on human resources, i.e., facility capacities, budget available for personnel categories, ceiling numbers for staff categories, etc. Once the constraints are defined in this way and compared to the information about human resources generated from the HRIS, it is possible to identify possible trade-offs and areas for policy change. The result is a contribution to realistic recruitment targets and plans

3. Are the human resources that are required for the program, given the constraints, already in the system?

   The information generated to respond to this question comes directly from an HRIS and is utilized for many other HRM tasks besides planning per se. The basic information for each category of staff includes personal data, technical and educational qualifications, employment experience, program activities, and some measure of performance. Most of the information can be obtained from employee files, but some will come from managers or the employees themselves.

   The output and summaries constitute a *human resource inventory* which describes the characteristics of research staff (such as age, level of education, experience, etc.) by units within an organizational structure or by discipline. Various levels of analysis can be performed on the data to establish ratios, percentages, and averages which help explain what human resources are available at any given point in time in relation to the program requirements. This information and analysis can be used to generate reports on what kinds and qualities of human resources are required for a future time frame.

4. What changes are taking place in the quantity and characteristics of human resources in the system?

   To deal with this question, it is necessary to be able to analyze the information in the HRIS at two or more points in time. The summary report on *human resource flows* yields information about attrition and turnover rates, intra- and interinstitutional transfers, and trainee return rates. Managers require this information in order to predict future changes and to develop recruitment, staffing, and training plans.

5. What are the options for improving the adequacy of human resources to meet the program requirements in the next time frame?

   The options that need to be considered include the possible availability of released manpower resulting from

changes in program objectives and plans, the variety of actions that can be taken to modify the existing human resources (e.g., training), and the availability of and opportunity to hire new staff. In most cases, some mix of these options will be appropriate and/or conditioned by resource or policy constraints. The information required for this level of planning includes the inventory of human resources from the HRIS; some measures of recruitment, training, redeployment, and other staff costs based on past experiences; and external information about the sources and availability of technical and scientific staff. Budget and expense information within the organization can be used in conjunction with an HRIS on a per unit basis for comparing the costs of various positive options. A separate data base can be maintained for information about the availability of national scientific staff who are in research degree programs within and outside of the country.

These are only some of the questions for planners concerned with human resources. The end product to which the organized information would contribute at this point is an overall *manpower plan*. In the best of circumstances, this would be an integral part of a development plan for the NARS.

Staffing

It is likely that new staff will need to be added to a NARS almost every year, either to maintain staff stability or to achieve planned growth. The management activities involved in this include the development of specific job descriptions and the recruitment, assimilation, and deployment of new staff. Redeployment of some existing staff is almost always necessary to accommodate the addition of new staff in a NARS. The major questions on staffing to which organized information can contribute to management decisions are as follows:

1. What specific positions need to be created and/or filled to meet the task requirements of the system?

   Following identification of tasks that need to be performed, it is necessary to develop job descriptions and identify the numbers of positions and locations where NARS staff will be deployed. The information required comes from the *human resource inventory* and the report on *human resource deployment* that are derived from the HRIS, civil service regulations (for grades and steps), budgets, and detailed program requirements of each unit in the NARS. The output to which the HRIS will contribute is a set of job descriptions for specific positions in the system which show the education, skill, and experience levels required.

2. Where can qualified new staff be obtained for the NARS?

   In most cases, NARS either include or at least have working relations with universities and colleges from which they recruit both scientists and technical support persons. Under certain circumstances, it may be helpful to develop a separate recruitment data base to maintain information on potential candidates from those institutions who might be suitable for future positions in a NARS. This data base can be an abbreviated version of a file for an existing staff member and can include similar information. This information can be utilized for a *recruitment plan* as well as providing a basis for collaboration with other institutions with research and training capabilities.

3. How can a new staff member be effectively assimilated into a NARS?

   New staff need considerable information at strategic points of an induction period into a NARS. This includes information about personnel policies that affect them; the mandate, objectives, and programs of the NARS and unit to which they are assigned; the specific job expectations for them; their relationship to supervisors, colleagues, and staff in other units; and performance evaluation criteria. It is recommended that research managers provide this information in an organized and strategic manner for persons in each position or unit.

4. What shifts in staff location and position are necessary to meet program objectives for the next time frame?

   New program objectives, staff attrition, staff promotions, new staff employed, and returning trainees together result in significant human resource changes within a NARS each year. The inevitable result is the need to redeploy several existing staff members in terms of physical location and/or position within the organization. Information from the HRIS report on *human resource deployment* will facilitate the process of reassignment to meet projected program objectives.

* * * * * *

The information needed for staffing relates primarily to the process and effects of hiring and deploying new staff. The remaining tasks of development, compensation, and evaluation relate to modifications that have an effect on existing staff in meeting program requirements. The following explains how organized information can be utilized for detailed planning and action for researcher development, compensation practices, and researcher evaluations.

Development

One of the major and often initial uses of data bases in a NARS is for coordination of staff development (training)

activities, particularly in heavy growth periods with donor participation. Staff development includes in-house apprenticeship training, internal and external degree training, internal and external short-term training, and attendance at national and international conferences. The major staff development questions for which organized information can facilitate appropriate management responses are as follows:

1. What new knowledge and skills are needed and when?

   Changes in program priorities, turnover of staff, and requirements for new research methods and techniques contribute to a need for continued staff development. It is recommended that a training needs assessment survey be conducted annually as part of the performance appraisal. The survey would yield information about the need for short-term training in skill areas like breeding techniques, FSR methods, economic and statistical analysis, etc. It would also identify the need for degree training and for organizational behavior training to develop leadership capacities for research program management. An analysis of the information contained in the needs assessment survey will permit the manager to develop an organizational *training plan* for the year. Training plans prioritize needs by training activity and form the basis for budgeting or discussions with donors prepared to support local and foreign training.

2. Who should be trained and what type of training is appropriate?

   The HRIS provides data on past education and training activities for each researcher in the form of a *training assessment report*. This information allows managers to select individuals for appropriate education and training. Selection criteria will, of course, include factors about individuals, such as age, future potential, mobility, etc. The output is a *training plan* for each researcher which can be activated based on the availability of training programs and financial resources.

3. What training opportunities exist in the NARS, the country, and abroad?

   In larger NARS where several researchers may be involved in development activities, it may be appropriate to develop a data base of information about specific training activities within the country and elsewhere. Information about foreign opportunities is often from donors who sponsor training. Within the country, universities and private groups are often prepared to conduct training on demand. Identification of these activities in advance facilitates the process of matching needs with program opportunities.

4. What progress is being made by researchers involved in degree training?

   An HRIS can be used to monitor research staff involved in training, particularly in institutions abroad. This will allow for better planning in relation to their return and the utilization of their expertise. Recruitment plans can also be improved by the addition of this information.

Compensation

The compensation schemes for research staff are often controlled by civil service or other outside agencies. Payroll and expense records are usually maintained by the NARS for administrative purposes. An HRIS can utilize these and other data and information to facilitate career planning, to make policy and program decisions on costs, and to seek major and minor changes in salaries and other benefits. Information from a *compensation review report* generated from an HRIS can help research managers address the following questions:

1. Is the scheme of service adequate for retention and motivation of staff?

   A critical factor in retention of researchers is the potential for regular promotion in the system, including adequate increases in salary and other benefits. An HRIS can help monitor rates of promotion and identify problem positions. Persons who remain in a position too long may become stagnant and lack motivation for improvement.

2. What are the costs of staff in absolute and relative terms?

   One of the critical factors in research management is to maintain control of costs. The HRIS can be used to focus on personnel costs. Other cost information will enable the manager to see if researchers have sufficient support to be effective and productive.

3. Are researchers being rewarded for exceptional performance?

   Information from performance reviews can be combined with salary, grades, and promotions to determine if the system is rewarding those who are most productive.

Evaluation

One of the most difficult, but important tasks of a manager is performance appraisal, particularly of scientists. The task is made easier if it is developed as a performance planning and appraisal system and conducted as part of a larger planning exercise for a NARS. An HRIS can be used not only for individual performance information, but also to analyze specific elements for planning and action (e.g., to develop a training plan and activities). Management questions on

staff evaluation include the following:

1. Have individuals met performance expectations? If not, why not?

   If a NARS has established norms and expectations for researcher performance and conducts regular performance appraisals, it is possible to summarize data from the HRIS that indicate a level of performance or rating for each researcher. Since this is recorded for professional, personal, and administrative performance, the information is useful for counseling, promotions, staff development, and redeployment of staff.

2. Is overall staff performance consistent with organizational and program plans and objectives?

   The relation of researcher output to program objectives and priorities is a major concern of agricultural research managers. Summaries of publications and other indicators of performance can be generated from the HRIS to compare with program planning documents. This allows the manager to monitor and evaluate actual versus planned performance of staff.

3. What motivates staff to improve performance?

   Information relating to researcher performance comes from the performance appraisal data for each individual in the HRIS and from a nonattributable survey completed periodically by research staff. Researcher performance reports from the HRIS provide basic information about levels of performance. The survey provides more direct information about staff perceptions of the critical factors that motivate them to improve their performance. The output of these two sources is a *researcher performance report*, which contributes to policy decisions relating to human resource recruitment, deployment, compensation, and development. It is also useful for counseling and crisis management.

4. What actions are required to assist staff in meeting performance expectations?

   Performance appraisals and surveys yield information about the reasons for a particular level of performance. Some of these relate to researchers, but often they relate to the organizational and program environment conditions over which a manager has some control. An effective information system will allow managers to evaluate the effects of policies and procedures that influence staff performance.

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Summary

Effective research management requires a continuous flow of information, particularly about the utilization of human resources in relation to changing program objectives and priorities. It is important that this information be useful for planning and management purposes, that it be reasonably accurate and comparable from year to year, as well as from unit to unit. It should be easy to obtain, update, and analyze for specific actions and should be presented in a clear, easily understood format. Also, the information should be readily accessible to and functional for managers at all levels at which human resource decisions and actions are required.

Research managers require reasonably accurate data about the following: the number of research personnel available in various categories, the qualifications and maturity of these persons, past experience and future potential for recruitment, the deployment of staff, levels of training of staff, program activities of research staff, and the level of staff productivity.

An effective system organizes information in anticipation of the annual planning/budgeting cycle and, thereby, is effectively integrated into a planning, budgeting, and monitoring system. This means, for example, that the process of performance reviews would yield information for the system about allocation of staff time to a particular activity and/or commodity. Given a change in activity and/or commodity focus in the next planning time frame, such information would form the basis of decisions about recruitment, training, and redeployment of staff.

A minimum data management system specifically designed to allow comparisons between various units at all levels within a NARS can be readily established. Such a system incorporates standard items of data and includes some standard types of analysis and reports. One advantage of the system is that it shows norms and ranges for several management factors such as ratios between scientists and technical support personnel. The structure of the system makes it possible for institute managers to compare specific management factors for their organization with those for other institutes and for NARS managers to do the same with respect to other NARS. The system would contain standard statistics that allow for the monitoring of changes from year to year.

References

Casio, Wayne F. and Awad, Elias M. 1981. Human Resource Management: An Information Systems Approach. Virginia: Reston Publishing Co.

II

Strategic Human Resource Planning

STRATEGIC PLANNING FOR HUMAN RESOURCES IN NATIONAL AGRICULTURAL RESEARCH SYSTEMS

Luka O. Abe and Paul Marcotte

One of the most important tasks of a research leader is to develop a cadre of experienced research personnel of the proper size, mix and educational level, and to inspire them to give outstanding performance.

With people who have been carefully selected to do specific tasks, who are skillfully coached to do that task, and, above all, who are highly motivated, there is almost no limit to what can be accomplished, even with less-than-ideal facilities and budgets.

John L. Nickel
(Research management for development. Letter to a newly appointed director in agricultural research. IICA, 1989.)

Corporate Strategic Planning

Strategic planning is the process by which an organization develops the most desirable vision of the future, taking into account the constraints it is likely to work within and how it can realize that vision (Taylor 1988). Strategic planning stresses the analysis of the forces of change in an environment, both internal and external.

Strategic planning demands creativity in crafting this vision, which offers strategic choices, that is, possible ways in which the organization may be shaped for an efficient and effective performance over a long-term perspective (five to 10 years).

In this analysis, the organization looks at certain features critical to its strategy and operating tasks. The strengths, weaknesses, opportunities, and threats (SWOT) to an organization's well-being and effective performance must be assessed.

Many national agricultural research systems (NARS) are responding to this planning approach in a proactive or reactive fashion, particularly as the competition for scarce resources stiffens; thus, emphasizing the need for strategic management of resources.

NARS work toward optimizing productivity and performance in meeting national agricultural research policy; their research efforts produce information and a pool of highly skilled researchers and scientists whose knowledge and experience are national assets to be used on a continuous basis. It is to be recognized that the raison d'etre and objectives of the NARS may be stated as follows (Haworth 1973):

1. to make available to government, on a continuous basis and in the appropriate form, information on which the agricultural development plans for the country can be based, for example:

   a. medium- and long-range market forecasting, both local and worldwide;

   b. the suitability of different zones for the production of the commodities and livestock required, in competition with other forms of land use;

   c. detailed technical information about storage, transport, and handling of produce to ensure minimal postharvest losses;

2. to make available to the extension service, and so to the farmer, detailed agronomic and economic information on which to base the production of crops and stock;

3. to estimate the national resources of land, capital, labor, and other expendable items (agronomic inputs — fertilizers, insecticides, etc.) likely to be needed to carry out the national agricultural development loans, while maintaining or improving the national land capital, especially its quality as measured by productive capacity;

4. to develop and maintain a body of well-trained, competent scientists in all relevant disciplines in *active research positions*, to carry out an on-going research program on a minimum five-year rolling program.

In other words, these objectives also serve as indicators of the performance of the NARS; they constitute the key factors of success of the organization.

Perspectives of Human Resource Management Functions

Once a research strategic plan has been formulated, a NARS will undertake strategic human resource planning as it forms part of the overall corporate plan. In this process, all the programs, projects, and activities related to the human resource management (HRM) functions such as recruitment and selection, staffing, performance assessment and appraisal, reward and control systems, and training and development must be designed, implemented, and evaluated in the context of the organizational mission, business strategy, goals, and objectives.

One of the deficiencies of human resource utilization and management in many NARS is that human resource management functions are not linked to an organization's overall strategic plan, often resulting in both qualitative and quantitative shortages. Worse, it is not uncommon for organizations to have *no* operational strategic plan. Within countries in the Southern African Development Coordinating Conference (SADCC), many NARS have realized the need for strategic planning and are thus developing them, or are striving to do so.

Definition of Strategic Planning for Human Resources

What then is strategic human resource planning and how can it be achieved? Strategic human resource planning is the process used to establish resource objectives, to develop strategies to obtain objectives, and to operationalize functional programs to acquire, develop, maintain, and manage human resources (Nkomo 1988:67). In accordance with this understanding, there are four distinct but interrelated activities/stages:

1. establishing objectives;
2. developing strategies;
3. operating the functional area programs;
4. managing the operational human resource plans and programs.

The conceptual model for this approach to strategic planning for human resources is illustrated in figure 1.

Stage I: Diagnosis

There are three steps to stage I: background, synthesis/ analysis, and defining the issues.

Information and data collection is the first step of stage I, the process of establishing objectives. This requires the integration of an analysis of the overall governmental policy, of part of the external environmental factor, and of the internal human resources of the NARS. As each of these analyses has an impact on the selection of human resource objectives, a strategic plan for human resources that lacks one of these is incomplete and likely to be ineffectual.

As stated above, strategic planning for human resources is possible only when there is an overall institutional or corporate strategy. For the NARS, this means a strategic plan for agricultural research, specifying the national commodity research priorities relevant to national agricultural development policy, as well as the optimal structure and organization of the NARS, its research programs, and the resources (including human) allocated to operationalize the plan.

Policy Objectives

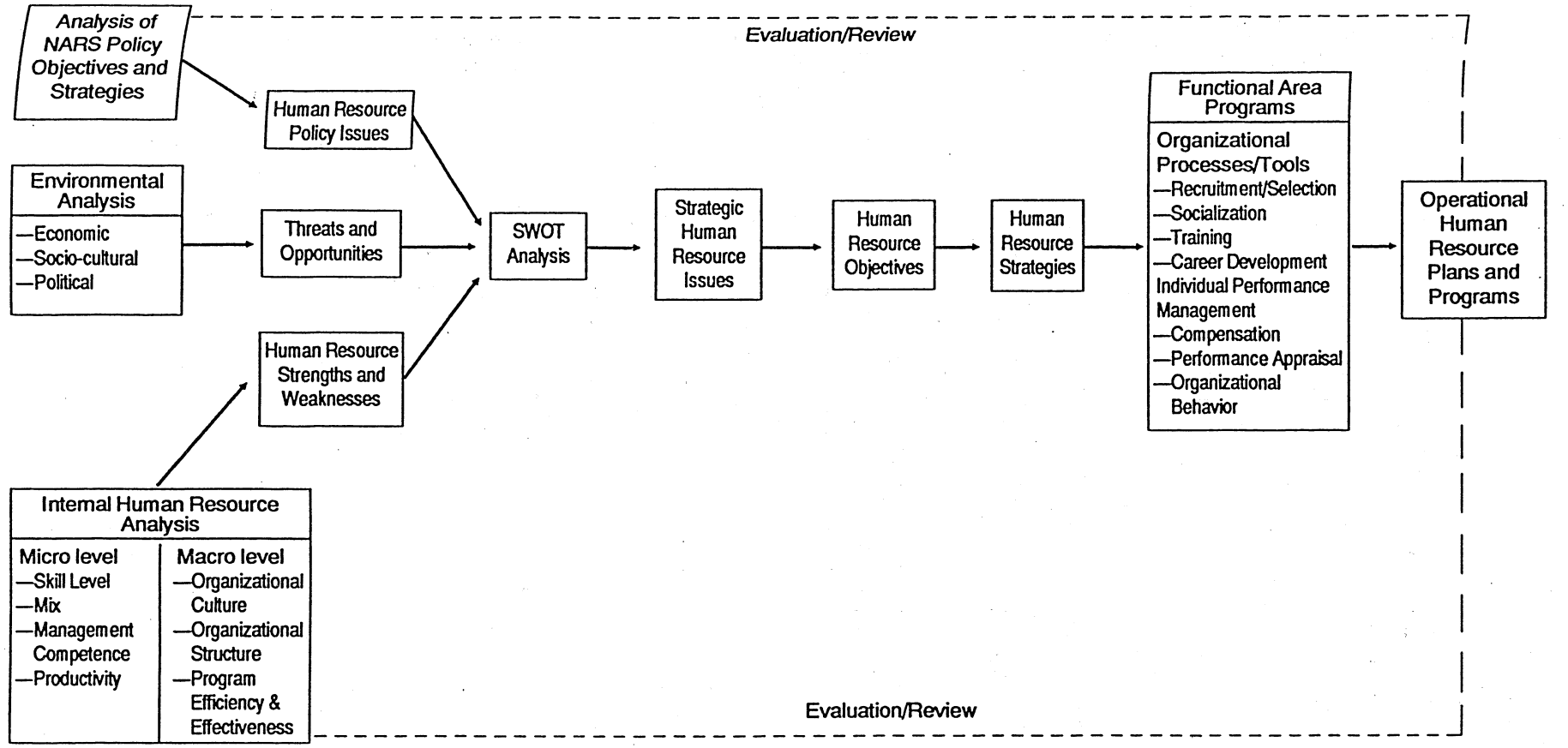
Empirical evidence indicates that often the major objectives of food policy in developing countries may be difficult to identify. This is mainly due to the fact that the objectives must of necessity satisfy differing sets of goals at the same time. Objectives must be deduced from official policy statements, on the one hand, and the implementation of programs and policies on the other. These objectives may be conflicting or mutually reinforcing, depending on the tradeoffs between producer and consumer, efficiency and self-sufficiency, and improved technology and distribution of income (Marcotte 1986:243).

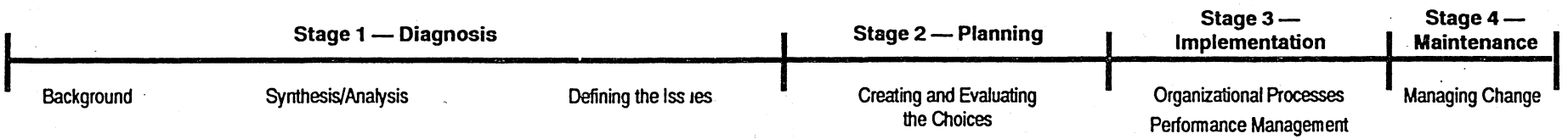
An analysis of the food policies of third-world countries indicates that there are eight common policy objectives:

1. Adequate and stable food consumption. This objective focuses on the provision of adequate nutrition and caloric intake.
2. Consumers' welfare — cheap food. This objective is usually directed towards the urban consumer to ensure that undue hardships are not imposed.
3. Producers' welfare — income generation for farmers. This policy is designed to increase food production and improve the income and standard of living of the producers by increasing returns over the prices that would be obtained without government intervention.
4. Generation of government revenue. An attempt by government to generate revenue (by taxation of export crops, for example).

Figure 1. Strategic Planning for Human Resources — A Conceptual Model

*Figure 1. Strategic Planning for Human Resources — A Conceptual Model**





*Adapted from Nkomo. 1988. Strategic Planning for Human Resources. *Long-Range Planning* 21(1):66-72.

5. Generation/conservation of foreign exchange. Conservation of foreign exchange can be accomplished by emphasizing the production of import-substitution crops or by utilizing concessional types of information.

6. Food self-sufficiency. An adoption of this type of objective may be extremely costly in terms of loss of internal welfare due to price restructuring or inadequate supplies for consumption.

7. Stable domestic food prices. This policy may hurt those consumers who are least able to purchase, as well as creating disincentives for producers.

8. Increased food production. This may be an intermediate objective to self-sufficiency, higher income, and foreign exchange.

All or some of these policies may be in evidence in a specific country. An analysis of selected country documents and reports indicates different policy arrays depending on the specific political and policy circumstances. These combinations of policy choices are illustrated in table 1.

It is from this array of national development goals that NARS derive their agricultural development goals. For example, many NARS select from the goals shown in table 2.

For example, a SADCC NARS determines its national commodity priorities based on national development goals, as shown in table 3.

Before the human resource objectives are set, NARS managers have to undertake environmental analysis of the organization related to the state of human resource development in the country. Factors such as the availability of agricultural researchers (in qualitative and quantitative terms); financial and funding considerations of the NARS; general economic conditions, such as agricultural gross domestic product (AgGDP) and the availability of scholarships, etc.; technological forecast, such as appropriate technologies to meet client needs or sociocultural considerations, such as, the role of women in national agricultural development, etc., and the competitive advantage of agricultural research to other disciplines in the general labor market.

Table 1. Government Food Policy Objectives for Twenty-One Developing Countries

Region country	Consumer welfare	Producer welfare	Government revenue	Foreign exchange	Self-sufficiency	Stable price	Food security
Africa:							
Botswana		x			x		x
Kenya		x		x	x		x
Mali		x			x	x	
Morocco					x		
Nigeria		x			x		
Senegal		x			x		
Sudan		x		x	x		
Tanzania					x		
Asia:							
Bangladesh	x	x		x	x	x	x
India	x	x			x	x	x
Indonesia	x	x			x	x	x
Philippines		x			x	x	x
Sri Lanka	x	x			x	x	
Thailand	x	x	x	x		x	
Latin America:							
Brazil	x			x	x		
Dominican Republic	x			x	x		
Guatemala	x	x	x	x	x	x	
Haiti		x				x	
Jamaica		x					
Paraguay		x		x			
Peru	x	x					x

Note: x indicates presence of objectives.
Source: Country Analysis in IED/ERS; Marcotte (1986:247).

Table 2. National Development Goals

NARS derive agricultural development goals from among the following alternatives:

- Increased food production
- Increased export products
- Increased agricultural products for domestic industries
- Increased productivity of land, labor, and inputs
- Ensured agricultural stability
- Encouragement of rural employment
- Conservation of natural resources
- Protection of health
- Increased agricultural profitability
- Reduced crop losses
- Improved product quality

Source: Abe (1989).

Table 3. National Commodity Priorities

Priority I	Priority II	Priority III	Priority IV
Maize	Cotton	Sorghum	Sheep
Rice	Cassava	Pastures	Barley
Groundnut	Wheat	Soyabeans	Chickpeas
Cattle	Vegetables	Sweet potatoes	Guar Beans
Beans	Irish potatoes	Spices	Rabbit
Tropical fruits	Temperate fruits	Millets	
Poultry	Pigeon peas	Cowpeas	
Tree nuts	Goats		
Coffee	Sunflower		
	Pigs		

Environmental Analysis

The second component of a background is an environmental analysis. NARS managers must undertake an environmental analysis of the organization in relation to the state of human resource development in the country. The key elements of environmental analysis are demographics, economics, technology, sociocultural constraints, labor market, and enabling legislation of the NARS. Analysis of these elements identifies both threats and opportunities that affect human resource issues and the setting of human resource objectives. The next section briefly describes the key areas that must be documented in each of these elements.

Economic Environment

In analyzing the effect of the economic environment on human resources, it is necessary to view the situation from several perspectives, including (but not limited to) pricing policy, fiscal and monetary policy, production, demographics, and technology. The economic environment incorporates resources such as labor as inputs and technology as outputs.

Economics. When conducting an analysis on the economic environment to identify strategic human resource issues, one should focus on the following:

1. the *prevailing* price system in the country or region, since, in a market economy, resources such as labor, land, and capital will be allocated following relative price signals. This directly and indirectly affects the demand for skilled manpower;

2. the relationship between development policies and agricultural policies, micro (prices) and macro (fiscal and monetary) policies does have an impact on the inputs and on the outputs of agricultural research;

3. a record of how agricultural productivity (of the 3 basic inputs) has evolved over time — has agricultural GDP (total) increased or decreased during the last five, 10, or 15 years?

4. the main issues to look for on the first three points are distortions and/or constraints that somewhat limit the potential for all resources, especially the human ones, to be efficient (Echeverria 1989).

Demographics. Demography is the statistical study of human populations, especially with reference to size, density, distribution, and vital statistics. The statistical characteristics of human populations, such as age, sex, income, rural to urban migration patterns, labor force changes, etc., are

used to identify markets, clients, or targets. It is essential for an organization to have demographic information because its ability to satisfy future staffing needs depends on the availability of capable, trained recruits. The ability to predict demographic changes in the workforce, such as private-sector involvement in research, dual-career necessity, the role of women in national agricultural development, etc., may influence the organization and its strategy for recruiting, maintaining, and developing its human resources.

Technology. As environmental analysis considers not only the current situation, but projections concerning the future environment as well, anticipated changes in technology must be considered. Thus, advances in research methodology, intensification of laboratory research such as recent advances in tissue culture and biotechnology, and incorporation and adaption of improved genetic varieties, have implications for staff training, facilities, scale and scope of experiments, and client/target groups. Awareness of technological innovations will allow organizations and management to consciously adapt to changing situations.

Sociocultural Environment

The key sociocultural issue in environmental analysis is the understanding of stakeholders. Stakeholders are individuals or groups whose lives are affected by the way an organization does its work. They also place demands on the system. Examples of stakeholders in agriculture are government, donors, rural banks, agroindustry, import/export firms, agriculturally related services, and clients (farmers). In stakeholder analysis, it is essential to identify key stakeholders, analyze and understand the stakes of each key stakeholder, develop and execute a strategy to manage the stakeholder, identify employees as key stakeholders, develop policies for relationships with employees, and make sure that organizational, external stakeholder, and employee concerns are integrated.

Political environment. The final element of the environmental analysis is political (i.e., the legislative mandate of the organization). The type of legislation, placement of the agricultural research institute within the governmental structure, and the degree of it has autonomy affect all functional area programs. Thus, it is necessary to assess the regulations and the latitude for change that are prescribed for training programs, recruitment and selection, compensation packages, and promotion policies, as these will affect the approaches that the organization can take for human resource management. Since NARS are public-service organizations, they are directly affected by legislation, and it is advisable for NARS to have a strong "lobby" in government.

Internal Human Resource Analysis

The third component of background is conducting an internal human resource analysis. As can be seen in figure 1, the internal analysis must be accomplished at both the micro and macro levels.

At the micro level, the analysis must include a demographic profile of the skill level and mix of the organizations' human resources. Thorough documentation of staff patterns; disciplinary mix; critical mass in areas of importance according to policy objectives; research station capability; mix of basic, applied, and adaptive research consistent with policy objectives; professional indicators; and individual scientist opinions as to their own career paths, opportunities, and constraints are essential elements of this analysis. In addition, it is often useful to document scientists' opinions on the competence of management because empirical evidence has shown that senior scientists are most concerned with the scientific credibility of the organization. The final component of the micro-level analysis is productivity, where scientific success, adoption of innovations, and applicability with respect to target groups must be documented.

At the macro level, an assessment of three factors must be accomplished: the organizational culture, the organizational structure, and individual members in terms of efficiency and effectiveness of program, as illustrated in figure 2.

Basically, according to the theorists, each of these elements affects and is affected by the others. All are influenced by their environment, as well as the economic, sociocultural, and political background and the organization's own history. It is essential that an analysis take into consideration the shared assumptions, meanings, and values of the organization so that the social behavior is understandable and predictable.

Figure 2. Elements of Organizations

SOURCE: Franks, Tom. 1989. *Bureaucracy and development* 1989: 357-368.

Strengths	Weaknesses
• Large number of highly trained research staff	• Poorly defined career structure
• Existence of performance appraisal scheme	• Inadequate ratio of support or technical staff to researchers
• Mature leadership for research programs	• High staff turnover
• Good personnel policies in place	• Inadequate mix of staff — no sociologists/economists for adaptive research work or on-farm research
• Intensive training and development for research staff	• Performance appraisal scheme not used effectively to assess staff because appraisers are not trained to use it and reports are not properly analyzed
	• No formalized scheme for training and development of support staff
etc.	etc.

Figure 3.
Example of Analysis of Strengths and Weaknesses of Human Resource Development and Utilization in a NARS

Step 2 of the diagnosis is the synthesis and analysis (SWOT) of human resource policy issues, the threats and opportunities to existing human capital, and the human resource strengths and weaknesses.

From these considerations, managers are able to determine the opportunities and threats to the NARS. Internally, the NARS will need to ensure that the organization has the right number of people, who are of the right profile and who are available at the right time. Specifically, managers must analyse the balance at the micro level for specific skills (plant breeding, soil science, agronomy, economy, etc.) and their mix — management competence and productivity within the overall organizational structure, culture and program efficiency, and productivity. Each of these elements should be examined for its strengths and weaknesses.

From this analysis, it is possible to glean strategic human resource issues, which may be categorized under recruitment and selection, socialization, performance assessment, communications, training and development, job evaluation, motivation, interpersonal problems, safety and health, discipline, high turnover, low morale, etc. All these may be derived from an audit of personnel policies for SWOT analysis (see boxed text).

An example of analysis of strengths and weaknesses of human resources that must be included in the SWOT analysis follows.

For instance, in some NARS there are no plans or clearly defined policies for human resources. In other organizations, they exist but not as project-management tools. Many SADCC NARS lack a detailed list of tasks or job description for each job. Yet this is vital in recruitment, training and development, performance evaluation and appraisal, career development, and conflict handling. Their argument for the absence of job descriptions in research positions is that they are more concerned with the knowledge content of the job and therefore place more emphasis on the individual's creativity, flexibility, and adaptability to change. Although this tends to highlight the rigidity of detailed job descriptions, their absence may be considered a weakness of the system. Nevertheless, many NARS are now developing job descriptions to distinguish the differences between research officer levels, commodity research coordinators, and team leaders.

Evaluation of Strategic Choices

Step 3 of the diagnosis is defining the issues.

As stated above, strategic planning deals with creating choices in an organization's directions. Because it is not possible to tackle *all* the issues and move in *all* directions, the organization must develop criteria for evaluating its options, and decide on the most appropriate course of action for the situation. Simple questions must be asked (such as, What is the direction (or strategy) for the research? How

can human resource development and management support this strategy? Should we increase the number of staff? Should we institute better remuneration packages and reduce high staff turnover?). When making choices, managers must be realistic, since the institute must have the capacity and means to implement each choice. The methods selected for making choices have to be objective, and the choices must look lucrative and attractive. In this regard, feasibility and chances of success must be considered. Can the organization afford to implement such a choice? By simply listing the choices, a simple cost/benefit analysis or scoring model using a matrix can be used to assess priorities. These priorities set the stage for stage II, planning.

Stage II: Formulation of Human Resource Objectives

Once the list of choices has been made, the manager should formulate the human resource objectives. For example, if the choice was to improve NARS staff performance assessment and appraisal, the manager may formulate objectives as shown in figure 4. We chose performance appraisal as an example since it commonly forms the weakest link in most NARS management systems.

1. Collecting information on actual performance of individual staff as a basis for formulating job descriptions.
2. Structuring the performance appraisal scheme according to the declared policy and objectives of the institution.
3. Establishing organizational, group, and individual goals and standards appropriately.
4. Developing appraisal techniques.
5. Training appraisers in use of appraisal techniques.
6. Developing techniques that use indicators that are easy to identify.
7. Establishing strong management commitment. This means producing regular performance appraisals and reports to decide on staff development, promotion and career development, merit awards, etc.
8. Ensuring that the performance appraisal is not subjective — the exercise should not become just simply a formality, but it should be an activity that reflects real performance.

Figure 4. Key Factors for Success for an Effective Performance Appraisal of NARS Staff

Development of the Human Resource Strategy

One must remember that although the choice for institutional change has been made in a particular functional area of human resource management, all the functional areas work as components of one another. Therefore, a strategy devised for the process of change must take full cognizance of the other interactive factors at the operational level.

Stage III: Functional Area Programs

Functional area programs are the tools, processes, and activities that the organization uses to implement the strategies defined in stage II. There are two types of functional area programs: The first type includes organizational processes or tools, such as recruitment/selection, socialization, training, and career development. The second type includes individual performance management processes or tools, such as compensation, performance appraisal, and organizational behavior.

Organizational Processes

For each of these processes, the following is a brief description. Full-length papers on and examples of these processes comprise the rest of this volume.

Recruitment and Selection

Recruitment/selection is the process by which organizations obtain employees with the right skills, training, and motivation and by which individuals obtain positions that fulfill their personal needs and aspirations.

Basically, recruitment is the process that identifies and fits applicants to organizational needs, while selection is the process of prediction or making informed estimates on the potential for an applicant's success on the job. This is a multistep process with a logical sequence that includes task analysis, job description, person specification, recruitment strategy, interview strategy, and decision-making processes. Details of tools or procedures to accomplish these steps efficiently are in this volume in the paper by Paul Marcotte entitled *Recruitment and Selection.*

Socialization

Socialization is the process by which new or returning staff are assimilated into the institutional culture to be effective members of the organization.

Descriptions of the elements of this process (rationale, tactics, and case studies) are presented in this volume in the paperby Luka O. Abe, *Socialization of Staff in NARS* .

Training

Training is a relatively formal, structured activity that allows management to improve the ability of individuals to perform their jobs effectively. It may be on-the-job training or formal classroom instruction to simulate work situations.

Details of concepts of training and development are presented in this volume in the paper by Luka O. Abe entitled *Some Aspects of Training in NARS*.

Career development

Career development refers to the creation of job sequences for employees that take advantage of present skills and develop new skills simultaneously so that there is a clear, logical development of careers and full use of each employee's potential.

Details of career development from the individual and organizational perspective are presented in the paper entitled *Careers and Career Development* by Paul Marcotte.

Individual Performance Management

Performance management is the set of activities by which an organization identifies expected behavior and provides incentives for that behavior. The incentives may be both monetary and nonmonetary. These activities also control disincentives or rewards for nonperformance.

In the text that follows, these performance management activities are subdivided into three distinct areas: compensation, performance appraisal, and organizational behavior. Details of performance management are contained in this volume in the following papers:

- *Annual Performance Appraisal Schemes in Agricultural Research Organizations* by Paul Bennell;
- *Annual Performance Assessment at NCRI* by Paul Bennell;
- *Job Evaluation at PARI* by Paul Bennell;
- *Organizational Behavior Factors* by Paul Marcotte;
- *Performance Assessment Factors for Agricultural Researchers* by Larry Zuidema.

Stage IV: Managing Change

Stage IV is the maintenance of operational human resource plans and programs — or managing change.

Planning inevitably produces change within an organization. Consequently, NARS managers must prepare the organization to cope with change at the outset by establishing an effective process to produce this change. This must be carried through all the steps of the process. The following criteria will ensure both quality and acceptance in planning and subsequent implementation:

- The process should be formalized within the organization with proper mechanisms in place.
- There must be a *high level of commitment*, both from policymakers, managers, and everyone else who is likely to be involved in any important decision-making process or in the implementation of the plan (e.g., from sectoral planners, key personnel in the public-service commission, and NARS leaders/directors to the research leaders and personnel administrators who are the NARS line managers. Thus, the team to involve in strategic human resource planning should be a *multifunctional group*, catering to all aspects of personnel management.
- Obtaining a high and sustainable level of commitment means *communicating the strategy*, both within and outside the NARS at all stages, starting with the initial phases.
- If a strategic human resource plan is well conceived and clearly aligned to the organization's strategic mission, then the plan should be given time, and consistency should be maintained in its implementation and operation.
- Above all, NARS should ensure that the direction of change and the choices made in moving from the current human resource scenario to a preferred scenario are clearly understood. This means constantly reviewing and evaluation all steps taken to achieve the target objectives.

Evaluation/Review

In order to ensure that the plan produces the prescribed change, proper measurements or criteria must be set to determine the success of the change process. For instance, indicators of improved HRM performance should be related to how effective the NARS has been in implementing its staff development plan, how many staff members are in training, what the quality of the training is, whether the researchers are being made to orient their research to the ultimate client and to address the problems of small farmers.

The process circumscribes the entire strategic process, is continuous, and interactive. No NARS ever masters strategic planning process: questions are continuously raised in its implementation.

Bibliography

Abe, L. O. 1988. Some aspects of training in national agricultural research systems. In Human Resource Management for National Agricultural Research, proceedings of a workshop, 7-11 November 1988. The Hague: ISNAR.

Abe, L. O. 1989. Presentation notes on management information systems (MIS). Presented at SACCAR/ISNAR workshop on the development of a Tanzania National Agricultural Research Masterplan, 10-20 July 1989, Arusha, Tanzania.

Echeverria, R. 1989. Personal communication.

Franks, Tom. 1989. *Bureaucracy and development* 1989: 357-368.

Haworth, F. 1973. Working paper on regional organization of agricultural research. Presented at meeting of Working Level Group in Agriculture, Northeast Agricultural Centre, 17-22 October 1973, Tha Phra, Thailand.

Marcotte, P. 1986. Farming systems research as a method for introducing sorghum in the Dominican Republic: A synthesis of the positivist and critical paradigms. Unpublished Ph.D. dissertation, University of Kentucky.

Nkomo, S. M. 1988. Strategic planning for human resources: Let's get started. *Long-range planning* Vol. 21, No. 1.

Taylor, T. A. 1988. Strategic planning in national agricultural research systems. Presented at SACCAR/ISNAR Workshop on Agricultural Research Management for Botswana, Lesotho and Swaziland, 23 May-3 June 1988, Maseru, Lesotho.

CASE STUDY

STAFFING REQUIREMENTS AND STAFFING PYRAMID FOR THE TANZANIA NATIONAL AGRICULTURAL AND LIVESTOCK RESEARCH SYSTEM

J. J. Mende[1]

Introduction

This paper is a case study of the staffing system in agricultural and livestock research in Tanzania. It is designed to offer some brief lessons on the approaches made by research managers to requirements in research staff. It provides an analysis of the existing staff and attempts to project future needs in human resources for the research system.

The paper is divided into four parts:

1. the structure of the NARS in Tanzania;
2. the current staffing systems of the NARS;
3. the staffing requirements of the NARS;
4. conclusions.

The Structure of the NARS in Tanzania

Previous Research Structures

There have been several attempts to establish an effective system for crop and livestock research in Tanzania ever since it started there during the early years of this century. In the pre-independence years, and for almost one decade after independence, the national agricultural research system (NARS) in the broadest sense included agriculture, livestock, fisheries, and forestry and wildlife. During the second decade after independence, the ministry was reorganized, and consequently, NARS in a narrower sense included only agriculture and livestock.

The Tanzania Agricultural Research Organization (TARO) and Tanzania Livestock Research Organization, (TALIRO) were actually established in 1980 from research departments in the Ministry of Agriculture and the Ministry of Livestock Development, respectively.[2] When they were created, both were semiautonomous parastatals, each headed by a director general responsible, through the respective councils, to the Ministry of Agriculture and Livestock Development (MALD). There was no linkage between them or with other research institutes or agencies.

The necessary steps and actions to be taken to strengthen the NARS were reiterated several times in different reports and forums. Included among these are the National Agricultural Policy, 1983; the Tanzania Agricultural Research Resource Assessment, 1985; and the UNDP/FAO and World Bank mission reports and Aide Memoires. The recommendations on the organization and management aspects agricultural and livestock research included the following:[3]

- consolidating the existing research institutions;
- focusing the research systems on major agroecological zones;
- improving and establishing linkages between research and extension;
- adopting a farming systems research (FSR) approach, with considerable emphasis on on-farm research, so that research could be more closely related to the technical and socioeconomic problems facing farmers.

Current Research Structure

The revised organizational structure and management system for national agricultural and livestock research is illustrated in appendix 2 at the end of this paper. It was based on the following objectives and principles, most of which were defined in the Tanzanian National Agricultural Policy Final Report dated October 1982.

- Research should be consolidated and coordinated at the national level.

- The organization of agricultural and livestock research organization should be redesigned to economize on costs in order to provide increased funding for the productive aspects of research.

- Links between research, training, and extension should be strengthened in order to facilitate technology transfer.

- Research programs should be based on agroecological considerations.

- Agricultural research should adopt a farm-oriented problem-solving approach to arrive at relevant extension packages.

- Research must take place with full farmer support since farmers know best what problems confront them. Research institutes should have balanced farm-based and station-based research programs.

- Education and training facilities should be expanded so that research manpower needs are met by planned recruitment and staff development.

- Government funding for agricultural research should be increased to reflect the importance of research in agricultural development.

- A well-stocked documentation center should be established for the whole agricultural sector and should disseminate agricultural research findings nationally and internationally.

- The following information and materials should be made available to agricultural producers and supporting services:

    - appropriate, reliable and detailed agronomic information for increased productivity with adequate protection of the resource base;

    - improved materials and prototypes on which to base increased production of crops, farm animals, and trees;

    - technologies to deal with biological hazards (pests, diseases, weeds, etc.).

- Technical and socioeconomic information for planning purposes should be made available to governmental and industrial decision makers. This would include the following:

    - information on new agricultural production opportunities (crops, animals, trees) for different agroecological zones;

    - technical information on storage, processing, transport, and handling of produce to minimize post-harvest losses;

    - estimates of land, labor, agronomic inputs, and capital needed to carry out national plans.

Staffing Position in Tanzanian NARS

This section is on the staffing requirements and staffing pyramid for the NARS in Tanzania. It is worth noting here that the NARS in Tanzania is in a transitional stage at the moment, following the recent reorganization from the parastatal structure to the civil service, directly under MALD. The Tanzanian NARS is a large, diverse, and complex system that requires very comprehensive human planning and development for research efficiency and output. There are several issues still to be rectified.

The preparation of the Research Master Plan (RMP) and priority research programs, for example, need to be resolved first before any serious projections on manpower demand can be made. What this paper will give are only tentative manpower requirements, as perceived by research managers. It will have to be updated as soon as the ongoing exercise on research priority setting is completed. The focus is, therefore on the following:

- current professional and technical manpower;

- current methodology and ratios to determine future human resource requirements for research and their limitations;

- tentative human resource requirements for NARS research in Tanzania.

Current Staffing for NARS in Tanzania

There are currently 3,462 total staff in research. Table 1 shows their distribution by research institutions, and their distribution by degree is shown below:

- 319 scientific staff (129 bachelor's degrees, 157 master's, and 33 PhDs);

- 561 technical staff (certificate and diploma);

- 1549 subtechnical staff (field attendants);

- 900 administrative staff;

- 130 accounting staff.

The majority of staff (44.7%) are subtechnical, followed by administrative personnel (26.0%), technical staff (16.2%), scientific staff (9.2%), and accounting personnel (3.8%).

Table 1. Staffing System by Designation/Grade, Agricultural and Livestock Research in Tanzania, March 1989

Parastatal Designation and Grade	Designation and Grade	Civil Service Salary Scale	Research Institution* MALD**	TARO**	TALIRO**	UAC Mbeya	TPRI	Total	Percent
Scientific									
CSO	PRO I	MS 16	–	–	–	–	–	–	
PSO I	PRO I	MS 14-15	1	–	–	–	–	1	
PSO II	PRO II	MS 12-13	3	–	4	1	3	11	
PSO III	SRO I	MS 10-11	–	2	–	3	2	7	
SSO II	SRO II	MS 7-9	1	8	8	18	3	38	
SSO II	SRO II	MS 6	2	44	9	10	5	70	
SO I	RO I	MS 5	4	63	22	5	6	100	
SO II	RO II	MS 4	8	–	14	10	8	40	
SO III	RO III	MS 3	17	28	–	–	7	52	
Subtotal			36	145	57	47	34	319	9.2
Technical									
PFO	CFO	MS 10	–	–	2	–	–	2	
SFO I	PRO	MS 7-9	–	2	3	–	–	5	
SFO II	SFO	MS 6	1	4	4	2	–	11	
FO I	FO I	MS 5	1	35	22	4	2	64	
FO II	FO II	MS 4	2	58	39	25	–	124	
FO III	FO III	MS 3	31	128	24	21	3	207	
FO IV	FO IV	MS 2	53	60	–	10	6	129	
F Asst. III & IV	F Asst. II	MS 1	–	–	–	15	419		
Subtotal			88	287	94	77	15	561	16.2
Subtechnical			55	986	292	151	65	1549	44.7
Administrative			NA	416	279	135	70	900	26.0
Accounting			NA	55	31	41	6	130	3.8
Grand Total			179	1889	753	451	190	3462	99.9

*Expatriates are not included in these numbers.

**These institutions have already been consolidated under MALD and are headed by the commissioner of research and training.

NOTE:
CSO = Chief Scientific Officer
PSO = Principal Scientific Officer
SSO = Senior Scientific Officer
SO = Scientific Officer
PRO = Principal Research Officer
SRO = Senior Research Officer
RO = Research Officer
CFO = Chief Field Officer
PFO = Principal Field Officer
SFO = Senior Field Officer
FO = Field Officer
F Asst = Field Assistant
MALD = Ministry of Agricultura and Livestock Development
TARO = Tanzania Agricultural Research Organization
TALIRO = Tanzania Livestock Research Organization
UAC = Uyole Agricultural Centre
TPTI = Tropical Pest Research Institute

Staffing systems of scientists by grade and educational qualifications. The staffing groups for the NARS have been defined into two groups here, i.e., by grade (status) and by educational qualifications for the professional staff, whose competence, organizational skills, and research entrepreneurship are considered to be crucial. However, it is worth noting that the distribution between these groups is determined over time by the effects of promotions, recruitment, and attrition rates.

The current staffing pyramid of professional and technical personnel by grade is shown in figures 1 and 2. There are nine grade levels in the professional cadre and eight grade levels in the technical cadre. According to the current schemes of service in the civil service, a young researcher joining the NARS at the age of 25 will reach the topmost grade level (Principal Research Officer I) when he/she is about 49 or 50 years old, assuming that there are regular intervals of promotion.

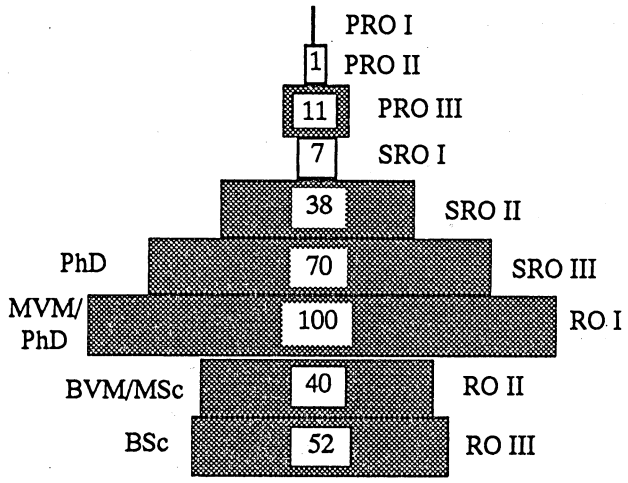


Figure 1.
Pyramid of Agricultural and Livestock Research Professional Staff, March 1989

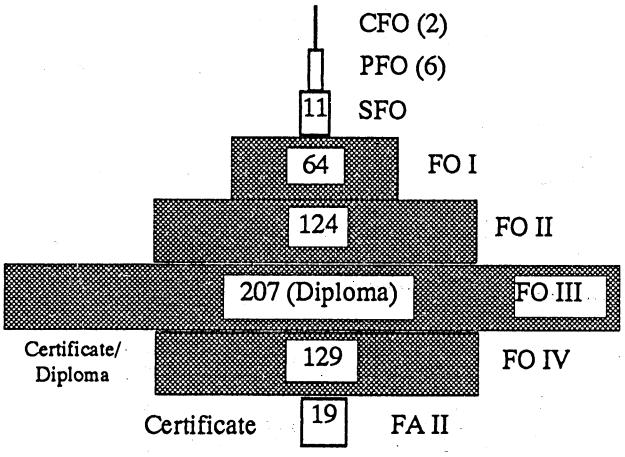


Figure 2.
Pyramid of Agricultural and Livestock Research Technical Staff, March 1989

In the case of the professional staffing pyramid, the following can be seen:

- There is a clear bulge in the middle grades. About 65.3% of the scientists are within the three middle grades (R.O. I - S.R.O. II);
- Only 28.8% of the scientists are in the bottom two grades (R.O. III - P.R. II), only 6% of them are in the upper three grades (S.R.O. I - P.R.O. II), and none are in the highest grade (P.R.O. I) in a research system that has operated since the early years of this century.

This staffing pattern should cause some concern for recruitment/career planners because there is a small pool at the lower grades, while the middle grades are very large. The upper grades are very thin, and the topmost grade is vacant.

Possible causes for this type of grade structure:

- BSc graduates enter the service as research officers grade III and BVM graduates enter as research officers grade II. According to the existing scheme of service, they can be promoted to the next grade levels within three years.
- Many of the BSc/BVM researchers are encouraged to pursue MS/MVM studies. On successful completion of their courses, they may qualify for promotion to research officers grade II/I, respectively.
- Promotion from middle grades to higher grade levels (apart from possession of higher educational qualifications) requires researchers to have published between two and four scientific papers since their last promotion.
- In short, it appears that there are too many researchers who are promoted and/or enter into the middle grade levels from the lower grade levels. Than, there are very few promoted to the higher grades from the middle grades.
- Unnecessary stagnation at the middle grades may cause frustration and, hence, decrease research efficiency and output. Ideally promotions should not be tied to managerial posts only, as seems to be the case here (see figure 1). It is hoped that a separate promotion stream to the topmost grades, based on recognition of research performance, will be created. This should have career scales without limitations of the number of posts at specific grades, provided job descriptions and evaluation criteria for promotions are strictly followed. The need for such an incentive scheme has been underscored as one of the more important items to be built into the research master plan that is currently under preparation.

Staffing system of scientists by educational qualifications. The distribution of educational backgrounds in the NARS staffing system can be used to help establish objectives for the recruitment of different types of skilled or qualified personnel. It can also be used to plan the recruitment and training required to achieve these objectives. As shown in table 2, out of 319 scientists, there are 33 PhDs, 157 with a master's degree, and 129 with a bachelor's. These scientists are supported by 561 trained technicians at certificate/diploma levels. Figure 3 shows the distribution of scientific staff by degree level. Those involved in agricultural research are deployed in 19 programs (17 programs on crops, one on soils, and one on farming systems research). However, those involved in livestock research are deployed in five programs:

1. animal breeding
2. nutrition
3. range and pasture development
4. vaccine production
5. pest and disease control

The following information can be derived from these figures:

- The ratio of professionals to technicians is 1:1.8.
- The ratio of PhDs to other degrees is 1:8.7.

These ratios are a subject for consideration, based on ratios for research staff in both developed and third-world countries. TALIRO, for example, was using a ratio of one scientist to three technicians in determining their recruitment needs. Personnel and training managers, therefore, would be concerned with establishing whether the staff with PhDs had sufficient funds and research facilities, whether the MSc staff had the scope to pursue a PhD, and whether they should be encouraged to do so lest the BSc holders would be left to become "super technicians." The trend in training efforts is clearly shown in figure 3 where we are beginning to have an inversion of the professional staff pyramid. This is an encouraging trend for any NARS, particularly in the third world. These research systems have not reached a constant size and, hence, are expected to continue expanding, based on strategic planning and priority setting.

Table 2. Staffing System by Educational Level, Agriculture and Livestock Research, Tanzania, March 1989

	Research Institutions*						
Educational Level	MALD	TARO	TALIRO	UAC Mbeya	TPRI	Total	Percent of Total
PhD	4	16	4	6	3	33	3.8
MSc/MVM	12	76	24	34	11	157	17.8
BSc/BVM	20	53	29	7	20	129	14.7
Dipl/Cert	88	287	94	77	15	561	63.7
Total	124	432	151	124	49	880	100.0
Percent of total	14.1	49.1	17.1	14.1	5.6	100.0	
Ratio of scientists to technicians	1:2.4	1:2	1:1.6	1:1.6	2.5:1	1:1.8	

NOTE: Staff in the Veterinary Investigation Centres (VICs) are not included because they are now in extension.
*Except for UAC, Mbeya, and TPRI, these institutions have been merged under the Ministry of Agriculture and Livestock Development (MALD).

Staffing Requirements for the NARS in Tanzania

As stated earlier, the Tanzanian agricultural and livestock research system is in transition, following the recent major structural reorganization in which TARO and TALIRO were dissolved and their research functions amalgamated within MALD under the commissioner of research and training (see appendix). As a result, there has been an enormous investment of labor in the preparation of the research master plan. Therefore, realistic projections of research manpower requirements can not be made before prioritized

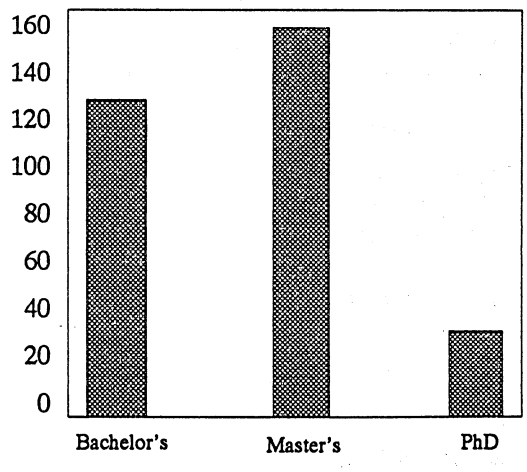


Figure 3.
Distribution of Scientific Staff by Education

research plans are drawn out. What follows are some of the attempts previously made by the research systems in Tanzania to project manpower requirements and their limitations.

Criteria Used in Staff Recruitment

There have been no rigid, concrete criteria on staff projections and recruitment for research. However, for purposes of determining staffing levels, managerial judgments based on past experience and the experience of similar organizations have been used. These have also been based on what research managers would "like" to have and, to some extent, on what they can afford – as indicated by approved annual budgets. Research managers normally respond to the following questions:

- How many researchers are needed at a given period?
- What types of researchers are needed?
- What kinds of educational qualifications are required?
- In which disciplinary fields should they be?

The former TARO, for example, indicated that it did not have strategic human resource planning but relied on established and funded posts. The former TALIRO, on the other hand, responded to such "wish questions" based on specific staffing ratios as follows:

- Staff are recruited on the basis of the mix of skills at three levels, i.e., scientific officers who are assisted by laboratory technicians/field officers, who are in turn assisted by laboratory/field assistants.
- A ratio of 1:3 scientists to technicians is used.
- Research managers are projected separately, depending on the number of research institutions and the size and number of departments per institute.

With these criteria in mind, the research managers indicated in 1987 that they would need 672 additional researchers (261 BSc, 283 Master's level, and 128 PhDs, see table 3) between 1988 and the year 2000 for both agricultural and livestock research.

This represents an average of 56 additional researchers per year with different educational qualifications and from different scientific disciplines for the seven zones and 34 institutes.

The major limitation in using an end-user method like this to get "wish lists" is the tendency to disregard budgetary constraints. The research managers tend to base their manpower needs on expected expansion and through fear that their annual personnel allotments might be cut by the ministry of finance. However, using the "wish lists," the research

Table 3. Expectations of Demand for Highly Trained Manpower, by Specialization for the year 1988 to 2000

Specialization	Bachelor's	Master's	PhD	Total	Percent of Total
Crops (General)	5	24	13	42	6.2
Crop Breeding	–	21	18	39	5.8
Crop Protection	29	106	20	155	23.1
Horticulture	1	3	2	6	0.9
Soil Science	1	7	3	11	1.6
Animal Science (General)	64	18	3	85	12.6
Animal Nutrition	–	–	–	–	–
Animal Breeding	–	3	2	5	0.7
Range and Pasture Mgt.	50	34	8	92	13.7
Hides and Skins	–	–	–	–	–
Veterinary Science/Med.	68	44	7	119	17.7
Technical Specialities	2	6	7	15	2.2
Agricultural Engineering	10	5	1	16	2.4
Agricultural Economics	7	4	2	13	1.9
Irrigation	–	–	–	–	–
Home Economics and Food Sci.	–	–	–	–	–
Extension	1	2	–	3	0.4
Agricultural Education	–	–	–	–	–
Research	–	3	4	7	1.0
Accounting	10	–	–	19	2.8
Admin. and General Mgt.	–	3	–	3	0.4
Other	4	2	38	44	6.5
Total	261	283	128	672	99.9
Percent of Total	38.8	42.1	19.0	99.9	

system may end up having too many researchers, with the result that physical resources and operating funds will be inadequate. Researchers will have trouble conducting the research they were hired to do, and they will become frustrated and demoralized. Besides, the potential supply of highly trained personnel from our local universities, particularly at the Master's and PhD level, is uncertain.

A more serious effort in establishing staffing requirements for research in Tanzania will be made after priority setting and programming have been completed.

Conclusions

This paper has focused on staffing in the Tanzanian NARS and on the approaches that have been used to determine staffing requirements for research, along with the limitations of these approaches. Since a master plan for research is currently being drawn up, No attempt was made here to come up with concrete manpower requirements. The requirements indicated in this paper were based on a survey done in 1987 using the end-user method; the matching of demand and supply is still a problem.

Notes

1. J. J. Mende is a senior agricultural training officer and head of the Sectoral Manpower Planning Unit within the Commission of Research and Training, MALD, Dar es Salaam, Tanzania.

2. The Ministry of Agriculture and the Ministry of Livestock Development were formed in 1980 and merged again in 1984 to form the current Ministry of Agriculture and Livestock Development (MALD).

3. The ministry has started to implement most of these recommendations.

4. The compulsory retirement age in Tanzania is 55.

Bibliography

MALD. 1982. Tanzania National Agricultural and Livestock Policy Report. Government Printer, Dar es Salaam, Tanzania.

Mende, J. J. and A. M. Mianga. 1988. Agricultural and Livestock Manpower Requirements for Research and Extension, Tanzania. Paper presented at the SACCAR Workshop on Manpower Planning and Development, Maseru-Lesotho 22-24 August.

Rugumyamheto, J. A. and L. A. Msambichaka. 1987. A study of High Level Agricultural Manpower and Technical Assistance. Draft Report. (Limited circulation).

Shao, F. M. 1988. Organizational and Planning Aspects of Crop and Livestock Research in Tanzania. Paper presented at the workshop on Development of a Master Plan for the NARS. AICC Arusha, 25-30 April.

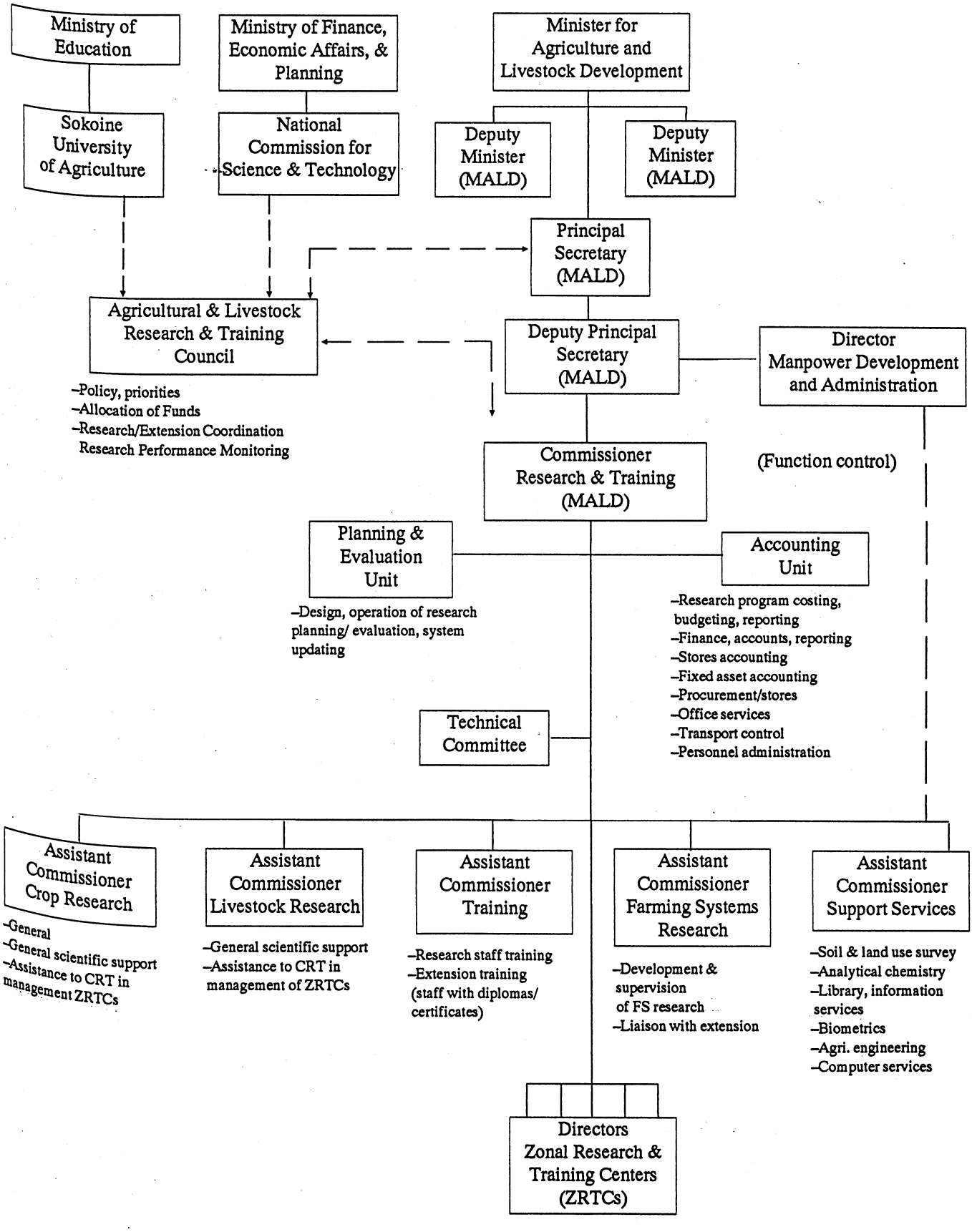
Tanzania Country Report. 1982. The UNDP/FAO Study on National Agricultural Research.

World Bank. 1987. Tanzania National Agricultural and Livestock Research Project Preparation Report.

APPENDIX 1
Proposed Zones

Zone	Zonal Center	Research Stations	Training Institute	Coverage
Lake	Ukiriguru	Malya LPRC, Maruku, Lubaga Mwamala, Mwanhala, Bwanga Kituntu, Mabuki	MATI Ukiriguru MATI Nyegezi MATI Maruku	Mwanza Shinyanga Mara, Kagera
Southern Highlands	Uyole	Mitalula, Mbimba, Ismani Kifyulilo, Igeri, Ndengo Suluti, Nkundi	MATI Uyole	Mbeya, Ruvuma Iringa, Rukwa
Northern	Salien	West Kilimanjaro, Lyamungu Miwaleni, Hanang	LITI tengeru	Kilimanjaro Arusha
Southern	Naliendele	Mtopwa, Nachingwea	MATI Naliendele	Mtwara, Idindi
Central	Mpwapwa	Hombolo, Kongwa, PRC	LITI Mpwapwa	Dodoma, Singida
Eastern	Ilonga	Mlingano, LPC Tanga, Katrin Kibaha, Marikitanda, Chambezi, Mpiji, Muheza, Horticulture	MATI Ilonga MATI Mlingano LITI Morogoro LITI Buhuri	Morogoro, Pwani, Tanga, Dar es Salaam
Western	Tumbi	Mtanila (Chunya) Seatondale (Iringa)	MATI Tumbi MATI Mubondo	Kigoma, Tabora

APPENDIX 2
Proposed Organization of the Research and Training Department, MALD



III

Recruitment/Selection

RECRUITMENT AND SELECTION*

Paul Marcotte

Recruitment and selection is the process by which organizations obtain employees with the right skills, training, and motivation and by which individuals obtain positions that fulfill their personal needs and aspirations. Basically, the *recruitment* process entails identifying potential applicants and ascertaining how well they fit organizational needs. *Selection*, on the other hand, is a process of prediction, or making an informed estimate on the potential for an applicant's success on the job.

Conceptually, there is a logical sequence of activities involved in acquiring employees, and these are position description, person specification, person profile, recruitment strategy, interview planning, interviews, and analysis of data and decision. These are illustrated in Figure 1, the recruitment/selection model. This paper briefly defines and describes each of these activities and identifies the tools or procedures required to accomplish them efficiently and effectively.

Position Description

In order to write a clear statement of what roles a person must play and what tasks and functions they are to perform in a job, it is necessary to conduct a *job analysis*. A job analysis is the process by which a job is dissected into component parts, which are then studied to identify the nature of the work. This requires looking at the tasks performed by incumbents, defining functions, and collecting information about the tasks and functions.

Task and function, according to job analysis literature, are defined as follows:

Task "a discrete organized unit of work, with a definite beginning and end, performed by an individual to accomplish the goals of a job."

Function "a broad subdivision of a job composed of a group of tasks that are somewhat related because of the nature of the work or the behavior involved." (Gael 1983: 9-10) [There are two types]:

1. supervisory work (organizing, planning, directing, developing)
2. direct work (maintaining, repairing, operating)

In studying the component parts of a job, it is also necessary to identify critical incidents encountered by incumbents.

To accomplish this, it is necessary to do the following (O'Hare and Associates 1988):

- Identify what led up to the incidents.
- Determine staff behavior that was effective (or ineffective).
- Identify the consequences of critical behavior.
- Determine if the consequences were within the control of the staff member.
- Calculate the frequency of tasks.
- Identify the importance of tasks.

The synthesis of the critical incidents of the incumbent and the well-defined job elements (i.e., tasks and functions) provide information for writing a clear statement on expected performance: the job or position description.

The elements that should be included in a job (position) description are as follows (Egan 1988a: 116-117):

1. the mission or purpose of the job in broad terms
2. a list of specific responsibilities

*This paper summarizes material from a variety of sources (see bibliography). Any errors are the responsibility of the author, not of the original source listed.

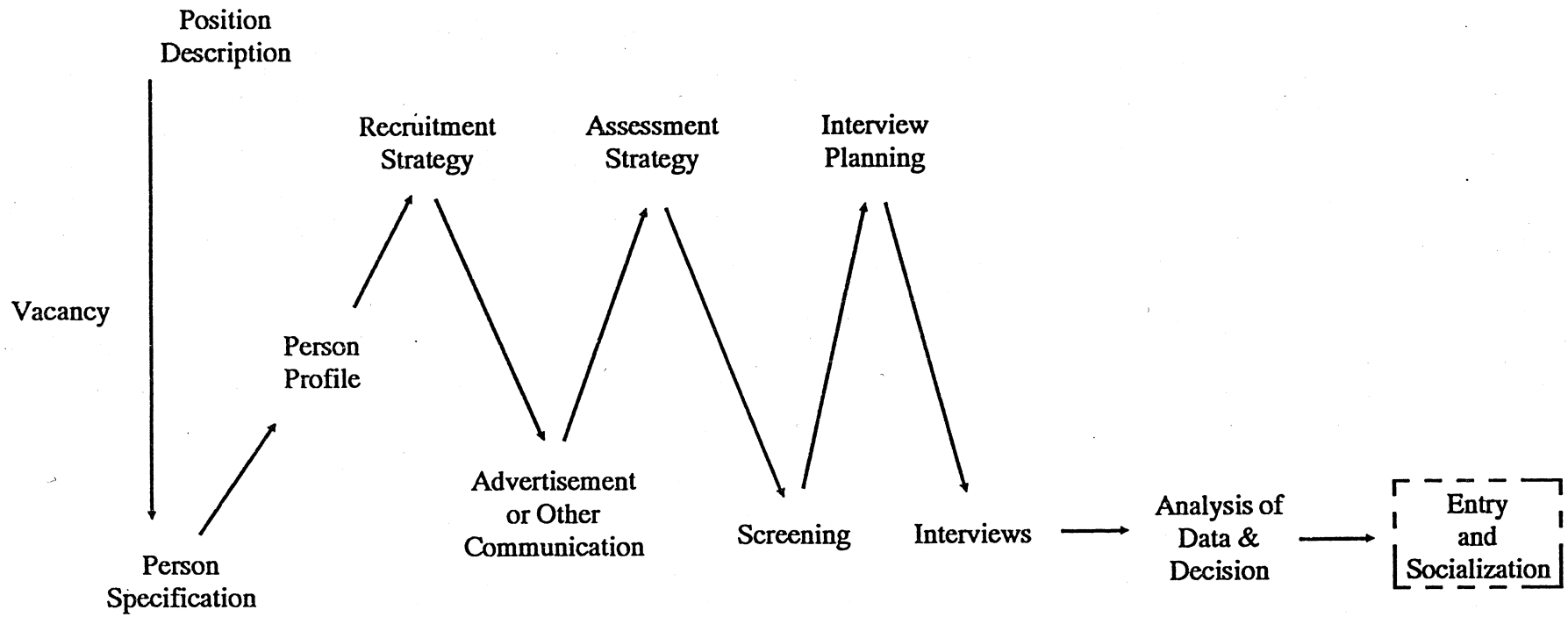


Figure 1. Recruitment and Selection

3. reservations of authority (such as committing the organization's funds or completing contractual arrangements with outside organizations)

4. a description of working relationships with other positions

5. specific objective measures or standards for the work

6. the assets, contacts, and specialized experience the individual brings to the job and is expected to maintain and develop (These represent the individual's "personal" investment in the organization.)

7. the salary range of the position and the way in which both individual and organizational accomplishments will be judged in determining salary decisions

8. a statement of personal liability in the event of individual or organizational failure, including the effect on salary, employment, and probable future allocation of human and physical resources

A job description form that identifies the main element of a job description and briefly describes the context of each element is attached for general information (appendix 1).

Person Specification

In addition to the elements outlined above in the job description, there may be other skills or characteristics required for the successful completion of a job. These may be the type of "personal" investments (such as assets, contacts or specialized experiences) outlined in number 6 above, or they may be "personal" characteristics or behavior such as assertiveness.

A form for identifying the person specifications of knowledge, skill, work experience, and people skills versus the job content/unit fit is attached (appendix 2).

Person Profile

In addition to the job analysis and person specification, there may be factors required to assure a proper team mix or organizational culture. A process to establish this "person profile" includes the following steps. The generic person specification should be reviewed to identify any unique personal characteristics, such as knowledge, skills, or social characteristics, that may be required. Next, significant others, i.e., other staff members on the team or unit, should be consulted to determine if they need or desire particular types of people for their units. The staffing mix should then be reviewed for demographics, skills, etc.

Based on this review, likely changes in roles or people over the next few years should be considered. Having identified the likely changes, there should be reflection on the unit culture, and efforts should be made to identify the type of person who is likely to fit in – and either maintain or add to the culture. Finally, based on this needs profile, priority requirements for hiring should be determined.

Recruitment Strategy

Once the position has been analysed and the desired characteristics are agreed upon, the recruitment strategy must be defined (see appendix 4). Initially the labor market must be analysed, which, according to economists, entails recognizing labor market bounderies, identifying available skills, assessing the organization's attractiveness and visibility, and being aware of the economic conditions of the labor market (Sayles and Strauss 1981: 172).

Once this has been accomplished, there are a variety of sources of recruits that may be considered. These include advertising, employment agencies, educational institutions, professional organizations, the military, labor unions, field trips or field recruiting, walk-ins, write-ins, intercompany transfers, employee referrals, and computer matching services (Cascio and Awad 1981: 21).

Regardless of the source of recruitment, the advertisement must contain essentials about the job. Typically, an adequate advertisement includes a statement about the mission of the organization, the outcome expected, the working role for the individual, the responsibilities of the job, prospects or career potential, and salary information.

Once a position has been advertised, an additional effort should be made to identify people who know potential candidates, or who know others who may know candidates or where to look for candidates.

Finally, it should be determined how much time should be invested in looking for recruits and where would be most likely to yield the fastest and best results, given the time and resources allocated to the process.

Assessment Strategy

As stated earlier, the selection process is basically one of prediction, with the objective being to find the best person for a given position. The assessment strategy entails creating and using instruments, tools, or processes to effectively assess the candidates against the person profile requirements for the position.

While it is understood that 100 percent prediction is impossible, the careful preparation and choice of selection instruments will enhance the prediction possibilities. These selection strategies include application forms, tests, interviews, reference checks, and possibly probationary periods for a more extended look at the candidate.

The application form is a traditional device for collecting information on (1) demographics — age, sex, education, and training, (2) work experience — previous positions, responsibilities, and tenure, 3) professional activities, such as society membership and publications, and (4) personal information, such as aspirations, interests, and special skills.

These forms may be used for a number of purposes. They indicate the applicant's ability to write, organize information and thoughts, and provide an expression of personality. The sequence of work experience and the acquisition of skills may also indicate the development or lack of a career path. While the application form also provides information about references, these may have limited value because applicants normally list only favorable references; however, they do provide confirmation about previous experiences.

The interview is the most widely used selection device. While it is considered to be an excellent means of assessing applicants in that it provides a sample of the applicant's behavior, motivation, and interpersonal skills, it also is generally the most unreliable and invalid selection device.

Some negative aspects of interviewing are listed below:

- Interviewers have stereotypes of what they consider to be a good employee.
- Interviewers tend to accept or reject applicants early in the interview process.
- Negative information tends to have a greater impact than positive information.
- The interviewer's judgments are influenced by previous interviewees as well by the applicant.
- Interviewers have difficulty in correctly assessing personality traits.
- The interviewee's appearance can influence the interviewer.
- Interviews can be discriminatory.

Some of the positive aspects of interviewing are as follows (Arnold and Feldman 1986: 439-440):

- The interview provides the organization with the opportunity to give information to the applicant.
- The organization can sell itself if the applicant is outstanding.
- The interview can be used to project a positive image of the organization.
- The interview can be a source of additional information about the applicant.
- The interview can provide information on how the individual will fit into the organizational culture.

There are a variety of tests to assess the candidate. Formal testing can be categorized by type, such as performance, intelligence, aptitude, and personality. Generally, performance tests demonstrate the applicant's ability to accomplish a task. Intelligence tests measure native intelligence with the assumption that more intelligent people can learn tasks more quickly and efficiently. Aptitude tests measure learning ability, and personality tests measure willingness to learn and maintain a high level of performance.

There are several assumptions underlying testing procedures. These include the following (Sayles and Strauss 1981/:182):

1. There are significant differences in the extent to which individuals possess certain characteristics.
2. There is a direct and important relationship between these characteristics and the ability of individuals to accomplish certain goals.
3. These characteristics can be accurately measured and the relationship between test results and job performance can be evaluated.

There are also several issues in testing that organizations must consider – the reliability of the test instrument, statistical inference, causality versus correlation, and cost.

Interview Planning/Interviews

In addition to the strengths and weaknesses of interviewing as a process (as identified earlier in the section on assessment strategy), interviews must be planned so that the best information possible can be gathered (see appendices 7 and 8).

In order to accomplish this, the objectives of the interview should be clearly defined. The first step is to identify and evaluate the candidate in terms of the match between organizational requirements and the individual's capabilities. The second objective is to provide information about the job to candidates so that they can realistically make a decision about the position. The third objective is to communicate what the organization stands for. Finally, the candidate should be persuaded that this decision is a correct one. It should be recognized that there are potential problems or weaknesses in interviewing. Planning for and structuring the interview should help to overcome these weaknesses. The following table suggests ways the interview process can be strengthened.

Table 1. Suggestions for Improving the Interview

1. Use a structured interview format.
2. Provide a complete job description to interviewers.
3. Use trained interviewers.
   Give applicants a chance to talk.
   Avoid stressful interviews.
   Avoid questions that are discriminatory.
4. Use multiple interviewers.
5. Avoid quotas.
6. Keep structured written records.
7. Use the interview as only one aspect of an overall selection system.

SOURCE: Arnold and Feldman (1986: 441).

There are several forms attached in the appendices which should be considered for interview planning and interviewing guidelines. While these will assist the process by helping select the best candidiate for the position, the next step, socialization, is of equal importance. This is the process by which people are transformed into effective, participating members of the organization. This is the topic of the next paper.

Selected Bibliography

Arnold, Hugh J. and Daniel C. Feldman. 1986. Organizational Behavior. New York: Mc Graw-Hill Book Co.

Cascio, Wayne F. and Elias M. Awad. 1981. Human Resources Management: An Information Systems Approach. Reston, Virginia: Reston Publishing Co., Inc.

Egan, Gerard. 1988a. Change Agent Skills A: Assessing and Designing Excellence. San Diego, California: University Associates, Inc.

Egan, Gerard. 1988b. Change Agent Skills B: Assessing and Designing Excellence. San Diego, California: University Associates, Inc.

Gael, Sidney. 1983. Job Analysis: A Guide to Assessing Work Activities. San Francisco, California: Jossey-Bass Publishers.

Miller, Donald Britton. 1986. Managing Professionals in Research and Development. San Francisco, California: Jossey-Bass Publishers

Kellogg, Marion S. 1979. Putting Management Theories to Work. Revised by Irving Burstiner. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

O'Hare Associates. 1988. ISNAR Management Training Program. The Hague, Netherlands: ISNAR.

Sayles, Leonard R. and George Strauss. 1981. Managing Human Resources. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Appendix 1
JOB DESCRIPTION FORM*

1. IDENTIFY JOB CONTEXT
   Current title.
   Department and division in which job is situated.
   The contribution the position makes to the overall mission of the division and department.

2. RESPONSIBILITIES
   Describe responsibilities or desired outcomes of the job clearly, quantifying wherever possible, and record the means by which the responsibilities are to be accomplished.

3. WORKING RELATIONSHIPS

List the working relationships with supervisors, clients, colleagues, subordinates, and people of other departments that effect the successful accomplishment of the desired outcomes of the job.

4. RESOURCES

List the resources to be used: people, equipment, money.

5. SUPERVISION

Specify the line of supervision, the criteria and procedures by which accomplishments are evaluated, and the sources and frequency of feedback.

6. WIDER CONTEXT

In addition to working relationships, list any steering commitees, advisory groups, professional groups, or contacts outside the organization with which the incumbent is expected to interact.

7. PHYSICAL CONDITIONS

Where is the work performed? What are the work hours? Does the job require stamina or accuracy? Does it entail travel? Are there any accident or health risks or stress factors?

8. REWARDS

State grade, salary range, and benefits applicable.

9. CAREER

State the career prospects, including promotion, lateral transfer, and relocation – the career potential of the position.

JOB DESCRIPTION FORM

- IDENTIFY JOB CONTEXT
- PURPOSE/DUTIES
- RESOURCES
- WORKING RELATIONSHIPS
- WIDER CONTEXT
- PHYSICAL CONDITIONS
- REWARDS
- SUPERVISION AND AUTHORITY
- CAREER

Appendix 2
PERSON SPECIFICATION*

JOB CONTENT/ UNIT FIT	KNOWLEDGE	SKILL	WORK EXPERIENCE	PEOPLE SKILLS

Appendix 3
PERSON PROFILE*

- REVIEW PERSON SPECIFICATION (GENERIC)

- CONSULT SIGNIFICANT OTHER/S

- REVIEW STAFFING MIX IN THIS POSITION, IF ANY

- CONSIDER LIKELY CHANGES IN ROLE/PEOPLE OVER NEXT FEW YEARS

- REFLECT ON UNIT CULTURE AND TYPE OF PERSON WHO IS MOST LIKELY TO FIT

- DETERMINE PRIORITY REQUIREMENTS (THIS TIME AROUND)

Appendix 4
RECRUITMENT STRATEGY*

- ANALYZE THE LABOR MARKET
- CONSIDER/IDENTIFY POSSIBLE SOURCES
- IDENTIFY SOURCES TO BE TAPPED
- CONSIDER IMAGE TO BE PROJECTED IN COMMUNICATING AND/OR ADVERTISING
- IDENTIFY OTHERS (INTERNALLY/EXTERNALLY) WHO SAY THAT THEY
  - KNOW POTENTIAL CANDIDATES
  - KNOW PEOPLE WHO KNOW POTENTIAL CANDIDATES
  - KNOW WHERE TO LOOK
- DETERMINE WHERE YOUR INVESTMENT OF TIME AND OTHER RESOURCES IS MOST LIKELY TO REAP THE FASTEST/BEST RESULTS
- PLAN RECRUITMENT COMPAIGN

Appendix 5
Assessment Strategy*

- PERSON
- PROFILE
- REQUIREMENTS
- _____
- _____
- _____
- _____

MOST EFFECTIVELY ASSESSABLE THROUGH

- APPLICATION FORM
- INSTRUMENTS
- TESTS
- ASSESSMENT CENTER
- INTERVIEWING
- REFERENCE CHECKS
- PROBATIONARY PERIOD

Appendix 6
OBJECTIVES OF THE INTERVIEW*

1. TO IDENTIFY/EVALUATE

2. TO PROVIDE

3. TO PROJECT

4. TO PERSUADE

Appendix 7
INTERVIEW PLANNING AND REVIEW FORM*

ITEM TO BE ASSESSED	QUESTION(S)/ SITUATION(S)	ASSESSMENT OF RESPONSE	EFFECTIVENESS OF QUESTIONS/ SITUATIONS	CHANGES/ IMPROVEMENTS FOR NEXT TIME

Appendix 8
10 + 1 INTERVIEWING GUIDELINES*

1. KNOW WHAT YOU WANT TO KNOW AT THE END OF INTERVIEW.

2. FRAME QUESTIONS/SITUATIONS DURING PREPARATION TO ELICIT WHAT YOU NEED TO ASSESS.

3. SAFEGUARD AGAINST BIASES.

4. MODULATED TONE OF VOICE.

5. USE LISTENING, PROBING, EMPATHY, FEEDBACK, AND CHALLENGING.

6. TAP INTO FEELINGS AND CONTENT.

7. USE HYPOTHETICAL SITUATIONS AND ROLE PLAYING.

8. CHANGE STRATEGY TO RESPOND TO CANDIDATE.

9. USE SILENCE TO FACILITATE DISCLOSURE.

10. TEST 'PERSONALITY RANGE.'

10 + 1 COMPARE CANDIDATE'S DISCLOSURES WITH HIS/HER SELF-PERCEPTION.

Appendix 9
OPEN-ENDED QUESTIONS*

The open-ended questions below are arranged in categories to facilitate selection in preparation of an interview structure. Each question is indicated as being useful for initiating exploration of a candidate's intellectual, motivational, personality, and/or knowledge suitability.

I Intellectual factor

M Motivational factor

P Personality factor

K Aptitude or knowledge factor

	Possible Use			
	I	M	P	K
Work Experience				
What changes have you ever made in your approach to others in order to become better accepted in your work setting?			X	
What kind of people do you like to work with?		X	X	
What kind of people do you find it most difficult to work with? Why?		X	X	
Do you prefer working alone or in groups?		X	X	
In your last job, what would you say were the main drawbacks to pursuing that kind of a job as a career?		X		X
Starting with your last job, what would you tell me about any of your achievements that were recognized by your superiors?	X			X
Can you give me an example or two of your ability to manage or supervise others?			X	X
What are some things you would like to avoid in a job? Why?		X		
In your previous job, what kind of pressures did you encounter?			X	
What would you say is the most important thing you are looking for in an employer?		X	X	
How do you feel about travel? On the average how many nights a week would you be willing to be away from home?		X		
What were some of the things about your last job that you found difficult to do?	X	X	X	X
What are some of the problems that you encounter in doing your job? Which one frustrates you the most? What do you usually do about it?		X	X	
How do you feel about the progress you have made with your present company?		X		
In what ways do you feel your present job has developed you to take on even greater responsibilities?	X		X	X
What would you say was the most, or least, promising job you ever had? Why do you feel that way?		X		
What do you feel has been your greatest frustration or disappointment on your present job and why do you feel this way?		X		
What are some of the reasons that are prompting you to consider leaving your present job?		X		
What are some things you particularly liked about your last job?		X		
Most jobs have pluses and minuses – what were some of the minuses in your last job?		X		
Do you consider your progress on the job to be representative of your ability? Why?	X	X		X

	Possible Use			
	I	M	P	K
What are some of the things about which you and your supervisor might occasionally disagree?			X	
How do you feel about the way you or others in the department were managed by your supervisor?			X	
In what ways has your supervisor helped you to further develop your capabilities?				X
What are some of the things your boss did that you particularly liked or disliked? Why did you feel that way?		X	X	
How do you feel your boss rated your work performance? What were some of the things he/she indicated you could improve upon?	X		X	X
Reactions to the job and company				
What do you see in this job that makes it appealing to you that you do not have in your present (last) job?		X		
How do you evaluate our company as a place to build your future?		X		
I know you don't have a good perspective of this job yet – not being in it – but from your present vantage point, what would you say there is about the job that is particularly appealing to you?		X	X	X
What would you say might not be highly desirable?		X	X	X
What is it that your are looking for in a company?		X		
Goals and Ambitions				
Where do you see yourself going from here? You may not have any particular goal at this time, but if you did, what might you be thinking about?		X		
What is your long-term career objective? What do you feel you need to develop yourself in to be ready for such a spot?	X	X	X	X
What is it you have going for you that might make you successful in such a job?	X		X	X
What are some things you would want to avoid in future jobs? Why?		X	X	X
Do you have any particular salary goals or targets? (If he/she describes some, ask how he/she arrived at them.) What makes you feel you will be able to earn that kind of income in ____ years?	X	X	X	X
What kinds of job or career objectives do you have?		X		
Who or what in your life would you say influenced you most with regard to your career objectives?		X	X	X
Can you pinpoint any specific things in your past experiences that affected your present career objectives?		X	X	X
Leisure-Time Activities				
What do you enjoy doing in your off hours?		X		
What do you like to avoid getting involved in during your off hours?		X	X	
Are there any talents you possess that are used during your leisure time that you have not been able to apply in a work situation?	X	X	X	X

Appendix 10
INTERVIEWER EVALUATON CHECKS*

- Did I enter the interviews adequately informed about the position and the characteristics of the person we are looking for to fill it?
- Had I drawn up a format to help me focus my data gathering during the interview?
- Had I agreed on the evaluation critieria with the other interviewers in this selection process?
- How well did I do in the following areas:

Establishing Rapport

- Putting the candidates at their ease?
- Privacy?
- Squared? Open? Leaning forward? Eye contact? Relaxed?
- Getting the candidates to start talking?
- Listening rather than talking?
- Playing down unfavorable information?
- Avoiding disagreements?
- Giving pats on the back?
- Injecting humor?

Gathering and Giving Information

- Using my prepared structure to direct and control the interviews?
- One clear question at a time?
- Conveying empathy towards the candidates? (Feeling as well as content)

- Allow thinking time for responses?
- Use of silence?
- Observe and interpret nonverbal signals.
- Double-edged questions?
- Noting my hypotheses to probe? (Never ask a question without a clear purpose in mind.)
- Use of two-step probe?
  (Using open-ended questions/comments and following with a specific probe.)
- Using hypothetical situations to probe? (Clarify ground rules and context.)
- Using role play to probe?
- Playing devil's advocate?
- Seeing image or reality?
- Controlling the process by not allowing the candidates to avoid or drift from issues I want to explore?
- Providing the candidate with sufficient opportunity to probe me about the position and the institution to ensure the selection process was mutual and realistic?
- Controlling the time to ensure that I acquired sufficient data on all the areas specified in my prepared format?
- Record keeping?

Minimizing Bias from

- Early impressions?
- Negative information?
- Shared attitudes/values?
- My idealized picture?
- What impression of the organization did the candidates receive from their interaction with me in the interview?
- How confident am I that I have learned what I wanted to know about the candidates in order to make an informed and realistic decision about the suitability of each one for the position?

Appendix 11
INTERVIEW REPORT*

Interview Criteria

1.

2.

3.

4.

Quality of Interview

(Sufficient time, rapport, openness of candidate, level of confidence in data acquired, level of comfort with assessment made against the respective criteria?)

FIRST CRITERION
Assessment of responses to probes into the area of first criterion.

SECOND CRITERION
Assessment of responses to probes into the area of second criterion.

THIRD CRITERION
Assessment of responses to probes into the area of third criterion.

FOURTH CRITERION
Assessment of responses to probes into the area of fourth criterion.

Other data acquired/assessments made.

Overall suitability and recommendations.

In favor of hiring.

Against hiring.

Other.

Rating against other candidates (if any).

QUANTITATIVE ASPECTS OF RECRUITMENT PLANNING FOR NATIONAL AGRICULTURAL RESEARCH: A METHODOLOGICAL NOTE[1]

Byron Mook

Introduction

How do research managers go about estimating the future manpower needs of their organization? How many scientists and managers will they need (*quantity*) and what kinds of people should they be (*quality*)?

The focus of this note is on *quantity* issues. The objective is to present a practical and powerful method for the manager to deal with the numerical aspects of recruitment planning. Potential users of this method include senior officials of national agricultural research systems (NARS), including those officials specifically charged with the management of scientific personnel.

General Considerations

The process of recruitment planning has five general steps. Each is presented below in the form of a series of questions for the research manager. The manager cannot logically move onto the next step until the question(s) for the previous one have been answered.

1. The Determination of Program
   a. What is my organization trying to accomplish?
   b. What are our research priorities?
2. The Identification of Manpower Needs
   a. What personnel do I need to implement these programs?
   b. What different mixes of scientific staff and support staff could I employ to meet these goals?
3. The Analysis of Existing Manpower Supply
   a. What personnel do I have now?
   b. Who will be retiring in the next five to 10 years?
   c. What new skills do I need?
4. The Choice among Alternatives
   a. Can I meet these skill requirements by upgrading the qualifications of existing staff (in-career training)?
   b. Or do I need to bring in new people?
5. The Match between Manpower and Money
   a. How much will whichever alternative I choose cost?
   b. And am I likely to have the funds?

In many NARS, the manager may find it difficult to answer such questions. Program priorities may not have been defined (no. 1) and the information base on existing personnel may be weak (no. 3). Training opportunities are often unclear (no. 4) and levels of future funding almost always are (no. 5).

In such situations, managers obviously have to do the best they can. For dealing with *quantity* issues in recruitment planning, managers have two options, which are politically and, even to some extent, philosophically different. The first is an approach based on what they would like — and the second on what they can afford.

Approach No. 1 — "Wish Lists"

The first approach is the one most commonly used. Its starting point is a request by the manager to heads of research institutes or programs to state their manpower "requirements" over the next *x* number of years.

- How many people do you need?
- Of what type?
- What kinds of qualifications should they have?
- In which scientific fields?

This approach is easy to follow but has two problems: (a) imprecision about the concept of "requirements" and, as a result, (b) a tendency to state "requirements" too high.

Let us examine the second problem first. . . . There are at least four reasons for the tendency of agricultural research managers to overestimate.

1. *Budgetary strategy.* Institute or program managers asked to state their manpower requirements usually feel that whatever number they give will be cut anyway. They therefore overestimate in the hope that they will finish with resources close to what they think they may actually need.

2. *Agricultural research in national development.* Most research managers believe that their scientists have a unique potential for making contributions to the nation. Their argument is that the economy depends on agriculture, and that agriculture depends on agricultural research.

3. *Professional status.* Research managers also tend to feel that they represent an elite group. Agricultural scientists are better educated than the majority of the national population, more widely travelled, and better paid. In order to maintain such status — so the (usually unstated) argument goes — research leaders must continually strengthen their organizations with more and better people.

4. *Empire building.* Some research managers equate numbers of subordinates with bureaucratic power. The more employees, the bigger the budget, the greater the influence.

All four such arguments are undoubtedly valid. But the managers who follow this first approach and make overestimates — often for good political and administrative reasons — seldom take sufficient account of the *general considerations* outlined in above. Their list of "requirements" is usually based on a less than thorough analysis of program (no. 1), job descriptions (no. 2), available manpower (no. 3), training opportunities (no. 4), or likely funds available (no. 5).

In such cases, the result is simply a *wish list* for new manpower rather than any kind of a systematic recruitment plan. But the costs of such management shorthand may be high. . . . If NARS recruit either too many people, and/or people who are too highly qualified, the manager is likely to have to deal with several interrelated problems.

1. *Lack of resources.* Most NARS now put at least 60% of the recurrent funds they receive into personnel. Many put more — and the salary bill is continually growing. If too much money goes into salaries, because too many highly qualified people have been recruited, there will obviously not be enough for actually doing research.

2. *Lack of motivation.* Without sufficient operating resources (including support staff, materials, and facilities), newly recruited scientists will not be able to do the work for which they have been trained. They will therefore become frustrated — and either become inactive or begin to look for alternative employment elsewhere.

3. *Lack of organizational coherence.* Finally, if a research organization recruits too many highly qualified personnel, it may develop what is sometimes called an "inversion of the skill hierarchy." In plain terms, the organization becomes top-heavy, with too many self-perceived leaders (senior scientists) and not enough followers (junior scientists and support staff).

Approach No. 2 — "What Can We Afford"

Basic Elements

The second approach is the primary focus of this methodological note. This approach is sounder from both a management and an economic point of view. It asks not "how much is needed" (as in the first approach), but rather "how much can we afford?" In a time of tight budgets and financial austerity, all research managers need to be asking this latter question.

In order to use this method, the research manager needs five types of data. These data are not complex and can usually be put together by the manager's staff with a minimum of effort.

1. *AGDP (Agricultural gross domestic product)* for the current fiscal year and with estimates of growth in the period for which recruitment is being planned.

2. *AGDP being spent on agricultural research* for the current fiscal year and — again — with estimates of growth in the period for which recruitment is being planned. Most NARS now get about 1% per year; some international agencies have set targets for NARS of 1.5%-2% per year.

3. *Bill for research salaries/benefits* expressed as a percentage of total research expenditure. As noted above, this figure in most NARS is at least 60% and is often closer to 80%.

4. *Bill for salaries/benefits of graduate scientific staff* (a derivative of no. 3). This is also expressed as a percentage of total research expenditure. When coupled with an analysis of the spread between salaries paid to different categories of personnel, this figure gives an indication of the shape of the personnel pyramid.

5. *Movement of graduate scientific staff into higher salary grades* over the period for which recruitment is being planned, called "grade creep." Even if a research organization does no recruitment at all in a given year, its salary and benefits bill will go up simply because of increments and promotions.

An Illustration of the Method from One NARS — Data

To illustrate the use of this approach in recruitment planning, a "real-life" example is appropriate. The data presented below are from one NARS.

1. *AGDP.* In 1981, AGDP was the equivalent of US$730,080,000. The government was optimistic that AGDP was going to grow at an annual rate of 4% over the next decade. But some nongovernment economists were unconvinced; they believed that such an estimate was very optimistic and argued that a more realistic AGDP growth rate was closer to 2%.

2. *Percent of AGDP being spent on agricultural research.* In 1981, this figure was 1.06%. Research planners hoped that the figure would rise closer to 1.5% within three to five years. But Ministry of Finance officials were publicly noncommittal and privately pessimistic about such an increase. Some even wondered whether the 1.06% level could be maintained in the face of increasing debt-service, military, and social-welfare pressures.

3. *Total bill for research salaries/benefits.* In 1981, this figure was the equivalent of US$5,423,000. Such a figure represented 70% of the operating (recurrent) expenditure budget.

4. *Total bill for salaries/benefits of graduate scientific staff.* In 1981, this figure was the equivalent of US$1,472,000 — or 19% of the operating expenditure budget. The NARS had about 550 BAs, MScs, and PhDs.

5. *Movement of graduate scientific staff into higher salary grades.* In 1981, planners estimated that the annual increased financial cost of "grade creep" was 3%.

An Illustration of the Method from One NARS — Future Scenarios

The payoff from the method described above comes in the ability of the manager to ask and answer "what-if" questions. *What if* AGDP does in fact grow at 2% instead of 4%? *What if* the percent of AGDP spent on agricultural research does indeed rise to 1.25%?

> **The basic question the manager is trying to answer is "How many more people will I be able to recruit while still keeping enough operational funds for research?"**

Let us use the above data to construct three such *what-if* scenarios . . .

Table 1 shows a 10-year personnel projection based on the following assumptions:

1. *AGDP.* **4%** annual growth.

2. *Percent of AGDP being spent on agricultural research.* Maintenance of the current **1.06%** figure.

3. *Total bill for research salaries/benefits.* Maintenance of the current **70%** figure.

4. *Total bill for salaries/benefits of graduate scientific staff.* Maintenance of the current **19%** figure.

5. *Movement of graduate scientific staff into higher salary grades.* **3%** per annum.

In this scenario, we see that the total number of graduate scientists that can be added to the research organization is 253 — an increase of 25 to 30 (or about 4%) per year. The figures in the bottom row of the table are *net*; that is, they represent the total of both recruits and retirements-plus-resignations.

Now let us suppose, however, that the manager starts from the other end. . . . Suppose he decides that an annual growth of 25 to 30 scientists is not enough, and that 50 to 70 is much more desirable.[2] What resources will be required to pay for such people?

Table 2 shows a 10-year projection based on these more ambitious growth assumptions:

1. *AGDP.* **4%** annual growth.

2. *Percent of AGDP being spent on agricultural research.* Growth in the current **1.06%** figure to **1.46%** by 1991 (in annual increments of 0.04%).

Table 1.

ASSUMPTIONS:			
4%	—	AGDP Growth	
1.06%	—	Percent of AGDP for Research	
70%	—	Total Salaries/Benefits	
19%	—	Graduate Salaries/Benefits	
3%	—	Grade Creep	

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total
AGDP based on 4% annual growth	730800	760032	790433	822051	854933	889130	924695	961683	1000150	1040156	1081763	
Total NARS oper. budget based on 1.06% of AGDP for research	7746	8056	8379	8714	9062	9425	9802	10194	10602	11026	11467	
Total staff sals/benefits based on 70% of oper. budget	5423	5639	5865	6100	6344	6597	6861	7136	7421	7718	8027	
Graduate sals/benefits based on 19% of oper.budget	1472	1531	1592	1656	1722	1791	1862	1937	2014	2095	2179	
Reduction in *real* graduate salaries/ benefits based on 3% annual grade creep		1486	1546	1607	1672	1739	1808	1880	1956	2034	2115	
Number of graduates at 2500 (constant)		594	618	643	669	695	723	752	782	814	846	
Net increase in graduates/year			24	25	26	27	28	29	30	31	33	253

Table 2.

ASSUMPTIONS:	4%	—	AGDP Growth	19%	—	Graduate Salaries/Benefits
	1.06% - 1.46%	—	Percent of AGDP for Research (0.04% annual growth)	3%	—	Grade Creep
	70%	—	Total Salaries/Benefits			

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total
AGDP based on 4% annual growth	730800	760032	790433	822051	854933	889130	924695	961683	1000150	1040156	1081763	
Total NARS oper. budget based on 1.06% of AGDP for research in 1981, rising by 0,04% annually to 1.46% in 1991	7746	8360	9011	9700	10430	11203	12021	12887	13802	14770	15794	
Total staff sals/benefits based on 70% of oper. budget	5423	5852	6308	6790	7301	7842	8415	9021	9661	10339	11056	
Graduate sals/benefits based on 19% of oper. budget	1472	1588	1712	1843	1982	2129	2284	2448	2622	2806	3001	
Reduction in *real* graduate salariess/ benefits based on 3% annual grade creep		1542	1662	1789	1924	2067	2217	2377	2546	2725	2913	
Number of graduates at 2500 (constant)		617	665	716	770	827	887	951	1018	1090	1165	
Net increase in graduates/year			48	51	54	57	60	64	68	71	76	549

3. *Total bill for research salaries/benefits.* Maintenance of the current **70%** figure.

4. *Total bill for salaries/benefits of graduate scientific staff.* Maintenance of the current **19%** figure.

5. *Movement of graduate scientific staff into higher salary grades.* **3%** per annum.

In this scenario, the total number of graduates that can be added to the research organization is 549 — a much more desirable result. But the assumption that makes this figure possible — a substantial growth in the percent of AGDP being spent for research — is *very* optimistic.

Finally, let us suppose the dependent variable is changed from the number of scientists that can be recruited to the percent of budget being spent on salaries/benefits. . . .

Table 3 shows a 10-year projection based on the following assumptions:

1. *AGDP.* **4%** annual growth.

2. *Percent of AGDP being spent on agricultural research.* Maintenance of the current **1.06%** figure.

3. *Average cost per scientist.* **6%** annual growth. This figure takes account of both grade creep (3%) and upward revision of civil service salary scales (3%).

4. *Number of scientists.* **5%** annual growth.

In this scenario, the percent of recurrent budget being spent on salaries/benefits by 1991 is 99%. In order to avoid such a disaster, the manager has to be able to show that the one of the above four variables is wrong. Either AGDP has to grow more, or more has to be spent on agricultural research, or the average cost per scientist has to grow less, or the number of scientists has to grow less. How much room for maneuver is there?

Conclusion

The focus of this brief methodological note is on a single management procedure. The objective is to put before research managers a practical technique that they and their staffs can use to plan the quantitative aspects of scientist recruitment.[3]

The attractiveness of the technique is that its use encourages research managers to take account of financial constraints. For NARS, the most critical moment in the recruitment process is when policymakers in the ministry of planning and/or in the ministry of finance and/or in the public service commission make decisions about the personnel plans formulated by the NARS. *The major assumption of this note is that such policymakers are more likely to provide increased staff resources for research when they can base their decisions on well-researched, well-documented, and well-argued cases.* "Wish lists" are not likely to be sufficient.

A Note on Microcomputer Use in the Application of the Method

The three tables included in this paper were put together using a basic *spreadsheet* program on a small microcomputer. A spreadsheet is simply a matrix consisting of rows (horizontal) and columns (vertical). Numbers are entered in the appropriate cells in the matrix, rows and columns are summed, and an overall total is calculated. Financial managers and accountants have used spreadsheets for years.

Before the advent of microcomputers, however, spreadsheet recalculations were usually tedious and time-consuming. Whenever the value in one cell in the matrix was changed, all row and column totals also changed. The amount of addition and readdition was therefore often very large.

With a simple microcomputer, however, such recalculations become instantaneous. When the manager changes a value in any one cell in a matrix, values in all other cells are recalculated automatically. *The advantage for a research manager of using a spreadsheet for functions other than finance — e.g., for recruitment planning, as described in this paper — are obvious.* The manager can ask "what-if" questions and can experiment with different scenarios. Tables 1 and 2 in this paper have the same structure but are based on different "what-if" assumptions.

Notes

1. Paul Bennell was a major contributor to the ideas presented in this paper.

2. In the real world, the 25-30 figures were in fact very disappointing to the managers of the NARS concerned. When they had earlier asked institute and program heads for "wish lists" (see the description of approach no. 1), the aggregate annual growth figures had actually been in the range of 50 to 70!

3. For a summary of the more theoretical aspects of recruitment planning, see ISNAR Working Paper No.15, *Human Resource Management for Agricultural Research: Overview and Issues*, by Paul Bennell and Larry Zuidema.

Table 3.

ASSUMPTIONS:			
4%	—	AGDP Growth	
1.06%	—	Percent of AGDP for Research	
6%	—	Annual Growth (Cost/Scientist)	
5%	—	Average Annual Growth (Numbers of Scientists)	

AGDP based on 4% annual growth	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total NARS oper. budget based on 1.06% of AGDP for research	730800	760032	790433	822051	854933	889130	924695	961683	1000150	1040156	1081763
Average cost per scientist (6% annual growth)	7746	8056	8379	8714	9062	9425	9802	10194	10602	11026	11467
Number of scientists (5% annual growth)		7.686	8.147	8.636	9.154	9.703	10.286	10.903	11.557	12.250	12.985
Total salary bill		566	594	624	655	688	722	758	796	836	878
Percent of budget being spent on personnel		4350	4842	5389	5998	6676	7430	8270	9204	10244	11402
		54%	58%	62%	66%	71%	76%	81%	87%	93%	99%

CASE STUDY
RECRUITMENT AND SELECTION OF STAFF IN THE DEPARTMENT OF AGRICULTURAL RESEARCH, MALAWI

E. M. Ntokotha

Introduction

Over 85% of the population in Malawi live in rural areas, deriving their livelihood from self-employment in agriculture. It, therefore, follows that agricultural development is very important in Malawi because it affects the welfare of a very large proportion on the population and is the backbone of the national economy in the absence of exploitable mineral wealth. The justification for government intervention in this sector is threefold:

1. to ensure self-sufficiency in food production;

2. to provide raw materials for local industries and export;

3. to ensure general development of the country, both socially and economically.

The growing population of Malawi necessitates a substantial growth in food production, particularly of maize, beans, groundnuts, rice, sorghum/millet, cassava, sweet potatoes, and livestock and livestock products. A sharp drop in the production of these commodities means that they must be imported, using scarce foreign exchange, which is also needed for importing such things as fuel, fertilizers, chemicals, vehicles, and equipment. Hence, the emphasis on self-sufficiency in food production.

Some industrial development is emerging in the Malawi economy, notably in the textile and edible-oil industries. Development in the agricultural sector will ensure a steady supply of raw materials for these industries at costs that will enable the products to be sold at competitive prices domestically and internationally.

The development of agriculture carries with it the basic infrastructural development required for the flow of goods and services into rural areas. This development represents a general development in rural areas in terms of roads, health units, water, electricity, training facilities, and other amenities. Because of the high proportion of the rural population compared to the total population in Malawi, once these areas have been developed, then a large proportion of the country's population will also have been developed.

It is axiomatic that agriculture is critical to the sustained national economic development of Malawi (and most African or third-world countries), especially considering that it contributes about 40% of the gross domestic product and accounts for about 90% of the foreign exchange. It is also axiomatic that technical change is one of the critical elements that determines the pace of agricultural growth in a developing country such as Malawi. Thus, agricultural improvement can be achieved through well-thought-out and coordinated agricultural research programs, developing appropriate technologies to be transferred to target groups. The increasing rate of agricultural development taking place in Malawi has necessitated both the intensification and expansion of the research effort, and with the advent of the National Rural Development Program (NRDP), the department of agricultural research (DAR) has had to provide and will continue to provide baseline data for planning purposes. The overall goal of NRDP is to increase the productivity, quality of life, and income of smallholder farmers by

1. increasing the general level of smallholder agricultural production in Malawi for domestic needs, import substitution, and export;

2. increasing agricultural productivity and, consequently, the income and welfare of smallholders by assuring access to needed inputs and services;

3. preserving Malawi's natural resources by encouraging conservation-linked crop production, developing multiuse conservation programs, and developing forestry reserves on customary and estate land.

In order for these goals to be achieved, research must provide the basic information to guide national planners on the validity of the technical assumptions on which their development objectives are based and on choices between technological alternatives (as well as their socioeconomic implications). For this reason, the DAR is charged with the national responsibility for research on all agricultural commodities, with the exception of sugar, tea, and tobacco, through applied and adaptive research. The DAR seeks to provide the means of solving the technical and agronomic problems of national priority to ensure adequate supplies of high-quality food and cash crops for processing and export.

As in all countries, the agricultural research system is only as good as what it produces, which in turn depends on the quality of the research staff since the generation, adaptation, and application of research knowledge requires a highly trained and motivated staff of research scientists, research administrators, and support staff. The identification and selection of candidates who have the aptitude to become researchers is of utmost importance in Malawi. The correct selection of future research scientists ensures the necessary foundation for a sound agricultural research system that will develop the technologies fundamental to the economic growth and stability of the agricultural sector.

Historical Development of Research Staffing in the Department of Agricultural Research.

Upon receiving her independence in 1964, Malawi had a human resource base that was insufficient for economic and social development. Institutional infrastructure for post-secondary training was virtually nonexistent and less than three percent of the budget was spent on education by the government. Similarly, post-secondary agricultural institutions were not in place, and the majority of key positions in the Ministry of Agriculture (MoA) were filled by expatriate personnel, as summarized in table 1.

However, since 1964, there has been a dramatic increase in the development of Malawi's human capital resource. The educational budget now represents 11% of total expenditure, and the resultant development of the University of Malawi system (Chancellor College, Bunda College, and the Polytechnic) since 1964 provides most of the country's essential domestic human resource requirements. Today Bunda College, from which the greater percentage of professional and technical officers are drawn, graduates about 35 degree and 90 to 100 diploma candidates each year. Others, albeit constituting lower numbers, come from Chancellor College and the Polytechnic. The annual output of the Natural Resources College is approximately 250 certificate holders, from which the bulk of the technical assistants is drawn. The present staff situation and deployment in DAR is summarized in table 2 and figure 1.

Present Mechanisms for Recruitment and Selection

The recruitment of individuals of various categories or grades is subject to the availability of positions that need to be filled. The availability of vacant positions is the result of a) resignation, b) termination of service, c) death, d) retire-

Table 1. Staff Situation in the Department of Agricultural Research in 1964

Professional Staff Diploma			Technical Staff Certificate	
PhD	MSc	BSc	Technical Officer	Technical Assistant
3 (All expatriates)	3 (All expatriates)	16 (15 expatriates)	8 (4 expatriates)	Expatriates

Table 2. Staff Situation in the Department of Agricultural Research as of 31 March 1989

Professional Staff Diploma			Technical Staff Certificate	
PhD[1]	MSc[2]	BSc[3]	Technical Officer	Technical Assistant
9 Malawians 4 Expatriates (USAID) TAs	45 Malawians No expatriates 20 on PhD study leave 13 in USA 6 in UK 1 in Canada	46 Malawians No expatriates 31 on MSc study leave 26 in USA 4 in UK 1 in Nigeria	87 Malawians No expatriates	246 Malawians No expatriates

1. Eight PhDs have moved to other departments, parastatals, and international organizations since 1985.
2. Two MScs have moved to other departments and private organizations.
3. One BSc has moved to another department.

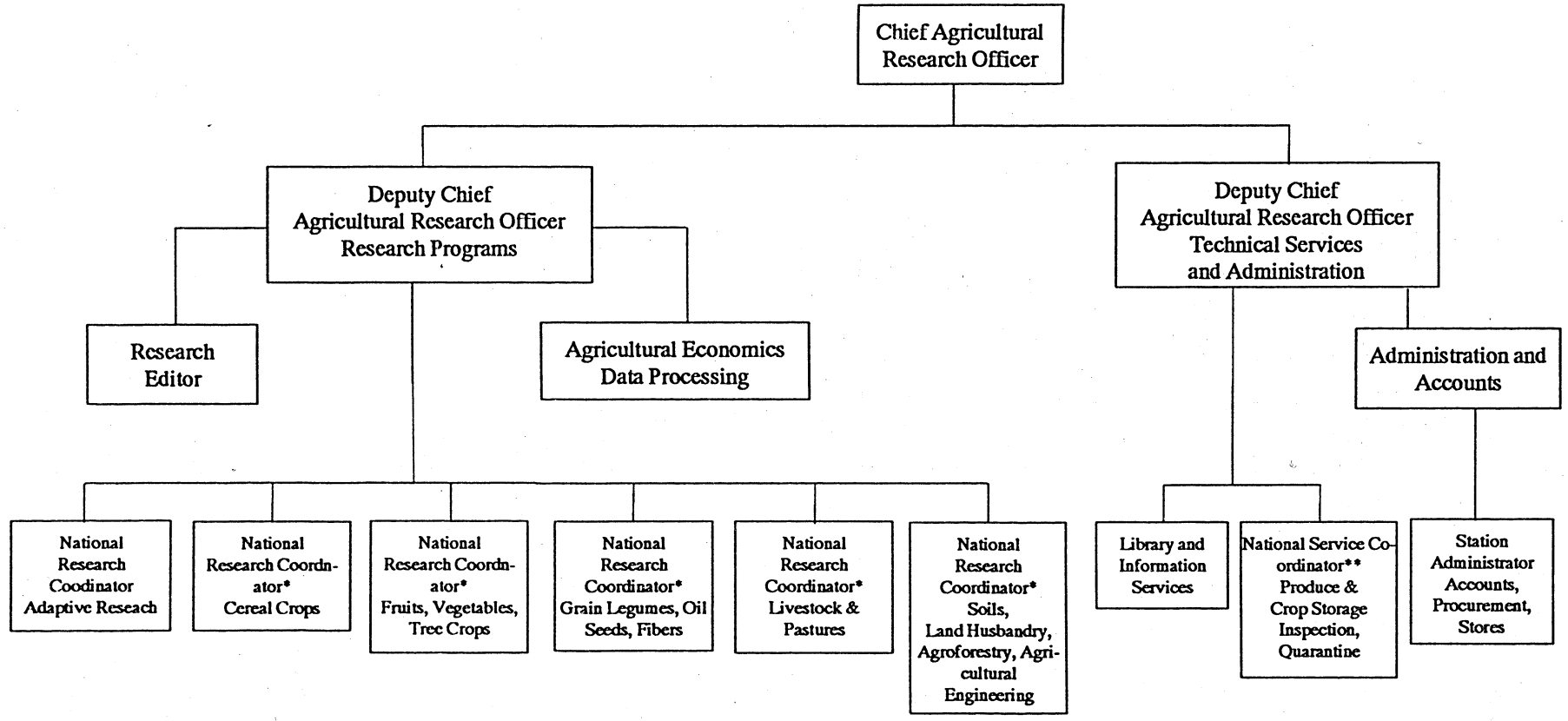


Figure 1. Organizational Structure of the Department of Agricultural Research, Malawi

*Oversee commodity teams.
**Oversees service teams.

ment, and e) expansion of programs. Notwithstanding the fact that accommodation in the civil service is a privilege and not a right, the availability of institutional housing, particularly for junior staff (technical or field assistants), is another factor to take into consideration.

Bodies Entrusted with Recruitment and Selection Exercises

Recruitment and selection of employees working in DAR is conducted by three different bodies, depending upon the required grades of the prospective employees. Three organizations are involved in the exercises:

1. station/departmental recruitment;

2. appointment and disciplinary committee (ADC ministerial recruitment);

3. public service commission recruitment.

Recruitment and Selection Processes

1. Station/Departmental
   (Workers recruited by a station in DAR)

   a. Industrial class employees

      i. Unclassified workers or laborers

      ii. Classified workers (grades III to I) (cooks, bartenders, and laboratory/field/livestock attendants, among others)

      iii. Operators (such as plant operators and motor vehicle and tractor drivers)

   b. Subordinate-class employees

2. ADC/Ministerial

3. Public Service Commission Recruitment

Unclassified Workers or Laborers

Commodity team leaders, in consultation/liaison with team members, identify the need for laborers to perform specific tasks. They seek approval from the station head to employ laborers. When approval has been granted, they ask the farm manager how many employees are needed, for what kind of work, with what skills and other characteristics, when the employees will be required and for how long. The farm manager then sends word of these vacancies to the communities surrounding the station. The farm manager is also the one who does the selection and hiring. The new employees' personal information is then given to the station payroll officer so that they will be added to the muster or payroll. The farm manager also sends this information to the commodity team leader who requested that new employees be hired.

Classified Workers and Operators

With this category of employees, the *modus operandi* regarding recruitment and selection is similar to that described for the unclassified workers. In this case, however, there are specific skills and various levels of competence within each group.

Because of the varied nature of skills involved, the need for a particular worker may be identified by the commodity team leader or farm manager (for station maintenance). And since the skills required are of a specialized nature, advertising is usually done through the labor office, where there are records of skilled workers who are looking for jobs. The labor office notifies suitable individuals and makes an appointment for them to come to the station for interviews. Hiring is done by the farm manager. In general, interviewing and hiring workers in this category is the sole responsibility of the farm manager or his representative.

Subordinate Class Employees

This class of employees consist of watchmen, security guards, and messengers. These fall under the station administration, so their recruitment and hiring is done by the administrative officer or his representative. However, the procedure is similar to the procedures involved in the employment of unskilled workers or laborers.

2. ADC/Ministerial Recruitment

Each government ministry has an ADC to which the public service commission has delegated functions relating to employees of the technical/field assistant grade. This group of employees has had two to four years of secondary education prior to undertaking a two-year training course in the more practical and less theoretical aspects of the agricultural sciences.

In the ministry of agriculture, there are six senior officers who represent the various departments and sections: agriculture (1), veterinary medicine (1), agricultural research (1), accounts (1), and personnel (2). The two officers from the personnel section are members of the ADC; the head of the personnel section chairs the ADC while the other acts as the secretary.

When a technical/field assistant is needed at the commodity team level, the commodity team leader takes up the issue with the station head, who will, when satisfied that the need is genuine, take up the matter with the chief agricultural research officer.

When the chief agricultural research officer has confirmed the existence of vacancies, the requirements are submitted

to the ministry of agriculture. When vacancies arise because of an expansion in programs, the ministry of agriculture negotiates with the department of personnel management and training (DPMT) for the creation of the new positions. Then the ministry of finance is requested to make funds available for salaries. In any case, the ministry of agriculture declares the vacant posts to the secretary of the ADC. With the approval of the ADC, the secretary advertises in the press that there are training vacancies at the Natural Resources College (NRC).

Once the secretary's short list is approved by the ADC, the secretary makes arrangement for the candidates to take an aptitude test administered by the Malawi National Examination Board (MANEB). On the basis of the examination results, a number of candidates (usually 10 per vacancy) are selected for oral interviews by boards constituted as follows:

- chairman of the ADC
- an officer from MoA personnel section (secretary)
- a representative from the ministry of agriculture
- a representative from the Natural Resources College
- a representative from any ministry the ADC chooses (perhaps with the exception of the secretary, all members of boards must be senior civil servants of good standing)

The recommendations of the examining boards are considered by the ADC, where the final selection is made. Minutes of the ADC are sent to the public service commission for ratification, with copies to the DPMT for their records. Once ratified by the PSC, the list of selected candidates is released to the principal of the Natural Resources College, who arranges with the ADC secretary to announce the names of the successful candidates and the dates they are to report to college.

In the last term of the second year of training, the principal requests that the chief agricultural research officer confirm his requirements. The principal then selects the required number of new employees from among those interested in joining DAR. At the close of the term, the principal informs those selected to report to DAR. DAR then gives the personal details of these candidates to the personnel office and the accounts section (salaries division) of the ministry of agriculture to finalize the employment procedures. The individuals are assigned to the various research stations as requested.

There are several factors that motivate prospective employees in this category and make them want to work for DAR. These include the following:

1. *Location.* Close to Chitedze Agricultural Research Station (CARS), which is the biggest in the country and is only about 8 km away from NRC. Field and educational visits are arranged annually for students. Ex-NRC students work at the station, so students visit from time to time and begin to appreciate what the station is all about. Furthermore, prior to moving to the present campus in 1984, the training of these students took place at the then Colby College of Agriculture within the same premises as CARS. This relationship is still active.

2. *Vacation employment.* From time to time a few students are employed at the research stations during their vacations, and their experiences influence them or their fellow students to join DAR.

3. *Training opportunities.* Occasionally, there are opportunities for outstanding students to proceed to Bunda College of Agriculture for a diploma and possibly a degree course. Furthermore, there are opportunities from time to time for members or staff in this category to go on short training courses abroad to gain specific skills at various international training institutes or international agricultural research centers.

4. *Interest in particular subjects or crops.* Students may be interested in a specific field, such as horticulture, which they would like to pursue as a career after college. By joining DAR, they can be certain that sooner or later they will work in their field of interest.

Public-Service Commission Recruitment

The public-service commission was set up by the government and charged with the responsibility for recruitment of all civil servants in the civil service with as much impartiality as possible. Other attendant responsibilities (executed on the basis of the recommendations of controlling officers) include:

1. granting promotions;
2. confirming appointments of probationers and terminating services of same;
3. granting salary advancements to deserving officers;
4. making critical evaluations of civil servants' career development, resulting in granting or not granting the crossing of efficiency bars.

Because the civil service is large and the volume of work is enormous, it was decided to establish ADCs in all ministries to which the PSC had delegated similar functions (as outlined above) for employees of the technical assistant or certificate grade. The PSC deals with employees of the technical officer or diploma grade and above, itself.

The process of recruitment and selection is similar to the ADC/ministerial process described above. After the need to recruit has been identified, The ministry of agriculture publicizes the vacancies along with job descriptions. The PSC puts out advertisements and arranges interviews. At the interviews, at least two members of the interviewing panel are from the PSC, two are independent (one of whom should be conversant with the nature of the work for which the candidates are being interviewed), and one is a representative of the department of agricultural research.

Almost 90% of the candidates in this group are drawn from Bunda College of Agriculture, and about 10% are from both Chancellor College and the Polytechnic.

A minor difference between the ADC and the PSC is that while the ADC recruits, in the first instance, for pre-employment training, the PSC recruits people who are already trained.

Salary Advancement and Promotions

Salary advancements and promotions are also the result of selections. There are two kinds of salary advancement:

1. accelerated salary advancement
2. crossing of the efficiency bar

There are also two types of promotions:

1. personal
2. regular

Accelerated Salary Advancement

When employees have served the mandatory probationary period of two years and are confirmed in their employment, and if their performance is considered outstanding, they are rewarded by being given several increments within their salary scale. Usually this happens during the first five years of a career.

Crossing of the Efficiency Bar

Efficiency bars are designed to ensure that civil servants do not continue to receive increments in a long salary scale segment. Exceptions to this occur when individuals have passed prescribed examinations and acquired additional qualifications that would enable them to perform the duties and responsibilities required in higher positions of their salary range. In the absence of examinations, civil servants can cross the efficiency bar if they are considered by their supervising officer and the ADC/PSC to be diligent, efficient, and hardworking.

Personal Promotions

Personal promotions are awarded to civil servants irrespective of the existence of a vacant or substantive post in the next grade to which they are promoted. Usually such promotions are given to government employees who have consistently performed their duties with dedication for a period of 10 years or so.

Regular Promotions

Regular promotions fill a vacant post. The process is similar to the recruitment process described earlier. Announcements of vacancies, with job descriptions attached, are sent to the ADC/PSC. The secretary of the ADC/PSC advertises the positions in the national press and arranges interviews for the short-listed candidates. If a current employee from a position in a lower grade applies for the vacancy and is accepted, then he/she is promoted to the level designated for the vacant position.

IV

Socialization into an Organization

SOCIALIZATION OF STAFF IN NARS

Luka O. Abe

Young researchers, joining a national agricultural research system (NARS) in their early careers, may face difficulties in the workplace unless a well-structured program of orientation and induction is laid out for them as they enter into the organization. Indeed, the working methods of the NARS and the culture of research may be bewildering, and a nightmare for the uninitiated researcher. In the SADCC NARS, the majority of staff joining the organization do so after their BSc training, and most of these undertake postgraduate education, usually abroad, before returning to work for the NARS. Both new recruits in a NARS and the researcher who has been in training away from the country need to undergo socialization in their entry or re-entry into the organization.

Definition

What then, is socialization? What is the rationale and justification for such a seemingly simple process? After all, since most staff are recruited within the country, they should have no difficulty adjusting to their environment! But this is not always the case. Socialization may be viewed as a process by which new staff, recruits or individuals, joining an institution are made to become productive members of the organization in the most efficient and effective way. It involves being initiated into the culture and introduced to the business contexts of the organization.

NARS Culture and Business Contexts in Socialization

In the NARS, the most critical elements of the business context are strategy for agricultural research, the generation of production technology, and the transfer of the technology to users, with primary emphasis on increased agricultural productivity and national development as the ultimate goals. The purview of the NARS embodies the goals and mandate of the institute, the resources at its disposal, the stakeholders and competitors (especially for resources), and the key changes the institution faces. On the other hand, elaboration of the culture to new staff should include an introduction to norms and values of the NARS with respect to how it organizes its research, how staff are expected to be treated, what behaviors are rewarded, and how conflicts are resolved. Specifically, the new staff's consciousness raising will stress, inter alia, their personal role in the NARS strategy and how to adapt to it, the professional culture, organizational politics, training benefits, reward systems (salaries and other benefits), the teamwork approach in research, the rituals, and the use of NARS information and communication systems. The net gain to the institution in having an effective socialization system is the maximization of the commitment of young researchers to the NARS workforce.

The vision elaborated in the strategic plan of an organization is often difficult to explain to new staff, since the concept may be elusive and managers, themselves, may have some trouble expressing it. Nonetheless, effective socialization attempts to accomplish this. New staff must be assisted in understanding the organization's culture, as well as knowing its people, organizational needs, and operational strategy. The research culture is complex, and the skills and resources required to make it function are diverse, as is the environment in which it operates. Young researchers are immediately faced with challenges in the form of the organization's clients: resource-poor farmers, extension agents, private-sector organizations, government institutions, and industry. The connections are not always easy to discern.

Young recruits are not expected to assimilate everything in a short period. It is hoped that through proper communication mechanisms, they can develop an appreciation of the diverse elements of the organization in the shortest time possible. The speed with which this occurs obviously depends upon their previous experience — whether they have worked with a NARS before, their level of education, their disciplinary background, etc.

Rationale for Socialization

Why should a NARS pay particular attention to its socialization process? The problem derives from the backgrounds of the recruits; the integration of individuals with varied backgrounds presents an interesting and challenging perspective to NARS. It is important to understand the unique-

ness of the research enterprise to fully appreciate the dimensions of the problem. Most of these have to do with critical issues in the early career of researchers.

- Research results are required immediately, yet the process can be slow. Young researchers may interpret this as meaning that they should generate rapid results, and 'quick fixes,' but they will be frustrated when confronted with the daunting challenge of conducting research whose results, in order to be productive, must not only address clients' problems, but must also be carried out in the most cost-effective way. It is difficult even for some of the more experienced researchers to comprehend this, let alone try to explain it to the young researcher.

Take the case of the recruit who joins the NARS to work within the plant breeding unit. The group is researching new varieties of maize that are resistant to a maize streak virus and stem-borers.

How does one explain to the young researcher that the fruits of such results may not be realized for five years or more?

- Closely connected to this is the fact that the time horizons in our world are much more likely to be either very short or very long. In other words, different processes or activities have different periods of completion. These two considerations may lead to serious frustration and disillusionment unless a young researcher becomes fully aware of them.

- The issue of supervision for young researchers keeps cropping up as a serious concern. In the SADCC NARS, most researchers are young (average age below 37), and about 40% of the researchers have a BSc, 45% have a MSc, and about 15% have a PhD. This means highly experienced research leadership is at a premium. Furthermore, the more experienced, highly trained individuals spend more than 20% of their time in administration. Effective supervision of young staff is therefore difficult to achieve. This problem should be confronted and either solved or explained to the new recruit to avoid frustration. Later in this paper, we explore a way of dealing with this problem.

- Related to the issue of supervision is feedback, so critical in the early career of a young researcher. The success of coaching and counselling by the experienced supervisor is determined by the quality and quantity of feedback the individual receives from the supervisor. Otherwise, young recruits will feel they are working in a vacuum and will become angry and frustrated.

Consider the case of Charles, 25 years old, officer-in-charge of a research station in a remote part of the country. Shortly after graduating from the university with a BSc in agriculture, Charles was sent to head this station, having spent just three weeks at headquarters. The station is conducting research in irrigated rice. Charles is one of the research officers, the other two having joined a year after him. Charles is an entomologist; the other two are an agronomist and an agricultural engineer. They are expected to do adaptive trials on new releases from IRRI rice varieties. How is it possible for Charles to effectively supervise and coach the other two?

- New staff become anxious about promotion and career development in the NARS as soon as they are made aware of the structure and organization of the institution and of their role in the institution and the reporting system. All aspects of performance management need to be fully explained to new staff, and their connection with career advancement, if any, also needs to be explained.

Management of the Socialization Process in NARS

- How do we manage the socialization process? The early stage of socialization begins before new staff enters the NARS; in fact, it starts at the university. Unfortunately for many of the NARS staff, this may not be the case, as they may not have had much choice in their placement in research. Some have literally found themselves, by fortune or luck, in the research branch of the ministry. Socialization plays a crucial role in helping such individuals establish themselves in their careers.

Consider the case of Felix, who, after graduating with a BA in agricultural economics, found himself on the streets without a job. After one year, Felix visited the public-service commission of country *X*, and was told there was a position available in the ministry of agriculture's research department. The position was for an agricultural economist to work with the farming systems research (FSR) group. Felix had never heard of FSR, but inquired about the position from the director of agricultural research. He was promptly hired, although he had attained only a second- (lower-) class degree, hardly a competitive level for research qualification.

From the above discourse, it is clear that socialization forms part of the recruitment and selection process. It is the stage of entry into the organization. Figure 1 depicts this, representing the ideal model of the recruitment process; it may vary considerably from the practice in your NARS. Arnold and Feldman (1986) describe three levels of socialization as 'getting in,' 'breaking in,' and 'settling in.' These levels correspond to the adjustment cycle shown in figure 2 for integrating individuals into an organization. It is vital to identify the behavior of recruits, taking appropriate measures either to reinforce or redress behaviors. The learning and adapting process is continuous, but supervisors or other persons designated to oversee this process should be alert and responsive if they are to carry out successful socialization. NARS managers will need to devise a system of signposts or indicators to measure their success. These may include the dependability and commitment of the recruit, a high degree of satisfaction and job involvement in general, a feeling of mutual acceptance, internal work motivation, etc.

Can you identify the three levels and their stages in your socialization process? How do you tackle each level as an HRM manager in the NARS? Cite examples of problems and solutions in your discussion.

Tactics in Socialization

In managing the socialization process in NARS, what tactics could we adopt? For each of the phases, NARS managers must devise mechanisms or approaches that will not only motivate and inspire recruits, but also see them through their research careers. This means conjuring up an environment of creativity and productivity in the first instance. Some of the tactics NARS managers could deploy are described below.

Take the case of a recruit who joins the NARS and is asked by his supervisor in the first week to travel with technicians to collect soil samples from various farmers' fields in the country. The analysis of the samples is done by the technicians, while the young researcher simply watches or spends his time in the library. This continues for several months before the supervisor assigns him a specific job to undertake a literature search for a paper he is to present at the regional symposium on land and water management.

What is the problem with this approach?

- As this may be the first serious encounter with productive research and development for recruits, their first impression may determine how quickly they will be assimilated and able to accept and realize their role in the organization. It is therefore vital that their first job or assignment in the organization be challenging but not insurmountable.

- Researchers often require very specific skills or use specialized methodologies for both laboratory and field studies. Unless the new recruits have done research before, it is unlikely that they will have acquired these requisite skills. The provision of relevant training in a timely way is crucial for successful and rapid socialization. Experienced researchers and technicians are often better at providing this in-service training, or coaching, of recruits. But this will not happen unless a well-structured program is laid out to accomplish this; it should be a continuous process guided by needs.

- Some NARS will arrange orientation for recruits, such as a session with the training officer on their first day to plan a program of visits and discussions with immediate supervisors and staff in the research program, the administrative or personnel officer to discuss standard operating procedures (SOP), and the director of research, head of station, and various physical facilities at the station. Rarely are recruits provided with the NARS research plans, annual report (it is usually too old or no extra copies are available), or even program work plans and their job descriptions.

  Both the NARS culture and business contexts need to be explicitly explained to the recruit. There is therefore a need to design a tightly planned, well-focused but relaxed orientation program. Young researchers are often curious and anxious to get on but need strong guidance and leadership.

- It is not always possible to place recruits in work groups with strong research leadership in most of our NARS, as most of the researchers are often young and lack solid experience. However, where possible, work groups must be cohesive and assimilative, with high morale and supportive supervision. The NARS need to train managers in aspects of supervisory leadership that promote organizational effectiveness.

- As stated earlier, the research environment should be creative. Rigidity, overregulation, and demand for overconformity to organizational norms stifle productivity. Flexibility in management with the correct balance of bottom-up, top-down decision-making processes is especially critical for the planning, programming, and implementation of research. Recruits are easily socialized in an environment that is seen as thriving in a collec-

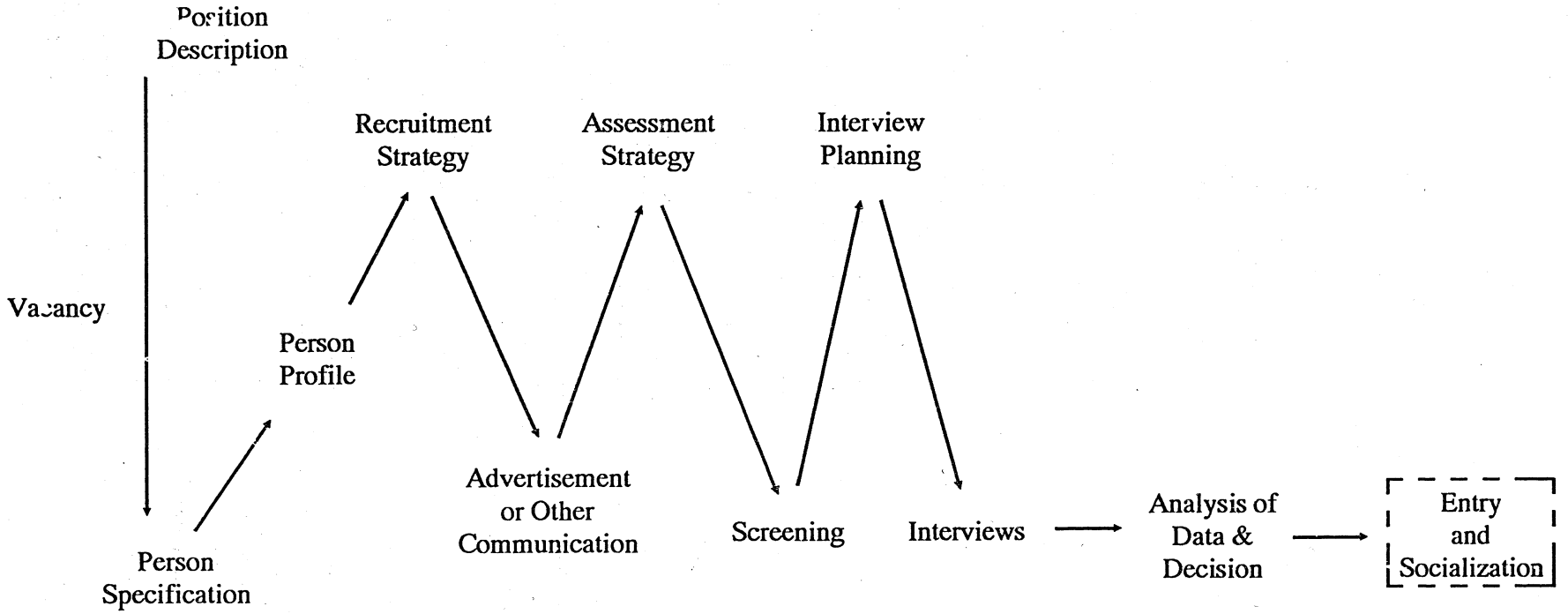


Figure 1. Recruitment and Selection

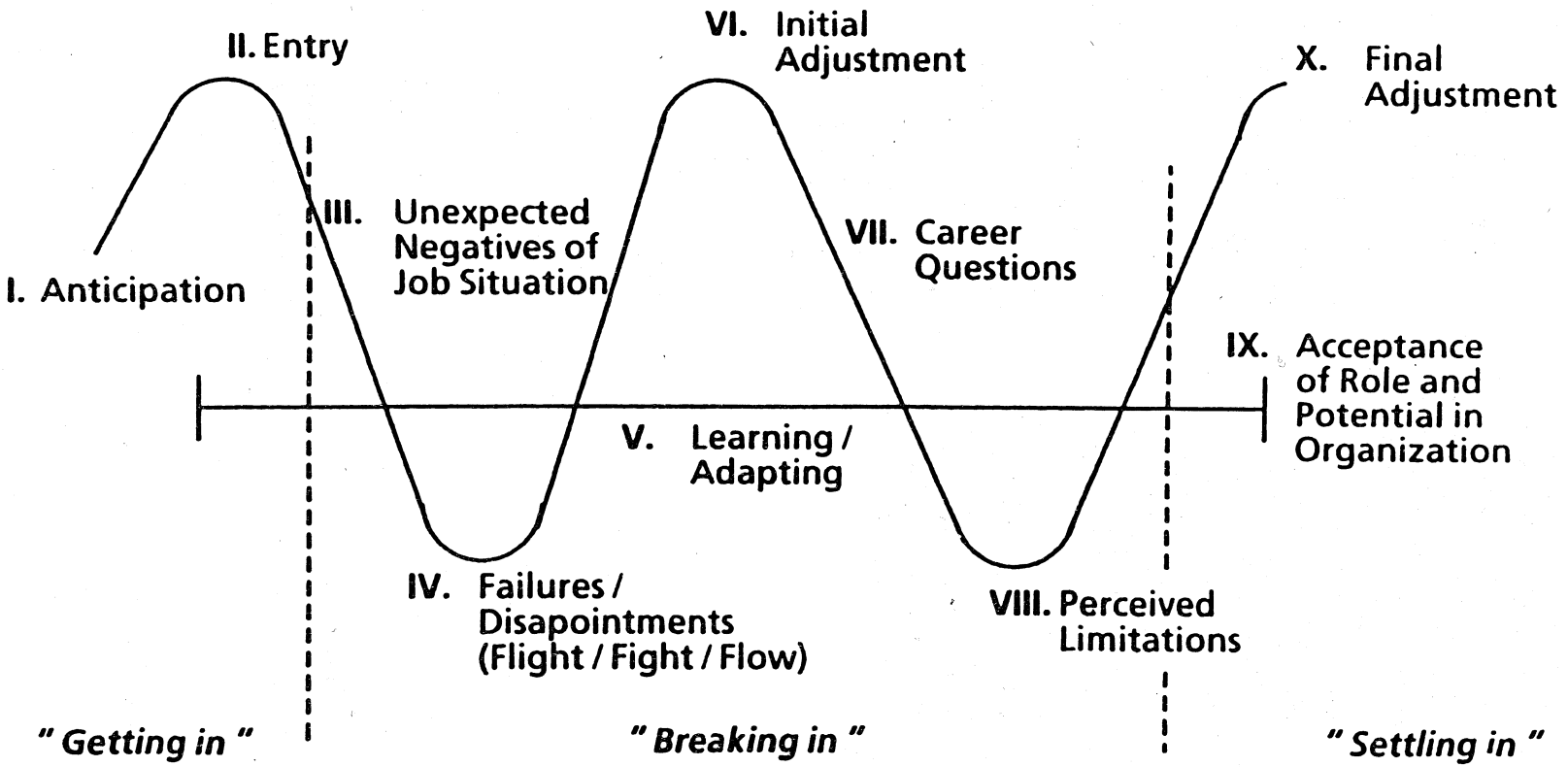


Figure 2. Adjustment Cycle of Organizational Integration

You have research stations in five natural regions of the country. Your NARS is conducting commodity research in maize in four of the natural regions. Maize is one of five commodities; the others are wheat, sorghum, livestock and pastures, and agroforestry. You have a recruit fresh from the university with a BSc in agriculture. He is to be placed at one of the research institutes (stations) to work as part of a research team conducting on-farm trials on maize. The team consists of a senior researcher with a PhD in plant breeding, an economist (with an MSc), and an agronomist (with a PhD). The agronomist is a foreign expert and it is the wish of your NARS to train and develop the young recruit to replace the foreign expert in the program within three to four years.

You are being requested to design and implement an orientation program for the individual. How do you proceed? How would you handle that for staff who have been on overseas training for four years? Would you use a similar approach?

tive teamwork approach, where goals, targets, and standards are set in a consultative manner.

Constraints in Socialization

In a NARS or research program where there is high turnover or a continuous flow of recruits, the task of socialization may be daunting and time-intensive for the NARS manager. Furthermore, socialization may require stretching the training department's budget if funds are not allocated. But as explained, it is an extremely important function in the NARS and efforts and resources must be devoted to it if an effective job is to be done.

What are some of your own frustrations?

How do you resolve these?

Discuss.

References

Arnold, J. M. and D. C. Feldman. 1986. Organizational Behavior. McGraw-Hill Series in Management. New York: McGraw-Hill Book Company.

V

Concepts of Training and Development

SOME ASPECTS OF TRAINING IN NATIONAL AGRICULTURAL RESEARCH SYSTEMS[1]

Luka O. Abe

Introduction

In our context, training may be described as a process that enables individuals to acquire knowledge, skills, and abilities that will enable them to fulfill the requirements of their job.

Training plays an extremely vital role in the acquisition and utilization of an organization's human capital. It is for this reason that an organization will incorporate training in its manpower planning. It is often said that in times of uncertainty, training becomes one of the most critical functions, and for most developing country national agricultural research systems (NARS), training is crucial in their strategy toward achieving food self-sufficiency.

Many developing country NARS have the challenge of simultaneously developing a large cadre of highly trained personnel, while attempting an ambitious research agenda for the provision of production technologies to the small-scale farmer. This, in many cases, has met with a great deal of frustration. NARS policymakers have grown impatient and express a lack of confidence in the NARS, and this has sometimes resulted from a lack of understanding of the rigors of research and the intricacy of institutional capacity building for research. Institutional capacity-building efforts such as the establishment or strengthening of national institutions to meet the needs of agriculture and research need careful preparation and substantial local commitment and input.[2]

For its viability and effectiveness in fulfilling its mandate, a NARS must build its human capital from an indigenous source, and in many cases, particularly in sub-Saharan Africa, the base has been narrow and weak because of constraints in its sources such as the institutions (universities and colleges). One may ask why this indigenous capacity is so vital to national agricultural research. A strong capacity will influence a number of factors related to agriculture and agricultural research, such as an increased capacity to demand support for agricultural research and influence in policy articulation, an enhanced ability to tap information worldwide such as from international agricultural research centers (IARCs), an ability to generate and transfer technology to the NARS, and the formulation of a vision for the NARS and the efficient and effective management of its resources.

Types of Training in NARS

When discussing national agricultural research systems in the context of manpower requirements and development, it is important to look at the availability of trained personnel in the country *in toto*. This gives some idea of the size and strength of the base and sources from which a NARS can acquire and develop its human capital. Typically, there are four categories of personnel engaged in a country's agricultural development:[3] professional personnel (with at least a BSc in scientific or technical agriculture), senior technical personnel (usually with postsecondary technical training or relevant experience equivalent to diploma level), junior technical personnel (usually with one or two years of agricultural training), and vocational or artisan personnel (with six months to two years of practical vocational education or on-the-job training leading to recognition of competence).

These constitute the potential pool for a NARS human resource. In most NARS, the professional and technical categories are the most vital. The difficulties often arise in the availability, the quality, and the level of training of the personnel in research vis-a-vis the agricultural research requirement of the NARS. Developing countries, particularly in Africa, have the following inherent constraints in their system-building efforts:

- The scientific manpower base is small, and the numbers of agricultural researchers show severe shortfalls. Hence NARS have to rely on a small pool of researchers, even very young and inexperienced ones, for leadership roles in research.

- This situation results from the lack of a strategy for developing agricultural research capacity, as in the integration of the continuum of research, experimentation,

adaptation, and dissemination of technology in to a national context.

- Many NARS have a high turnover of staff (in 1984, 51% of researchers in the Kenya NARS had been on the job less than two years, and only 9% had more than 10 years' experience).

- Training at advanced and intermediate levels and at educational institutions often fails to meet the needs of agriculture and research.

To meet human resource requirements, NARS may include the following in their staff development programs: induction training, on-the-job training, postgraduate professional training, short-term training, research management training, and technical training. These are often used as a means of improving the performance and enhancing the capabilities of staff. Table 1 summarizes each of these, their broad objectives, duration, target groups in NARS, where such training may be obtained, and expected behavioral and technical outcomes.

The Training Process

It is through the activities involved in human resource planning that a NARS is able to identify its broad training plans. Human resource planning gives us the number of researchers available and their qualifications, activities, and experience. It also specifies their discipline and commodity research areas and the distribution within the network of institutions or research stations. The information is vital in assessing the human resource potential of the NARS, and it further assists in diagnosing weaknesses in the system that can be remedied through training. Figure 1 depicts the training process as having at least six components: review or diagnosis of NARS, identification of management and training requirements and assessment of training needs, training

Table 1. Typology of Training in NARS

TYPE OF TRAINING	OBJECTIVE	DURATION	TARGET	LOCATION	EXPECTED RESULT
Induction	—To enable staff to become acquainted with organizational mandate, goals, rules, and regulations. —To meet others and become more acquainted with the programs and activities within a short time. —To facilitate socialization.	Few days to one month	All new staff	In the organization	Faster integration and assimilation of staff into the organization.
On-the-job	—To enable researchers to learn research techniques and methods. —To coach young researchers on the scientific and research process.	Continuous	All but emphasis on young researchers	Other institutions or at own institutes	Improved research productivity, job satisfaction, reduction in downtime of equipment, motivation and leadership role, etc.
Short-term (e.g. short-term travel grants)	—To enable staff to acquire new skills, knowledge, and attitudes.	Few days to six months	*All*, depending on topic		improved research productivity.
Postgraduate or Professional	—To increase knowledge and upgrade skills and research capability in general. —To enable staff to achieve academic advancement.	One year to 3 to 5 years	BSc or MSc degree holders	At local or overseas universities or institutions	Enhanced research skills and knowledge. Research leadership improved. Better career prospects.
Postdoctoral or long-term fellowships	—To improve knowledge, skills, and professional contacts. —To upgrade skills of researchers.	Up to one year	MSc or PhD degree holders	At IARCs, other universities or institutions	Improved leadership, technical skills, and knowledge.
Agricultural research management	—To improve capacity for management of resources, develop skills in agricultural research planning and budgeting, monitoring and evaluation, and improve supervisory and management leadership, etc.	Few days to one month	Mid- to senior-level research managers	National training, international or regional seminars, conferences, and symposia	Improved managerial skills—leadership and motivational. Improved resource management skills.
Technical	—To upgrade expertise of technical personnel.	A few months	Technical staff	At polytechnics, international institutes, or other laboratories	Improved specialized techniques and methodology.

objectives, formulation of training plan, implementation of plan, and evaluation.

NARS should not regard training as a panacea for improving low staff performance. Low performance may be due to various factors which must be investigated to determine the utilization of staff in the NARS to ensure that training is the right course of action to take. Among these factors could be inadequate job design; poor motivation (e.g., reward systems); lack of leadership and guidance, (or ineffective supervision) particularly for young researchers; poor work conditions or an environment not conducive to high productivity (e.g., poor research facilities, such as equipment, field facilities, etc.); unclear vision and priorities for the NARS; poor management support of the research operations (e.g., inadequate funding and supply of both technical administrative support personnel, an overloaded research officer, which may result in intolerable work pressures); intragroup conflict, dissatisfaction, or grievances, etc.

This list is not exhaustive. However, experience shows that when certain changes are expected in the organization, training and retraining personnel is advisable. Table 2 summarizes NARS training-need indicators with direct implications for training. These serve as early-warning systems that may guide a NARS toward training.

These indicators tell us where gaps between the job requirements and individuals' abilities are likely to occur — thus the need for training. All too often researchers are whisked off for training only to return to the same set of conditions they left. Unless the constraints are carefully diagnosed, the problem of staff opting for training will persist; eventually this may result in demotivation, frustration, and low institutional productivity. Furthermore, a caveat is issued to NARS that training is not always the wisest or least costly course of action, especially if trainees with the right kind of abilities are not selected or if poor performance is a result of any one of the factors indicated above.

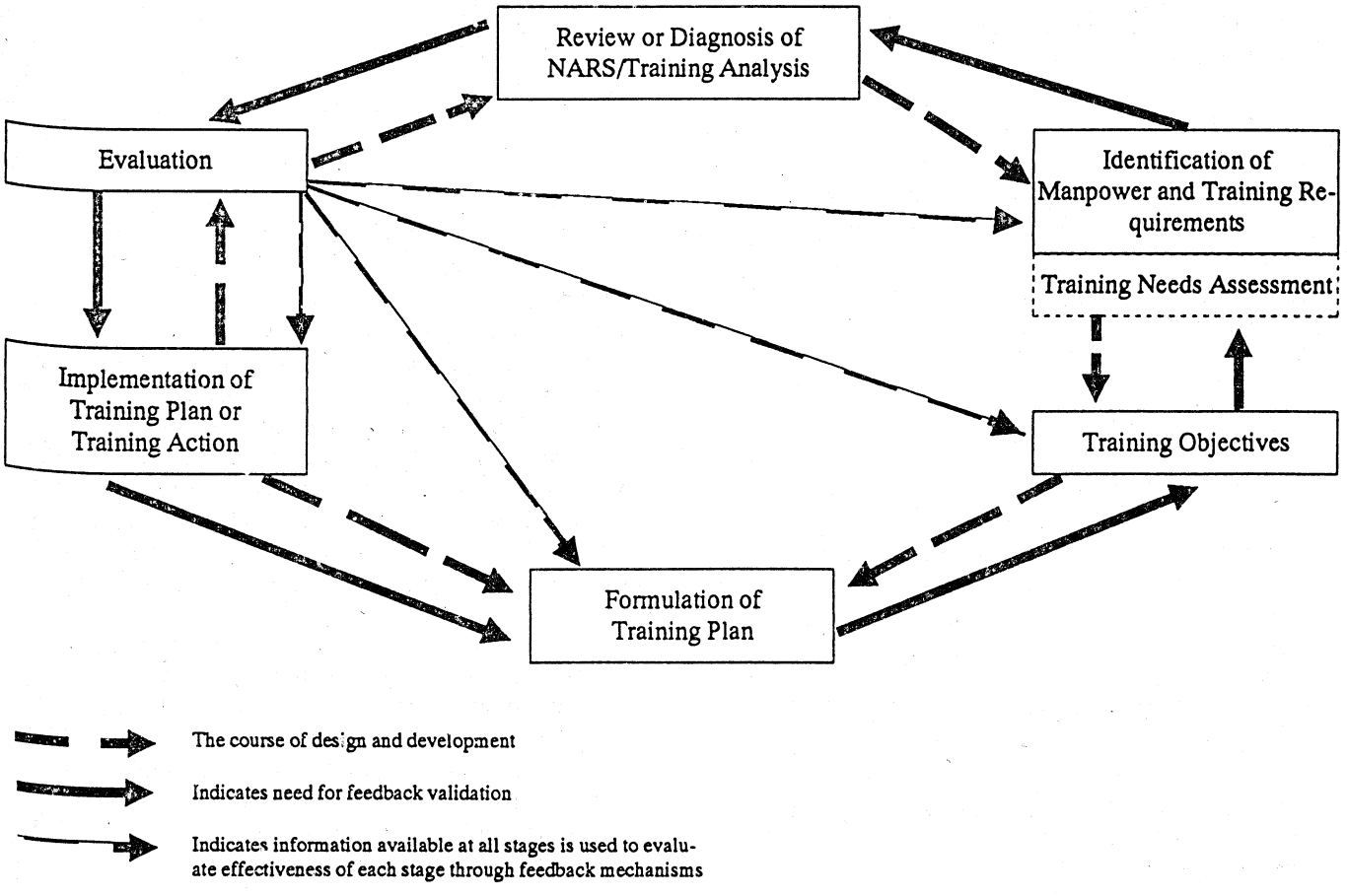


Figure 1. Training process for institution and for individual staff

(Adapted from L.A. Stanley. 1987. Guide to Training Need Assessment. International Centre for Public Enterprises in Developing Countries.)

Determining training needs is one step in the training process. Suffice it to say that training analysis revolves around evaluating research priorities, activities, and available resources; relationships between and among the elements; physical, environmental, and social constraints; and the knowledge, skills, and capabilities necessary to undertake the various tasks to fulfill a NARS mandate.

Table 2. Training-Need Indicators

1. **Organizational Plans**
   (Research Strategy, or Manpower Development and Training Plans)
   - Projected changes in mandate (or objectives) and research priorities
   - Changes in structure and organization

2. **Employee Records**
   - Staff turnover
   - Low performance ratings
   - Career paths and plans

3. **Research Operations**
   - Acquisition of new research equipment, techniques, or methodologies
   - Fluctuations in research output
   - Performance appraisals

4. **Staff Selection Policy**
   - Qualifications of staff at functional levels
   - Experience and training background of staff

5. **Morale Factors**
   - Personnel friction
   - Conflicts
   - Poor leadership

6. **Job Knowledge**
   - Technical aspects
   - Administrative aspects
   - Supervisory aspects

7. **Communication Facilities**
   - Poor written and oral communications
   - Poor flow of information up and down

8. **Supervision**
   - Lack of clarity in work assignments
   - Planning and scheduling
   - Improper resolution of conflict

In most cases, training-need assessments have to answer questions related to the job and tasks of an individual like the following:

- What is the purpose of the job?
- What basic training should the jobholder possess?
- Where does the jobholder fit in the organization?
- What tasks and duties does the jobholder have to carry out?
- What is the indication that the job is not being carried out properly?
- What are the communication links between jobholders and their colleagues in other activities and how will they be supervised?
- Where would such training be tenable?

The Need for an Institutional Training Plan

A short case study of the manpower and training plans of the Kenya NARS, formulated in 1982 in anticipation of a restructuring and reorganization of the NARS, can be used to underscore the need for a training plan.[4] The formulation of the Kenya NARS training plan recognized the need for the NARS's expansion. The following steps were taken in the planning: analysis of constrained and unconstrained demands for additional research scientists, support personnel, and specification of remedies; the allocation of additional staff to priority research areas; an indication of the current and desired balance between basic, applied, and adaptive research; the linkages between research and extension; and the allocation of personnel to various commodity research areas — crops, forestry, animal production, and veterinary medicine. This plan went further and identified the training needs of the research personnel and the strategies for meeting them. Among the training needs were the following:

- As stated in the plan, for the young research officer, developing a positive attitude toward a career in agricultural research and an orientation toward the role of an agricultural researcher as one who develops solutions to farmer problems is probably the most difficult educational objective. In this belief, it was hoped that the NARS could create an environment conducive to high productivity through appropriate motivation of staff.
- A second priority training area recommended in this plan was short courses at the international agricultural research centers (IARCs). Again following on the need for changing attitudes and the acquisition of skills and knowledge as behavioral outcomes, such training should stimulate interest and enthusiasm in young researchers as they are immersed in active research programs, working under experienced scientists. It is to be noted, however, that short-term production courses such as those in IARCs are also tenable at other national or regional research organizations.

- The plan recommends postgraduate training for research officers to increase their technical knowledge and skills in research methodology and techniques. The recommendation observes that MSc-level training should be the minimum qualification for all senior research officers, and PhD-level training would be a prerequisite for research leaders such as program coordinators, directors, etc.

All these factors need to be considered when formulating a NARS training plan, which should include the following features: an inventory of agricultural research scientists by discipline; a projection of both the unconstrained and constrained demand for agricultural research scientists in a country; a clear policy on selection and recruitment and on career paths for scientists as well as personnel costs; an overall training strategy — statement on the priority of training needs; types of training — whether professional, short-term, study tours, or leadership training — and how these are to be implemented; a statement on how staff will be deployed once trained — which research commodity group, location, or discipline; and finally, it must state the availability of support staff for backstopping research where the trained researchers are expected to work. The plan would also state actual and desired ratios of scientists and technical staff, and if shortfalls occur, how this will be remedied.

Evaluation of Training

In a training context, evaluation is the assessment of the value of a training system, course, or program in special as well as financial terms. What evaluation fails to do in training, particularly in agricultural research, is validation, which is a measure of the overall benefit, in terms of cost, of a course or program. Evaluation can assess course objectives; however, validation is not possible, since the impact of training has long-range, and multifarious, implications that are difficult to quantify and measure. This often seriously limits efforts to generate support for training. The rationale for evaluation is reflected in the common thread that runs through the training process. Evaluation attempts to show whether the training has achieved its stated objectives and to what extent it was effective, to what extent it has contributed to the organization as a whole, and to what extent it has influenced future training and training-related decisions and actions. In other words, evaluation attempts to establish whether the right action was taken.

The relationship of evaluation to the other components in a training process is strong. Evaluation as part of the training process provides feedback information at each stage to enable planners and implementors to effectively execute training. A typical evaluation scenario for an individual undergoing a training event is shown in figure 2, where five outcomes may be evaluated. A NARS should develop its own scheme for all the training it delivers or supports.

In steps 2 and 3, an on-going evaluation is conducted. In step 2, it is important to assess not only the progress of technical or management training, but it is also important to understand how well satisfied trainees are with their progress. In step 4, when trainees are back at their posts, it is important to evaluate the knowledge, skills, and attitudinal benefits of training. This should be done carefully to assess and discuss with trainees the changes they expect to bring into the workplace. Often trainees are left at this stage to wonder just how the organization plans for them to propose and implement changes.

This problem is characteristically summed up in a statement by David F. Nygaard, "Too often newly trained men

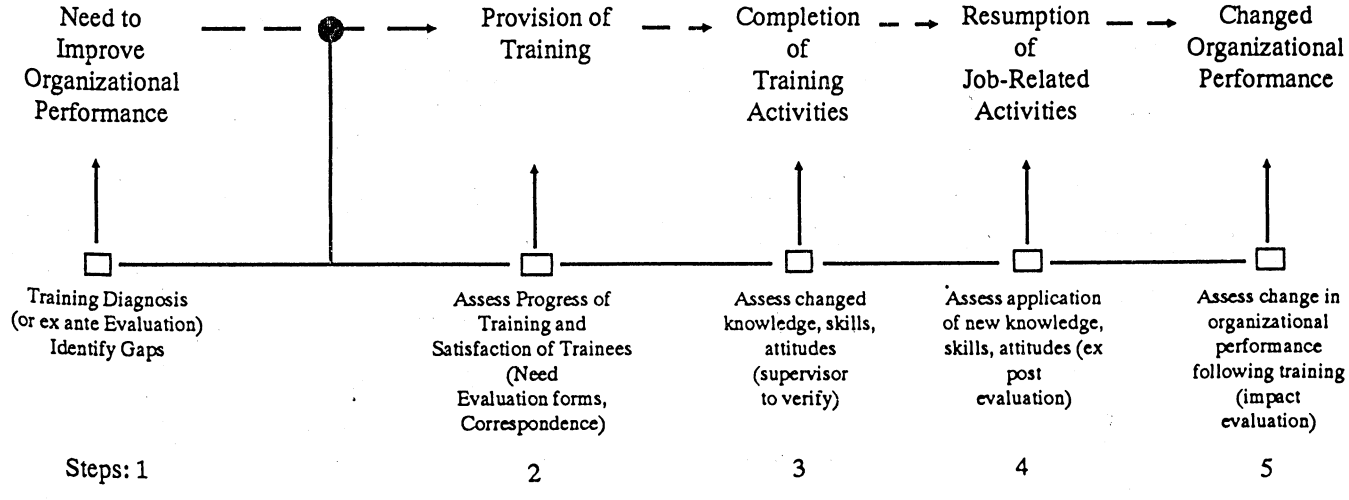


Figure 2. Evaluation of five levels of management training outcomes

(Adapted from K. Brethower and G. Rummler. 1979. Evaluating Training. Training Development Journal, May 1979: 17.)

and women go home to unchallenging situations, professional isolation, no money for research, and equipment that doesn't work. When that's the case, everyone loses."[5] This need not happen if we plan a follow-up scheme to keep trainees inspired and to capture their enthusiasm and interest to ensure transfer of acquired skills or knowledge to their work. A follow-up scheme validates whether the skills and knowledge gained were beneficial, practical, and useful. Step 5 is concerned with impact evaluation — the long-term impact of a training program on the system.

A scheme for follow-up of training is given in figure 3. It identifies four areas — further personal development, liaison with former participants, help in the practical application of knowledge and skills acquired, and evaluation of the training — as vital to the process. The components used in a follow-up exercise to guarantee training impact are indicated. When selecting training institutions, NARS should opt for those that incorporate these points in their follow-up of participants.

Some Key Considerations in the Management of Training in a NARS

Most NARS usually have an officer designated as a *training officer*. However, very often his/her task is not well defined; thus, the organization is unable to respond promptly and effectively to the training requirements of the system. Because the training officer is an important staff member in the NARS, it is vital to fully understand this role.

The training officer's primary function is basically to assist research managers — directors of research, heads of stations, program coordinators, or team leaders — in their responsibility to train young scientists. In agricultural research where a lot of coaching is needed, training officers could inspire program coordinators to analyze the problems of young researchers, identify which ones constitute training problems, and to provide advice, information, help, services, etc, to them to resolve these problems. While they may not have specialized knowledge and skills in the various research technologies and methodologies, training officers, with their own specialized knowledge and skills, could contribute in the area of manpower planning, training-need assessments, performance appraisals, instruction techniques, preparation of training materials and audio-visuals, evaluation and follow-up, etc. What has tended to happen in most NARS is that training officers are simply used in the implementation of training and rarely in the planning and design of training. This is unfortunate since they are usually expected to possess the analytical skills necessary for assessment of training needs.

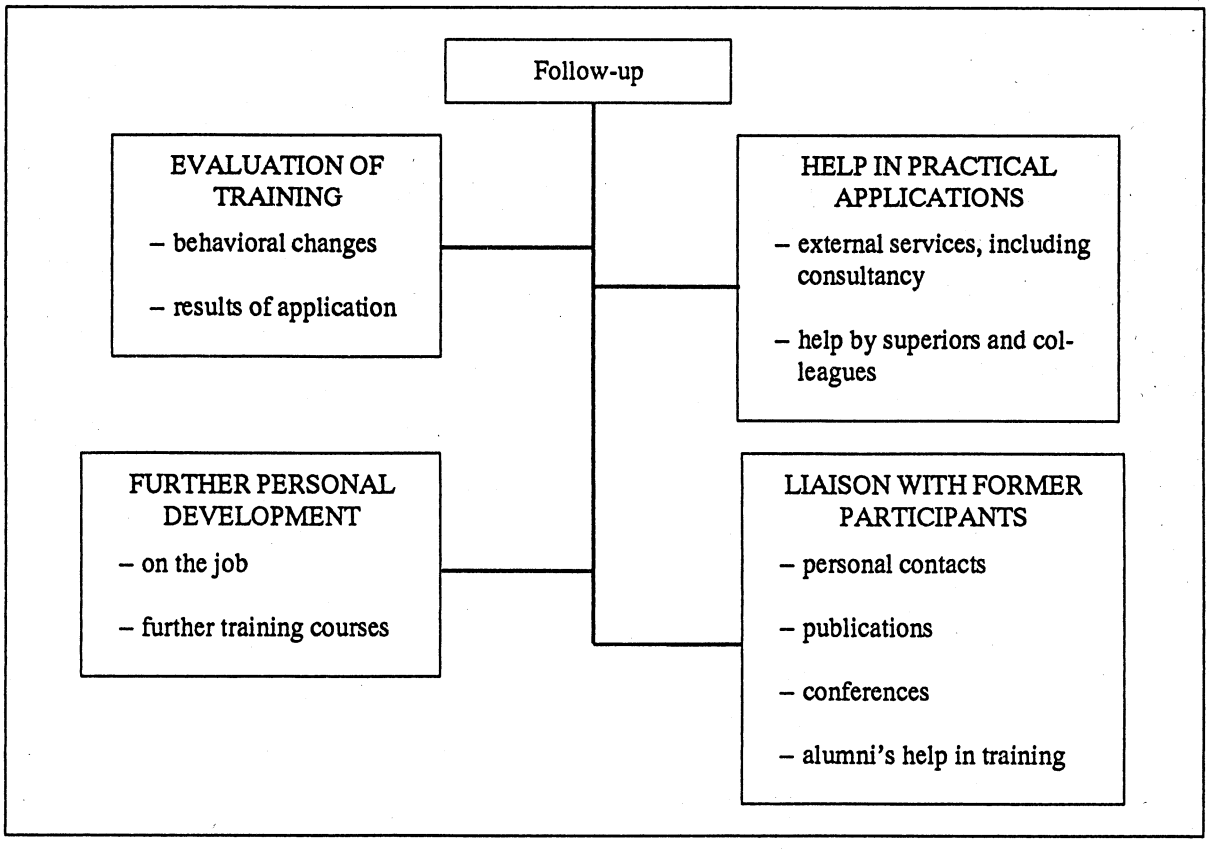


Figure 3. Follow-up scheme of participants

(Adapted from M. Kubr. 1985. An Introductory Course in Teaching and Training Methods for Management Development. ILO. Geneva.)

Organizationally, training is an integral part of the personnel function; this is where the process of job description begins. Training officers should participate in this process as it presents an opportunity to identify gaps in knowledge of personnel and the training requirements of the staff they are requested to organize training for.

A word about funding training. Professional development is a costly venture requiring careful planning and adequate funding for its systematic implementation if it is to achieve its unified system-building function. NARS should ensure that investment in training programs is commensurate to, in step with, and complementary to its other institution-building and research programs.

Disjointed and uncoordinated funding tends to disrupt rather than harmonize these vital components of a NARS. Donors sometimes unwittingly encourage this because they may support commodity research without providing funds for training indigenous staff to assume future research leadership roles. Good research planning, manpower projection, and training-need identification will enable NARS to avoid this pitfall. A classic example of this can be taken from the Malawi NARS where the Overseas Development Administration (ODA) (UK) made a heavy investment in research on maize, but little or no support was provided for research training. However, thanks to USAID, a vigorous training scheme was launched to correct this anomaly, and the continued productivity of the Malawi NARS maize research program was assured.

In terms of supplementary funding, most NARS are still not fully exploiting the potential sources that exist from various bilateral and multilateral assistance organizations, private institutions, etc. It is incumbent upon policymakers and directors of NARS to actively seek support from these agencies.[6] It is important, however, to point out that although it is widely accepted that research and its associated technological applications are human-resource intensive, the investment in training has been lackluster and donors have not placed a high premium on it.

The international agricultural research centers (IARCs) and other regional centers are also good sources of support. For instance, the Southern African Center for Cooperation in Agricultural Research (SACCAR) is an important source of support for training researchers in the member states of the Southern African Development Coordination Conference (SADCC). SACCAR has a mandate to foster cooperation in agricultural research and to improve the capacity of individual countries to undertake carefully prioritized agricultural research projects.

For many NARS, promoting organizational changes must focus on professional training of staff to advanced degree levels. Since local universities are weak and lack resources, greater reliance will be placed on overseas training. Where possible, governments are responding by attempting to overhaul or reorganize national higher educational programs. As an example, the SADCC member states are establishing regional centers of excellence in the faculties of national universities. This move aims, *inter alia*, to strengthen postgraduate training for NARS staff in selected disciplines. Through SACCAR, short-term travel grants and long-term fellowships to upgrade the formal skills of NARS staff are also used to achieve the aims of institution-building and strengthening.

Notes

1. Originally entitled "Human Resource Development in National Agricultural Research Systems (NARS)."

2. Uma Lele et al. 1987. The Development of National Agricultural Research Capacity: India's Experience with the Rockefeller Foundation and Its Significance for Africa.

3. FAO. 1983. Trained Agricultural Manpower Assessment in Africa.

4. NCST/ISNAR. 1982. A Manpower and Training Plan for the Agricultural Research System in Kenya, 1983-87.

5. David F. Nygaard (Director, Human Capital Development, Winrock International). 1970. We Foster Leadership. *In* 1987 Winrock International Annual Report.

6. Two publications are useful as guides: (a) Agricultural Assistance Sources. 1982. Published by International Agricultural Development Service. 1611 North Kent Street, Arlington, VA 22209, USA. (Now called Winrock-International Institute for Agricultural Development.) (b) The International Foundation Directory (Edited by H.V. Hodson), published by Europa Publications Ltd., 18 Bedford Square, London, WC1B 3JN. NARS should request these.

VI

Career Development

CAREERS AND CAREER DEVELOPMENT

Paul Marcotte

Careers and the development of careers must be observed from two perspectives, the individual and the organizational. Both have needs, expectations, and goals, and the success of each is dependent upon the other and upon the synthesis of the two. The purpose of this paper is to define both these perspectives and identify the linkage points, thereby indicating how this interdependence can be fostered.

First, there are a number of ways to define "career."

- A career can be seen as a sequence of promotions or lateral transfers to more responsible jobs or to better locations within or across a work-related hierarchy during a person's work years.
- A career can refer to occupations that provide a clear pattern of systematic advancement, such as a career ladder or career path.
- A career can be a person's job history, i.e., a series of positions held over an individual's entire work life (Cascio and Awad 1981: 273-274).

Career development, on the other hand, is the recognition that employing organizations as well as individuals have career needs. Thus, from the perspective of career development, the essence of career planning is the interaction of the individual and the organization over time. It is the successful matching of individual and organizational needs and requirements that fulfills individual and organizational desires. This perspective is illustrated in figure 1.

The Individual Perspective

As can be seen in figure 1, the individual has certain needs which must be fulfilled for the career development process to be successful. These are motivation, choice, opportunities, and self-evaluation.

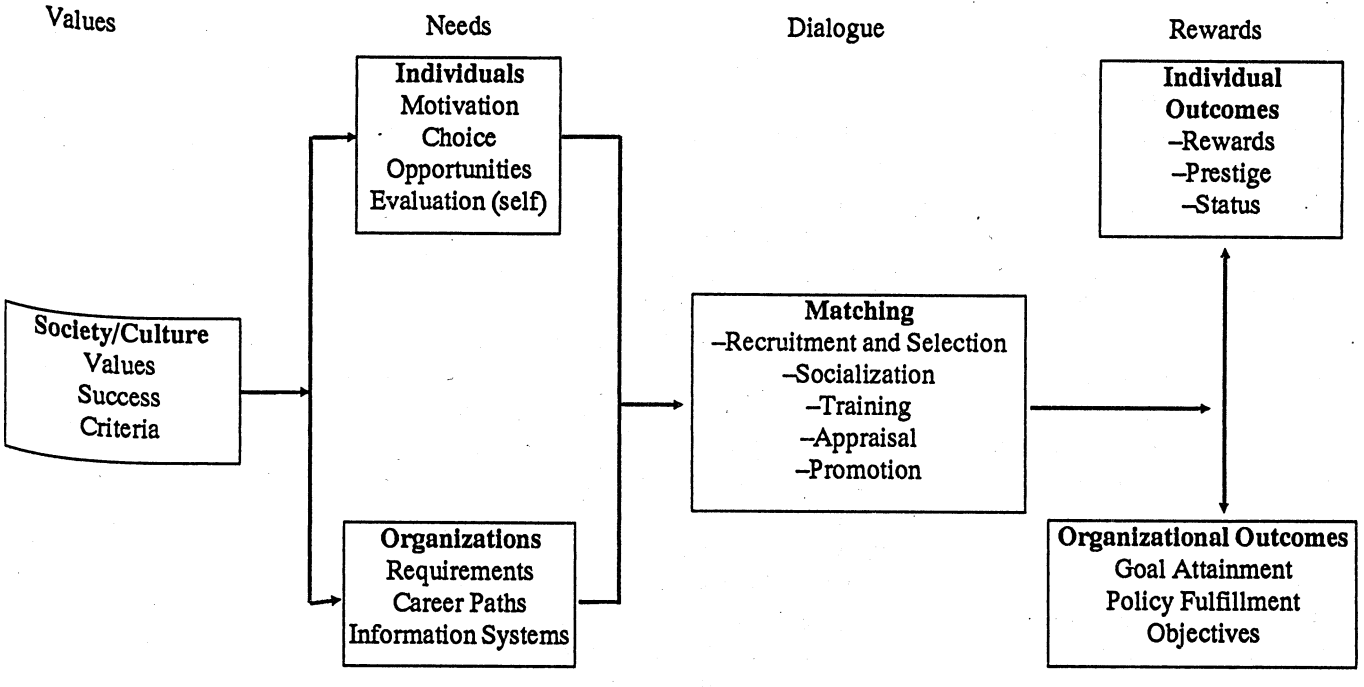


Figure 1. Career Development

With respect to motivation, individuals are generally attracted to certain kinds of jobs because of personal interest, skills, and vocational training. At the beginning of their careers, individuals are generally self-motivated. Once an individual has settled into a position, there are theories on how the individual can be motivated that have been popular over the years. The principal ones are "universal," "environmental," and "composite" theories. An example of the universal type is the Maslow theory that contends that each individual has a set of needs that are in a predetermined hierarchical order. An example of the environmental model is Herzberg's two-factor theory that contends that factors in the environment contribute to behavior. The third type, the "composite" theory, as advanced in Vroom's Expectancy Model, is a combination of the previous two and describes how individuals develop preferences and make choices.

With respect to individual choice, there are two major theories. The first is an interdisciplinary concept that maintains that career choice is a compromise by an individual between preferred and expected occupations based on job availability. It also has an organizational basis, which maintains that the organization compromises between the ideal and available worker for its occupational vacancies. The second career-choice theory is typology theory. An example of this is Holland's theory which assumes that individuals search for environments that allow them to exercise their skills in keeping with their values and acceptable roles. Holland assumes that career choice is a combination of heredity and environmental forces. An individual develops a "typology" and then seeks environments that are consistent with that orientation.

With respect to opportunities, the individual must be able to identify career paths to follow. In these paths, it must be clear what skill levels are required, how much experience is necessary, and where the path ultimately leads. Without this knowledge, individuals can not determine whether their long-term needs and goals will be attained.

Finally, with respect to self-evaluation, individuals must be able to determine the progress they are making along their chosen career path. This information is essential to assure that they are as motivated and productive as possible, thus assuring that the organization's needs and goals are likely to be realized.

It must also be understood that the particular needs of the individual may change over time. Thus, it is important to document the various stages of life and careers. Generally, these stages are described in table 1. It should be noted that while these stages and concerns are based on empirical studies, not all individuals will experience them. However, there are typical concerns that are experienced by different age groups during the various stages of their careers.

Career Planning Cycle for the Individual

In order to successfully function and advance in a career, there are a number of activities that must occur on a continuous basis. This process of planning a career is known as career path planning. For the individual it consists of establishing objectives, designing strategies, evaluating actual versus planned progress, and taking corrective action when necessary. This cycle is illustrated in figure 2. The major steps of the cycle are

Table 1. Career Stages of Managers

Age group	Career stage	Career concerns
15-22	*Exploration*	Finding the right career Getting the appropriate education
22-30	Early career: *Trial*	Getting the first job Adjusting to daily work routine and supervisors
30-38	Early career: *Establishment*	Choosing specialty and deciding on level of commitment Transfers and promotions Broadening perspective of occupation and organization
38-45	Middle career: *Growth*	Establishing professional or organizational identity Choosing between alternative career paths (e.g., technical vs. managerial)
45-55	Middle career: *Maintenance*	Being an independent contributor to the organization Taking on more areas of responsibility
55-62	Later career: *Plateau*	Training and developing subordinates Shaping the future direction of the organization Dealing with threats to position from younger, more aggressive employees
62-70	Later career: *Decline*	Planning for retirement Developing one's replacement Dealing with a reduced work load and less power

SOURCE: Arnold and Feldman (1986:548).

Clearly not all individuals experience these needs or stages. In fact, in developing countries in general, and particularly in agricultural research, these may be quite different. The essential questions for defining individual needs are as follows:

- How are individuals motivated to become agricultural scientists?
- What choices did they consider?
- What continues to motivate scientists once they are in agricultural research organizations?
- What opportunities are available for advancement?
- How do individuals make choices about career paths?
- How can agricultural scientists evaluate their progress in their chosen career?

1) *Know the Career Structure* – In order to understand the career structure (and how to proceed up through the structure), the individual must be able to ascertain levels of responsibility, have knowledge of training and experience requirements for various positions, and be aware of alternative paths.

2) *Establish Long-Term Career Goals* – In order to achieve a long-term career goal, a series of lower-level or intermediate goals should be set.

3) *Evaluate Present Position* – Individuals should determine where they currently stand with respect to long-term goals. They will need to evaluate level of responsibility, experience, and skills.

4) *Evaluate Desired Position* – Identify the training, skills, and requirements of the desired position.

5) *Develop a Plan of Action* – Develop a plan of action that will lead to obtaining the desired position.

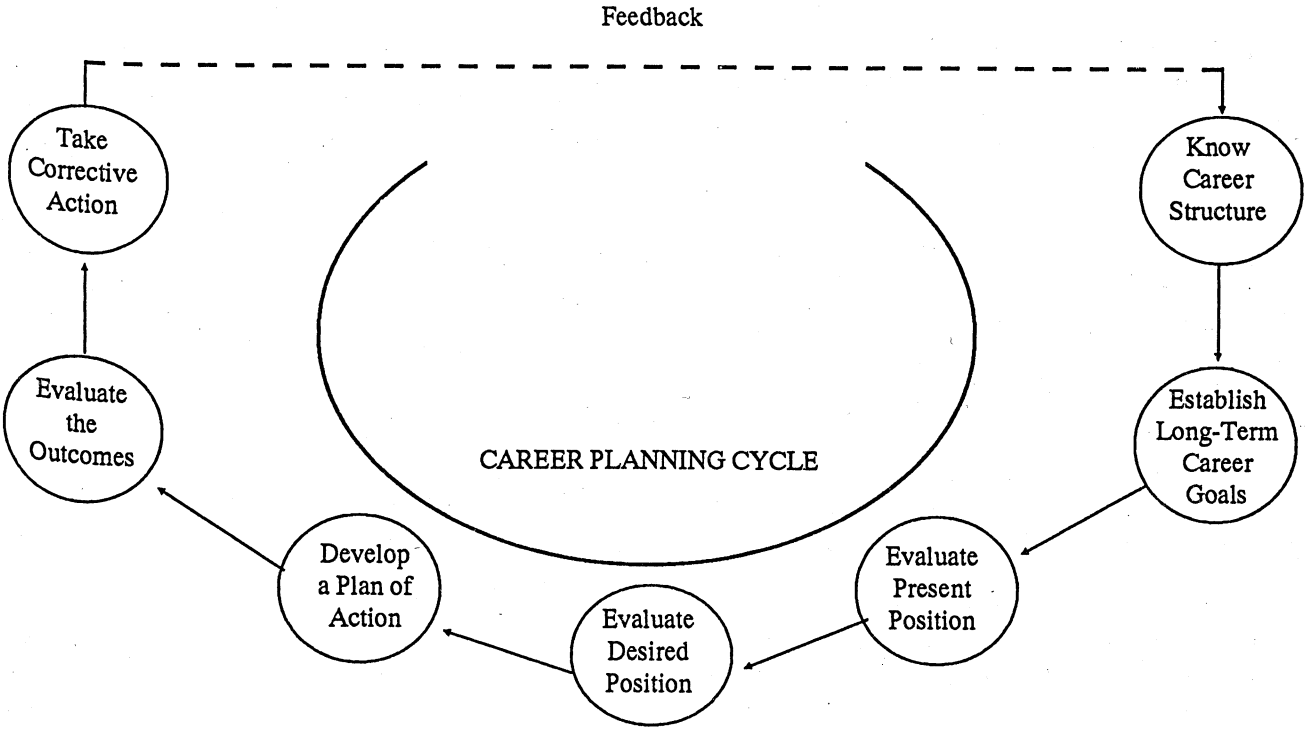


Figure 2. Career Planning Cycle

SOURCE: Cassio and Awad (1981: 287).

6) *Evaluate the Outcomes* – Periodically conduct a review of the plan versus the present situation. This will provide information for corrective action if the plan is not on course.

7) *Take Corrective Action* – Deviations from the plan require corrective action. This may mean reviewing earlier steps in the planning cycle for continued viability and/or relevance.

Mini Case 1 – The Individual

Upon completion of a BSc in Biology from the National University, Robert was assigned to the National Agricultural Research Institute (NARI) by the Civil Service Commission (CSC). He had not studied agricultural at all at the university. In fact, he had pursued biological science in the hope of going to medical school some day.

His first assignment in NARI was at a remote research station. The station is a very small one and there are fewer than 10 people on the staff. Many of the scientists are like Robert in that they have little experience in agriculture and had not requested work at NARI–they had been were assigned to NARI and the research station by the CSC.

- What kind of motivation problems would you expect Robert and his peers to have?
- How could these be alleviated?
- What problems would Robert encounter in following a "career planning cycle"?
- What implications would there be for the organization?

The Organizational Perspective

Career development from the organizational perspective requires the organization to develop plans and programs to facilitate individual careers and thus assure that the organization fulfills its potential and attains its goals. Areas for which this is necessary include career counseling, career pathing, and career information systems.

Career Counseling

Career counseling programs assist in matching organizational requirements to individual needs. As such, they vary according to individual and organizational needs. Ideally, from the organizational perspective, there are at least three types of career counseling programs: performance review, testing, and workshops for identification and development of career goals.

The first of these, performance review, provides the opportunity to assess whether or not organizational needs are being met by the individual. At the same time, the individual can make plans for feedback and corrective action. The second type, testing, provides the opportunity to assess individual needs, particularly for those who may be having difficulty in their present job. The third type, workshops, are designed to help employees assess their career goals and plan their futures.

It is essential that these counseling programs insure the development of realistic aspirations. This helps make sure that individuals obtain the skills and experience required for them to perform their jobs successfully.

Career Pathing

The second area is career pathing. Career pathing is the logical sequencing of personnel that allows for employees to use their present skills to full capacity, identifies skills for subsequent levels, and clearly spells out the paths to be followed for promotion and advancement towards individual (and thus, organizational) goals. The organization must clearly define this process so that employees understand the progression from one job to another.

There are a number of organizational advantages for designing career paths. Some of these are as follows (Sayles and Strauss 1981: 154):

- It creates challenge and thus employee growth
- It replenishes qualified employees
- It is an important source of motivation
- It allows for appraisal based on performance rather than potential

Institutions may have one or more types of career or promotion ladders. In the first type, all employees are expected to begin at the bottom and work their way up. This is relatively rare and probably nonexistent in organizations that require sophisticated, technical training, such as that required by agricultural research organizations.

A second type is a two-career ladder system. An example of this type for agricultural research would be a technical lad-

Important considerations for designing career ladders are their length and breadth. The length of the career ladder is important in that fewer people will reach the peak and because of this, more people will lose motivation as they perceive their positions to be dead ends. Likewise, the breadth of the career ladder is important because it allows for lateral transfer, diverse exposure, and thus more qualified and motivated employees. The essential questions about career paths are as follows:

- How many career paths does your organization have?
- How many steps are required before an employee reaches the top of the ladder?
- Is it possible to cross over from one ladder to another?
- What kind of training is provided for those selected to cross over?
- Is the information about the ladders, steps, and opportunities available to all personnel?

der, which successively moves unskilled laborers to skilled categories, and a professional ladder, which requires advanced scientific credentials and moves employees from junior to senior scientist levels. A third type would be a caste system, in which upward mobility within strict categories is maintained but no crossover is allowed.

The third area of career development from the organizational perspective is career information systems. By design, career information systems provide complete, accurate information about opportunities in the organization. Quite simply, this requires that jobs be posted so that all interested personnel can obtain information. A complete job announcement includes qualifications, and skills required, experience desired or required, where and when to apply, and salary and benefits.

Mini Case 2 – The Organizational Perspective

Akeem has been a commodity leader for eight years. He is an excellent scientist, and the direction he has given his team has provided them with clear objectives. Their success as a team is evidenced in the adoption rates of the varieties that they have produced.

The success of Akeem and the team has meant that Akeem has increasingly been absent because he has been invited to speak at seminars and workshops and he has acted as a consultant to governments and other external organizations. It is apparent that Akeem will move up to be the director of agricultural research as soon as the present director retires.

Akeem has appointed one of his younger, brighter scientists to direct the commodity projects when he must be absent. This man has been chosen because he has recently graduated and is more aware of some of the current techniques being used in the experiments. Thus, there is greater assurance, according to Akeem, that the experiments will be successful.

From the organizational perspective, there are a number of questions that must be raised based on this scenario. For example:

- What match has been made between organizational needs and individual career aspirations?
- Are the skills exhibited by these individuals at one level what the organization needs at a higher level?
- What kind of counseling or testing should occur?
- What is likely to occur with the other commodity group scientists?

VII

Human Assets Framework

HUMAN ASSETS FRAMEWORK*

Paul Marcotte

Human assets framework is a process for categorizing human resources so that managers and supervisors can stay in touch with the needs of individual workers and manage them accordingly. Odiorne (1984) used a "portfolio analysis" framework that assessed human assets as if they were financial assets.

The model of a human resource portfolio matrix, as adapted by Odiorne, is shown here as figure 1. The two dimensions of the matrix, performance and productivity, reflect the two major objectives of human resource management. For the purpose of the matrix, performance refers to the actual achievements of the individual as compared to the objectives planned by management and the individual. Potential refers to the possibility or likelihood of the employee to make contributions of value to the organization.

The human assets framework is a version of the portfolio grid with four distinct cells based on potential and productivity. The cell labeled "deadwood, mismatch," refers to those employees whose performance and potential are both low. In this category there is little growth potential and performance does not come up to expectations.

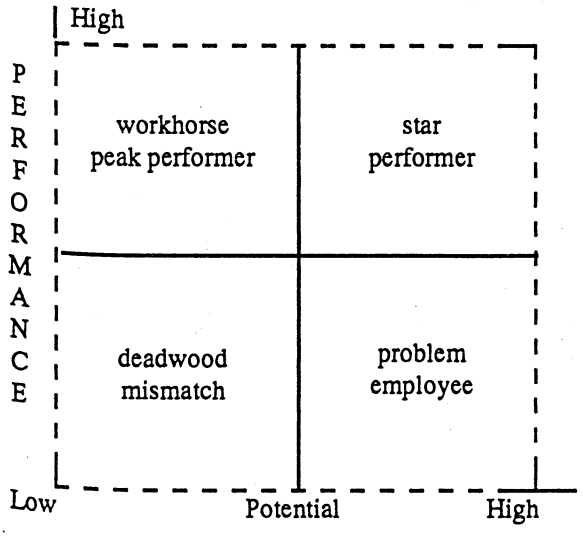


Figure 1. Human Assets Framework

The cell labeled "workhorse, peak performance," constitutes the majority of employees. Empirical studies indicate that as many as 80% of emplyees may fall into this category. People in this category typically work up to optimal level of performance but may have limited potential because knowledge and/or skill level, or capability.

The cell labeled "star performer" includes people of high potential who are also working to maximum ability (such as young people who are highly motivated or senior people who remain creative and productive) and who incorporate experience into their jobs.

The cell labeled "problem performer" contains people who have great potential but who are working below capacity with mixed results. This category is the most complicated as it includes younger people without clear career goals, older people with mixed success, which may include unfavorable experiences due to poor management in the past, as well as individual behavior problems. These employees are worth saving because their high potential. They should receive attention from development specialists, counselors, and/or trainers or they may become deadwood over time.

Details of characteristics, problems, and possible solutions for each of the categories are listed in table 1.

The material in this paper has been excerpted and condensed by Paul Marcotte from George S. Odione. 1984. *Strategic management of human resources.* And Gerard Egan. 1988. *Change-agent skills.*

Table 1. Human Assets Framework

Category	Characteristics	% Total Staff	Problems	Possible Solutions
Deadwood/Mismatched	–Low performance –Low potential –Unqualified –Incompetent –Little effort	Very low	–Limit learning ability –Obsolescence –No motivation	–Developmental discipline – follow steps in progressive discipline –Remedial education –Testing of skills and capabilities
Workhorses/ Peak Performance	–Peak of performance –Limited potential	Largest % Up to 80%	–Job skills may become obsolete due to infrequent change –May become demotivated	–Provide salary increase to keep up with cost of living –Provide job security –Provide training to improve performance –Provide training for job change –Provide motivation through job enrichment, i.e., communication, feedback, and reward for results –Provide motivation through job design, i.e., provide more variety, increase level of knowledge and skill, and give responsibility for planning, directing, and controlling activities
Stars	–High potential –Performing at the highest level of potential –Often young –Highly motivated	Up to 15% of managers	–Enterprenuerial approach may be interfered with by mangement	–Challenging goals –Careful performance appraisal –Personal coaching –Mentoring –a personel interest must be taken –early identification –setting clear goals –top management attention –special assignments
Problem Employees	–High potential –Performing well below capacity –Mixed results –Young people without firm grasp on career –older people who are sometimes brilliant but sometimes fail	Very low	Problem employees may –engage in harmful actions –waste time –disrupt operations	–Counseling –Job reassignments –New challenges –Ultimatums –Time deadlines

VIII

Performance Management

ORGANIZATIONAL BEHAVIOR FACTORS: A BRIEF SYNOPSIS OF LEADERSHIP, MOTIVATION, AND CONFLICT MANAGEMENT

Paul Marcotte

All of us spend part or all of our working lives as members or directors of organizations. It is the contention of those who study the field of organizational behavior that the way these organizations are structured and managed influences our work, the effectiveness of our performance, and our feelings about ourselves (Arnold and Feldman 1986: 3).

Of particular interest for those who are directors, managers, and leaders, is that there are common misperceptions and misunderstandings of what effective managers do or should do.

The most common misperception is in regard to what managers actually do. The common stereotype of managers is that they give orders, make decisions, analyze technical reports, and develop sophisticated plans. While that would be wonderful, the truth is much more mundane. Empirical studies indicate that the characteristics of the actual management job are quite different:

- Managers produce a large quantity of work, varying from 22 to 77 activities in an average workday.
- Activities are brief, varied, and fragmented.
- Activities are highly structured, allowing for little creativity or reflection.
- Verbal contact takes precedence over studying written reports or analyzing information.
- Managers spend anywhere from one-third to three-fourths of their time dealing with subordinates rather than making decisions and giving orders.

The implications of this characterization are clear. While technical knowledge and skills are necessary for specialized and analytical positions, managers need skills in organizing, performing tasks quickly and efficiently, and communicating clearly with subordinates.

The study of the skills required for management is a field in itself and is known as organizational behavior. The underlying assumption of the field is that thorough knowledge, understanding, and the acquired skills of the management of behavior will allow the manager to perform duties with efficiency and effectiveness and thus return to the original stereotype of a manager.

Skills or dimensions commonly ascribed to "organizational behavior" are motivation, leadership, communication, conflict management, delegation, decision making, and team building (see figure 1). Each of these dimensions has also become a field of study with theoretical frameworks, models, and empirical studies.

It is not possible to cover all of these areas in a brief paper, so the following is a selection of three important areas: leadership, motivation, and conflict management. For each of these, there is a brief introduction to the theory and current models.

Leadership

What exactly is leadership? While there have been as many definitions of the topic as there have been researchers, for the purpose of this paper the following definition will be used:

> Leadership is a process by which one person attempts to influence the behavior of another (or a group) with the expressed purpose of achieving a goal (or goals).

In the study of leadership, three major theories have emerged: trait theory, behavioral theory, and situational or contingency theory.

Trait theory

The first of these, trait theory, has been characterized as the

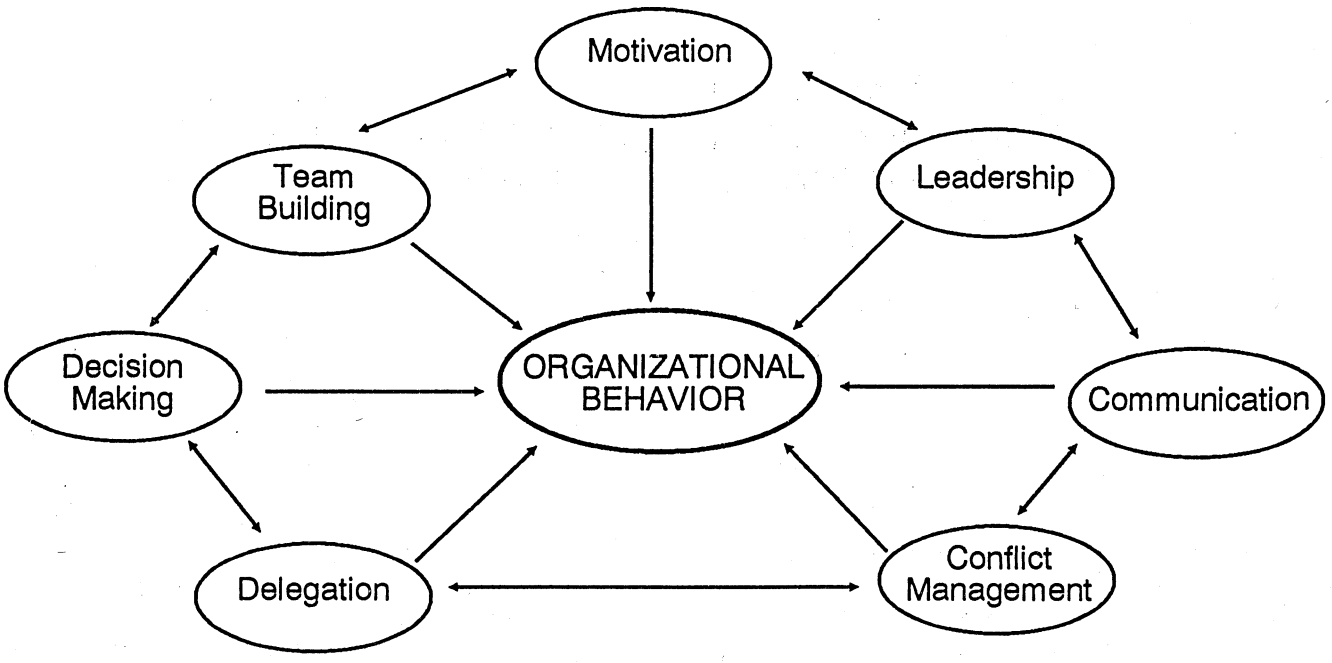


Figure 1. Dimensions of organizational behavior

"great person" theory of leadership. According to this theory, leaders are born, not made. The focal point of studies of trait theory is to identify the traits of leaders, such as physical characteristics, personality characteristics, social characteristics (including background and participation), and task-related characteristics such as need for achievement and initiative. Criticism of this has been that, while the theory is considered necessary, it is not sufficient in and of itself, as not all leaders have the same traits, and the traits required are different for different situations.

Behavioral theory

The inadequacies of trait theory led to behavioral theory. Basically, the behavioral approach focuses on what leaders actually do and then attempts to understand the relationship between leader action and subordinate reaction. This theoretical approach has been labeled "Theory X and Theory Y," the "Ohio State studies," and the "Michigan studies" at various periods of its development, but there are two main styles of leadership behavior identified: concern with the task and concern with people.

The following is a summary of the terminology for the two styles:

Concern with task	Concern with people
Initiating structures	Consideration
Task behavior	Support behavior
Concern for results	Concern for relationship
Autocratic	Democratic
Theory X	Theory Y
Boss-centered (authoritarian)	Subordinate-centered

In an attempt to identify the relationship of the two types of behavior as a continuum, Tannenbaum and Schmidt (1973) constructed the following design:

Boss-Centered Leadership — Subordinate-Centered Leadership

Use of authority by the manager

Area of freedom for subordinates

Manager makes decision and announces it	Manager "sells" decision	Manager presents ideas and invites questions	Manager presents tentative decision subject to change	Manager presents problem, gets suggestions, makes decision	Manager defines limits, asks group to make decision	Manager permits subordinates to function within limits defined by superior

Continuum of Leadership Behavior (HBR: May/June 1973: 164)

While the behavioral approach expanded the analysis of leadership to include interaction, there were two major constraints to the approach. One, by focusing on the relationship between the leader and follower, the situation within which the relationship takes place was not considered. And two, the separation of behavior to either task-oriented *or* people-oriented was too restrictive.

Situational leadership

The inability of either of these two approaches to address the problem in its entirety has led to the most recent theory, situation or contingency theory. This approach attempts to achieve a fit between the leader's behavior and the demands of a particular situation. While this theoretical approach has also gone through several evolutionary phases, such as Fiedlers Contingency Theory, Path-Goal Theory based on research by Evans and House, and the Vroom and Yetton Model, the current, and probably simplest of the examples, is the Blanchard model of situational leadership.

Simply put, the situational leadership model attempts to match four basic leadership styles with the development level of the followers that the leaders are trying to influence. These four basic leadership styles are the result of a two-by-two matrix defined by the combination of directive and supportive leadership behavior. By definition, directive behavior is the extent to which a leader engages in one-way communication in defining follower roles, while supportive behavior is the extent to which the leader engages in two-way communication, listens, encourages, incorporates followers, etc. Specifically the styles are as follows:

- Style 1 (S1) is high on direction and low on support. This type of leadership behavior is referred to as "directing," where the leader defines the roles, makes decisions, and closely supervises.

- Style 2 (S2) is high on direction and support. This type of leadership is referred to as "coaching," where the leader still provides direction, but attempts to incorporate the follower's input. Control over decisions remains with the leader.

- Style 3 (S3) is high on support and low on direction. This type of leadership is referred to as "supporting," where problem solving and decision making shifts from leader to follower, and the leader provides recognition and facilitation.

- Style 4 (S4) is low on support and direction. This type of leadership is referred to as "delegating," where leaders and followers jointly agree on problem definition and then decision making is delegated to the follower.

Empirical evidence has shown that of the four basic styles none are considered "best" to maximize productivity, satisfaction, and development. Rather, successful leaders are those who adapt their styles to the situation.

In order for the style to be adapted to the situation, i.e., *when* to use *which* style, the Blanchard model maintains that the key factor that affects choice of style is the "development level" of the follower. Development level is a function of the competence and commitment of the follower, where competence is knowledge and skills gained from education (as opposed to natural ability) and commitment is confidence and motivation.

The model identifies four levels of development that represent the various combinations of competence and commitment, where

D1 = Low

D2 = Low to Moderate

D3 = Moderate to High

D4 = High

The levels of development can also be characterized as moving from enthusiastic beginner to disillusioned learner to reluctant contributor to peak performer when the individual is given appropriate amounts of direction and support.

In the final synthesis of the model, the style of leadership is matched to the development level of the follower. In summary, the four possibilities are as follows:

1. directing style (S1) that provides clear direction and close supervision for an enthusiastic beginner (D1) who has high commitment but low competence;

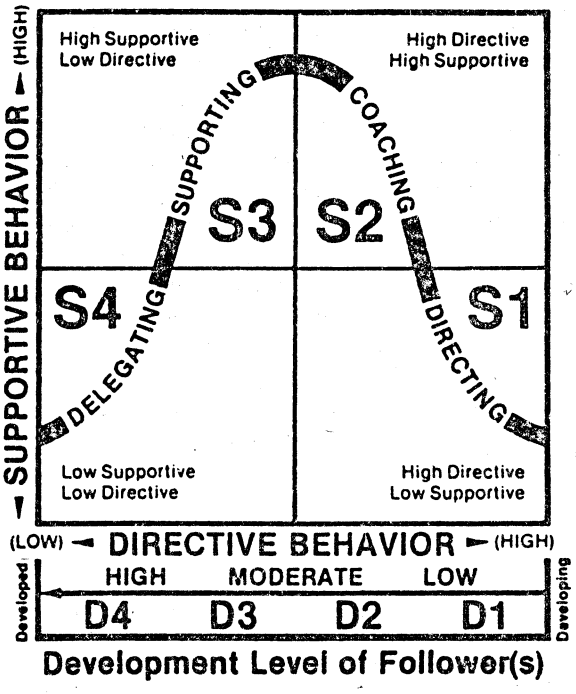
2. coaching style (S2) that provides directive behavior with supportive behavior to instill confidence to a disillusioned learner (D2) who has some competence but lacks commitment;

3. supporting style (S3) that provides a share in the decision with facilitating behavior to a reluctant contributor (D3) who has competence but lacks confidence;

4. delegating style (S4) that allows competent and motivated peak performers (D4) to take responsibility.

In summary, the situational leadership model contends that successful leaders are those who know their staff well enough to change their leadership style accordingly. Development levels of followers must be continuously assessed so that correct leadership styles can be adopted.

Thus situational leadership depends on a continual readjustment of leadership style. "It is this shifting forward and



The Four Leadership Styles

backward in style that makes Situational Leadership a truly developmental model for both managers and subordinates" (Blanchard 1985: 10).

A precondition for the efficient use of this model is an understanding of the concept of power by the leader. Power is an integral part of influencing behavior and as such requires understanding by the leader to assure that there will be compliance of followers. As is the case with the situational leadership model, this requires a knowledge not only of leadership power but also of the correct fit to the levels of maturity of the followers and their understanding of power as it affects their response or compliance. Table 1 identifies the power bases defined by maturity levels and the corresponding follower expectations and needs.

Motivation

The second area of organizational behavior to be discussed is motivation. By definition, motivation is a process by which people are stimulated to action to achieve desired goals. There are two interrelated issues in theories of motivation: the choice people make regarding action and the intensity of action once the choice is made.

The classic example of motivation theory is Maslow's hierarchy of needs (1943). Maslow hypothesizes that people act in order to satisfy a set of personal needs ranging from the need to survive to the need for growth and development. He contends that these needs are hierarchical. Once a need is satisfied at a given level, it ceases to motivate. If a need is not satisfied, its importance becomes preeminent over successive hierarchical levels.

Herzberg (1968) refined and expanded Maslow's hierarchy by discriminating between factors which dissatisfy, i.e., hygiene factors, and those which motivate. Hygiene factors

Table 1. Power Relationship

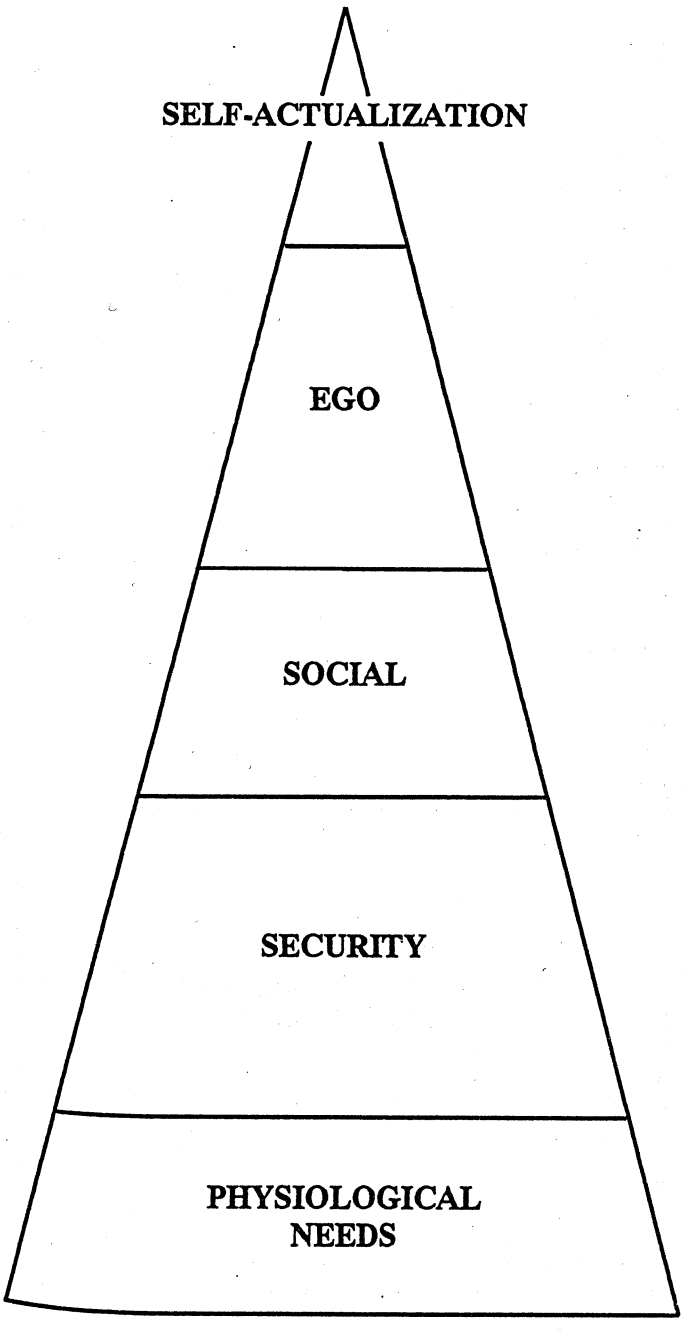
High Maturity	Leader	Follower
Expert	Based on expertise and skill. Facilitates behavior with expertise.	Needs little direction or support — will perform on own.
Information	Based on access to information. Others need information.	Needs information to improve or maintain performance.
Referent	Based on personal traits. Administration and identification influence.	Needs little direction but communication and support required.
Legitimate	Based on position. Others feel leader has right by position.	Will comply with legitimized position in organizational hierarchy.
Reward	Based on ability to provide rewards. Compliance leads to positive incentives.	Needs supportive and directive behavior enhanced by reward.
Connection	Based on connections. Induced compliance for favor or avoidance of disfavor.	Directive behavior required. Supportive behavior also important.
Coercive	Based on *Fear*. Induced compliance. Failure leads to punishment.	Needs strong directive behavior. Sanctions induce compliance.
Low Maturity		

provide a feeling of contentment (or dissatisfaction) but do not necessarily motivate, while the motivating factors provide stimulation for intensity of action towards the desired goal.

McGregor's (1969) Theory X, Theory Y, as described in the Leadership section above, defined management's approach based on the leader's understanding of the nature of the followers.

Gilbert's performance engineering model is concerned with productivity and the incentives which enhance performance. The underlying assumption of this approach is that people want to perform well, and the incentives required are the access to resources and support.

A final approach is reinforcement theory, which argues that behavior is largely determined by its consequences. Simply, if an action produces a positive response it will be repeated. However those actions which stimulate negative responses will be less likely to be repeated. This approach was popularized by Skinner (1953).



Self-Actualization
1. Chance to contribute
2. Chance for advancement
3. Chance for personal growth
4. More control over one's environment
5. Challenging work
6. Relief from monotony

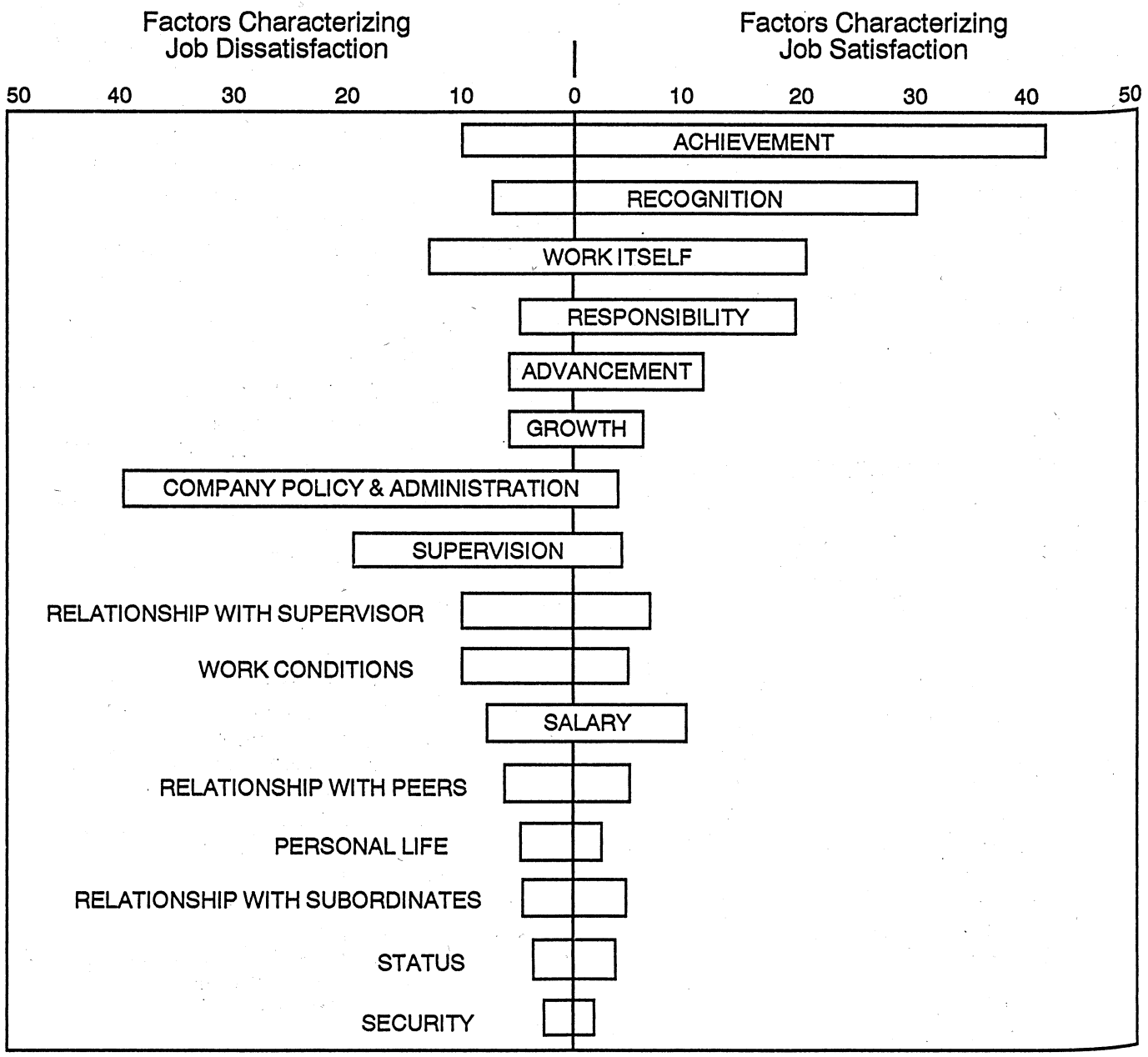
Ego Needs
1. Status/prestige
2. Sense of self-worth
3. Human dignity
4. Individual consideration
5. Impartial treatment
6. Recognition/appreciation
7. Pay — as a status indicator
8. Achievement

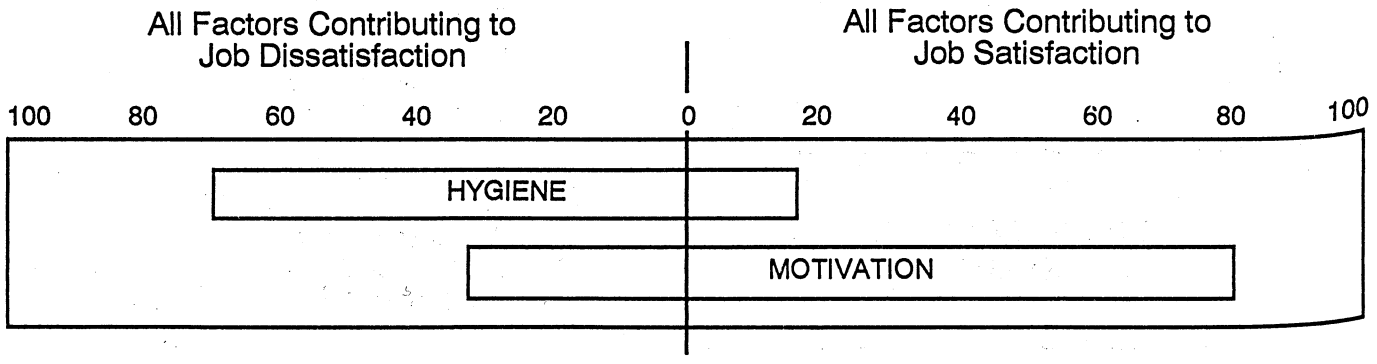
Social Needs
1. Sense of belonging to a worthy group/team member
2. Acceptance by one's fellows
3. Congenial work climate
4. Participation

Security Needs
1. Knowing expectations
2. Information/feedback
3. Training
4. Belonging to good company
5. Fair supervision
6. Job security
7. Continued income
8. In the right job

Physiological Needs
1. Food
2. Work conditions
3. Relaxation
4. Bodily safety
5. Pay

Maslow's Hierarchy of Individual Needs





Herzberg's Hygiene-Motivation Factors

Theory X	Theory Y
People by nature:	**People by nature:**
1. Lack integrity.	1. Have integrity.
2. Are fundamentally lazy and desire to work as little as possible.	2. Work hard towards objectives to which they are committed.
3. Avoid responsibility.	3. Assume responsibility within these commitments.
4. Are not interested in achievement.	4. Desire to achieve.
5. Are incapable of directing their own behavior.	5. Are capable of directing their own behavior.
6. Are indifferent to organizational needs.	6. Want their organizations to succeed.
7. Prefer to be directed by others.	7. Are not passive and submissive.
8. Avoid making decisions whenever possible.	8. Will make decisions within their commitments.
9. Are not very bright.	9. Are not stupid.

Managers with Theory X assumptions will therefore exercise tight controls, will not delegate, will keep all information to themselves, will not trust subordinates, and will drive, push and shove people towards greater production. Persons managed this way will tend to display the very qualities they are assumed to have; they will behave as if they were dishonest, lazy, indifferent, etc. On the other hand, persons managed under Theory Y assumptions will tend to demonstrate the positive qualities implied.

McGregor's Theory X, Theory Y

SOURCE: Summarized from George Mulenga. 1970. AMA Management Handbook. Lusaka, Zambia: Management Services Board.

Conflict Management

The third area is conflict management. According to Lewis A. Coser (IESS 1968: 232), conflict, as defined in the International Encyclopedia of the Social Sciences, is "a struggle over values or claims to status, power, and scarce resources, in which the aims of the conflicting parties are not only to gain the desired values but also to neutralize, injure, or eliminate their rivals."

The first step in managing conflict is recognizing that it exists and is an integral part of human communicative behavior. The second step is that once conflict is recognized, it should not be repressed, but rather should be channeled into positive endeavors.

When viewed as a common, normal social phenomenon of individuals and groups, conflict can be seen as positively functional for organizations in the following ways:

1. It can prevent stagnation.
2. It can stimulate interest and curiosity.
3. It can be the medium through which problems can arise and be discussed openly.
4. It can be the root of personal and social change.
5. It can be part of the process of personal testing and assessment.
6. It can demarcate groups from one another and thus establish group identity and personal allegiance.
7. It can foster internal cohesiveness to deal with external conflict (Simmel 1955).

Thus, conflict should be considered desirable as it fosters creativity and constitutes a relationship (not the absence of one) that allows for creative resolution.

One of the most lucid statements on conflict comes from one of the early students of conflict and its management. Despite the fact that the statement is now over 30 years old, it clearly delineates the fundamental principles upon which the debate and the evolution of the various approaches depend.

> In loosely structured groups and open societies, conflict which aims at a resolution of tension between antagonists, is likely to have stabilizing and

The goals, objectives, outcomes that need to be achieved are clear to the staff member.

These goals are both substantive (not set too low) and realistic (not set too high).

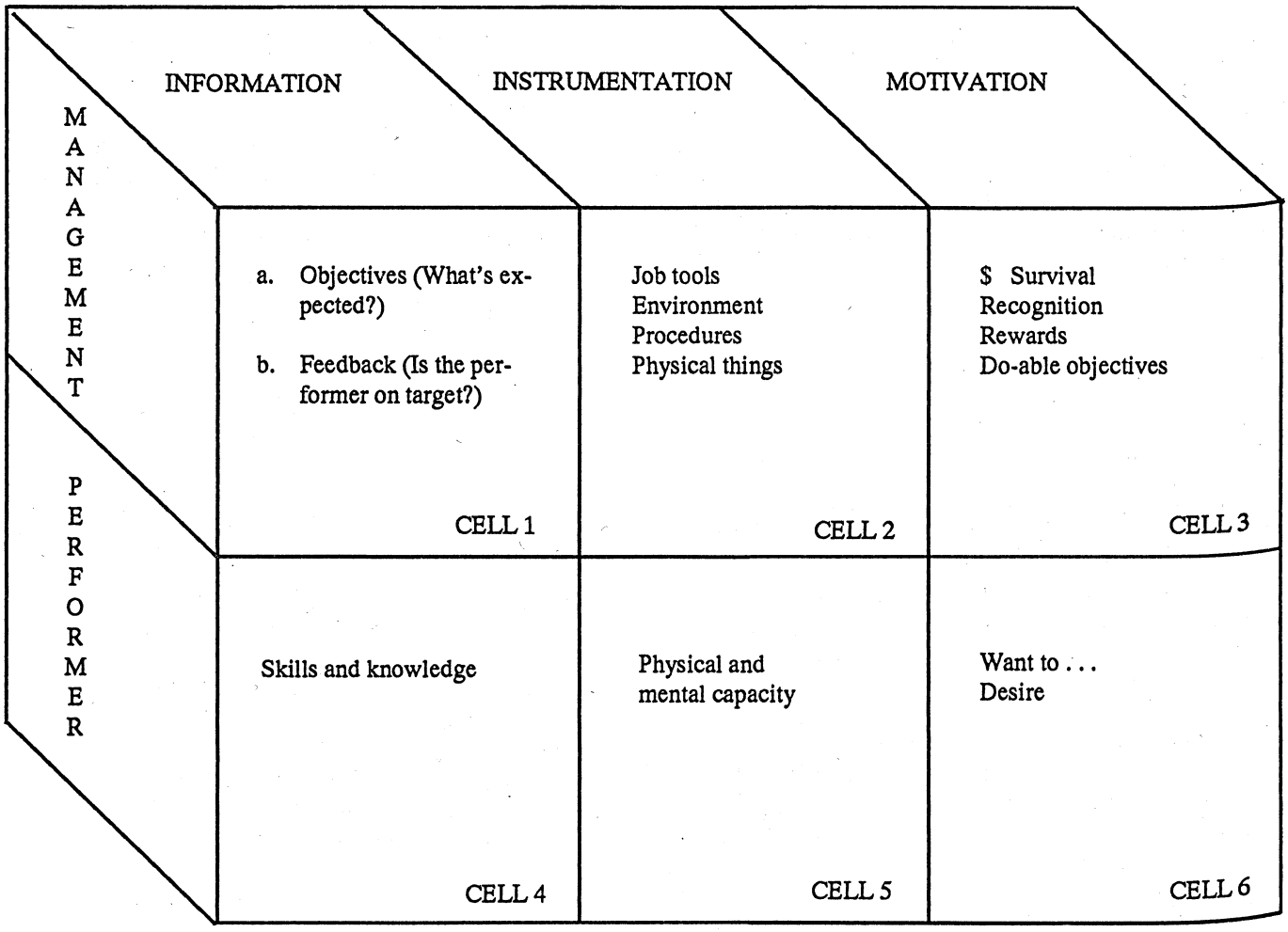
The staff member has the tools/resources needed to achieve these goals.

Staff members receive both confirmatory and corrective feedback from their superior and relevant others (for instance, team members, clients) on their performance.

Staff members receive training and whatever other developmental experiences are needed to help them cope with new responsibilities.

The staff member is challenged to develop task-relevant unused resources.

The staff member is challenged to move beyond self-defeating attitudes that interfere with performance.



The Six-Cell Performance Engineering Model

Gilbert's Performance Incentives

integrative functions for the relationship. By permitting immediate and direct expression of rival claims, such social systems are able to readjust their structures by eliminating the sources of dissatisfaction. The multiple conflicts which they experience may serve to eliminate the causes for dissociation and to re-establish unity. These systems avail themselves, through the toleration and institutionalization of conflict, of an important stabilizing mechanism.

In addition, conflict within a group frequently helps to revitalize existent norms; or it contributes to the emergence of new norms. In this sense, social conflict is a mechanism for adjustment of norms adequate to new conditions. A flexible society benefits from conflict because such behavior, by helping to create and modify norms, assures its continuance under changed conditions. Such a mechanism for readjustment of norms is hardly available to rigid systems: by suppressing conflict, the latter smother a useful warning signal, thereby maximizing the danger of catastrophic breakdown.

Internal conflict can also serve as a means for ascertaining the relative strength of antagonistic interests within the structure, and in this way constitute a mechanism for the maintenance of continual readjustment of the balance of power. Since the outbreak of a conflict indicates a rejection of a previous accommodation between parties, once the respective power of the contenders has been ascertained through conflict, a new equilibrium can be established and the relationship can proceed on this new basis (Coser 1956: 154-55).

While a number of strategies and typologies have been constructed over time based on this initial understanding (Rapoport 1960; Boulding 1962; Deutsche 1973), the most useful of those for managing intergroup conflict for us here is the Arnold and Feldman (1986) table that follows (table 2).

Briefly, there are four basic strategies for resolution of intergroup conflict. The first of these is *avoidance*, wherein the conflict is kept from coming into the open. There are two basic approaches that managers use in avoidance. The first is ignoring the conflict because the matter is either triv-

Table 2. Conflict Management Strategies

Conflict Resolution Strategy	Type of Strategy	Appropriate Situation
Ignoring the conflict	Avoidance	When the issue is trivial When the issue is symptomatic of more basic, pressing problems
Imposing a solution	Avoidance	When quick, decisive action is needed When unpopular decisions need to be made and consensus among the groups appears very unlikely
Smoothing	Defusion	As stop-gap measure: let people cool down and regain perspective When the conflict is over nonwork issues
Appealing to superordinate goals	Defusion	When there is a mutually important goal that neither group can achieve without the cooperation of the other When survival or success of overall organization is in jeopardy
Bargaining	Containment	When the two parties are of relatively equal power When there are several acceptable, alternative solutions that both parties would be willing to consider
Structuring the interaction	Containment	When previous attempts to openly discuss conflict issues led to conflict escalation rather than to problem solution When a respected third party is available to provide some structure and could serve as a mediator
Integrative problem solving	Confrontation	When there is a minimum level of trust between groups and there is no time pressure for a quick solution When the organization can benefit from merging the differing perspectives and insights of the groups in making key decisions
Redesigning the organization	Confrontation	When the sources of conflict come from the coordination of work When the work can be easily divided into clear project responsibilities (self-contained work groups) or when activities require a lot of interdepartmental coordination over time (lateral relations)

(Arnold and Feldman 1986:225)

ial or symptomatic of larger problems. The second circumstance for which an avoidance strategy is appropriate is imposing a solution from a higher level when decisive action is required or a consensus is unlikely.

The second type of strategy is *defusion*, wherein the conflict is kept in abeyance by smoothing, playing down its importance, or diverting attention by appealing to superordinate goals.

The third type of strategy is *containment*, which attempts to contain the conflict by controlling the issues and the manner in which they are discussed by either bargaining or structuring the interaction.

The fourth type of strategy is *confrontation*, whereby attempts to integrate or reconcile are made so that the needs of both conflicting parties are met or organizations are redesigned so that conflict from lack of coordination can be eliminated.

Needless to say, it would be a unique manager who has acquired the skills or has the temperament to successfully operate at all levels. Thus, it is incumbent upon managers who attempt to successfully use conflict to advantage to, first, identify their own styles and, second, make sure the style is appropriate to the situation. If their style is not appropriate to the situation, then they must either adopt a different style or operate in such a manner that a desirable, predictable outcome can occur, one that is acceptable to all parties concerned.

There are a variety of methods to assist managers in identifying their strengths in strategies of conflict resolution, such as the Myers-Briggs Type Indicator and Keirsey-Bates Temperament Sorter. These simple questionnaires are designed to assist in the identification of preferred styles of conflict resolution so that a determination can be made on whether a style is consistent with the various situations in which managers find themselves.

Bibliography

Adair, John. 1984. The Skills of Leadership. Hants: Gower Publishing Co. Ltd.

Arnold, Hugh J. and Daniel C. Feldman. 1986. Organizational Behavior. New York: McGraw-Hill.

Association of Project Managers. 1984. Closing the Gaps in Project Management Systems. Systems Gap Working Party Report. UK: Bullerworths.

Blanchard, Kenneth H. 1985. A Situational Approach to Managing People. California: BTD.

Boulding, K. E. 1962. Conflict and Defence. New York: Harper.

Briggs Myers, Isabel. 1986. Introduction to Type. Palo Alto California: Consulting Psychologists Press.

Buchanan, Paul C. The Leader Looks at Individual Motivation. Looking into Leadership Series.

Callaham, Rober E., C. Patrick Fleenor and Harr R. Knudson. 1986. Understanding Organizational Behaviour. Columbus: Merrill.

Carroll J. Stephen et al. 1977. The Management Processes Cases and Readings. 2nd Edition. MacMillan Publishing Co.

Coser, L. 1956. The Function of Social Conflict. Glencoe, Illinois: Free Press.

Deutsch, Morton. 1973. The Resolution of Conflict. New Haven and London: Yale University Press.

Hart, Lois Borland. 1981. Learning from Conflict: A Handbook for Trainees and Group Leaders. Reading: Addison-Wesley Pub. Co.

Hersey, Paul and Kenneth H. Blanchard. 1977. Motivation and Behavior. Chapter 2 from Management of Organizational Behavior: Utilizing Human Resources. 3rd Edition. Prentice-Hall.

Herzberg, Frederick. 1968. One More Time: How Do You Motivate Employees? Harvard Business Review January-February 1968:53-62.

IESS (International Encyclopedia of the Social Sciences). 1968. Edited by David L. Sills. New York: Free Press.

Jandt, Fred E. (Ed) 1973. Conflict Resolution through Communication. New York: Harper and Row Publishers.

Jenkins, W. O. 1947. A Review of Leadership Studies with Particular Reference to Military Problems. Psychological Bulletin, Vol. 44:54-79.

Jessey, Francis V. 1972. Job Enrichment. The 1972 Annual Handbook for Group Facilitators, University Associates, Inc., pp. 127-129.

Keirsey, David and Marily Bates. 1984. Please Understand Me. Del Mar, California: Prometheus Nemesis Book Co.

Longenecker, J. G. and Charles D. Pringle. 1984. Management. 6th Edition. Columbus: Merrill.

Marjoribanks, John. 1982. Leadership. Swaziland: Mananga Agricultural Management Center, L6311.

Maslow, Abraham H. 1943. A theory of human motivation. Psychological Review. 50:370-396.

McGregor, D. 1969. The Human Side of Enterprise. New York: McGraw-Hill.

Mintzberg, H. 1973. The Nature of Managerial Work. New York: Harper and Row.

Moore, P. H. and Thomas H. 1976. The Anatomy of Decisions. UK: Penguin Management Texts.

Owen, James. 1974. You Can Lift Morale and Productivity. Supervisory Management July 1974:30-38.

Pedler, Mike and John Burgoyne. 1986. A Manager's Guide to Self-Development. 2nd Edition. London: McGraw-Hill Book Co.

Pedler, Mike, John Burgoyne and Tom Boydell. 1978. A Manager's Guide to Self-Development. London: McGraw-Hill Book Co.

Pfeiffer, Sandra L. 1972. The Maslow Need Hierarchy. The 1972 Annual Handbook for Group Facilitators. University Associates.

Rapoport. 1960. Fights, Games, and Debates. Ann Arbor: University of Michigan Press.

Reitz, H. Joseph. 1981. Behavior in Organizations. Irwin, Homewood.

Rue, Leslie W. and Lloyd L. Byars. 1980. Motivation: The Moving Function. Chapter 9 from Management Theory and Application. Richard D. Irwin, Inc.

Scott Myers, M. 1964. Who Are Your Motivated Workers? Harvard Business Review January-February 1964:73-88.

Sills, David L. (Ed) 1986. International Encyclopedia of the Social Sciences (IESS). New York: Free Press.

Simmel, G. 1955. Conflict. New York: Free Press.

Skinner, B. F. 1953. Science and Human Behavior. New York: McMillan.

Stogdill, R. M. 1948. Personal Factors Associated with Leadership: A Survey of the Literature. Journal of Psychology, Vol. 25, 1948:35-71.

Tannenbaum, R. and W. H. Schmidt. 1973. Harvard Business Review. May-June.

Tannenbaum, R. and W. H. Schmidt. 1958. How to Choose a Leadership Pattern. Harvard Business Review March-April 1958.

Zinyemba, A. 1988. Leadership and Management Styles. Zimbabwe: ZIPAM.

CASE STUDY
SITUATIONAL LEADERSHIP
The G.T. Nmenda Case

Paul Marcotte

An African national agricultural research institute (NARI) established a research station in one of the country's outlying provinces 15 years ago. The station began operations with a small work force. G.T. Nmenda, a local resident with a BSc in general agriculture, was put in charge of the crop program, which included himself and a technician.

Over the years, the station was enlarged and the staff expanded. The government declared that it was going to be self-sufficient in grain production. In an effort to curb the importation of grains, a program for import substitution was begun. The duties and responsibilities of G.T. Nmenda increased commensurately.

He discovered that he was often required to work overtime and was frequently called to the station in the evenings and on weekends. He conscientiously performed his work without complaint, and over the years he proved himself to be a dedicated and loyal employee. Additional employees were occasionally added to the crop program, and before too long G.T. had the responsibility of supervising five crop scientists, five technicians, and 10 laborers. Most of the scientists were younger but had received Master's level training as part of the new development program.

The head of crop production (HCP) for NARI noted that G.T. still preferred to design experiments and supervise field trials personally rather than direct the work of his subordinates. The HCP requested that G.T. meet with him to discuss the nature of his role as supervisor. G.T. was told that the work of the crop program had grown in complexity and responsibility. One person could no longer perform the work required of the department. A supervisor of such a department must select capable subordinates, train them in the various tasks, and direct them in such a way that work would be performed in an efficient manner. G.T. agreed to perform the functions required of a supervisor.

The HCP was disappointed to learn in the following months that G.T. was supervisor in title only. Some of the crop scientists had become accustomed to his hands-on style and were hesitant to make their own decisions. Some resented G.T.'s leadership style and thought that his continual interventions were an interference. G.T., himself, was possessive in regard to the experiments, resented others taking charge, and refused to delegate responsibilities to his subordinates. G.T. preferred, instead, working long hours overtime and returning to the station in the early hours of the morning. He had also hesitated to select and train competent subordinates.

The HCP realized that some action would have to be taken, but at the same time he recognized the fact that G.T. was a valuable employee, had devoted many years to the station, and exhibited unique loyality. To discharge such a man would be a poor way indeed to compensate him for such loyalty.

Questions:

1. What leadership style has G.T. adopted over the years?
2. What leadership style should be used for G.T.'s followers?
3. What problems are caused by the variance in styles?
4. What would you do if you were the HCP?

CASE STUDY
RESEARCH TEAMS IN MALDANO*

Paul Bennell

Introduction

Dr. Joseph Pirali, the Director of the Department of Agricultural Research (DAR) in the Republic of Maldano, sat in his office. He was thinking about the monthly meeting later that morning with his two deputy directors of crops and livestock research. At the top of Pirali's agenda was the need to improve the functioning of the seven commodity research teams in the department. Having just attended a two-week workshop on agricultural research management, he was very aware that the CRTs were not operating effectively enough as coherent teams and that something needed to be done about this, and soon. He couldn't help comparing the CRTs with the Farming Systems Research (FSR) Unit that had been established five years earlier. The FSR Unit was a close-knit team that had achieved excellent research results in a short period of time. Surely, he thought, the experience of the FSR Unit had important lessons for the functioning of the CRTs.

Pirali decided therefore to request his deputy director of crops research, Dr. Felix Zonpalt, to review the CRTs and the FSR Unit and submit a report that could be discussed at the next monthly meeting. The Maize Research Team was the largest and most important team and in many ways was typical of the problems that researchers seemed to have working collaboratively in teams.

It seemed sensible therefore that Dr. Zonpalt should start his review by focusing on the Maize Research Team.

The Department of Agricultural Research

DAR had overall responsibility for crops and livestock research in Maldano. Total employment amounted to 1350 in 1987 with 235 professional researchers and 370 fully qualified field and laboratory technicians.

The DAR was made up of two main divisions, crops and livestock research, each of which was further subdivided into mainly discipline-based institutes and stations, each with its own head. The main exception was the FSR Unit which was multidisciplinary but was the overall responsibility of the deputy director of the Crops Research Division.

The seven commodity research teams were superimposed on this disciplinary departmental structure, creating a matrix type of organizational structure. The CRTs had been created in the mid 1970s in order to ensure that the activities of different specialist researchers working on the same or related commodities were more effectively integrated and coordinated.

The Maize Research Team

The Maize Research Team (MRT) was the first commodity research team to be established back in 1974. Originally, the team had five members, but by 1988 it had grown to 11 members covering a wide range of specializations. Only the two breeders allocated all their time to the MRT. Dr. Albert Mena had been the head of MRT since 1979. He was a competent maize breeder with many years of experience so it seemed only natural that he should be made team leader.

The Zonpalt-Mena Meeting

Zonpalt met with Mena and explained his assignment to him. Mena was not pleased: "Everytime Pirali goes to one of these workshops he comes back with a lot of trendy ideas and immediately wants to start trying them out on us. First it was program budgeting, then performance appraisal and now interdisciplinary research, whatever that is!"

Zonpalt grinned. "So you wouldn't make any changes to the MRT, Albert?"

Mena: "How did you guess? No. But quite seriously, I wouldn't make any fundamental changes. I think our achievements during the last 10 years speak for themselves. We've produced very good research with high potential in

*This case is designed to serve as a basis for discussion, rather than to illustrate either effective or ineffective management policies or practices. It is based on a variety of unpublished sources and is not to be quoted, cited, reproduced, or published in any form.

most of the main agroecological areas where maize can be grown in Maldano. The breeding work has been exceptionally successful, as you know. I accept that the large gaps between experimental and farm yields are worrying, but, quite frankly, this is mainly due to the quality of extension and other services. We probably do need to put more emphasis on on-farm diagnosis and testing but in a commodity research program like ours, the disciplinary research on-station will continue to be our primary activity."

Zonpalt: "But what about the criticism of our extensionist friends and, in particular, the subject-matter specialists that the MRT's research is not adaptive enough and that it is too fragmented into disciplinary bits and pieces that don't fit together in a systematic and coherent way? They seem to want a far more integrated approach."

Mena: "Come on, Felix, what do that lot know about research? Anyway, we do have an integrated approach — after all, that is what the planning and evaluation meetings are all about. If they want more integration, they should come to these meetings. We invite them every year to participate but most of them never turn up. I know there is a lot of talk these days about the need for interdisciplinary research but that's all it is — talk! Given the complexity and enormous range of problems in crop science there is no alternative but to have distinct specializations based on a logical division of labor. This is accepted for other occupations like engineering or medicine. Why should it be any different for agricultural research? Look, I'm a maize breeder and I don't need economists or range management experts telling me how to do my job. Of course, I accept the need to sit down with people from other disciplinary backgrounds when we're all working on the same commodity in order to coordinate our work. But this is precisely what the MRT already does!"

Zonpalt: "How successfully then do members of MRT work together as a team?"

Mena: "Really quite well I think. Inevitably we are a fairly loose-knit group. The really important aspect of the MRT's work is in setting research priorities and resource allocations for the maize program as a whole and the formulation and evaluation of specific research projects. We have, as you know, two meetings a year. The first after the main cropping season in September is where my researchers present their research findings. The second meeting is convened shortly afterwards, usually in late October or early November, in order to discuss and vet the proposed research activities for the following year. Now that there are 11 in the team, these meetings can last up to two days. Each researcher is given around 45 minutes to present his results or outline the major thrusts and objectives of future research. This includes the time taken for questions from other team members. As chairman of these meetings, I always have a lot to say, of course."

Zonpalt: "I've heard some colleagues complain that the planning meetings are rather dull."

Mena: "That may be, but I don't see any other way of doing it. We certainly don't need any more meetings, that's for sure. Most of us have a chance to talk on a daily basis if we need to, usually in the staff room during tea breaks."

Zonpalt: "How do you see your role in the MRT?"

Mena: "Well, I'm the leader obviously and I take my responsibilities very seriously, as you know. I'm really an information collector and synthesizer. I am the hub of the team."

Zonpalt: "Like the hub of a wheel?"

Mena: "Exactly. All information has to be channelled through me and ultimately it is myself, in consultation, of course, with senior management, who are responsible for modifying and approving all maize research. As I said before, it's this planning and evaluating role that is really critical."

Zonpalt: "Some would say that you play too dominant a role in the MRT and that you tend to be, how I shall say, rather bossy."

Mena: "You mean authoritarian, don't you? Yes, I accept that this is true to some extent. But you have to be firm, otherwise nothing would ever get decided. Of course, a lot of the younger researchers just don't like authority."

Zonpalt: "But does the MRT provide a sufficiently supportive environment for its members?"

Mena: "I'm not sure what you mean exactly. Do I stroke their egos and pat them on the back when they are doing good work? Sure I do. But frankly, the most important team for a breeder or an agronomist or whoever is the people in his own department sharing the same disciplinary specialization. Again, some of the younger members of MRT have said they want closer interactions between members of the team. From a strictly scientific perspective, I think, as I said earlier, that there is some justification for some joint diagnostic work but this must be kept strictly in bounds."

Zonpalt: "Is there much conflict in the MRT?"

Mena: "Not conflict so much as disagreements. Yes, there have certainly been plenty of these in the past. But this is to be expected because every good scientist is always after the resources he needs to do his research and our planning meetings are the forum for this competition. There is nothing wrong with this. On the contrary, it's healthy. I do admit, however, that some of the old interdepartmental

rivalries have carried over into the group. We breeders always seem to take a lot of stick, as you know. And Bontontara, the economist, has had a pretty rough time as well because team members don't like to be told that their research is not economically viable or relevant. I've clashed with him frequently but he can take it. He's got a pretty thick skin. Of course, a lot of these flare-ups are just due to personality differences. Maldanos, especially the male of the species, are a volatile lot, there's no getting away from it! And research scientists in general are rarely good team players."

Zonpalt: "How would you rate the morale in the MRT?"

Mena: "Not brilliant but that's true for all scientists in the department. Morale will continue to fall as long as the government does nothing about our miserable salaries and career prospects."

Zonpalt: "Finally then, how if at all would you change the MRT?"

Mena: "Not a lot really. But there are three things I would like:

1. Clearer lines of authority between department heads and CRT leaders like myself. I'd like more control over the day-to-day activities of MRT members and a bigger say in their evaluations, both annual and grade promotions.

2. More people in the team, in particular another breeder and soil scientist.

3. And a deputy to help me."

Zonpalt: "And what about more diagnosis and testing?"

Mena: "Oh yes, that as well. But the really critical requirement for us is the availability of resources. Donor support has dried up since 1983 — never mind about group dynamics! Tell that to Pirali."

Zonpalt: "How about changes in your leaderstyle style?"

Mena: "You must be joking! I'm too old to change my ways now."

Some days later, Zonpalt met the MRT as a group to discuss with them the strengths and weaknesses of the team as they perceived them. It seemed to Zonpalt that there was a small group of mainly older team members who had much the same views and attitudes as Dr. Mena. The remainder of the team were clearly less happy about the functioning of the MRT but seemed surprisingly reticent about airing their specific criticisms. However, with his previous in-depth knowledge of the MRT coupled with his recent meetings with Dr. Mena and team members, it was not too difficult for Zonpalt to see what these criticisms might be. Before analysing the FSR Unit, Zonpalt realized that it was important to diagnose these problems clearly and come to some preliminary conclusions as to how they could be solved.

Zonpalt's Assignment: Part Two

The Farming Systems Research Unit

Now that he had done his preliminary analysis of the MRT, Zonpalt began to look in detail at the FSR Unit.

The FSR Unit was established as a donor-funded project in 1982 with a clearly defined mandate to undertake closely integrated cross-disciplinary research on the major crops and livestock species produced by small, resource-poor farmers in Maldano. Such integration was deemed to be necessary in order to properly identify the key production constraints of these farmers and develop viable technologies to overcome them.

After extensive consultations, it was decided that the FSR Unit should focus on just two relatively small but well-defined farming areas during the first phase of the project. Diagnostic surveys were undertaken, and these formed the basis for a series of on-farm trials with, where necessary, appropriate component research from other research specializations.

The Zonpalt-Gotfried Meeting

Dr. Zonpalt felt that he already knew everything he needed to know about the history and functioning of the FSR Unit. He decided nonetheless that he should have a formal meeting with Dr. Martina Gotfried, the head of the FSR Unit, in order to get her to describe, as clearly and succinctly as possible, the main achievements and problems of the Unit. Later that day the two met in Zonpalt's office. Having described his assignment, Zonpalt asked Gotfried to summarize the main achievements of the project.

Gotfried: "I think there have been a number of important achievements. First, we have met the main objectives for the first phase of the project. The surveys have been completed, extensive on-farm trials are in progress, and I am confident that we will be in a position to make comprehensive sets of recommendations in the next two or three years. And what is more we have not exceeded our budget. Second, we have learned to work well together as a team in a purposeful, integrated manner. Morale is very high. And third, we have developed considerable institutional capacity in this important area of research that can be built on further in the future. I think FSR is here to stay."

Zonpalt: "What factors can you identify that help to explain the unit's performance?"

Gotfried: "That's a difficult question because when you look at it in detail, so many factors have influenced our performance as a team. In many ways, managing a team involves the same challenges and problems as running a larger department, but there are some important differences. Perhaps I should list some of the key performance factors and quickly run through them.

"Objectives and resources: Our objectives were clearly stated, we had excellent support from management and, in general, had sufficient resources to carry out the necessary tasks, thanks to the donors. Everyone understood and accepted these objectives. We spent a lot of time discussing them so that everyone felt that they were theirs and not somebody else's. We deliberately started off low-key with very manageable objectives so as not to arouse expectations that were too high.

"The nature of the research: The farming systems research perspective encouraged us to operate as a team. We soon discovered that no one discipline could adequately explain what was happening in these complex farming systems, so we were forced to work closely with each other. At first, none of us really understood what FSR was all about, so again we had to learn together in a sort of piecemeal fashion. We have always tried to build on each other's ideas. Now we tend to interact like a football team with each member continually adjusting his position in relation to the others.

"Size and participation: Being small with a full-time commitment has been very important. There haven't been any of the frustrations you get when people try to communicate with each other in large groups. In the unit everyone can say what they want, all of the time! Nor, with just six people, have any cliques or factions formed around powerful personalities. But I guess there are some disadvantages to being small. I certainly felt a little vulnerable at times. The team is predominantly young and inexperienced. This was a major drawback at first because they lacked the capacity to do very much FSR. But, being young, they were keen to prove themselves and because we were able to offer the right kind of supervision and training, they soon picked up the necessary skills. And, of course, their commitment to helping poor farmers has been a key factor. This commitment was somewhat academic and idealistic when they first started, but now that they have had so much contact with the farmers, it is central to their value system as scientists.

"Team spirit and morale: There has been good team spirit and high morale based on mutual support and trust. In fact, I would say that the success of the team has had as much to do with how team members get on with each other as it has with their individual abilities as researchers and technicians. We seem to have had the right combination of personalities. I knew most of these people before they joined the team and I can tell you their behavior as individuals was quite different. It's difficult to believe but its true. Unless the team as a whole meets important individual needs, then it probably won't achieve its stated objectives. I've found that with effective teams like the FSR Unit, individuals play different roles that complement each other. For example, Tom Sanalitona is the idea man in the team, whereas Peter Casaravilla is more concerned with getting the work done as well as possible and making sure that nothing is overlooked.

"Participation: I have encouraged a high level of participation and openness by team members. Unlike the situation in the CRTs, our technicians are full and active members. We reach decisions by consensus wherever possible. We are a fairly heterogeneous group, which has resulted in some conflict and differences of opinion. Certainly in the early days there were lots of disagreements about what we should do. But, personally, I think this is not a bad thing because you are more likely to reach a good decision than if you are agreed at the outset. Some people were also quite defensive at first because they were unclear about what they expected from each other. But this soon disappeared once we really got going. Now our team has definite norms, both in terms of tasks and behavior requirements.

"Organization: The unit has enjoyed a well-defined organizational position with a clear mandate and its own resources. From the beginning, senior management has encouraged and, where necessary, cajoled researchers from the other departments to work with the FSR Unit.

"Rewards and status: Membership in the unit has clearly benefited the researchers and technicians who have belonged to it. The work environment has been stimulating, there have been plenty of training opportunities, and, now that the vital role of FSR is recognized, there is a lot of status attached to being part of the FSR Unit. As a young group faced with the deep-seated scepticism of their senior colleagues about FSR, they have been determined to prove themselves and the value of this type of research. With such high commitment, very few people have left us.

"Self awareness: We have tried to be as open as possible and diagnose how we are getting on as a group. We all spent three days at the Public Service Training Center doing a team-development course that was very useful."

Zonpalt: "How would you describe your role as team leader?"

Gotfried: "I think my present role as team leader has changed somewhat from what it was during the early days. Nobody had much idea of what FSR was about and the researchers who were assigned to the unit had little experience working in a genuine collaborative manner, especially with people in different disciplinary areas. So I was obliged

to adopt more of a coaching style of leadership. But, at the same time, I did not want to appear to be too directive because I genuinely wanted every team member to participate fully in a collective decision-making process. As team members have gained experience and confidence, I have been able to take more of a backseat role and do more research myself. Of course, in practice, there have really been two team leaders in the unit. Okay, I am, formally speaking, the team leader, but Dr. Peter Casaravilla has also played a crucial leadership role. In many respects, I have been more concerned about what one could call the personal or emotional needs of the team members and generally building up good group dynamics. Peter, on the other hand, has taken on most of the responsibility for actually getting the work done. He has really been my right-hand man."

Zonpalt: "What have been the main problems in building the FSR team?"

Gotfried: "Well, fortunately, not that many really. In fact, I would identify only three major ones:

- FSR is a new area so everyone has floundered around to some extent. This, coupled with uncertainties about the FSR Unit's future once donor funding ceases next year worries some team members.

- A true interdisciplinary team with a high degree of work integration is a new phenomenon in DAR, as is FSR itself. We have run into a lot of suspicion from other researchers — even from some technicians. We've had to be patient and slowly prove that we have something to offer. Also, team members bring certain values with them, in particular those associated with individualism and disciplinary specialization, that have to be changed. Again, this takes time. We still have a ways to go — I would say at least another 10 years before we are a fully mature team.

- Mr. Tanmillo was a major headache. It's amazing how just one person can seriously undermine an entire team effort, especially when you're as small as we were and had just got going. This young man had lots of personal problems and he just couldn't get on with anyone in the team. He tried to monopolize discussions and rarely listened. I spent a lot of time trying to help him but got absolutely nowhere. He eventually left DAR, thank God, but he really slowed things down for the year he was with us."

Zonpalt: "So what changes, if any, would you make to the FSR Unit?"

Gotfried: "Changes will always be necessary as the team matures, but now that the team is functionning well these will be fairly minor and subtle. Of course, that's not to say that I don't want more FSR in the department. Of course I do. We should certainly start to think about establishing another FSR team in the very near future."

Conclusion

It was Sunday. Zonpalt had just two days to produce his report on the CRTs. He was still not sure how he should structure the report and, more important still, what his main recommendations should be.

The one thing he *was* sure of was that more integrated teamwork in the CRTs was required and that a deliberate strategy of team building in DAR should be started as soon as possible.

Many ideas mingled uneasily in his mind as he gazed out of the window. He was impressed with the performance of the FSR Unit, but he was still unclear exactly how the experience with this very specific type of team could be replicated in the CRTs. This would clearly require careful answers to many questions. Just what is a team? Is it possible to categorize different types of teams? What are the functional requirements for an effective team? What are the really critical performance factors? Is there any way of grouping these? Certainly Gotfried's long list was useful but rather confusing. What are the main roles performed by team members? Obviously there is a technical role but it seemed to Zonpalt that there are many more quite distinct social-emotional roles. What sort of leadership styles are appropriate? What is team building? How should it be done among the CRTs?

Perhaps there were also other questions he should have asked Drs. Mena and Gotfried. Reading the transcript of the Gotfried interview, Zonpalt couldn't help thinking that it all sounded too good to be totally true. If only Mena and Gotfried got on better than they did it would have been nice to get them together in order to thrash out the issues. Mena would certainly have had plenty of things to say about the FSR Unit and so probably would Gotfried about the MRT and the other CRTs.

Zonpalt knew from previous experience that Pirali liked to be presented with a set of options for action. This would have to be an important part of his report. Some of the options that came immediately to mind were

- Do nothing. (Pirali wouldn't like this!)

- Disband the CRTs. (Nor this!).

- Reduce the size of the large CRTs (such as MRT) and increase the participation of their members — ideally to full-time.

- Appoint new leaders of those CRTs which clearly have leadership problems. Perhaps Gotfried could be appointed as the leader of the MRT!

- Take concrete steps to increase the task interaction and thus interdependency of team members, probably through greater emphasis on joint on-farm diagnosis and testing activities.

- Include extension personnel as full members of the CRTs.

- Establish a training program to promote the right values and attitudes towards teamwork.

Some options would clearly be mutually exclusive. Others could be mutually compatible. But Zonpalt knew that he would have to put these together in a coherent, logical way. Pirali was a stickler for detail.

It was getting late and Zonpalt hadn't even started writing. He clearly wasn't going to get much sleep that night.

TEACHING NOTE:
Research Teams in Maldano

Format

The case should be taught in two parts. With the amount of material that is contained in the case, participants should be given at least three to four hours to read, think about, and discuss it. A suggested format is as follows:

	Minutes
Part I :	
Individual reading	30
Group discussion	30
Plenary discussion	30
(Subtotal)	(90)
Part II:	
Individual reading	30
Group discussion	40
Plenary discussion	40
(Subtotal)	(110)
Total	200

Content

Part I: The participants should be directed to analyse the nature of the MRT as a form of cross-disciplinary interaction with specific objectives and related tasks and the extent to which these are being fulfilled. This will entail the enumeration of various performance factors and the strengths and weaknesses of the MRT in relation to these. A useful way of grouping performance factors is the following:

- job content — objectives and activities
- work environment
- personal goals and objectives and other individual characteristics
- leadership

It may also be useful to get the participants to provide clear definitions of teams and team building: "A team is a close and continuing contract between individuals leading to outcomes that are influenced by the degree of interaction."

"Team building is the process of taking a collection of individuals with different needs, backgrounds and expertise and transforming them into an integrated effective work unit."

Emphasis should be given to analysing (1) what specific functions the MRT was originally intended to achieve on the basis of teamwork, (2) to what extent these had been achieved, and (3) how, if at all, the original functions/objectives (i.e., the emphasis on planning narrowly defined as "the planning meetings") should be changed in the future (i.e., more teamwork interaction in the actual implementation of research) or, alternatively, merely strengthened. In other words, to what extent is the concept and modus operandi of the CRT fundamentally flawed? Or is the problem principally one of ensuring that the team is managed properly with adequate resources, etc.?

Participants should be encouraged to look at team research activities in their own situations as this will not only make the case more real for them but also help them tease out the problems with the MRT. What goes on in the MRT planning meetings is clearly crucial to the success of the limited amount of teamwork in MRT.

The basic message is that the MRT is not working well — neither in relation to its intended role as a collective planning and evaluation mechanism nor in relation to more ambitious goals of achieving much closer integration of the planning *and* implementation *and* evaluation activities of maize researchers working purposively as a team.

Part II: The FSR Unit, team comparisons, and recommendations/preferred options.

The discussion of the FSR Unit deliberately sets out to highlight many of the key issues in team/group processes and team building. Participants should then compare the *similarities* and *differences* between the two team activities on a factor-by-factor basis (table 1)

Before considering the core question of replicability of the FSR Unit, it is useful to run through some of the more general questions concerning teams and team performance raised by Zonpalt in the conclusion.

Functional requirements and roles: The distinction between technical and social functions of a team should be discussed. Figure 1 could be used for this purpose. The concept of team *roles* is also critical. Some of the key technical/task and social/group maintenance roles are described in figure 2.

Leadership style: The concept and practice of leadership style are highlighted by the case. Gotfried purposively

Table 1. Similarities and Differences between FSR and MRT Teams

	FSR	MRT
Function	Detailed planning, implementation (diagnosis, testing, etc.)	General planning and evaluation
Degree of team interaction	high	low
Intended team interaction	high	? medium
Size	small (6)	high (11)
Years in operation	5	15
Composition	3 disciplines, mainly younger	hetrogeneous-wide range ages
Participation	full time	limited (20-40% time)
Leadership	variable-coaching/delegating; effectively two "leaders"	fixed-directive single person
Degree of conflict	low — high cohesion	high — low cohesion
Morale	high	low
Organizational status	distinct unit with own budget	part of matrix structure but disciplinary depts dominant
Communication pattern	—	hub and spokes mainly
Work environment	on-farm close intergration farmers	station-based predominantly
Resources	strong donor support	limited

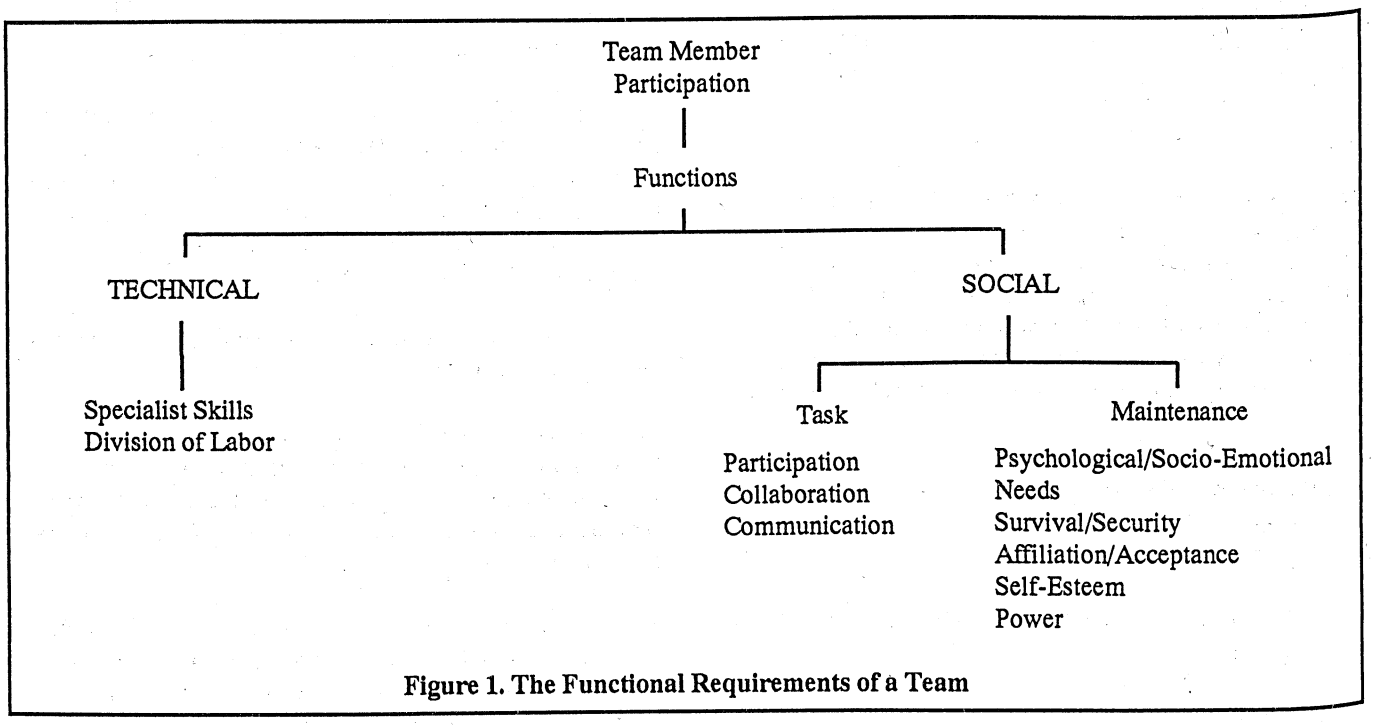


Figure 1. The Functional Requirements of a Team

adapted her leadership style over time depending on (1) the individual needs and capacities of team members, (2) the stage of evolution of the team, and (3) the particular tasks in hand. The well-known Hersey-Blanchard diagram (figure 3) could be presented at this point. The FSR Unit had dual leaders — one performing mainly a social role, the other technical. Again, this is a widely observed phenomenon in many effective teams.

The stage of team development: MRT has not developed beyond stage 1 (see figure 4) in nearly 15 years of operation, whereas the FSR Unit is at least at stage 2, if not at stage 3, after only five years or so. However, Gotfried is aware that developing a really mature team is a lengthy process.

TASK ROLES (the job to be done):

To contribute — by suggesting or proposing new ideas for getting the job done. ("I wonder if it wouldn't be wise to set the date of the meeting first, before talking about publicity for it.")

To clarify — by trying to pull ideas and suggestions together in a way that shows their relationship to each other. ("We have two methods for the presentation — a lecture and a video. Why not have a short lecture followed by a video on the research trials?")

To expedite — by prodding and stimulating the group to take action or to make a decision. ("We have all the facts. Can we now set a date and appoint the committees?")

To give information — by asking for facts that will clarify the task at hand. ("Since we don't have that much in the budget, does anyone know of a cheaper way of doing it?")

To give opinions — by stating your belief or opinion, on a suggestion that has been made, of what seems to be best for everyone concerned. ("I believe that next Tuesday would suit everyone.")

To seek opinions — by asking for a clearer statement of what is involved in a suggestion that has been made. ("I wonder if Jane would tell us how many people she needs to carry out the project.")

GROUP MAINTENANCE ROLES (the harmony of the group doing the job):

To encourage — by praising, agreeing with, and accepting the contributions of other members. ("Peter's idea is excellent. Let's hear it again, Peter.")

To harmonize — by trying to reconcile disagreements and relieve tensions by pouring oil on troubled waters. ("I think Peter and Maria are really saying the same thing, but in two different ways.")

To observe — by watching how the group operates and telling the group what you have seen. ("We don't all seem to be equally concerned with the task at hand. Perhaps the meeting is getting a little long.")

To sensitize — by attempting to make sure everyone participates and is given the opportunity to do so. ("We haven't heard Leslie's ideas yet.")

To set standards — by offering standards for the group to attempt to achieve or meet. ("We ought to be able to reach a decision tonight without having another meeting, since we have all the facts.")

To support — by making compromises in order to move along with the group, by admitting your error, or by disciplining yourself to help maintain harmony within the group. ("Well, I can see that my original idea won't work. Let's drop it and move ahead.")

To follow — by going along with the group, accepting the ideas of others, and serving as a sort of audience in the group discussions. ("I can go along with that, if that's what the group wants.")

INDIVIDUAL ROLES (self-oriented behavior):

To be aggressive — by deflating fellow members, expressing envy or disapproval of what they say, or attacking the whole group or the task at hand. ("Shut up, Horace. You're just plain stupid!")

To be dominating — by trying to assert authority or superiority, by trying to manipulate the group or individual members through flattery, commands, interruptions, or threats. ("Either we do it my way or I quit. After all, I'm the group leader.")

To be dependent — by trying to line up with a certain strong individual or combination of individuals (clique). ("I agree with Susan. She's the most experienced and she's always right.")

To block — by resisting stubbornly, disagreeing unreasonably, or attempting to bring up an issue again after the group has passed on beyond it. ("I still say we should do it the other way.")

To goof off — by making a display of your lack of interest in what's going on through cynicism, horse-play, etc. ("Let's continue the meeting in the bar.")

Figure 2. Main Roles Performed by Individual Team Members

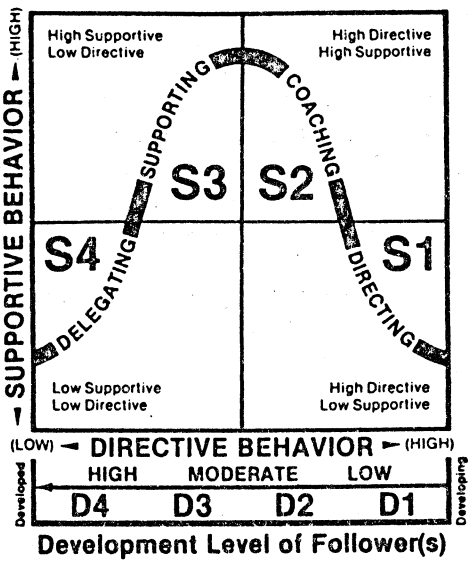


Figure 3.
Hersey-Blanchard Situational Leadership Diagram

Replicability and Recommendations

This is the most difficult and hence challenging aspect of the case for participants. Zonpalt has to assess the extent to which the FSR Unit can be replicated by the CRTs. It is first necessary therefore to look at the existing *goals and functions* of the two groups. They are very different. Thus, should those of the CRTs be changed so that they are more in line with the FSR Unit? This is clearly a complex issue and there is insufficient information in the case to answer it properly. However, the important point to emphasize is the degree of *task interdependency* for each of the main functional activities in the research process (i.e., planning, implementation/experimentation, testing, evaluation, etc.) that Zonplat thinks should be aimed for in the future.

Once these goals and functions have been ascertained, Zonpalt has to consider what type of team is most appropriate. In many respects, the design variables mirror the performance factors enumerated earlier, e.g., size, individual involvement, decision-making mechanisms, type and frequency of interaction, style of leadership, etc. Certainly there are important general lessons to be learned from the FSR Unit, but the point to stress is that one has to be extremely cautious in applying these in an uncritical way to another team situation.

The options presented in the case should be discussed. Participants should be encouraged to develop further those they think could be potentially valuable, in addition to thinking of new ones.

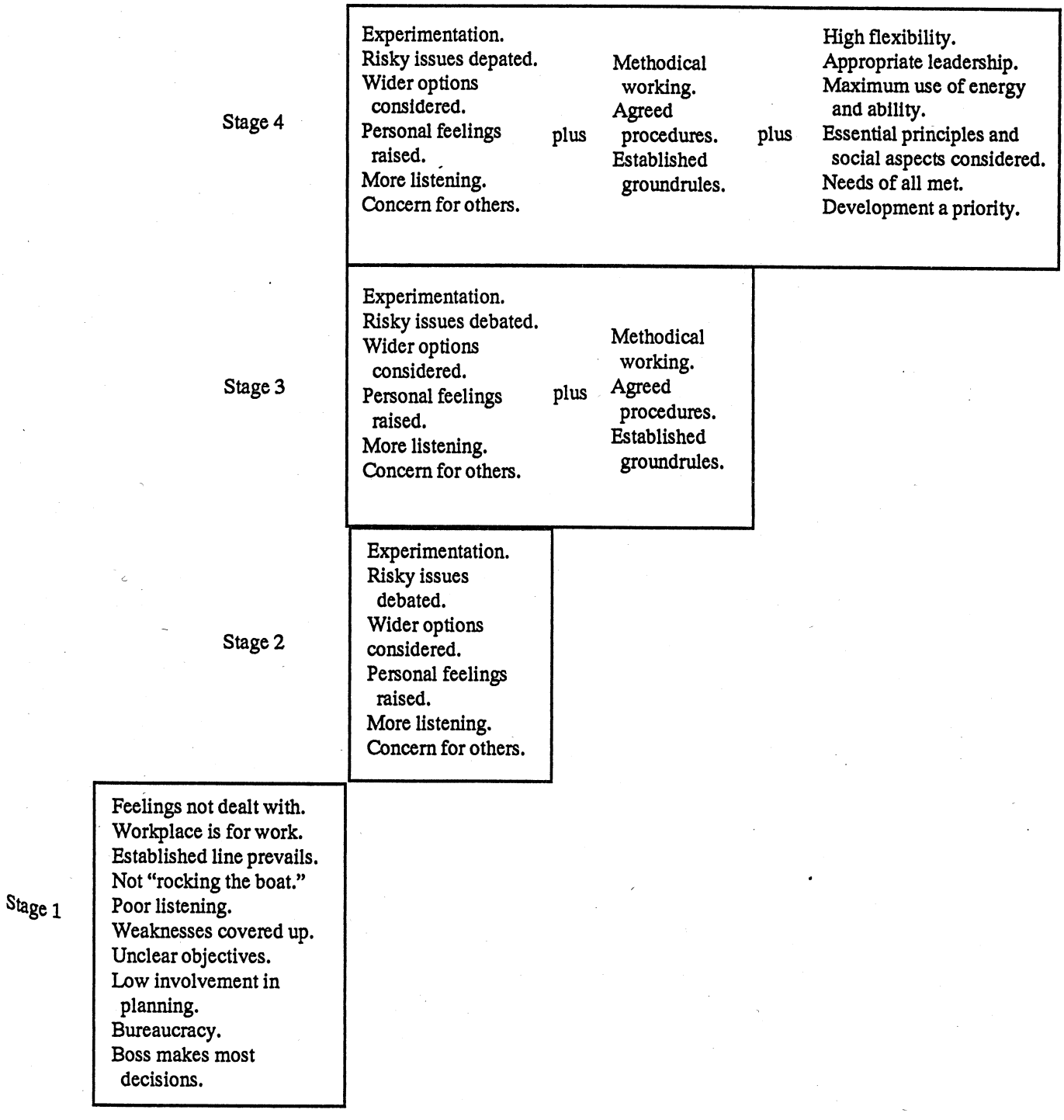


Figure 4. Stage of Team Development

CASE STUDY

MANAGEMENT OF RESEARCH TEAMS IN NATIONAL AGRICULTURAL RESEARCH SYSTEMS: THE ZAMBIAN EXPERIENCE

L. P. Singogo

Introduction

The national agricultural research system in Zambia consists of several institutions, falling mainly under different parastatal organizations and government ministries, as indicated in figure 1. Among these are the Ministry of Higher Education, Science, and Technlogy (under which are the University of Zambia's National Council for Scientific Research [NCSR] and School of Agricultural Sciences), the Ministry of Lands, Water, and Natural Resources (under which the forestry and fisheries departments fall), and the Ministry of Agriculture and Cooperatives (under which we have the research branch of the Department of Agriculture).

The specific research institutions under these ministries include the research branch of the Department of Agriculture, whose prinicipal research activities are crop improvement, soil productivity, seed services, and food conservation and storage. The research division of the Department of Veterinary and Tsetse Control Services is mainly responsible for research on animal diseases and vaccine production. The division in the Department of Fisheries undertakes research in limnology and improvement of fishing craft. The School of Agricultural Sciences at the University of Zambia conducts research in crop improvement and animal nutrition. Socioeconomic studies on farmers and the rural population are conducted by the Rural Development Studies Bureau of the University of Zambia.

The organizational and structural relationships of the Zambian NARS have been described elsewhere (Singogo and Russell 1984). The scope of this paper does not provide an opportunity for detailed analysis of how each of these institutions is managed. It therefore focuses its discussion on one institution: the reseach branch of the Department of Agriculture. This selection has been made based on criteria in Zambia. The branch has undergone significant structural and organizational changes in recent years, and some of its research teams have been intensively studied and analysed, which will provide reference points for discussion.

The management of research teams or indeed any other organization involves five main universally accepted functions. These are planning, organizing, directing, coordinating, and controlling, all of which are aimed at attaining organizational goals and objectives. This paper generally focuses on how these functions have been carried out in the research branch with reference to human resource management. Specific reference will be made to human resource planning, the organizational structure of the research branch, team coordination and leadership, performance appraisal and reward systems, socialization of individuals into the whole research branch and into individual teams, and training and development.

The Organizational Structure of the Research Branch

The research branch is headed by the assistant director of agricultural research, who is supported by the chief agricultural research officer. Figure 2 indicates that under the chief agricultural research officer, there are 17 commodity and specialist research teams. There are also supposed to be nine adaptive research and planning teams and three general services units. The interdisciplinary commodity and specialist research teams are based at either the central or regional research stations, where they conduct mainly on-station research in the various agroecological zones. The adaptive research and planning teams are based at the research stations in each of the nine provinces and conduct farming systems research. The emphasis is largely on adaptive research, including on-farm trials under farmers' conditions and with farmer participation.

Several research support services are based at the central research station, including the crop advisory service, the li-

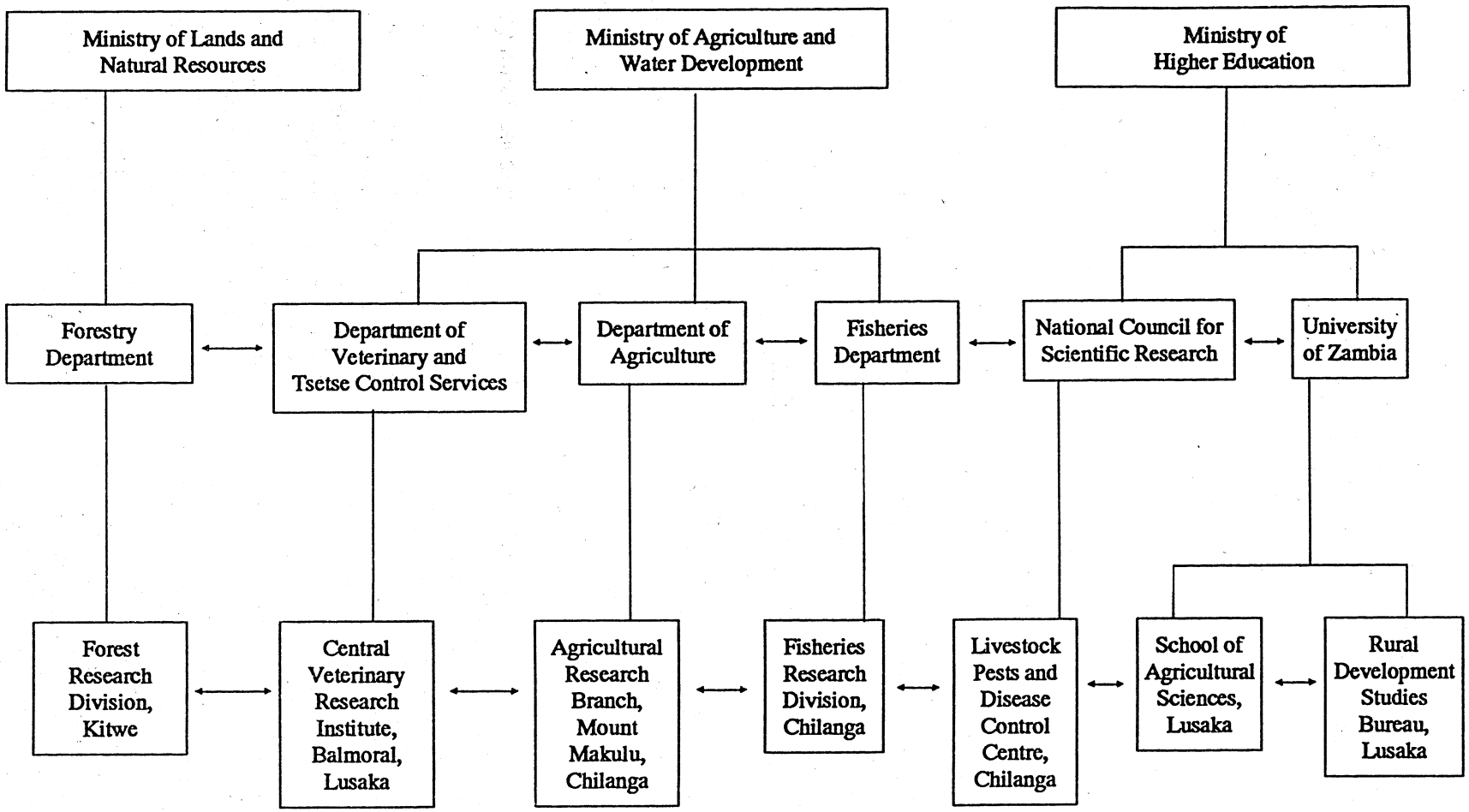


Figure 1. Organizational Structure of Agricultural Research Institutions in Zambia

SOURCE: Singogo and Russell (1984).

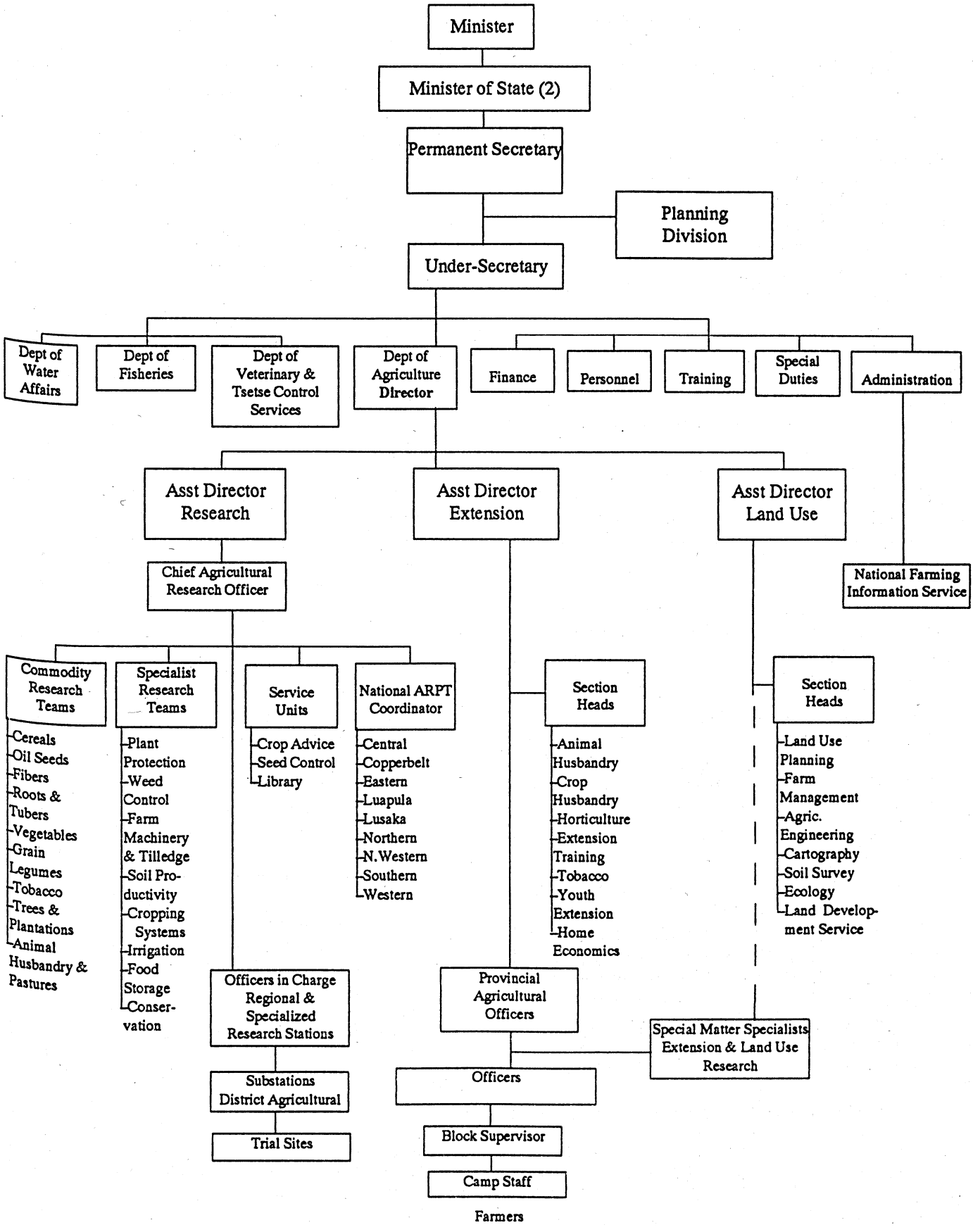


Figure 2. Present Structure of the Department of Agriculture, Ministry of Agriculture and Water Development

brary, soils analysis laboratory, and biometric and seed control and certification. The research station network is made up of a central research station and several regional research stations of varying sizes. The system is quite centralized in handling the placement and posting of human, financial, and physical resources; hence, decision making is also highly centralized. In 1986 for instance, 11 out of 23 research teams had their headquarters at the central research station, and 44% of the research scientists as well as 33% of the technical staff were based there.

Strategic Human Resource Planning in the Research Branch

Historical Background

The fundamental, long-term, human resource requirements of the research branch, disciplines, and teams have not been adequately addressed. These strategic considerations have often been sacrificed for short-term demands and requirements. In order to be able to come up with a long-term strategy for the human resource requirements in research, a strategic long-term workplan must be drawn up, based the key issues that must be addressed during the process of implementing the plan.

Between the mid 1970s and the present, the research branch has undergone several organizational and policy changes. During the early 1970s, research workplans and activities were influenced by whichever scientists were available in the institution. This meant that research work would concentrate on identifying the most prevalent species of trees and grass in the country, if the research officer available at that time was an ecologist or a botanist. There was only a handful of professional staff at that time, and they were mainly expatriates. Interactions across disciplines were minimal. Since research programs were closely tied to individual reserchers, their departure at the end of each contract and the arrival of new staff quite often meant changes in the workplans and research activities.

By the mid 1970s, the research branch was organized on by disciplines, such as agronomy, plant pathology, plant breeding, and soil science. As the number of scientists increased, the need to coordinate their activities, both within and across disciplines, also increased. This was accomplished by filling the posts of principal research officers with individuals who could coordinate the disciplinary programs. One of them was also responsible, as a program officer, for coordinating all the research programs across disciplines. In the late 1970s, the research branch was reorganized into interdisciplinary commodity and specialist research teams. Each of these teams was placed under one team leader, who was responsible for formulating, implementing, reporting, and evaluating all of the team's research programs and activities. By the beginning of 1980, the adaptive research planning teams had been instituted into the research branch alongside the commodity and specialist research teams.

The commodity and specialist research teams' terms of reference are broad and make up the national mandate for all agroecological zones in Zambia on the improvement of one or more specific crops. The efforts of the adaptive research planning teams are area-specific in geographical coverage but very broad in their mandate for covering crop or research issues. The commodity and specialist research teams are listed in figure 2. At the moment, there is an adaptive research planning team in each of the nine provinces of Zambia except the Southern and Copperbelt Provinces.

National Policy Guidance on Agricultural Research

The priorities of any agricultural research workplan that sets human resource requirements should be guided by the national priorities in agricultural development. These are periodically spelled out in the national development plans as being among the main development objectives of the agricultural sector for that period. However, these objectives are so broadly stated that any research program or activity could be interpreted as pursuing national objectives. The following paragraph illustrates this.

One of the important economic objectives in the third national development plan (1979-1983) was to "diversify the economic structure in order to reduce the country's dependence on copper and to undertake crash economic programs for promoting agriculture and industry . . . to give the highest priority to rural development in order to create a strong rural economy" (GRZ 1979). The broad objectives of agricultural development in the same document were stated as follows:

- achieve self-sufficiency in staple foods and, where feasible, to provide raw materials for agro-industries;
- stimulate and increase production for export;
- increase the contribution of the rural sector to the gross national product and to promote diversification of the rural economy;
- improve the standard of living and nutritional status of the rural population;
- create new employment and income opportunities in the rural areas to counteract rural-urban migration.

The fourth national development plan has similar objectives for the agricultural sector, except it expands on efforts to achieve import substitution.

One aspect of Zambia's national development plans that makes them less useful in formulating long-term strategic human resource plans, is that they are only of short- or me-

dium-term duration, ranging from two to five years. Because of Zambia's recent economic problems, it has been difficult to implement and sustain even these short-range plans. And even at the national level, immediate requirements and demands on national resources receive a better response than do the long-term programs.

Observations on the objectives and goals of agricultural development have been made, but similar statements on what changes ought to be instituted in terms of human resource numbers in appropriate departments or branches have been inadequate. There are presently only 68 professional positions in the staff register of the research branch. This number was planned during the 1965-1966 period and no date for revision was specified. Nevertheless, because of the favorable response from donors to short-term project requests for Zambian counterparts on the research staff, the current number of professional staff stands at more than 157 (72 expatriates and over 85 Zambians).

Recruitment and Selection

Determinants of Human Resource Acquisition

As already stated elsewhere, there is an apparent absence of any meaningful, long-term workplan for agricultural research .either at the national or branch level. What exists are short-term workplans in the form of research projects, mainly funded by donors. The research branch has responded to the requirements of these research projects by recruiting Zambian researchers, mainly as counterparts to experienced expatriate personnel. An analysis of the number of scientists compared to the number of research teams revealed that teams receiving the heaviest donor support had the largest number of research scientists (Kean and Singogo 1988).

Among the largest of these teams are the adaptive research planning teams, the soils research team, and the maize and wheat team. Details on numbers in other teams are found in table 1. In terms of the allocation of human, physical, and financial resources, one would conclude that the priority list of workplans and programs for the research branch is as outlined in table 1. However, it is doubtful that these priorities fully address national policy objectives on agricultural development. Even if they do address national objectives, it would still be interesting to see whether the apportioning of resources among these teams and commodities has been rational.

Source and Recruitment Process

The main sources of local research scientists are the University of Zambia for professional staff (BSc and above), the Natural Resources Development College for higher-level technical staff, and Zambia College of Agriculture (at Monze and Mpika) for lower-level technical staff. Expatriate staff are recruited from all over the world but mainly from the West. Sources of expatriate staff are mainly determined by donor financing.

Local scientists are normally recruited centrally, at department level. This recruitment is done after requests for additional staff have been received from team leaders through the chief agricultural research officer. In this respect, team leaders usually do not have the opportunity to interact with or interview prospective candidates for positions on their teams. Since the inception of the adaptice research planning teams, however, the team leader has been able to interact and interview a number of candidates before the final selection is made. The names of selected candidates are then submitted to the director of agriculture for recruitment.

Recruitment of expatriate scientists is mainly the responsibility of donors. Each of the donors has their own procedures. However, the common feature among them is that candidates must receive approval from the Zambian government before their contract can be signed. The actual process of interviewing and selection of expatriate candidates by the Zambian authorities varies widely among donors. In general, there is little participation by team leaders, the chief agricultural research officer, or the assistant director of research in recruiting and selecting expatriate staff.

A number of issues and problems arise from the modes of recruitment and selection discussed above. First, team leaders and coordinators have little control over the quality, and sometimes the *quantity* of scientists they have in their teams. Second, because of limited interaction and dissemination of information to prospective candidates, scientists join the teams and the research branch with inadequate knowledge about the organization, what it can offer, and whether their expectations and individual needs will be met. Third, since there are no structured interviews (except for individuals recruited into the adaptive research planning teams), there is no real screening process to make sure that properly qualified candidates are assigned to the most appropriate team. It is very likely that team coordinators may be assigned staff who are not appropriately specialized or who do not have the background needed for the research activities being undertaken in those teams. This may have adverse implications for the future career prospects of these individuals.

Some possibilities for improvement exist. Team coordinators already have terms of reference for the positions that they would like to fill. Based on these, they should be given ample opportunity to participate in the recruitment and selection of both local and expatriate staff. This should be done in close communication with the directorate, especially the personnel director, who should campaign for and advertise the organization's activities to prospective candidates. This can go a long way toward enlightening candidates about the nature of the organization they may be interested in working for.

Table 1. Disciplines of Scientists on All Research Teams

Discipline	1977	%	1982	%	1986	%
Research Branch						
Agronomy	24	35	24	26	53	34
Plant Breeding	9	13	17	19	27	17
Economics	–	–	4	4	15	9
Pathology	4	6	10	11	10	6
Rural Sociology	–	–	–	–	3	2
Animal Husbandry	4	6	4	4	3	2
Statistics	–	–	1	1	1	1
Virology	–	–	1	1	1	1
Horticulture	2	3	6	7	5	3
Library	1	1	1	1	1	1
Soil Science	4	6	5	6	8	5
Microbiology	2	4	1	1	3	2
Agricultural Chemistry	3	4	3	3	4	3
Entomology	6	9	6	7	9	6
Engineering	3	4	5	5	6	4
Food Technology	1	1	–	–	–	–
Nematology	1	1	1	1	1	1
Seed Technology	4	6	3	3	5	3
Agroforestry	–	–	–	–	–	–
Ecology	1	1	–	–	–	–
Total	69	100	92	100	157	100
ARPT						
Agronomy	–	–	4	17*	15	28*
Economics	–	–	4	100*	14	93*
Rural Sociology	–	–	–	–	3	100*
Total	–	–	8	9*	32	20*

SOURCE: ISNAR (1987).
*Many officers-in-charge are also members of research teams.

Team Leadership and Coordination

The Set-Up

Most major teams have team leaders, and almost 50% have their headquarters at the central research station. The rest operate from a network of regional research stations. It should also be noted that some of the teams discussed here can really not be called *teams* at all, since they have hardly any team members. Some of these are weed control, cropping systems, germ plasm collection, and farm machinery and tillage, to mention but a few.

In the set-up of the adaptive research planning teams, in addition to the national coordinator, there are provincial coordinators who are responsible for the supervision of two to eight research scientists within the provincial teams. This has meant a fairly hierarchical arrangement that ensures an adequate degree of control at the provincial and lower levels. This organizational arrangement is not clearly delineated in the leadership of other teams.

The terms of reference and responsibilities of team coordinators are in a state of flux. Individual team leaders have taken the responsibility and initiative to decide for themselves the best way of coordinating the teams. In the absence of clearly defined roles and expectations as to output, the task of monitoring and appraising performance both within the team and from outside by senior staff is difficult.

Communication Channels and Coordination

Communication channels within the teams are well established and function adequately. In the adaptive research planning teams, the national coordinator communicates all the relevant national issues to the adaptive research provincial coordinators, who in turn, pass this information on to their provincial staff. Several coordinating mechanisms have been developed within and among the adaptive research teams. These include budgeting and work program meetings within the provincial teams and work reviews and steering committee meetings in which outsiders representing the commodity and specialist research teams, extension, and agroindustries participate.

Some mechanisms have been developed to coordinate and control the activities of all the adaptive research planning teams in the country. First, each adaptive research planning team is required to visit at least one other team every season, especially during the period when most crops are in the vegetative stage of growth. This enables both teams to share ideas on research methodologies and review each other's work. Second, all teams used to meet every quarter at the central research station to report and discuss each team's achievements, programs, and problems for the previous and the coming quarters. These meetings have now been reduced to twice yearly. This provides an opportunity for team members to share experiences and evaluate their own programs in relation to the achievements made by others and by the corrective measures they have undertaken. Third, individual disciplines such as agronomy, economy, and rural sociology convene meetings and workshops once or twice a year to discuss and share ideas on specific issues. All meetings convened at the national level are coordinated by the national coordinator; those at the provincial level are the responsibility of the provincial coordinator.

The flow of information from provincial teams is routed to users either directly or through the national coordinator. The main users of the information generated by the adaptive research planning teams are extension, the commodity and specialist research teams, and the agriculture policy planners at both the provincial and national level.

The commodity and specialist research teams are relatively smaller than the adaptive research planning teams, and the scientists in the commodity and specialist research teams are concentrated either at one regional research station or at the central station.

Their research on advanced breeding materials and agronomic work is undertaken in selected locations within the regional research station network. At the stations, this work is normally undertaken by general agronomists or technical staff assigned to assist various teams. In this context, their coordination activities are mainly confined to team members based at the same research station.

One of the most important aspects of research team management is the coordination of all the teams in the research branch. This is the responsibility of the chief agricultural research officer. The first step toward this end involves strengthening team leadership and coordination among the teams themselves.

Several management mechanisms have been developed to facilitate interteam coordination. At the research branch level, the chief agricultural research officer has formed a research management committee comprising all major team coordinators. This committee is responsible for major decisions on issues related to the activities of the research branch. This facilitates closer cooperation and communication among different team leaders. At the provincial level, all research scientists have been directed to collectively develop a schedule of priorities for agricultural research and development in their area. This has meant that for the first time, scientists have been able to discuss priority areas for research in a broad, long-term basis with minimum emphasis on their own discipline or team specialities. Third, there is a deliberate move to work on regional research and development plans rather than focusing on plans for specific commodities or research teams. It is hoped that such moves will further strengthen coordination among different teams.

Constraints and Lessons Learned

During the last few years of team building, the research branch has had some drawbacks but now has useful lessons to draw on in the future. Coordinating teams that vary widely in funding levels require greater efforts to achieve the desired goals. Teams with less financial support are less enthusiastic in responding to and developing new ideas.

Where leadership within a team is weak and, hence, coordination inadequate, communication channels between that team and the rest of the research branch is disrupted. Given the nature and size of Zambia (750,000 square kilometers), it is appropriate to place some teams in areas where their commodities are produced. However, long distances, coupled with a poor telecommunications network, limit the effectiveness of control and coordination from a central level.

The differences in teams performance and outputs have been influenced less by the quality of leadership. More important factors have been access to financial resources, clear definition of the problems and possible solutions, and above all, adherence to the terms of reference for that particular team or individual.

Socialization, Training, and Development

Within the research branch, there is no set procedure for providing information in terms of lectures or handouts to newly recruited staff on how the organization operates. Bearing in mind the complexity of government procedures, it usually takes quite some time before individuals get to know where to go for assistance for any particular problem. This is true also for expatriate staff. However, some donors conduct their own independent orientation courses for expatriate staff who come under their research programs.

When individuals return to the research branch from long-term training, they are assumed to be knowledgeable about the organization; therefore, little attempt is made by either the team leaders or personnel administrators to acquaint them with latest changes. Observations indicate, however, that reorientation of returning staff is beneficial.

Inclusion of Social Scientists into Research Branch

During the reorganization of the research branch at the time the adaptive research planning teams were instituted, the inclusion of social scientists such as economists and rural sociologists raised a lot of debate. This was mainly on the issue of what contribution social scientists would make to the research branch, which had traditionally been oriented toward technical research.

The strategy of opting for separate, provincially based adaptive research teams (as opposed to including social scientists in the already existing commodity teams) assisted in their assimilation into the research branch. Now, the services of social scientists are in demand even outside the adaptive research teams. This is mainly because of positive outputs from the social scientists. Their terms of reference are now being expanded to include them on the commodity teams, in extension, and in policy analysis.

The greatest problem the social scientists have had was the delay in their appointment into the permanent establishment of the research branch. This has now been resolved. However, what still seems to be unclear is their career path and future prospects. Just as with other experienced scientists, the problem of retaining them is even more acute. The demand for their services outside the research branch is increasing, and it is therefore more likely that the research branch might lose their services.

Training and Development

The research branch has no definite long-term training program for its staff. This is understandable when the financial limitations are taken into consideration. However, individual research projects that are adequately funded by donors do have short- and long-term training programs. These training programs are aimed at developing the Zambian staff who will eventually run the projects when expatriate staff are withdrawn. One drawback in this scheme is that the expatriates have no real interest in training young Zambian researchers, nor do they have the expertise required to do so. Due to the nature of their short-term engagements in research projects, most of their energies are concentrated on producing research results rather than on training Zambian scientists.

Despite these drawbacks, some teams have very elaborate and systematic training plans and programs. In the adaptive research program, for instance, every team member undergoes a series of in-region short courses, ranging from two to three weeks in length, within a year or two after joining the team. These courses cover subjects specifically related to the methodologies of farming systems research. All adaptive research team members who have the potential for postgraduate training are put on a training plan toward a master's degree after spending two years in the field. The assurance of training opportunities serves as a very powerful incentive to the Zambian staff.

References

Birgegard, L. 1988. The Zambian Agricultural Research System–Issues and Problems. Issues paper no. 5. IRDC, Swedish University of Agricultural Sciences.

GRZ. 1979. Third National Development Plan, 1979-1983. National Commission for Development Planning, Government of the Republic of Zambia (GRZ), Lusaka.

ISNAR. 1987. International Workshop on Agricultural Research Management. International Service for National Agricultural Research (ISNAR), The Hague, Netherlands

Kean, S.A. and L.P. Singogo. 1988. Zambia: Organization and Management of the Adaptive Research Planning Team (ARPT), Research Branch, Ministry of Agriculture and Water Development. OFCOR Case Study No.1. International Service for National Agricultural Research (ISNAR), The Hague, Netherlands.

Singogo, L.P. and M.B. Russell. 1984. Agricultural Research Resource Assessment in the SADCC Countries – Volume II. Country Report: Zambia. SADCC (The ARRA study), Gaborone, Botswana.

THE PRACTICE OF DELEGATION

A. Zinyemba

Effective Delegation

Introduction

Rationale. The most successful managers are able to accomplish all the work they are responsible for, as well as some additional responsibilities. One of the ways they do this is to get work done through other people. Successful managers delegate effectively. They do not view delegation as dumping or abdication of authority, but rather as a process of job enrichment. They delegate tasks that can be done more effectively by others, then use their time to focus on the high-priority items that are most critical to their own performance. The ability to delegate effectively is one of the keys to successful management.

Objectives. After completing this unit, participants will be able to do the following:

- explain essential ingredients in effective delegation;
- identify what assignments can and cannot be delegated;
- describe and apply the three steps to be taken when delegating assignments to subordinates;
- identify assignments in their own job situations that can be delegated, and develop a strategy for delegating them to subordinates.

Materials for the Participant

The materials listed below are included in this unit. Supplementary materials may be distributed by the trainer.

- Core material on effective delegation;
- Activity 1 — Signs of nondelegation;
- Activity 2 — Arguments for and against delegation;
- Activity 3 — Self-audit: Are you a good delegator?

Key Points

- A positive attitude about people and their reaction to work is necessary for effective delegation.
- Delegation contributes to the growth and development of subordinates, utilizes their skills and abilities, and frees the manager to manage.
- Effective delegation consists of three steps: (1) assigning responsibility, (2) granting authority, and (3) creating accountability for results.
- The manager who does not delegate accumulates more and more tasks, becomes heavily involved in day-to-day detail, and therefore neglects many of the more important concerns.

It was late Friday afternoon and Tony Carbo, chief of the ministry's planning division, had just finished packing his briefcase in preparation for going home. As he was about to leave the office, Sally Schwenn, head of the agricultural extension office, popped her head in the door to wish Tony a pleasant weekend. Somewhat sarcastically Tony replied, "With all the work I have to do, I will be lucky if I get a chance to sleep." As the conversation continued, Tony complained that there just did not seem to be enough hours in the day. He talked about the constant pressure of the job, how hard it was to find good people, and how no one seemed to want to assume any responsibility. When Sally suggested that maybe some of Tony's problems reflected a lack of adequate delegation, Tony countered with comments like "Subordinates lack experience." "It takes more time to explain than to do the job myself." And, "Experimentation and mistakes can be too costly. Most of my people are specialists and do not have the overall knowledge needed to make the decisions." He repeated the thought that most people are not willing to accept responsibility anyway.

Delegation is one of the manager's most useful tools.

Effective delegation begins with a positive attitude about people and their reaction to work.

Managers with a negative attitude about people and their reaction to work are not likely to practice effective delegation. Rather, they will tend to try to do the following:

- control people and work very closely with them;
- be overly involved in day-to-day details;
- make decisions without seeking participation;
- rely on authority, power, pressure, and discipline to get results.

On the other hand, managers whose general attitude about people and their reaction to work is positive will tend to do the following:

- create a climate where subordinates are fully involved in their jobs;
- concentrate on overall goals and objectives;
- gain commitment by involving subordinates in decision making;
- help subordinates achieve results by communicating effectively with them.

A positive attitude about people and their reaction to work is necessary for effective delegation. Managers who are positive in their attitude are able to use delegation as a way of motivating people to their maximum potential. The act of delegating, then, is both a vote of confidence and a growth opportunity for the subordinate.

DELEGATION

Contributes to growth and development of subordinates

Utilizes skills and abilities of subordinates

Frees the manager to manage

The Role of Delegation

Contributing to Growth and Development

Two statements frequently quoted are "people learn by doing" and "experience is the best teacher." Delegation is a key factor in turning these statements into operating principles rather than just cliches. With effective delegation, subordinates have an opportunity to perform and, within broad limits, have freedom to work. As they learn by experience, they should be entrusted with greater responsibility, which may take the form of added or more difficult tasks, increased authority and accountability, or independent decision making. Managers must share responsibility with their subordinates if subordinates are to grow and develop their abilities.

Utilizing Skills and Abilities

Delegation ensures the maximum use of subordinates' skills and abilities. Through delegation, managers can also discover the true capabilities of subordinates. Without delegation, their assessment of subordinates' future potential is based on subjective judgments. Thus, not only does delegation provide the means for managers to make maximum use of their subordinates' skills and abilities, but it is also the only way to determine the extent of those skills and abilities in the first place.

Freeing the Manager to Manage

As soon as people move into a position where they supervise the work of others, their job changes. Their main responsibility is to "get things done through others." In short, they are no longer doers, but instead, they are managers, who must do whatever they can to help their subordinates accomplish maximum results within the limits of their skills and abilities. This means that managers must define jobs in terms of the results to be achieved, work with subordinates in determining the best way to achieve these results, help subordinates identify and overcome problems that hinder this achievement, counsel, coach, give assistance as needed, and give subordinates the opportunity to perform on the job. To the extent that managers do not do these things, they are not delegating, not getting things done through others, and consequently, not managing. There is a limit to what managers can accomplish on their own, and without delegation, the whole operation is confined to this limit. Thus, delegation is one of the main tools managers can use to ensure that they spend their time managing rather than doing.

What Can or Cannot Be Delegated?

Assignments which a manager can delegate include the following:

- Bona fide problems or issues that require exploration, study, analysis, and recommendations for solution;
- Activities beyond day-to-day operations but still within the scope of the subordinate's job and abilities;

- Projects that guide human talent in a positive direction — toward the organization's goals and also toward the employee's continuing development and growth;

- Problems which, if handled well by the subordinate, would conserve the manager's time.

There is no exact prescription for what cannot be delegated. However, managers generally agree on certain tasks that cannot or should not be delegated. These include the following:

- Planning — setting plans within larger goals or objectives;

- Morale problems that are of considerable importance to the work unit;

- Reconciling line and staff conflicts or differences;

- Coaching and training subordinates and reviewing their performance;

- Assignments that have been given specifically to the manager by his/her superior;

- Any part of a committee or task force assignment (especially if the information is confidential) to which the manager given his/her personal commitment;

- Certain pet projects, ideas, or activities of the manager him/herself, when these do not distract seriously from larger responsibilities;

- Matters on which there just is not enough qualified talent available for delegation — or which involve too much of a risk.

How to delegate

Historically, delegation has proved to be an elusive concept. It has been talked about a great deal but practiced considerably less. One of the problems is that the concept of delegation has been oversimplified. Considerable time and effort have been devoted to developing neat definitions, but in the process, the true meaning of delegation has been lost. Delegation is a total philosophy of how to manage people. Once the elements of this philosophy are fully understood and the manager is personally committed to developing a professional approach to managing, then and only then will delegation be effective.

Whenever mangers delegate, they performs three steps: (1) they assign responsibility, (2) they grant authority, and (3) they create accountability for results.

Step 1. Assigning Responsibility

The assignment of responsibility is the step that has received the greatest emphasis over the years. Most managers can give a clear description of the duties or tasks that their subordinates must perform. Similarly, most employees can give an adequate description of their job in a physical or "doing work" sense. In assigning responsibility, however, managers must go beyond the typical job description. This is only half of what assigning responsibility means. The other half — the important half — is to do the following:

Specify what results are expected after an employee has performed the work.

It is this latter half that managers often neglect.

Essentially, it is a question of what people are paid to do. Is it to work a given number of hours and during that time to perform certain tasks? Or, is it to achieve specified results as a culmination of having performed these tasks? The latter is much more logical. Accordingly, managers of a grain storage cooperative are more than day-to-day administrators of the storage operation. Their responsibilities should include keeping losses to a specified minimum, establishing the most economical work flow and equipment utilization, scheduling grain deliveries and pickups to maintain maximum usage of storage space, and the like. In terms of results to be achieved, the assigned responsibilities might include analyzing the quality and capacity of the storage facilities, determining the causes of problems, developing actions to resolve problems, and presenting recommendations for improvements to the board of directors of the cooperative.

The "assignment-of-responsibility" step of delegation is not quite as simple as it might appear and goes beyond what is done by many managers. Managers and their subordinates, must have a clear understanding and agreement about the following items:

1. The activities or tasks the subordinate is responsible for performing;

2. The areas of the job where they are responsible or accountable for achieving results;

3. The specific results they are accountable for achieving in each area;

4. How performance in each area of accountability will be measured.

Step 2. Granting Authority

The second step in delegating has also been limited in its interpretation. This step involves more than simply telling subordinates to go ahead and do whatever they think should be done or telling them to "make whatever decisions must be made." A manager cannot grant authority without at the same time incurring managerial and leadership responsibilities.

The process of granting authority can be divided into two phases: a preliminary phase and a continuing support phase. During the preliminary phase, the manager and subordinate should reach an agreement about the results expected. The manager should then do the following:

1. Ask the subordinate to present ideas and plans for achieving the desired results.

2. By raising questions, suggest possible alternatives and help the subordinate to explore all aspects of the situation.

3. Prompt the subordinate to think about and identify potential problems and how to overcome them if they appear.

4. Agree on the course of action to be followed.

The continuing support phase of granting authority can be summed up as follows:

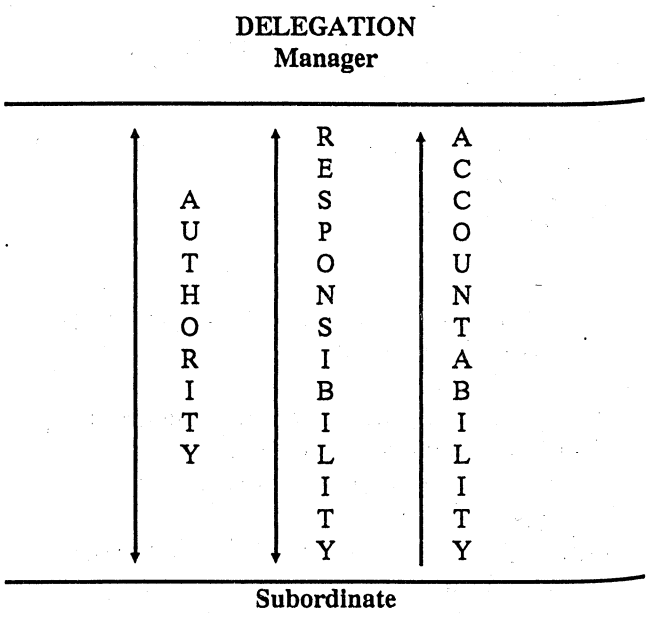
> Managers have responsibility downward to their subordinates. They make sure their subordinates know and understand what is demanded of them. Then they help their subordinates reach these objectives. Managers are responsible for getting the tools, the staff, and the information they need. They help their subordinates with advice and counsel. And, if necessary, they teach them to do better.

Thus, the granting of authority is not a "you-are-on-your-own" situation. Neither is it a one-way situation where the manager explains what is to be done, when it is to be done, how it is to be done, who is to do it, and single-handedly makes all the decisions in between. Instead, it is a blending of two factors: a subordinate's skills, abilities, knowledge, and potential to contribute, and a manager's guidance, counsel, and help.

Step 3. Creating Accountability

Accountability is the end product of delegation. Accountability is not something that subordinates can accept or reject as they choose. When all the ingredients of effective delegation are present, then the recipients of the delegated responsibility and authority must be held accountable for the results (good or bad) of their activities.

In theory, the subordinate's acceptance of accountability should be a semiautomatic process that logically flows from and is part of the total delegation process. In practice, however, this acceptance is not always present. In fact, a subordinate may resist being held accountable for results. When this happens, there are two possible explanations. First, the manager can simply assume that a subordinate has a negative attitude. In that case, the response is to replace the individual, threaten punishment, withhold rewards, or exert pressure through close control and exercise of authority. Second, the manager can consider the possibility that something is missing completely or only partially present in the work climate. This is a much more constructive approach.



What Delegation Is Not

In order to remove some common misconceptions about delegation, it may be helpful to briefly examine what delegation is not and why attempts at delegation may fail.

Dumping

First of all, delegation is *not* "dumping." It is not giving someone a job to do and just telling them to do it. When this approach is taken, the results a manager expects are seldom achieved. Receivers of this type of delegation must justify why what was expected did not happen, when in fact they were not given any indication of what was expected. In a climate such as this, subordinates will avoid any attempt by the manager to delegate responsibility. As pointed out earlier, delegation must also include a statement of the results expected, and then, during the performance period, a manager must provide support, coaching, and help, if needed.

Also to be effective, the responsibilities delegated must be meaningful to subordinates. They must know why the results are important and what their contributions mean to the overall effort. Above all, they must receive feedback upon successful completion of the tasks.

Abdication of authority

Second, delegation is *not* abdication of authority. When managers delegate, they set certain parameters within which subordinates are expected to operate. These parameters may limit the type and magnitude of decisions subordinates can make without first clearing them with the manager. The parameters may also permit subordinates to operate only within the limits of certain policies and procedures. It is important to point out, however, that if every decision must be cleared, there is no delegation. Similarly, if subordinates must defend every decision or action, they will soon be unwilling to do anything without first checking and getting approval.

Policies and procedures should facilitate the accomplishment of results, not hinder them. Nothing will destroy delegation and the willingness to accept it more quickly than being crippled by unnecessary rules and regulations. Managers can greatly increase the effectiveness of their delegation by making sure that the climate in which subordinates operate is one which helps them to achieve. Although limits on delegation can be important, the limits must not be carried to extremes.

Loss of control

Third, delegation does *not* mean that the manager loses control. When delegation occurs, various checks should be established. When and where these checkpoints occur is based on the manager's knowledge and experience of the situation. In any operation or project, there are usually certain critical stages. If results are on target at each of these stages, we can be reasonably be sure that the final results will meet the goal. By indentifying these critical points and reviewing progress at each one, the manager can maintain control.

Avoiding decisions

Finally, delegation is *not* avoiding decisions. Managers who delegate still make decisions. The important point is that they can concentrate their efforts on the most important decisions and allow their subordinates to make those decisions that are best made at the point of direct contact. In doing this, managesr avoid day-to-day detail, take maximum advantage of skills, and give greater support. Some types of questions that require a manager's decision-making function include the following: What results are desired? What problems may arise in achieving these results? How can these results best be achieved? Which tasks should be delegated and to whom? When should progress be reviewed? When should results be achieved?

Why Managers Do Not Always Delegate

While the reasons frequently given for not delegating may appear to be valid, further analysis reveals some serious weaknesses in logic and some long-range negative repercussions.

The first reason a manager may give for not delegating is that "delegating takes more time than doing it myself." This may be true in the short run, but not in the long run. Managers who do not delegate accumulate more and more tasks and become heavily involved in day-to-day detail. Since their time and energy are limited, they will eventually reach a point where "something has to give." When this point is reached, some things will be delayed while others will go completely undone. As the pile grows larger, these managers are more likely to be faced with emergencies and to direct their efforts toward crisis situations. They will become fire fighters, and many of the more important concerns that should occupy their time and attention will be neglected. At the same time, their subordinates will begin to lose interest in their jobs.

Managers may also claim that they cannot delegate because their subordinates lack experience. However, the only way subordinates can get the necessary experience and grow and develop in their jobs is to learn by doing. Without delegation, the process of learning by doing cannot take place. This, of course, leads to an underutilization of skills and abilities. If subordinates are not given opportunities to perform, they may eventually decide to leave and seek employment elsewhere. Their only way to deal with this is to provide opportunities for responsible work assignments that "stretch" the individual and at the same time provide necessary training and guidance.

Another argument a manager may use against delegation is that "mistakes are too costly." Delegation does not mean that the manager loses control. Rather, two essential features of effective delegation are (1) managers interact with their subordinates in planning how desired results can best be achieved and (2) various checkpoints along the way are established to review progress. If these two steps are taken, costly and serious mistakes can be substantially, if not completely, eliminated. This does not mean that subordinates will always approach an assignment exactly the way their superior does. Indeed, they may find a better way. If managers interpret mistakes to mean that theirs is the only way, then they will have other more serious problems in the long run.

Another reason managers may give for not delegating is "subordinates are specialists without the necessary overall knowledge required to make many decisions." However, it

is the manager's job to coach and develop subordinates on a continuous basis. Managers must broaden their subordinates' perspectives, knowledge, insight, and overall understanding as they progress on the job. This can best be accomplished by a specific development program for each employee. In this way, managers can be assured that their people will gradually receive the background they need in order to accomplish delegated assignments.

Managers may be reluctant to delegate because they are afraid that a subordinate "will perform so well that they might replace the manager." For good managers, such fears are totally unfounded. Managers' performance is a reflection of their subordinates' performance. If the subordinates "look good," the manager "looks good"; if the subordinates "look bad," the manager "looks bad."

A final reason managers may not delegate is that they find it difficult to justify to themselves and others the time they spend planning. Many were taught to believe that being creative may look as if they are not busy and subject them to criticism from others.

Why Subordinates Do Not Always Accept Delegation

The reasons subordinates do not always accept delegation are primarily associated with fear. Most significant is the fear of failure, and this can be caused by lack of self-confidence. It does not really make much difference why subordinates lack self-confidence, the important point is that they do. When this is true, managers must delegate in such a way as to stimulate confidence and thus acceptance. Specifically, they must clearly indicate that they will be available to help if needed and the type of support that they will provide. In addition, they may want to spend more time working with subordinates in planning "how" to proceed as well as establishing more frequent formal review times for evaluating the progress of the delegation.

Fear of failure can also be a result of the way mistakes have been handled in the past. To establish a set of circumstances that would completely eliminate the possibility of all mistakes would also defeat delegation. Thus, some mistakes are bound to occur. The critical issue is how mistakes are handled when they occur. More specifically, does the manager use them constructively as a learning experience for subordinates or is the emphasis on the mistake itself? If the latter is true and occurs too often, subordinates will be conditioned to resist further delegation.

Resistance to delegation may also occur if subordinates are overloaded with work and if, in addition, there is confusion resulting from poor organization. When this condition exists, there is usually an overall hectic atmosphere that tends to discourage anything more than minimal development.

Subordinates may be reluctant to accept delegation if the task is not challenging, or if it is routine or uninteresting. It is also possible that the relationship between the manager and the subordinate may be one of suspicion rather than trust. The subordinate may not accept the authority of the manager.

Effective Delegation

In summary, the primary function of managers is to preside over the process of delegation. This requires all of their judgment and much of their time. Effective managers are constantly trying to provide, through delegation, the opportunities for growth that their subordinates demand. The strength of any organization increases when its employees at all levels are able to accept responsibility. The assignment of responsibility should never be static, but should change with the situation and with the increasing capacity of the employees. When good managers delegate responsibility to subordinates and train them to discharge their responsibilities well, the managers themselves are developing their skills as managers as well as increasing the satisfaction and ability of their subordinates.

Activity 1
Signs of Nondelegation

Inadequate delegation in an organization will reveal itself even if for a time the organization seems to be operating adequately. Various symptoms become apparent in an organization if delegation to subordinates is meager. These signs are evident when

"Putting out fires" or handling "crisis situations" becomes a pattern.

Things tend to slow down, even come to a standstill, when the manager is away.

Bottlenecks exists and nobody seems to get to the task of removing them.

Deadlines are often missed.

Inequitable workloads develop between two levels of management, with one level quite overworked and the other somewhat underworked.

A backlog of good ideas accumulates but is never pursued.

Management objectives and goals receive very little interest.

A very casual attitude develops toward making mistakes.

Key managers are unduly preoccupied with details — there is too much detail for its own sake rather then for use in confirmation.

Decision making is slow, with too much authority clustered at the upper levels.

Managerial time is used poorly.

There is limited interest in managerial succession or preparedness for promotions and transfers to positions of higher responsibility.

Line and staff misunderstandings remain unresolved.

Committees and task forces are used excessively to resolve problems.

Do you agree that the above are symptoms of nondelegation?

Do any of these symptoms exist in your organization?

Are they caused by inadequate delegation or are there other causes?

What specific actions would you propose to eliminate the symptoms?

Activity 2
Arguments for and against Delegation

Imagine a debate between two managers. Manager *A* takes a more traditional point of view and tends to be skeptical of the value of broad delegation of responsibility. Manager *B* feels that delegation is the most effective and subtle tool at a manager's disposal. Each manager has chosen an extreme position, Manager *A* against delegation and Manager *B* in favor of broad delegation. Manager *A*'s argument is summarized on the left in four points. By drawing a line, match each of Manager *A*'s points with Manager *B*'s corresponding rebuttal (as has already been done with Manager *A*'s first point). An opinion may be rebutted more than once, but all rebuttals must be used.

MANAGER *A*	MANAGER *B*
"Delegation takes more time than doing it myself."	"The only way a subordinate can get the necessary experience is by doing."
"Mistakes are too costly."	"Without delegation, learning cannot take place and employee dissatisfaction becomes a problem."
"Subordinates often lack experience."	"Managerial control can be maintained by periodic reviews at critical points."
"Subordinates often are specialists without the necessary overall knowledge required to make decisions."	"For the sake of organizational stability, a manager should develop a timetable for the training of each employee."
	"A manager who does not delegate becomes overwhelmed by day-to-day details, to the detriment of everyone."

Activity 3
Self Audit: Are You a Good Delegator?

Think about the way you function as a manager and answer the following questions.

1. Do you have to take work home quite often?

   Yes No

   Why?

2. Do you work longer hours than those you supervise or than is usual for people working in your type of organization?

   Yes No

3. Do you have little time for appointments, recreation, study, civic work, and the like?

   Yes No

4. Do you need more phones and/or secretarial assistance than before?

   Yes No

5. Are you frequently interrupted because others come to you with questions or for advice?

   Yes No

6. Do you spend some of your working time doing things for others that they could do themselves?

   Yes No

7. Do you have unfinished jobs accumulating or difficulty meeting deadlines?

   Yes No

8. Do you spend more of your time working on details than on planning and supervision?

   Yes No

   Why?

9. Are you inclined to closely watch everything that is going on?

   Yes No

10. Do you lack confidence in your workers' abilities to the extent that you are afraid to risk letting them take over more details?

    Yes No

11. Are you too conscientious (a perfectionist) about details that are not important for the main objectives of your position?

    Yes No

12. Do you believe that executives should be rushed in order to justify their salary?

Yes No

Why?

13. Do you hesitate to admit that you need help to keep on top of your job?

Yes No

What are some examples of help you could use?

14. Do you neglect to ask workers for their ideas about problems that arise in their work?

Yes No

15. At the staff meetings you convene, do you find that the same items on the agenda tend to be repeated because not much action has been taken on them?

Yes No

Why do you think this happens?

16. Do you find after you are ill, on vacation, or away from the office for a few days (travel, attendance at a conference, visiting a field plant, etc.), your in-basket is quite full upon your return?

Yes No

What do you think the reasons for this are?

From the self-audit, identify three of the most critical problems that you have.

1.

2.

3.

Now, look at your particular work situation and identify some of the areas where you may be able to delegate more effectively. Begin by completing the following Delegation Analysis Sheet.

DELEGATION ANALYSIS			
What I Do	Why I Do It	Can a Subordinate Do It?	Can a Subordinate Be Trained to Do It?

Delegation Strategies

Do you feel you are delegating well enough?

Was it difficult to identify any employees who could do some of your work for you?

Review your Delegation Analysis Sheet and list those things you do that could be delegated to one of your subordinates.

Develop a strategy for delegating at least three of these responsibilities. The plan should include the following:

What you will delegate.

Who you will delegate it to.

When you will start to delegate it.

How you will delegate it.

How you will keep in contact with the subordinate concerning the delegated responsibility.

Why Supervisors Do Not Delegate

1. Power — people become dependent on the supervisor.
2. Fear that subordinates will learn too much about their techniques.
3. Fear of subordinate failure even if they wish to delegate.
4. Lack of trust.
5. Fear to lose control over their department/section.
6. Jealousy — they want to take all the credit and therefore do not involve subordinates.
7. Lack of role clarity. They do not know which tasks and duties can/should be delegated.

Why Delegate?

1. To develop and groom subordinates.
2. It is a good management technique.
3. Time management — Time saver.

What to Do

Step 1 Supervisors should analyse their own jobs to ascertain major tasks and duties. Know what to delegate.

Step 2 Supervisors should monitor critical activities most carefully.

Step 3 Determine the degree of delegation.

Step 4 Follow-up.

Determining the Degree of Delegation

1. Authority is retained by the supervisor.
2. Subordinate can act after the supervisor's approval.
3. Subordinate acts and then reports to the supervisor.
4. Complete authority is delegated to the subordinate.

NB:

1. Supervisor still has the responsibility for the actions of the subordinate.
2. Type of delegation should not be considered as fixed and static. There can be progression, as in phased delegation.

Critical Activities: Those activities that must be completed if the organization is to accomplish its basic goals, e.g., ordering supplies, paying checks, etc.

Needed Activities: Those activities that should be performed if the section is to operate efficiently, e.g., inservice training in the use of new equipment.

Peripheral Activities: Activities not directly related to major goals, e.g., fund raising, organizing picnics.

Overall Activities for Delegation

Activity	Nature	Importance	Degree of Delegation	Development Potential for Subordinate
Daily inventory	Routine	Critical	Act and report daily	Moderate
Performance appraisals	Nonroutine	Needed	Retain	Not applicable
Work scheduling	Both	Critical	Act after approval	Moderate
Flower fund	Nonroutine	Peripheral	Complete authority	Low
Prepare monthly budget	Nonroutine	Needed	Act after approval	High
Process grievances	Nonroutine	Critical	Retain	Not applicable
Conversations with boss	Both	Needed	Retain	High
Salary committee	Nonroutine	Peripheral	Unsure	High

ANNUAL PERFORMANCE APPRAISAL SCHEMES IN AGRICULTURAL RESEARCH ORGANIZATIONS

Paul Bennell

Executive Summary

This paper examines current and potential uses of annual performance appraisal schemes (APAS) for employees of agricultural research organizations in developing countries. Despite certain common reservations by research managers, APAS can play a central role in the overall management process. Experience with APAS throughout the world during the last 30 years has clearly demonstrated the value of well-designed and implemented individual performance assessment schemes.

The first part of the paper discusses key issues concerning the functions, criteria, and methodologies of annual appraisal schemes. Appraisal should be more than just simply evaluating past performance. It should also motivate staff, help identify training needs, and be integrally related to the planning and programming of agricultural research activities. Appraisal criteria have generated considerable controversy among agricultural research managers and their staffs. Much of this concern has centered on the extent to which these criteria relate to organizational goals. Three separate types of criteria can be identified — namely those based on the description of behaviors, the evaluation of results, and the estimation of their effects upon the overall effectiveness of the organization in meeting its goals and objectives. Selecting meaningful performance criteria is clearly critical for effective appraisal schemes.

Once criteria have been selected, specific methodologies or instruments must be developed in order to measure individual performance against these criteria. While a few objective, quantifiable measures of performance can be used, the appraisal process, for agricultural researchers at least, will continue to rely heavily on subjective judgments. The challenge, therefore, is to devise appraisal schemes that ensure that these judgments are made as rigorously and systematically as possible. This is not easy and is, in fact, subject to often deep-seated judgment errors. The main appraisal methodologies — open-ended report forms, direct rating scales and ranking procedures — are briefly reviewed.

The second part of the paper identifies the main characteristics of what is referred to as the traditional approach to APAS. These include an overemphasis on evaluation and concern with financial and other rewards, and the process of appraisal itself which tends to be top-down, centralized, and secretive, with limited participation in the appraisal process by individual appraisees. Examples of typical rating forms used by agricultural research organizations are presented. These tend to rely heavily on somewhat vague behavioral performance criteria.

The third and final section of the paper focuses on how the appraisal process can be improved. This requires a clear understanding of what the objectives and general requirements of an APAS should be. The appraisal process must focus on individual (rather than just organizational) needs, be dynamic and forward-looking and thus strongly goal-oriented, serve multiple functions, and be based on a high level of participation and face-to-face interaction between the manager and the individual being appraised. However, such an appraisal process is more management-intensive than the traditional approach and managers need to be both committed and competent.

The performance review and development (PRD) appraisal scheme incorporates many of the key features of this new approach. PRD focuses on job definition and the annual work goals of the individual as the primary means of assessing past performance. Individual goals and objectives become the yardstick against which individual performance is assessed at the end of the year. These goals need therefore to be not only clear and realistic but also challenging, specific, and controllable.

The action plan forms the basis for both setting individual goals and assessing them. Individuals assess themselves and then are assessed by their supervisor. At the PRD interview that follows, both parties discuss in an open way the strengths and weaknesses of the year's work and begin to set work and performance improvement objectives for the following year. This interview is, therefore, of central im-

portance to the PRD approach. The paper looks at the objectives, style, and structure of this interview process.

PRD is not a universal panacea equally relevant to all agricultural research organizations throughout the world. But it is an important and potentially valuable approach that senior research managers should know about and possibly consider introducing in their own organization.

Introduction

The purpose of this paper is to examine current and potential uses of annual performance appraisal schemes (APAS) for employees of agricultural research organizations in developing countries. The research manager's main objective is to plan and manage the performance of his/her subordinates. Consequently, the design and management of APAS should be of central importance in the overall management process. What is perhaps most striking, however, is that agricultural research managers typically spend so little of their time formally appraising the performance of their scientists and other research personnel. Indeed, in some agricultural research organizations (ARO), staff appraisal is regarded by managers as a bureaucratic encumbrance that is complied with in a ritualistic, almost perfunctory manner. The necessary forms and procedures are completed as quickly as possible so that research managers and scientists can get on with the serious but exciting job of creating new knowledge and developing new agricultural technologies.

Why don't agricultural research managers take the formal appraisal process more seriously? One obvious reason is that appraising the performance of scientists, in common with other "knowledge workers," is not easy (or, some would say, even possible), given the complexity, uniqueness, and novelty of the tasks carried out. To do this every four or five years when the scientist is seeking promotion is difficult enough, let alone on an annual basis. Another more pragmatic reason is that AROs in developing countries often do not have the necessary room for manoeuver needed to introduce an effective APAS because they are tied to inappropriate civil service appraisal schemes. And, more serious still, there seems little point worrying about staff appraisal when no significant financial rewards are attached to the appraisal process.

These are important reasons that cannot be overlooked. However, it is equally true that agricultural research managers often have an insufficient understanding of the role of APAS. This is not a problem unique to agricultural research. It has been commonly observed among managers in all areas of research throughout the world. Thus, in general, "technical leaders fail to understand the dynamics of the process wherein the manager and the employee talk meaningfully about performance improvement, about measurement, and about how the individual can grow in his or her capability and career" (Miller 1986: 15). A typical response of research managers is that their staff, particularly scientists, don't want to be appraised, since they are sufficiently self-motivated and capable of managing their own work. Moreover, such a process is antithetical to the high level of collegiality among peers that is deemed necessary for effective research. Appraisal involves measuring differences in performance between individuals — most research managers do not like doing this, especially when they have to work closely with their colleagues on a daily basis.

Such concerns are understandable. It is equally apparent that agricultural research directors are becoming increasingly concerned about the inadequacies of their staff appraisal schemes and many are actively seeking to develop new schemes to fit their specific institutional needs. This concern has been consistently expressed at numerous workshops and seminars organized by ISNAR in recent years.

The following discussion will examine the strengths and weaknesses of the main appraisal schemes currently used by AROs in developing countries. This is not intended to be a detailed and exhaustive review of appraisal policies and practices in all AROs — we do not have sufficient information available to do this at present — but rather to provide a broad overview of the types of staff appraisal schemes that have been adopted. Nor do we propose to systematically review the management literature on APAS, since there are hundreds of books and articles on this topic. However, we will consider in some detail the relevance to AROs in developing countries of some of the main policies and practices that have been proposed by management experts in order to establish effective and efficient APAS. Clearly, given the diversity of agricultural research activities and the enormous variety of institutional and cultural milieux in which these are undertaken throughout the developing world, it is not possible to make detailed recommendations about the design and management of specific APAS. As Ahmad (1981: 70) points out, "The evaluation of knowledge is a long-standing problem for which no ready-made solutions are available in the literature on the management of research." To suggest that such ready-made solutions are available would be naïve. However, important lessons have been learned about how to design and manage APAS that can help agricultural research managers when reviewing their own appraisal schemes.

The discussion is structured as follows. The first section provides a broad overview of the why (functions), what (criteria), and how (methodologies) of the appraisal process. In the second section, we consider the main features of current appraisal schemes in AROs. The last section then discusses how the appraisal process could be improved in AROs in the future.

The paper forms part of ISNAR's ongoing work on the topic of performance appraisal. Two case studies have already been prepared (Performance Assessment at NCRI

and Performance Review and Development at DAR) for use at management training workshops.

Chapter 1
Appraisal Functions, Criteria, and Methodologies

The annual appraisal process consists of formal interactions between appraiser and appraisee over the course of a year. These interactions are formal in the sense that they occur at regular, predetermined times and seek to achieve clearly specified objectives according to certain procedures. Information about the performance of the appraisee is collected using written documentation.

It is important to stress that we are concerned here only with annual performance planning and appraisal of the individual ARO staff member. In most AROs, performance is also appraised over longer periods of time, usually when a staff member seeks promotion from one grade or job position to another. Although the two appraisal processes are normally interrelated in various ways, they are qualitatively different, both in terms of the actual process of appraisal and their roles in the overall management process. The need for comprehensive, systematic, periodic promotion appraisals for agricultural research personnel is generally well accepted by both senior managers and research staff in AROs. However, there is usually much less acceptance of comprehensive, systematic annual performance appraisals.

Appraisal Functions

Annual appraisals of personnel can facilitate all or some of the following human resource management functions:

- **evaluation:** to enable the organization to evaluate staff in order to allocate organizational rewards in the form of annual salary increases (normally fixed increments) and major job promotions;
- **auditing:** to discover the work potential, both present and future, of individuals and departments;
- **motivating staff:** to reach organizational standards and objectives;
- **discovering training needs:** by exposing inadequacies and deficiencies that could be remedied by training;
- **developing individuals:** by advice, information, and attempts at shaping behavior by praise or constructive criticism.
- **planning:** developing work plans with the individual.

Some of these functions may conflict with each other, most notably the formal evaluation and the motivation and development functions. Avoiding these functional conflicts is therefore a major issue in the design of APAS.

It is generally recognized that these functions can only be adequetely met if the appraisal process is subdivided into two discrete parts, usually termed reward and performance reviews.

The reward review

Like other organizations, AROs need a formal appraisal process to allow them to allocate financial rewards to employees in a justifiable and equitable manner. The extent to which rewards are made on an annual basis varies considerably among organizations. In private enterprises, the reward review is used to determine what increases in salary and other benefits each individual will receive. These increases often vary significantly between individuals. However, most public-sector research organizations are not able to award variable rewards to their employees in this manner. They have to adhere to fixed salary scales that apply to all employees in a given grade or category. A few do operate bonus schemes but this is the exception rather than the rule. Typically, the annual reward review is used to assess whether an employee should be awarded an additional fixed salary increment. In addition, results of annual reward reviews are usually taken into account when employees are seeking major promotions to higher positions or grades.

The performance review

The performance review is explicitly concerned with improving the performance of the individual employee. It is part and parcel of a wider system of performance management that entails a process of agreeing about what is to be done, planning how to do it, observing how it is done, feeding back these observations, and measuring and assessing performance. The main objectives of the performance review are therefore to plan, motivate, and develop the employee's skills by identifying future training needs.

Because the objectives of reward and performance reviews differ, it is important for the two appraisal processes to be separated from each other as much as possible. Employees are unlikely to engage in an open and frank discussion with their managers about past and current performance if at the same time they are being evaluated for a possible increase in salary. Given that most AROs in developing countries are not able to give variable annual increases in salary and other rewards to their employees, this incompatibility between reward and performance reviews is less of a problem.

Appraisal Criteria

A criterion is a standard rule by which a judgment can be made. There are three general requirements:

1. **Relevance** to an important goal or goals. Some group

or person must decide which activities are most relevant to success. Once these activities have been identified, then sound measures of these activities need to be developed.

2. **Reliability.**

3. **Practicality.**

Criteria can be classified according to the time span covered, their specificity, and "their closeness to organizational goals" (Smith 1976: 749). With regard to the latter, there are three separate but interrelated dimensions — namely those based on the description of behaviors, the evaluation of results and the estimation of the effects upon the overall effectiveness of the organization in meeting its goals and objectives. We have, therefore

BEHAVIORS ⟶ RESULTS ⟶ ORGANIZATIONAL EFFECTIVENESS

For complex organizations, such as AROs, multiple criteria are required in order to assess individual performance. A single or ultimate criterion would considerably simplify the process but, in practice, this is neither feasible nor even desirable.

Behaviors

There are two main types of behavioral criteria — (1) general behavioral traits of the individual and (2) actual observed behavior on the job.

Trait-oriented performance assessments are based on the following kind of criteria: judgment, diligence and application, dependability, self-reliance and drive, initiative, calmness, oral and written communication, organizing ability, leadership, enthusiasm, competence, human relations/cooperation with others, and ability to adapt. These types of assessments of criteria are still widely used by ORAs, in particular those that are ministry based and required to comply with civil service assessment procedures.

Trait-oriented performance criteria have two main advantages. First, they can be developed quickly. It does not take much thought to arrive at a set of words that are considered positive, complimentary, and necessary for effective job performance. Second, the trait scales can be used across all jobs. Thus the organization can often get by with only one appraisal form. However, it is generally recognized that the disadvantages of employing trait-oriented criteria and scales far outweigh their advantages. Even where attempts to define traits are made, there remains an unacceptably high degree of ambiguity and subjectivity in their interpretation. Equally serious, the relationship between general behavioral traits and actual job performance is both vague and invariably highly tenuous. This is particularly the case where the traits are closely linked to characteristics of an individual's personality. Finally, because criteria on behavioral traits are so general, they provide little indication to individuals about precisely what they should do to improve their behavior in areas where they are considered to be weak.

Dissatisfaction with the generality and ambiguity of trait-oriented criteria has led to the development of new appraisal schemes that seek to compare actual observed behaviors in a precise and rigorous manner. The best known and most widely adopted of this type of scheme is the Behaviorally Anchored Rating Scales (BARS). However, BARS is only likely to be applicable to lower grades of research personnel and is generally too complicated and time consuming for most AROs in developing countries to use.

The behavioral observation scale (BOS) is an alternative appraisal scheme that is considerably simpler than BARS and which therefore has potentially much greater applicability. We shall briefly review the BOS appraisal methodology in a later section.

Results

The second main type of criteria that can be used for individual performance appraisal are those that seek to measure the actual results or outputs produced by the individual during the course of the year. Thus, a result-oriented appraisal tends to ignore the specific behaviors of the individual and focuses instead on the actual results produced. In other words, it is not so much *how* the employee has done something but, more directly, *what* has been achieved. For agricultural researchers and their support staff, the main outputs are new agricultural knowledge and technologies which can be embodied in new products (such as a plant variety or animal breed) or disembodied (most notably in the form of agronomic recommendations or in the design of a new farming system). In addition, agricultural researchers often produce other important "outputs," most notably various advisory services to farmers and other clients.

Influential management writers such as Peter Drucker argue that the manager should only be interested in appraising the results of the employees' work activities and that they have no right to make judgments about specific individual behaviors.

An employee's work at the end of the year can be measured in two ways: as absolute outputs and as outputs measured against predetermined output objectives.

Absolute outputs. Here the individual is appraised simply on the basis of what he/she has produced without any clear reference to any individual or wider organizational objectives. For agricultural researchers, the widespread use of their publications output is perhaps the best example of an absolute output appraisal criterion. The continued impor-

tance attached to publications is a reflection of the fact that, traditionally, agricultural researchers, along with other scientists, have been in a strong position to determine the main output criteria for their separate professions. New knowledge is written up and submitted to the appropriate professional journal, where it is evaluated anonymously by respected peers. In an important sense, therefore, appraisal is taken out of the hands of the researcher's manager or even their major clients (i.e., government and producers).

Reliance on the publication criterion has a number of distinct advantages. First, as noted above, it externalizes the appraisal process for managers. (With the development of computerized bibliographical databases, the researchers' publications output can be assessed still further on the basis of citation indexes which measure the number of times a publication has been cited in other publications.) Second, researchers often accept that the publication should be the main performance indicator. Third, it provides a powerful incentive for researchers to write up their research results and, where publication standards are high, to attain or maintain high scientific standards.

The main disadvantage of the publication criterion is that, in terms of actual research content, a publication, while valued by the profession, may contribute very little to meeting the needs of the research organization's main clients. The "cosmopolitan" researcher who looks to the international professional community will tend to seek recognition through publications. In contrast, however, agricultural research organizations typically need "development" researchers who are primarily oriented towards directly serving the technological needs of their clients. Much of the research that is needed here is not publishable in professional journals.

Clearly the written output of a researcher *is* an important indicator of the research that has been completed. However, this can only be adequately assessed in relation to the research organization's goals and objectives (see below). Probably the most important written outputs that should be appraised are not journal articles but rather annual reports and other technical publications which are distributed to producers and agricultural development personnel. Typically, however, the highest (explicit or implicit) weights that are attached to publications are for refereed journals often published overseas. Reversing this weighting system will require a major reorientation of professional values and organizational culture.

A more comprehensive measure of absolute output than publications alone is required, one that can be applied for *all* employees and not just researchers. These should be based on the quantity and quality of research and other activities, as well as on efficiency criteria, most notably the manner in which human and financial resources are utilized. Research by Stahl et al. (1984: 28) found that the following output criteria for professionals are the most important in R&D organizations: works hard, completes project(s) on time, meets technical specifications, and works well with peers — added to the longer-term effectiveness of the work produced.

A number of fundamental problems have to be addressed in applying absolute output appraisal criteria to agricultural research organizations. First, the actual outputs themselves are often difficult to identify precisely, especially over a period of just one year. Second, even where output can be identified, the prevalence of team work or interrelated research activities often makes it difficult to determine the precise contribution of a specific individual. Third, given the wide range of specializations and activities, markedly different outputs have to be made equivalent if the appraisal is to be used to make comparisons among individuals. Finally, output is affected by many factors over which the individual has little or no control.

Output by objectives. Many appraisal specialists believe that criteria that look at "outputs by objectives" are most desirable, especially for organizations that have relatively large numbers of professional and higher technical personnel. Odiore (1985: 261) states that "the best standards for appraisal are those that measure results against goals or objectives set for the organization as a whole or part of it." Similarly, Patten (1982: 127) argues that they are "the best tool available for performance appraisal."

Various APAS have been developed that are based on outputs-by-objectives criteria. The most well-known is the management system called Management by Objectives. The success of an outputs-by-objectives appraisal scheme depends on the ability of the manager and the employee to develop well-specified performance objectives on an annual basis for each main area of activity. These objectives can be changes in individual behavior, but expected work outputs are generally given the most emphasis. Wherever possible expected outputs should be quantified with target completion dates. Setting realistic but challenging objectives enhances motivation and serves an essential development function in improving the performance of individual employees. We shall consider how such an "output-by- objectives" APAS can be developed and managed in agricultural research organizations in the last section.

Organizational effectiveness

The third type of performance criteria measures individual performance in relation to overall organizational effectiveness. This can be undertaken at two levels. The first is an examination of the relevance of individual research goals and objectives and related research outputs in meeting major organizational goals, and thus the extent to which they contribute to organizational effectiveness. Even with a properly functioning outputs-by-objectives appraisal

scheme, individual researchers and their managers may not them set objectives which, from an overall organizational perspective, are entirely appropriate. Because the process of setting correct goals largely determines organizational effectiveness, the performance/role of the individual in this process must also be assessed.

Second, individual performance can be assessed by measuring potential and actual impact of research activities on the welfare of target producers and consumers, and the realization of government agricultural development objectives. Such criteria include changes in producer and consumer surpluses (as defined by economists), the productivity of the main factors of production (land, labor, and capital) and more generally, the overall economic rate of return to specific research investments for which the individual (perhaps in conjunction with others) has been responsible.

The main problem here, of course, is that most of these welfare and production indicators are very difficult to measure. The necessary statistics are frequently unavailable, as are economists with the skills necessary to undertake this type of evaluation work.

Appraisal Methodologies

We have identified three broad types of performance criteria: behavior, results, and organizational effectiveness. Assessing individual performance against these criteria depends, of course, on the overall objectives of the appraisal process. Is it, for example, concerned mainly with allocating financial rewards to employees? Or alternatively, to what extent is this concern with rewards combined with an explicit desire to use the appraisal process to plan and improve individual performance?

Once overall appraisal objectives have been established, appraisal instruments based on specific performance criteria using specific appraisal methodologies must be devised. These appraisal instruments can be classified into two broad types: those that rely on "hard" quantifiable data to measure individual performance with respect to certain criteria and those that are primarily based on the subjective judgments of the appraiser. Of course, all appraisal assessments involve some subjectivity but, in practice, the distinction between objective and judgmental measures is useful.

Objective measurements

Objective quantifiable measures of performance can be derived for each of the three main types of criteria. With regard to *behavioral* criteria, these include data on tardiness, unexcused absences, and work-related accidents. Most behaviors are, however, intrinsically difficult or impossible to quantify in a meaningful way. The results of an employee's activities can be objectively measured either in an absolute sense or in relation to predetermined objectives. The allocation of rewards requires that individual staff outputs be made equivalent and then compared with one another. This can be done relatively accurately where the same or very similar outputs are produced by significantly large groups of employees, e.g., sales of a specific product by marketing personnel. However, this is rarely the case in AROs and therefore subjective judgments about individual performances are critical in the appraisal process.

Judgment

Given that considerable subjectivity is generally unavoidable in the appraisal process, the challenge is therefore to devise appraisal schemes that ensure that managerial judgments about individual performances are made as rigorously and systematically as possible. This is not easy because judgment is a cognitive operation which is subject to deep-seated psychological processes. Much of the discipline of social psychology is concerned with the judgments people make about each other and, in particular, the kinds of distortions that occur in this process.

Judgment errors. It has been found that the judgment errors that typically arise in the appraisal process occur in a systematic manner whenever an individual observes and evaluates another. In many instances, appraisers are totally unaware that they are making such errors and find it hard to correct these errors even when they are informed that they are committing them.

A major source of judgment error arises from ambiguities in defining performance criteria. In other words, the criteria themselves lack definition, concreteness, and measurability. Appraisers also have differing perceptions of the same individuals. For example, managers tend to rate employees who are similar to themselves in background, values, and style of behavior higher than they rate employees with dissimilar life styles. This has been labelled the similar-to-me effect. Conversely, appraisers often do not see certain kinds of defects in the performance of an employee because they are the same or very similar to their own (the so-called blind-spot effect).

The halo effect arises when an appraiser rates an employee as good or bad on all characteristics based on the assessment of only one characteristic. In other words, the rating given to just one characteristic strongly influences or contaminates the rating given to all other characteristics. Thus, there appears to be an unreal similarity in the rating scores.

First-impression errors. Here the manager makes an initial favorable or unfavorable judgment about an employee and then ignores subsequent information, so as to support the initial impression.

Excessive leniency or strictness. Managers may be afraid to give low ratings for fear of antagonizing their subordinates and making them less cooperative. Conversely, some man-

agers may be excessively strict in their appraisal judgments. The specific causes of this hypercritical effect include "the perfectionist boss," undesirable personality traits of the employee, and self-comparison, i.e., the employee does not do the job as the manager remembers doing it when he or she held that position.

Recency. Recent events are given greater weight in the appraisal process than those occurring at the beginning of the rating period.

Central tendency errors. These are errors committed by managers who want to play safe by giving the same or very similar ratings to all employees in a given group. Central tendency and leniency errors frequently go together, with the result that appraisees are bunched together as above average.

Influence of the job. It is common to give senior managers higher ratings just because of their position.

The open-ended report form. The simplest procedure for judging the annual performance of the employee is the open-ended report form. This type of form requires a sketch of the individual's performance to be prepared by the appraised. Some written report-type of forms are on a "controlled" basis. In other words, the appraiser is given guidelines, headings, or factors that should be covered in the report as appropriate.

There are obvious drawbacks to the open-ended report form, most notably the high degree of subjectivity involved and problems of interindividual comparison. Randell et al. (1984: 58) conclude that "despite the fact that some managers find this a more natural way of assessing staff, the degree of subjectivity and variation makes it difficult to reconcile the method to the main objectives of an appraisal system."

Direct rating scales. In practice "most criteria boil down to ratings" (Smith 1976: 746). As a result, an enormous amount of effort has been spent exploring the potential effects of various rating formats. The designing of an appraisal form based on direct rating scales involves: (1) the "dimension definition" of the scales, (2) the actual calibration of the scale using various "anchors," and (3) weighting each scale dimension according to its perceived relative value in the appraisal process of each type of employee.

Dimension definition. Rating scales normally consist of varying combinations of behavioral and result-oriented dimension criteria.

Scale anchors. Four types of scale anchors or categories can be employed in rating schemes: numerical, alphabetical, adjectival, and descriptive. Numerical and alphabetical ratings have scales of categories from high to low (or something similar) identified in numerical and/or alphabetical terms (i.e., 1 to 7 or A to E, etc.). With adjectival ratings, each anchor is identified by adjectives (i.e., excellent, good, average, weak/unsatisfactory). Descriptive ratings are anchored on the basis of short written descriptions of the type of performance associated with each scale category. Research has shown that descriptive anchors are relatively more effective than simple numerical, alphabetical, or adjectival anchors. The optimal number of response categories has been found to be between five and nine (see Landy and Farr 1980).

Weighting. If the rating criteria are not considered to be of equal importance, then it is necessary to weight them. This is a common practice in many rating schemes.

Rating scales can also be used in output-by-objectives appraisal schemes in order to gauge the extent to which goals and objectives have been attained. However, greater emphasis is normally given to the appraiser's written assessment of appraisee goal attainment, since this provides more adequate information, particularly in relation to improving future performance.

Rating schemes suffer from many of the judgmental errors discussed earlier. Central tendency, leniency, and halo errors are particularly serious in most schemes. Over time these errors become well-entrenched habits that are difficult to break. However, training managers to recognize and thus avoid rating errors has proved to be at least partially successful.

The severe limitations of rating scales as an accurate and reliable method of measuring individual performance have meant that they have become increasingly less popular over the years.

Ranking. Appraisal schemes based on individual rankings offer a distinct alternative to conventional scale rating schemes. Unlike the latter schemes, which appraise individual performance in an absolute sense against specific performance criteria, with rankings the appraisal is made by comparing an appraisee against other appraisees on the dimensions of interest. These can be weighted and combined in order to obtain an overall ranking of individual performance in the relevant employment group.

Ranking schemes have been widely used in private-sector industrial R&D organizations in the US and other high-income industrial countries. In reviewing these schemes, Decker and van Atta (1973: 22) conclude that "we are aware of no substitute for the ranking process for defining a professional's overall value to the organization."

The main advantages of appraisal rankings are that they are not subject to leniency, central tendency, and strictness judgment errors. The principal disadvantages are

1. Rankings are ordinal, so they do not indicate by how much one individual is better or worse than another. This is clearly unsatisfactory where the differences in individual performance are relatively small.

2. It is difficult to rank the performance of heterogeneous research groups and specialists.

3. Ranking appraisals are of virtually no value for developmental and feedback purposes. Typically appraisee rankings are kept secret.

Chapter 2
Performance Appraisal in Practice

What can be called the traditional philosophy or approach to annual performance appraisals typically prevails in agricultural research organizations in developing countries. There are some AROs where this is not the case but they are exceptional.

The Traditional Approach

The traditional appraisal approach has a number of related characteristics. These are summarized below:

Evaluation

The evaluation of employees is considered to be the main objective of the appraisal process. This is therefore a limited conception of the appraisal process because it excludes other major appraisal functions, most notably the explicit incorporation of performance planning and the motivational and developmental needs of the individual appraisee. This preoccupation with evaluation per se is usually most marked in those ministry-based AROs that are required to follow general civil service appraisal policies and practices that typically have remained largely unchanged for many years. Here, the appraisal is concerned with ensuring the accountability of the ARO employee as a government civil servant. Thus it is backward rather than forward looking in the sense that the major concern is with evaluating the past performance of the individual rather than using the evaluation in a way that can assist in improving performance in the future.

Rewards and sanctions

Given that the traditional appraisal approach focuses on evaluation, the main concern of both managers and employees is with the effect the appraisal has on the allocation of financial rewards both in the short term and the long term. Unlike private-sector AROs, the management of public-sector AROs usually has little or no scope for making variable annual salary awards on an individual basis. Typically, the main outcome of the appraisal is whether the staff member should be awarded a fixed increment on a given salary scale. Not surprisingly, where these increments are relatively small and/or are awarded virtually automatically, little importance is attached to the appraisal, either by management or employees. The extent to which annual performance ratings are taken into account in assessing the suitability of an employee for major promotions can, however, be an important factor.

Top-down, centralized, and secretive

The traditional appraisal approach tends to be by its very nature top-down and centralized, since the appraisal is administered by senior management with limited participation (if any at all) by the appraisee or even his/her immediate supervisor. Furthermore, the whole process is often shrouded in secrecy, with confidentiality of all reporting processes being the norm. Frequently the results of the appraisal are not even divulged to the appraisee. As noted above, the award of a salary increment is the result. In some situations, it is only when the appraisee is rated as being unsatisfactory that the individual is informed. Thus, in general, the traditional approach tends to be an impersonal, bureaucratic process.

The appraisal form

The appraisal form is of preeminent importance in the traditional appraisal approach. Where taken seriously, there is often an excessive preoccupation with the design of this form and, in particular, the construction of rating schemes with which to assess the behavior and output of the appraisee. The form is repeatedly redesigned, often becoming increasingly complex and elaborate. Equally common are appraisal forms with vague and ambiguous rating criteria, many of which have little to do with actual on-the-job performance. Numerical points rather than written descriptions are normally preferred, since these are seen to be more objective and enable individual appraisals to be compared. Typical examples of the kind of rating scales used by AROs are presented in figures 1 and 2.

Credibility, anxiety, and commitment

Typically, the traditional appraisal approach lacks credibility among both appraisers and appraisees. Managers do not like "playing God" and generally lack any strong commitment to the appraisal process. This is often manifested in excessive lenience and bunching of rating scores when the appraisal form is completed. Nearly everyone is assessed as "good" or "very good," with "no one but the rater's sworn enemies receiving 'fair' or 'poor'" (Caplow 1983: 132). The appraisal process thus becomes a virtually meaningless ritual. If employees care at all, the APAS tends if anything to engender anxiety and interpersonal conflict and demotivates rather than motivates. As Zemke (1985: 24) puts it, "most appraisal systems are more noteworthy for the angst they create than the results they achieve."

Name: _____

Institute/Branch/Station: _____

Merit Criterion	Weighting Factor	Points Rating	Weighted Rating
Critical and creative faculties	4X		
Judgment	4X		
Professional competence	4X		
Organizing ability	3X		
Written communication	3X		
Oral communication	1X		
Output	2X		
Dependability	4X		
Self-reliance and drive	4X		
Human relations	3X		
Leadership	2X		
Enthusiasm	1X		

Aggregate Merit Rating: _____

Comments: _____

_____

_____

_____

Date: _____ Reporting Officer: _____

Figure 1. Trait Behavioral Criteria Rating Form, an African Example

Measurable output

Among professionals, publishing is seen as objective, measurable output. With the complex array of outputs produced by researchers in widely differing specializations, most AROs make relatively little attempt to use objective output indicators that relate more directly to the impact of individual research activities in meeting specific organizational objectives. Typically, therefore, considerable reliance is placed on individual publication outputs as the only readily available and seemingly objective performance indicator. In some AROs, different types of publications are weighted according to their perceived importance and publication points awarded to each researcher. However, the publication process is itself strongly influenced by subjective factors. Perhaps the most significant and pervasive of these is the Matthew Effect, whereby better-known scientists are more likely to get their research work published, regardless of its quality (Merton 1973).

Ranking

Employees are rarely ranked during of the annual appraisal process because, unlike private-sector research organizations, AROs in developing countries are not able to reward personnel individually on an annual basis. However, some ranking inevitably occurs among candidates competing for promotion to higher grades and/or positions.

Chapter 3
Improving the Appraisal Process

Given the serious inadequacies of the traditional APAS, it is clear that a new approach to performance appraisal is ur-

FACTORS	GRADE				
	1	2	3	4	5
Output					
Responsibility					
Initiative					
Cooperation					
Mental sharpness					
Respect for authority and regulations					
Tact and social conduct					
Supervisory skills					

Figure 2. Trait Behavioral Criteria Rating Form, a South American Example

NOTE: Translated from Spanish.

gently required. In this section, we first outline the objectives and requirements of this approach and then describe in greater detail two appraisal schemes: performance review and development and behavioral observation scales that between them fulfil these objectives and requirements.

Objectives and Requirements

According to this new approach, the overriding objective of an APAS is to improve individual performance and productivity in a purposeful manner. In order to achieve this, it is necessary that:

- Information is assembled and shared, providing both the individual, the manager, and the organization as a whole with a learning experience.

- The appraisal process is accorded central importance in the management of human resources and thus of the organization as a whole. From being of only marginal concern to managers, APAS should become one of the key vehicles for managing personnel and improving their performance. Often, therefore, it is only feasible to introduce this new approach to APAS as part of a concerted attempt to create a new organizational culture. However, there is always the danger that APAS can be expected to do too much.

- Individual appraisees and their needs become the focus of the appraisal process. Organizational needs for appraisal of staff members must still be met but these should be of only secondary importance.

- The appraisal process is dynamic and forward looking. The traditional APAS is concerned only with looking back at an individual's performance. The new approach, on the other hand, is more concerned with the development of the individual in the future. It is therefore dynamic and interventionist rather than simply passive.

- The appraisal process serves multiple functions. Not only does it evaluate individual performance, it helps management to motivate staff, plan and monitor their work activities, and generally develop their work-related skills. A more appropriate description for the appraisal process, therefore, is annual performance planning and appraisal.

- The appraisal process, in seeking to improve individual performance, should be strongly goal-oriented.

- There is a high level of participation in the appraisal process by individual staff members. This in turn requires considerable openness between managers and their staff during the appraisal process. The appraisal interview is of greater importance than the appraisal form.

- Management should be highly committed and competent in appraising staff. The appraisal process is "an act" that has to be learned through training and supervised experience.

- Performance must be accurately, reliably, and equitably measured. However, this will always involve some degree of subjectivity. Management needs to accept and come to terms with this.

- The appraisal process should be continuous rather than discrete.

Motivation: Information feedback, goals, and participation

The explicit use of the appraisal process to motivate staff is one of the most important features of the new approach to

APAS outlined above. Motivation is enhanced in three distinct but interrelated ways. First, the appraisal process enables the individual staff member to obtain a clear, unambiguous, and comprehensive assessment of his performance during the previous year. This is essential because individuals, regardless of their culture, have a powerful psychological need to know where they stand in the eyes of their managers. Failure to receive adequate feedback of this kind results in internal tensions and anxieties in the individual staff member which adversely affect motivation and thus performance. For research scientists, in particular, while they may be required to work on their own for long periods and be "self-starters," they still require detailed feedback on their performance. As Ahmad (1981: 76) points out, "interest, praise, and recognition are among the most valued rewards of R&D professionals."

Many managers believe that their staff members already know where they stand, without having to undergo a formal appraisal. However, interviews with individual staff members rarely bear this out. While it is common for the manager and the individual to discuss particular problems, rarely do they sit down and reflect on the job as a whole.

The second way in which the new appraisal process seeks to enhance motivation is by setting well-defined and suitably challenging goals. Again, research has clearly shown that individuals have a fundamental psychological need to know what is expected of them in the future and that well-defined goals are strong motivators.

Third, allowing individuals to participate actively in the appraisal process has strong positive effects on their motivation. AROs are supposed to be participative and collegial in terms of their management style and decision- making processes, but this rarely extends to the appraisal process itself. Because participation is so minimal, it is easy for the appraisal process to be subverted or even rigged.

Annual appraisal interviews provide the main opportunity for individual participation in the appraisal process. This is a key event for both the individual and manager because it is here that past performance is reviewed and future work goals and specific actions for performance improvement are discussed. Critical self-appraisal by the appraisee is seen as an important part of the preparation for the appraisal interview. The structure and conduct of appraisal interviews is discussed in greater detail in a later section.

Participation should also extend to the actual design and introduction of the appraisal scheme. It is essential that any scheme meets individual needs and goals as well as those of the organization. Thus all staff members must be consulted about the utility, objectives, and scope of the proposed scheme. "If there is not a fair consensus after consulting on the above areas, you should seriously question the wisdom of proceeding" (Ahmad 1981: 15).

Management commitment and competence

The new approach to performance appraisal highlights the need for high levels of management commitment and competence. The tendency in the past has been to focus mainly on the design of appraisal forms and related procedures with relatively little attention being devoted to the role of managers in the appraisal process.

Without high levels of management commitment to the new appraisal process, it is obvious that it will founder. "The focus on papers and processes — how the evaluation forms should be designed, how the information should be collected and presented, how the meeting should be conducted and so forth — is misplaced effort. The real issue is does line management buy it . . . if management does not own the system, forget it. The game is over" (Zemke 1985: 29). Thus, the motivation of management to do a good job in appraising staff is probably the most important factor in determining the success of this approach.

For the majority of agricultural research organizations, such an approach represents a major departure from earlier methods of appraisal. The new approach clearly involves managers giving far greater attention to human resource management, since it makes explicit the overriding responsibility of managers to improve the performance of their staff on the basis of a detailed understanding of their needs as individuals and how these can be met. It also entails acceptance of considerably greater responsibility in judging the performance of staff. The whole appraisal process, being a central part of human resource management, is more time-consuming than before. Managers have to be convinced, therefore, that the payoffs will be sufficiently large to justify this increased level of effort and exposure.

To gain acceptance, this new appraisal process must be strongly supported by senior management. As noted earlier, it is ultimately counter-productive to try to foist a new scheme on an organization's management. However, because such a scheme is a major intervention into the "culture" of an organization, it is inevitable that senior management must play a very active promotional role in ensuring its successful implementation. Some agricultural research managers are likely to view such changes with caution, if not outright resistance, at least in the initial stages of discussion. Of particular concern is likely to be the increased participation and openness of the new approach to annual appraisal. Managers correctly recognize that "the appraisal interview is likely to be one of the most difficult interactions likely to be encountered by a manager" (Pratt 1984: 22). While probably unhappy with the existing appraisal process, they are inevitably fearful of a new form of appraisal that entails important changes in their expected responsibilities and skills as managers of people. Many are likely to justify their resistance by arguing that such an appraisal scheme is incompatible with local culture.

These apprehensions by research managers are understandable. They can only be dealt with effectively by developing the competence of managers to effectively manage the new appraisal process. More than anything else this requires training in the necessary appraisal skills.

Performance Review and Development

We have described above some of the key features of what we have called the new approach to performance appraisal. In practice, of course, appraisal schemes based on this approach are different in important respects, in particular the emphasis that is given to the various appraisal functions (evaluation, motivation, planning, etc.) and the specific modalities for carrying out the appraisal.

A good example of how the key features of this new approach have been integrated in a comprehensive and coherent manner is the appraisal scheme called performance review and development (PRD) (see Olson 1981). As can be observed in figure 3, PRD is comprised of six interrelated sets of activities that enable the manager to review past and current performance and plan for future performance. PRD focuses on job definition and annual work goals as the primary means of assessing past performance. The appraisal interview is the principal means for the communication of this assessment to the staff member. A future course of action is mutually agreed upon by the manager and the staff member. This specifies operational task objectives in the form of an annual work plan and also identifies specific areas for performance improvement which often will involve training activities.

The difficulties involved in objectively measuring and then equalizing the results produced by each type of ARO staff are, in practice, largely insurmountable. Proponents of the PRD approach assert, however, that it is still possible to assess in a relatively objective manner the extent to which each ARO employee has achieved specific predefined goals. In other words, the intention is not to derive objective, absolute indicators of job outputs that can be used as a basis of performance comparisons between employees performing the same or similar jobs, but rather to develop measurable annual performance goals and objectives for each individual. While the PRD approach stresses the need to develop measurable goals and objectives, considerable subjective judgment is still involved on the part of the appraiser in the setting of objectives and in assessing the extent to which these objectives have been met. Moreover, management has still somehow to compare individual job performances in allocating any financial rewards to ARO staff.

Goal Setting and Performance Assessment

The PRD appraisal scheme is comprised of two interrelated sets of activities: goal setting and performance assessment.

Individual goals and objectives are the yardstick against which individual performance is assessed at the end of the year. They should therefore be clear, realistic but challenging, highly specific, and controllable. Ideally all goals should be quantified. Where this is not feasible, well-specified goals should enable the appraiser to make reasonably precise qualitative assessments of goal attainment.

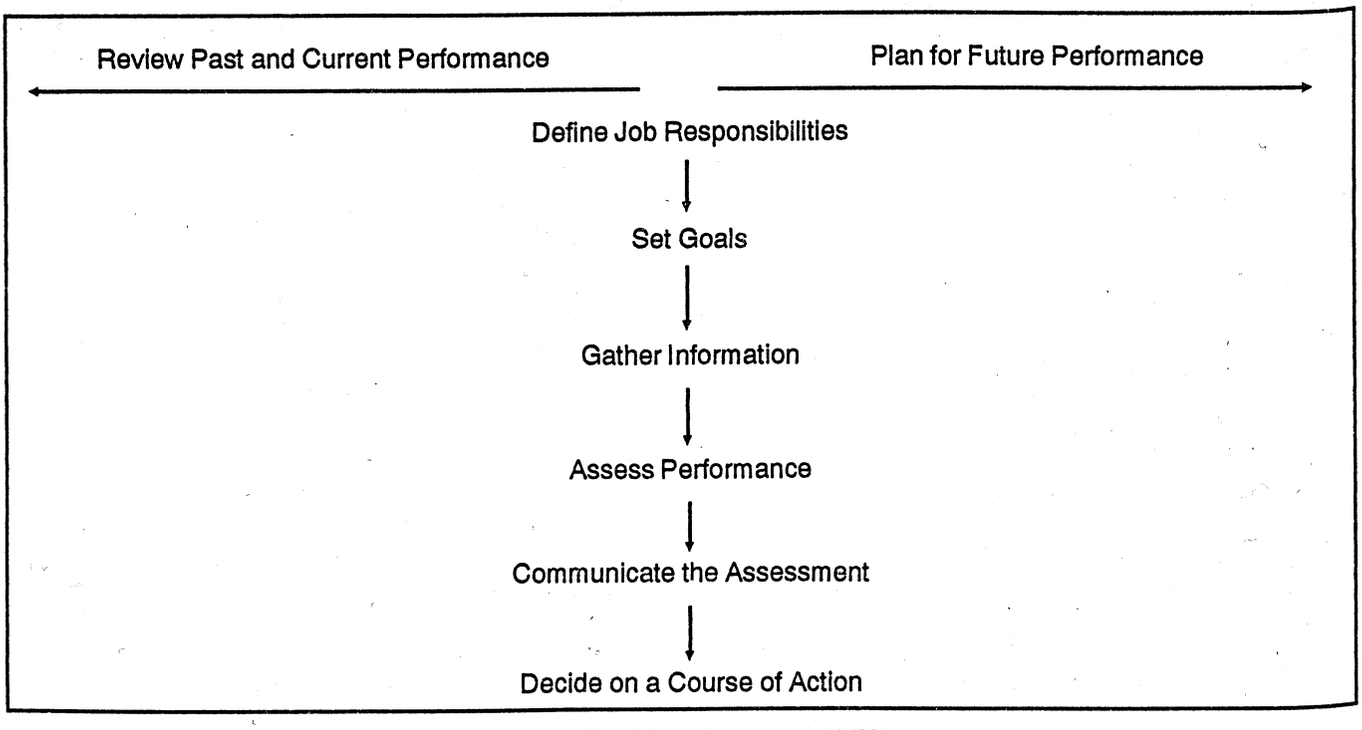


Figure 3. The Main Elements of PRD

SOURCE: R. F. Olson (1981: 35).

The appraiser and appraisee have the joint responsibility of setting the latter's annual performance goals and objectives. The appraiser needs therefore to undertake a careful analysis of how his section, department (or whatever area he/she is responsible for) is functioning and where there is potential for beneficial change. This analysis would seek to answer the following kinds of questions:

- What areas for improvement in efficiency can you identify if you are to use your staff to best effect?
- What activities will have the greatest success in improving your section's overall success?
- What "failures" occurred last year and how can they be avoided in the future?
- What contribution do you expect from each member of your staff?

Once this analysis has been undertaken, managers should be in a good position to develop appropriate goals and objectives for their staff.

The action plan is the basis for setting individual goals. First, appraisees provide the following information:

1. job title and purpose of the job;
2. main activities and duties, including an indication of their importance and the time likely to be allotted to them;
3. specific objectives that relate directly to operational tasks to be completed as a matter of priority during the coming year (in addition, personal improvement objectives should, where appropriate, be specified);
4. resources managed (i.e., the staff, expenditure, and other resources controlled by the appraisee in order to give a broad indication of the true responsibility for the cost-effective and efficient use of resources).

Scientists in AROs with well-developed strategic planning and programming functions should have little difficulty in specifying their specific research goals and objectives for the year, although frequently an additional effort will have to be made in order to ensure that anticipated research outputs are measurable and the goals and objectives for nonresearch activities are made specific. With the exception of unskilled manual workers, all technical and administrative support staff should also be required to elaborate their annual work goals and objectives in an action plan.

An example of an action plan form (called in this case a "Forward Job Plan") currently used by an ARO is presented in figure 4.

Once the action plan has been completed, appraisees discuss their ideas with the manager to whom they are directly responsible. Managers then assess individual goals and objectives in order to ensure that they are

1. consonant with the overall objectives of the unit for which they are responsible;
2. sufficiently precise in their definition;
3. achievable, given the competency of the individual and the likely availability of resources.

While the manager must always take the initiative in setting standards and defining the main duties, ultimately the manager and employee must both agree with the goals and objectives that are elaborated. It is important that the manager express confidence in and support of the employee.

The goals and objectives contained in the action plan should be discussed and, when necessary, amended throughout the year. They should not be set in concrete.

The action plan is used as the basis for assessing performance. Ideally, employees should be required to make a self-appraisal of their own performance in relation to the goals and objectives laid down in the action plan. With this information, managers can then complete a performance assessment report. Part of the report form used by our example ARO is presented in figure 5. In part (b), the manager must assess how effectively the main duties have been carried out and specific objectives achieved. No formal performance rating of these duties and objectives is cailed for in this form, although, as noted earlier, some forms do have simple rating schemes to help managers gauge objective attainment. In addition, weights can also be attached to these ratings. Part (a) of the form comprises a convential results-oriented rating scheme.

Once the performance assessment report has been completed by the manager and reviewed by a more senior "countersigning" officer, appraisees are normally allowed to read the assessment as part of their preparation for the annual appraisal review interview with their manager.

The PRD Interview

The traditional APAS approach, being based on written reports and/or conventional rating procedures, places little or no reliance on interpersonal interactions between appraiser and appraisee. The PRD appraisal scheme, on the other hand, regards the appraisal review interview as the most important aspect of the appraisal process, since it enables the appraisee to obtain clear feedback on job performance in relation to well-defined and agreed-upon objectives. It also enables the appraiser to perform important coaching and counselling roles.

FORWARD JOB PLAN

Name _____ Grade _____ Division _____

Set out below the purpose and main duties of your job.

Try to set the duties out in order of importance under a number of headings. Do not forget staff management and training responsibilities.

Duties	Percentage time spent on this activity

List specific objectives

These should show what you are expected to do and how. For some parts of your job, this may be in clear-cut terms (e.g., quantity, cost, target dates, etc.), but other objectives could be about how the job is done or how it will affect other people. Be as specific as possible so that everyone will understand how you are to be assessed. Do not set too many objectives — 4 or 5 may be enough. Be realistic — they should be challenging but possible.

Give a broad indication of the resources you manage and any changes you plan.

Only a general indication is required. Examples include the number of staff you are responsible for and what expenditures you advise upon and control directly. Are you planning any changes to get better value for money?

Timescale of forward job plan: _____

Note changes agreed upon through the year on the back of this form.

Figure 4. Outline of a Forward Job Plan of an Agricultural Research Organization

Performance Assessment by the Reporting Officer

Definition of ratings:

1 = Outstanding	4 = Performance not fully up to requirements — some improvement necessary
2 = Performance significantly above requirements	5 = Unacceptable
3 = Performance fully meets normal requirements of the job	

A. Give a rating between 1 and 5 for each relevant aspect of performance listed below. Make full use of the space provided for your comments.

WORK ACTIVITY ☐ Quality of work ☐ Output of work ☐ Planning of work	
MANAGEMENT ☐ Management of staff ☐ Effective use of other resources	
COMMUNICATION ☐ Oral communication ☐ Written communication	
WORKING RELATIONSHIPS ☐ Relations with other staff ☐ Relations with the public	
KNOWLEDGE/SKILLS ☐ Professional and technical knowledge ☐ Application of knowledge and skills ☐ Numeric ability	

B. How effectively have each of this employee's main duties been carried out and his/her specific objectives achieved? Give examples of work done well and areas where performance could be bettered.

Figure 5. PRD Report Form for an Agricultural Research Organization

To be successful, the appraisal review interview must be taken seriously by all the managers involved. It also requires considerable skill on the part of the appraiser. Where the necessary attitudes and skills are deficient, the appraisal interview will usually be a disappointment for both parties. More serious still, a badly conducted interview can undermine the appraisee's self-esteem and adversely effect relationships between appraiser and appraisee. It is essential, therefore, that appraisers receive appropriate training in order to develop their interview skills and generally build up their commitment to and confidence in the PRD process.

Objectives and Style

An interview is a skillfully conducted conversation with a purpose. The main purpose of the PRD interview is twofold, namely to provide the opportunity for the appraiser and appraisee to review in an open and constructive manner the progress made by the appraisee during the last year in meeting the goals and objectives laid down in the individual's action plan and, in addition, to look to the future by beginning to develop new goals and objectives for performance improvement. The interview, by letting appraisees know where they stand and providing strong positive feedback on their work, serves as a powerful motivator.

In addition, however, the interview should provide the opportunity to discuss specific problems and difficulties, particularly those that are potentially remediable in the future. It is clearly unrealistic to think that the appraiser and appraisee can cover all aspects of past and potential future performance and achieve complete understanding during an interview that will not normally last more than 45 to 60 minutes. However, with careful preparation, a focussed discussion can normally address many of the key issues that are of greatest concern to both the appraiser and appraisee.

The review interview should not be an event in isolation, but an extension of day-to-day leadership and supervision. While it may be the case that an exceptionally talented manager is able to meet the objectives of the PRD approach without a formal interview, this is not true for the large majority of managers. Similarly, however talented or well-known the individual employee, the review interview should never be treated as a mere formality.

In order to achieve the PRD interview objectives, the style in which the interview is conducted is a crucial factor. Not surprisingly, a considerable amount of discussion has focussed on this issue.

Three interview styles are commonly identified:

1. "Tell and sell," in which the appraiser communicates the evaluation to the appraisee as accurately as possible, gaining acceptance of the evaluation and getting him/her to follow a plan for his/her improvement. In the more extreme versions of this approach, the manager in the role as evaluator informs the appraisee of his/her faults in a straightforward no-nonsense fashion.

2. "Tell and listen," where the appraiser communicates the evaluation to the appraisee, outlining the main strengths and weaknesses and then lets the appraisee respond to it.

3. The problem-solving approach, where the appraiser adopts mainly counselling and coaching roles (i.e., weaknesses in performance that are remediable are jointly identified and discussed). The intention is to discuss these problems in a nonjudgmental atmosphere so as to stimulate the appraisee to think about them and propose positive suggestions rather than the appraiser attempting to offer solutions.

In general, the problem-solving approach is preferable, although this should not result in the appraiser glossing over important weaknessess. The responses of a large sample of civil servants in the UK who were appraised using either the "tell and sell" or "problem-solving" styles are summarized in table 1. It is clear from these responses that the appraisees who were interviewed using the problem-solving style generally got far more out of the interview process. Central to this was the opportunity for appraisees to express fully their points of view during the interview, not only about past performance but also the future.

Preparation and Structure

Careful preparation for the interview by both the appraiser and appraisee is essential. This will help to ensure that in the limited time available both parties are able to address their principal concerns in a focussed and efficient manner. While appraisers will already have completed the performance appraisal form, it is necessary that they have a clear idea of how it will be discussed with the appraisee and, in particular, what specific issues they would like to single out for a problem-solving discussion during the interview. More generally, in preparing for the interview, appraisers should ask themselves the following questions:

- Will what I propose to say actually help?
- How can I control the situation in a nondefensive manner?
- How will it maintain or enhance the employee's esteem and self-image?
- When the employee walks out of the room, what are the four or five questions I'd like to be able to answer about this person?

Similarly, appraisees should carefully study the perfor-

Table 1. Responses of Two Groups of Employees to "Tell-and-Sell" and "Problem-Solving" Appraisal Interviews

"Tell-and-Sell" Style	Percent		"Problem-Solving" Style
The interviewer did nearly all the talking in the interview	54	46	I did most of the talking in the interview
The interviewer seemed wholly concerned with assessing my work performance over the last year	50	50	The interviewer seemed chiefly interested in improving my work performance in the year ahead
I took the line of least resistance when criticized	23	77	I discussed the assessments with the interviewer when I did not agree with him/her
The interviewer did not allow me to offer my viewpoint on the way I coped with the job.	6	94	The interviewer allowed me to put forward my own views on how I coped with the job
The interviewer seemed to have made up his mind about things before the interview started	28	72	I got the impression that the interviewer was willing to change his/her views about things in light of what I said
Almost all the ideas for getting around job difficulties came from the interviewer	45	55	I provided most of the solutions to the problems we discussed
The interviewer made no attempt to understand my feelings about the job	11	89	The interviewer made every attempt to understand the way I felt about the job
The interviewer did not appear to be paying attention when I was speaking	6	94	The interviewer listened most attentively when I spoke
The interviewer did not invite me to put forward any ideas or suggestions about the job	14	86	The interviewer continually pressed me for my ideas and suggestions about the job
The interviewer did not really make my own thoughts about my job any clearer	38	62	The interviewer helped me clarify my own thoughts and ideas about my work

SOURCE: C. A. Fletcher (1973)

mance appraisal form so that they are in a position to discuss issues perhaps requiring clarification from the appraiser and, if necessary, question specific aspects of the appraisal. It may be helpful for appraisees to organize their thoughts using an interview preparation form. An example of such a form is presented in table 2.

The precise structure of the review interview will vary according to the needs of the appraiser and appraisee. However, the following broad format is frequently adopted.

Warm-up. Both appraiser and appraisee normally feel nervous and apprehensive. It is important for the appraiser to establish as soon as possible a cordial, relaxed atmosphere. A natural opener to the discussion could be a recent incident that is of mutual interest to both parties.

Appraisal and interview objectives. With the introduction of a PRD scheme, the appraisee may not be clear about the precise objectives of the appraisal process in general and the interview in particular. As a general rule, the appraisee should normally be allowed to talk first — here the appraiser would seek to get the appraisee's views on how he/she sees the appraisal and interview process.

Performance review. The appraisee is asked to first respond to the appraiser's written appraisal. This forms the basis for an interactive two-way problem-solving discussion about key aspects of appraisal performance during the last year. The appraiser should praise the appraisee for specific goal achievements, in particular those where significant performance improvement has been achieved and where specific goals have called for special effort and persistence. If performance has been poor in certain areas, this should not be avoided. Perhaps the best approach here is to invite the appraisee to comment on the achievement of a specific goal. Normally he/she will recognize that performance has been less than that specified in the action plan. Alternatively, the appraiser can ask general questions, such as: What has disappointed you most about your job in the

Table 2. Review Interview Preparation Form (Employee's Self-Appraisal)

Name: _____

1. (Circle the appropriate answers and write any comments in the space provided under section 8.)

a.	Do you have an up-to-date job description?	Yes	Partly	No
b.	Do you have an up-to-date list of objectives?	Yes	Partly	No
c.	Do you understand all the requirements of your job?	Yes	Partly	No
d.	Do you have regular opportunities to discuss your work and objectives?	Yes	Partly	No
e.	Have you made the improvements agreed upon with your manager at the last appropriate meeting?	Yes	Partly	No

2. What have you accomplished over and above the minimum requirements of your job description in the period under review? (Consider the early part of the period as well as more recent events.)

3. List any difficulties you have had in carrying out your work (including personal difficulties).

4. What parts of your job do you. . .

   a. do best?

   b. do less well?

   c. have difficulty with?

   d. fail to enjoy?

5. Have you any skills, aptitude, or knowledge not fully utilized in your job? If so, what are they and how could they be used?

Table 2. (continued)

6. Is there any special help or coaching you would like from your manager? Can you suggest ways of improving your working relationships, with your manager or with others?

7. Can you suggest any training that would help you improve your performance or development?

8. Additional remarks, notes, questions, or suggestions:

SOURCE: Randall et al. (1984).

last year? In what areas do you feel least effective? What have you been doing to increase your effectiveness in these areas?

Areas for improvement. The last part of the interview should be concerned with the question: Where do we go from here? The approach is therefore positive and forward looking. The appraiser and appraisee should seek to identify possible areas of performance improvement for the appraisee during the next year. After the review interview, both parties can think about these further. Some of them will eventually be incorporated into the individual's action plan for the next year.

Wrap-up. At the end of the interview, the appraisee's general reactions to the session and ways to improve it should be sought. The main points discussed should be summarized.

Immediately after the interview, the appraiser should, using an interview record form, provide a written summary of the main points and agreements made during the interview. This should then be sent to the appraisee for comments and signature. An example of an interview record form is presented in figure 6.

Can PRD work?

The PRD approach is closely related to management by objectives. In the past, MBO management systems have been criticized for a number of reasons.

1. MBO requires very sophisticated management with well-established planning and evaluation procedures.

2. Because goals and objectives are set for each staff member, this makes the allocation of rewards more difficult.

3. By placing particular emphasis on measurable standards, there is a danger that more intangible factors that are equally important for overall organizational effectiveness are ignored or undervalued.

Interviewer's Action Record

Record what you have learned in the interview. This should include comments on training needs and the employee's view and preferences. Where performance did not meet normal requirements, set out what action you propose.

Signature_____ Grade _____ Date _____

Employee's Comments

Please sign below to show that you have had the opportunity to read this performance report and discuss it with your interviewing officer, and that you have agreed with it and recorded your job description for the next reporting period.

Comment below if you wish.

Signature_____ Date _____

Figure 6. Interview Record Form

4. It is often very difficult to develop meaningful and reasonable objectives. "It is one thing to say that outcomes must be measured against objectives but another far more complex thing to come up with a list of assessment items which does justice to the entire range of an individual's professional and organizational involvements" (Ahmad 1981: 73).

5. MBO tends to encourage a short-term rather than a long-term orientation.

6. The organizational and managerial environments in the majority of developing countries are fundamentally incompatible with such an approach.

Faced with these problems and difficulties, Badawy (1987: 38) observes that even in developed countries, research managers "tend to reject MBO, and dismiss the possibility of its succesful implementation."

While these criticisms should not be taken lightly, they are far outweighed by the proven benefits of adopting a PRD approach to performance appraisal. PRD is logical, simple, and universally applicable. Whatever the job, performance goals can be defined and assessed. Clearly, the specific cultural and other social environments in which each ARO has to operate must be taken into consideration and any PRD scheme that is introduced should be appropriately adapted. A comprehensive training program is also essential to building management commitment and competence.

The Behavior Observation Rating Scheme

In its pure form, PRD is an individualized scheme of appraisal. However, managers must still be able to compare the work performance of staff within each relevant employment category. Thus an additional appraisal instrument is required, one that can be used in conjunction with PRD. In many AROs, the behavior observation rating scheme

(BOS) mentioned earlier is an appropriate instrument for this task.

BOS consists of specific behaviorally based measures that use on detailed profiles of effective performance for each type of job being appraised. More specifically, BOS identifies the key types of work behavior typically required for effective performance in each type of job and then assesses the extent to which each individual staff member has displayed this behavior during the past year.

The identification of these key types of work behavior is usually based on a job-analysis procedure known as the critical incident technique (CIT). Essentially, CIT requires people who are aware of the aims and objectives of a given job and see the staff members performing this job on a frequent basis to describe incidents of effective and ineffective job behaviors that they have observed over the past year. These incidents are then categorized into broad behavior-based performance criteria (e.g., technical competence, planning skills, interpersonal skills). Each behavioral criterion is then rated using a standard scale. Examples of two BOS rating scales for agricultural researchers in the areas of planning and interpersonal relationships are pre
sented in table 3.

Table 3. Hypothetical Examples of Rating Scales for the Behavior Observation Rating Scheme for Agricultural Research Scientists

PLANNING

1. Completes project review forms carefully and on time
   Almost always 0 1 2 3 4 Almost never
2. Has intensive discussions with scientist colleagues working in relevant areas
   Almost always 0 1 2 3 4 Almost never
3. Consults extensively with other interested individuals (e.g., extension agents)
   Almost always 0 1 2 3 4 Almost never
4. Sets research goals that are difficult but attainable
   Almost always 0 1 2 3 4 Almost never
5. Has a clear idea of the overall objectives of the research programs in which he/she participates
   Almost always 0 1 2 3 4 Almost never
6. Rigorously evaluates research that he/she undertakes
   Almost always 0 1 2 3 4 Almost never

INTERPERSONAL RELATIONSHIPS/TEAMWORK

1. Looks for ways to support research colleagues
   Almost always 0 1 2 3 4 Almost never
2. Is able to comment on colleagues' work in a critical but supportive manner that does not antagonize
   Almost always 0 1 2 3 4 Almost never
3. Is prepared to put the interests of the research team above his/her own
   Almost always 0 1 2 3 4 Almost never
4. Admits when he/she does not know the answer
   Almost always 0 1 2 3 4 Almost never
5. Encourages candid comments on own work
   Almost always 0 1 2 3 4 Almost never
6. Actively supports management decisions once they have been made
   Almost always 0 1 2 3 4 Almost never
7. Works well with support staff
   Almost always 0 1 2 3 4 Almost never
8. Procrastinates when dealing with poor performers
   Almost always 0 1 2 3 4 Almost never
9. Clearly defines the responsibilities of support staff
   Almost always 0 1 2 3 4 Almost never

Concluding Remarks

We have three major conclusions. First, annual appraisal schemes should be central to the overall management of human resources in AROs, regardless of their size or location. However, this requires high levels of management commitment to making the appraisal process work.

Second, the traditional appraisal approach that is so prevalent in AROs in developing countries is seriously inadequate in meeting the key objectives of a viable appraisal process.

And third, the PRD appraisal scheme offers the greatest potential as the basis of a new approach to annual performance appraisal for AROs. While PRD is not a simple panacea, it can be made to work in most developing-country contexts.

References

Ahmad, A. 1981. Knowledge work: Its evaluation and rewards. R&D Management Vol. 11, No. 2: 69-78.

Badawy, M. K. 1987. Applying management by objectives to R&D labs. Research Management Vol. 35: 35-40.

Caplow, O. 1983. Managing and organization.

Decker, W. D., and C. M. van Atta. 1973. Steps to maintain high levels of staff performance. Research Management Vol. 20.

Fletcher, C. A. 1973. An evaluation study of job appraisal reviews. Management services in Government. London: HMSO.

Landy, F. J., and J. L. Farr. 1980. Performance rating. Psychological Bulletin Vol. 87: 72-107.

Latham, G. P., and K. N. Wexey. 1981. Increasing productivity through performance appraisal. Reading, MA: Addison-Wesley.

Merton, R. K. 1973. The sociology of science.

Miller, D. B. 1987. Managing professionals in R&D.

Odiore, G. S. 1984. Strategic management of human resources. San Francisco, CA: Jossey Bass.

Olson, R. F. 1981. Performance appraisal: A guide to greater productivity. New York, NY: John Wiley.

Patten, T. H. 1982. A manager's guide to performance appraisal. The Free Press.

Pratt, K. J. 1984. Effective staff appraisal. Princeton, NJ: van Nostrand Rheinhold.

Randell, G., P. Packard, and J. Slater. 1984. Staff appraisal. London: IPM.

Smith, P.C. 1976. "Behaviors, results, and organizational effectiveness: The problem of criteria". In M. D. Dunette (editor) Handbook of industrial and organizational psychology. New York, NY: Rand McNally.

Stahl, M. J., T. W. Zimmerer, and A. Gulati. 1984. Measuring innovation, productivity and job performance of professionals: A decision modelling approach. IEEE Transactions on Engineering Management. Vol. EM-31, No. 1. February: 25-29.

Zemke, R. 1985. Is performance appraisal a paper tiger? Training Dec. 1985: 24-32.

PERFORMANCE ASSESSMENT FACTORS FOR AGRICULTURAL RESEARCHERS

Larry Zuidema

Managers are responsible for the performance of staff to the extent that they have the policy options and mechanisms to select, motivate, and support them. One such mechanism is performance management, which includes mutual understanding and agreement, joint planning of activities, continuous and timely feedback, observation, and appraisal. The focus of this paper is on performance planning and appraisals with particular attention to assessment factors appropriate for agricultural researchers.

Performance planning and appraisal serves both the organization and the researcher. For managers, it provides essential information for planning the future use of human resources. For researchers, it can be decisive in improving and maintaining motivation and even creativity.

The process of *performance planning* involves (1) a prior and periodic elaboration of individual goals to be achieved in relation to program goals and (2) the establishment of criteria by which specific aspects of the achievement of researchers' goals can be measured. *Performance appraisal* involves a periodic and mutual assessment of actual performance in relation to desired (planned) performance. It offers the opportunity to review researcher, management, and organizational factors that may influence researcher performance.

Performance appraisals of agricultural research staff are vital to the maintenance of effective research programs. First, they motivate researchers toward the goals of the research organization by communicating its culture, values, and expectations. Second, they are the basis for personnel actions such as work assignments, promotions, rewards, transfers, and training.

The process of researcher appraisal is usually governed by the codes and procedures of the institutions conducting agricultural research. For those in ministries and departments of agriculture, civil service regulations (which may or may not be related to scientists) usually apply. In a university setting, tenure and promotion guidelines prevail. In either case, research managers need to evaluate these procedures for management purposes and develop complementary procedures when necessary.

This paper reviews what factors influence performance, what assessment strategies have been employed, and why assessments are made. A major section is devoted to a review of what researcher performance assessment factors (criteria) are used. The material in this paper comes from a small sampling of appraisal forms and procedures used by several NARS throughout the world as well as a review of reports about performance appraisal systems in research organizations.

What Factors Influence Performance?

Any system that is used to assess researcher performance must take the influences of both the individual researcher and the organization itself into account. Performance assessment procedures need to make clear distinctions between and allow for consideration of the following factors which influence performance:

1. **Researcher attributes** — Researcher attributes include the personal characteristics and traits that contribute to the behaviors and attitudes of the researcher. Many civil service appraisal systems focus on these characteristics and traits.

2. **Researcher knowledge and skills** — Researcher knowledge and skills include the technical knowledge resulting from education and experience and the professional skills achieved through training and experience.

3. **Organizational policies and procedures** — These are personnel policies (including compensation) that influence motivation and organizational procedures and set the conditions for the work environment can have significant influence on researcher performance.

4. **Management and support services** — This includes the level of financial support for important inputs for research, primarily technicians, and it is critical to the performance of researchers.

5. **Program opportunities and activities** — The mandates and defined programs of the research organization set the limits for researchers and form the basis for allocation of resources.

Figure 1 shows the components of agricultural researcher performance assessment and demonstrates the relationship of these five factors to the results and impact of research efforts. The inputs are the researchers (personal attributes, knowledge, and skills), organizational policies and procedures, and management and support services. These inputs are applied to the processes that correspond to the program activities of researchers. The activities result in outputs and eventually outcomes. It is important to note that performance assessments can and often do take account of all of these components.

What Strategies Are Used?

The nature of the organization and its institutional framework usually influences performance assessment strategies. As one looks at the various approaches or strategies that have been employed in assessing the performance of researchers, the following characterizations can be made:

1. **Employment and autonomy** — This approach is to hire very selectively and then let researchers alone to do the job for which they were hired. The rationale is that creativity requires freedom from administrative controls and procedures. In effect, this justifies the absence of a performance management system. Appraisals are not conducted unless the situation is clearly a serious problem. The problem with this strategy is that many national research systems do not control the process of selection and there is often a small pool of qualified candidates for the positions offerred. In addition, some NARS only recruit at the BS degree level and then provide opportunities for research degree training early in the researcher's career.

2. **Projects, not people** — This approach is to put the emphasis on peer assessment of project proposals and project results rather than direct researcher assessment. The rationale is that organizational objectives are met through projects and that this is the appropriate focus of evaluation. This too avoids the necessity of developing a performance management system. Appraisals are conducted only in crisis situations. The problem with this approach is that project reviews are infrequent and irregular with respect to timing and content. This is not conducive to good human resource management since it does not allow for discussions relating to progress and planning for future activities in relation to program goals.

3. **(Ap)praise and promote** — This approach focuses the performance assessment process entirely on the administrative requirements of the institution. The rationale employed is that the only reason for conducting appraisals is for promotions. This means that appraisals are conducted every three-five years, depending on the system's norms for career advancement. Normally such appraisals focus on the researcher's behavior and results that can be documented by administrators. In

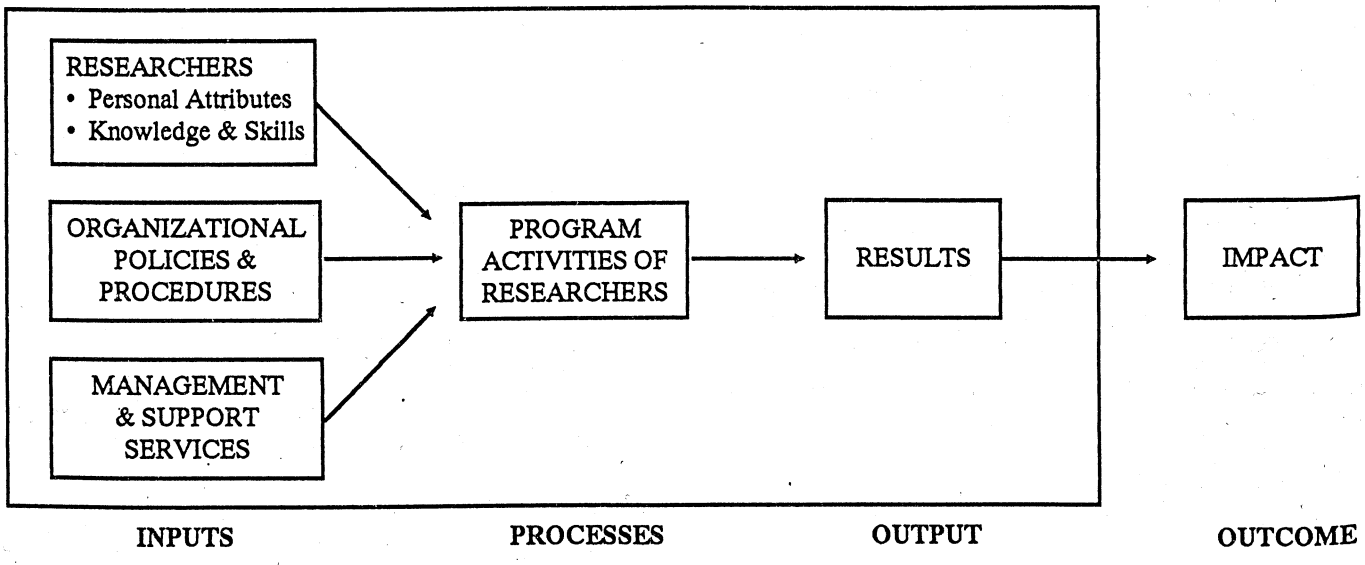


Figure 1. Components of Agricultural Researcher Performance Assessment

the case of university-based researchers, peer reviews are common. The problem with this approach is that the pressure to promote (praise) reduces the value of the exercise. Also, assessments with such a narrow goal, conducted infrequently do not permit effective researcher management.

4. **The annual ritual** — This approach also places high value on administrative requirements, but on an annual basis. Often the requirements and procedures are generic for all civil service employees and of low applicability to research institutions. The forms used most often stress evaluations of personal attributes and behaviors rather than activities and outputs. The major problem is that it is difficult to relate the process to program planning and evaluation. This is not a research management-oriented process.

5. **Backward and forward** — The approach is to assess researcher activities and results of a past period against the program plans and objectives agreed upon for that period. Normally, the process includes agreement on and the establishment of individual goals and objectives for the next time period. The rationale is that researchers are best judged on individually planned performance since research is not a uniform activity. The appraisals are conducted annually in conjunction with overall program planning activities. While this is the currently favored approach for agricultural researcher assessment, one problem is that the tendency of those using the approach is to focus more on planning than on assessment of past performance. Also, it is not compatible with most civil service requirements.

Why Make Assessments?

With these strategies in mind, it is now appropriate to ask why it is that we make performance assessments of researchers. The following are the most cited reasons by research managers. These multiple reasons obviously influence both what is assessed and what processes are used to conduct the assessments.

1. **Basis for promotion and rewards** — The need for an equitable and fair system to allocate rewards and to maintain careers for researchers is often the prime motivation for appraisals. The procedures are often determined by civil service units and are out of the hands of research managers. In a few cases, special systems have been created for scientists. In still fewer cases, a level of autonomy has been reached which permits research institutions to establish their own systems for promotion and rewards.

2. **Develop researcher capacity** — An effective assessment process yields information about the need for further training of researchers. A desirable output from the whole assessment process involves developing and up-dating a comprehensive training plan, both degree and nondegree. Both the organization and the individual benefit from this outcome of the assessment process.

3. **Improve motivation and performance** — The best outcome of a performance assessment process is a more highly motivated researcher with a desire for and capability to improve levels of performance. This will depend on the factors that are assessed and the process used. The process that reviews past performance against past plans and then proceeds to develop mutual and specific goals for the future will most likely succeed in improving motivation.

4. **Facilitate progam and work planning** — Assigning researchers to priority research areas and programs requires an understanding of their current capabilities and commitments. Only if the assessment process includes an element of forward planning is it likely to contribute to effective program planning for the research organization. The accumulation of individual work plans is, de facto, the summation of program plans for the organization.

Another way in which one can answer the question of why we make performance assessments is to provide regular, organized, and periodic feedback to both researchers and managers. This is a more positive and contructive approach to performance assessment. It makes the whole process acceptable for all parties and changes the ambiance from a process to be dreaded and feared to a process anticipated and welcomed. In the end, the four reasons for conducting performance assessments remain, but the approach and process stresses feedback.

This process is designed to provide feedback to managers for (1) promotion and rewards, (2) staff development planning and counseling, and (3) program planning. Feedback to researchers would be for (1) self-development, (2) motivation, and (3) work planning. The concept of feedback is relevant to the content of the following section on what factors are assessed.

What Factors Do We Assess?

A review of instruments (forms) used for making assessments of agricultural researchers throughout the world shows that a wide variety of factors are included. Most forms, however, emphasize a few and utilize both rating scales and behaviorally oriented statements. The following are six factors that are used for assessing the performance of researchers. Each of these factors is reviewed in some detail and questions are raised for readers to contemplate and about which to draw conclusions in relation to their own system. Refer to figure 1 which shows the relationship of these factors to each other.

1.	Personal attributes	what they are
2.	Technical knowledge	what they can do
3.	Professional skills	what they can do
4.	Professional activities and behaviors	what they do
5.	Outputs/results	what they accomplish
6.	Outcome/impact	consequences

The first three factors may be considered to be predictors of performance. Activities and results are more direct measures of performance, while impact serves to validate and substantiate performance evaluated in some previous time frame. In reviewing the utility of these factors, it is important to think about their effectiveness in relation to the reasons given above for performance assessments. In particular, how do assessments of each of these factors relate to the achievement of program goals and objectives?

1. Personal attributes

Personal attributes (characteristics and traits) are usually measured on a graphic scale that is quantified and comparable but based on the general judgment of the rater. It is also possible to describe and rank personal attributes qualitatively. For example, the top ranking for "judgment" could be "outstanding ability for defining objectives, formulating programs, and evaluating results or trends from data and reports." The bottom ranking would be "requires assistance in evaluating results of his/her own projects." Combinations of qualitative and quantitative evaluations are also used to score personal characteristics. The criteria selected often reflect the organization's concept of the personality profile of a productive employee.

The following are several criteria that have been taken from performance appraisal forms used to evaluate personal attributes of researchers.

maturity	responsibility
motivation	accuracy
initiative	speed
integrity	imagination
cooperativeness	enthusiasm
decisiveness	self-reliance
judgment	drive
foresight	creativity
reliability	attitude
punctuality	resourcefulness
manners	personality
intelligence	loyalty
appearance	innovativeness

This is a wide spectrum of attributes, and most would agree that many are not appropriate for the evaluation of research staff. In fact, there is considerable doubt that performance assessments should include any reference to personal attributes at all. The following are some questions for contemplation. Which of these attributes are most critical for researchers? In particular, how important are those selected as contributors to actual performance? For those that are important, how do we assess them objectively? Furthermore, how much change in these personal attributes can managers stimulate?

2. Technical knowledge

Required knowledge is usually reflected in the job description for the position. Often, staff are hired with the required technical knowledge, and an evaluation occurs in the recruitment process. In other cases, generalists are employed at the BS level with the expectation that those worthy will be given the opportunity to obtain increased technical knowledge through degree and nondegree training on the job. Usually, it is expected that the employee will maintain and improve knowledge in technical areas. Therefore, it may be appropriate to periodically evaluate progress made against expected and planned improvements in technical knowledge.

Some examples of areas for assessment relating to technical knowledge include

1. educational qualifications
2. accumulated experience
3. continued degree study
4. participation in short-term training
5. involvement in on-the-job training activities

Most of these areas are best assessed upon entry to an organization, but they are also appropriate for reassessment at the time of consideration for a promotion or new assignment within the organization.

The following are some questions that are relevant to assessment of technical knowledge. Is education an accurate reflection of technical knowledge? Do high levels of technical knowledge ensure high levels of performance? What is the best way to proceed to assess levels of technical knowledge? At what point is investment in improving technical knowledge most beneficial to the organization?

3. Professional skills

In addition to technical knowledge, researchers are expected to possess skills that permit the effective use of knowledge in a research environment. Furthermore, it is expected

that researchers will improve these skills throughout their careers through experience and training. Some of the skills that are required of nearly all researchers are as follows:

1. oral and written communications
2. interpersonal relations
3. leadership
4. program management
5. supervision of staff
6. statistical analysis
7. organization of work activities

If the research organization values these skills, there must be a way to assess the level of their application by researchers and then to provide opportunities for improvement. Most of these skill areas can be observed and evaluated somewhat objectively.

Some relevant questions are as follows: What other areas can be identified? How important are professional skills to the job performance of researchers? How would one conduct skill evaluations? How much change is possible in a researcher's career?

4. Professional activities and behaviors

Many professional activities and behaviors contribute to output. Their assessment is particularly useful for program areas where output is infrequent or not easily measured. The following are professional activities and behaviors valued by agricultural research institutions:

1. keeping up with the scientific literature
2. ability to define research problems
3. ability to design, undertake, and interpret experiments
4. timely reporting of experimental results and conclusions
5. effective documentation for potential users
6. active participation in professional meetings
7. effective training of support and junior staff
8. collaboration with other researchers on teams
9. joint activities with extension workers

These and other activities and behaviors should be a evaluated as a part of the assessment process since they convey what the research organization desires of its researchers. Some questions for consideration are as follows: What other activities and behaviors are desirable and important to evaluate? Do job descriptions adequately reflect expected and desirable behaviors and activities? What are the best ways to assess behaviors? How much change in researcher behavior is possible?

5. Outputs and results

Outputs and results are usually measured in gross terms such as "quantity of work" and "quality of work" and using graphic scales from "outstanding" to "poor." Normally, this is not sufficient for effective researcher assessment. Standards of performance are sometimes used to measure quantity and quality in terms of numbers, time periods, and expense. These objective measures may be reviewed in absolute terms against a set standard or in relative terms comparing output of similar staff.

For agricultural research, both objective and subjective measures of output are useful. In most cases, standards of performance should be directly related to a plan of work agreed upon as part of a previous performance planning and appraisal process. Both the plan of work and the standards of performance should take into account the capabilities of the researcher and be realistic in terms of time, financial support requirements, and institutional capabilities.

Researcher outputs/results evaluated by agricultural research managers include media output, plant varieties, prototypes, patents, etc. In the case of a journal article, it is important to evaluate the quality of the article as well as the publication in which it appears. Criteria for such an evaluation would include relevance, responsiveness, and utility for the national program. The following are some examples of researcher outputs/results:

1. scientific journal articles
2. books written and edited (including chapters)
3. research reports
4. research abstracts
5. conference reports and papers
6. extension publications
7. position papers
8. radio/TV/video tapes
9. news articles

10. designs released

11. patents received

12. varieties released

13. prototypes produced

14. proposals accepted

It is relatively easy to count these items. However, variability among the norms for specific positions and disciplines needs to be taken into account when evaluating quantity of output. But more important, the quality of that output needs to be assessed. Some important questions are as follows: Is it enough to make judgments from outstanding to poor? Is it possible to employ criteria like relevance, responsiveness, and usefulness? For client-oriented research, can we use adoption as a criteria for researcher appraisal?

5. Outcome/Impact

The ultimate tests of the effectiveness of an agricultural research institution and its staff are client acceptance and adoption of researcher products. These are almost always observable only at some distant time and, in fact, may not be easily attributable to any one person. Nevertheless, the evaluation of researchers should include measures and criteria relating to outcomes and impact if they can be attributed and assessed.

Some examples of measures of impact are

1. honors and awards received (particularly from client groups)

2. widespread acceptance and adoption of a technology (e.g., a variety)

3. frequent citations of professional papers by other researchers

This third example is the subject of considerable research and debate since citations do not always correlate with quality. In all cases, the measures of effective impact should include considerations of relevance, responsiveness, usefulness, and cost-effectiveness.

Some questions about the assessment of impact are as follows: Can outcomes/impact be easily attributed to a single researcher? Do outcomes reflect program objectives? Does the technology favor one group at the expense of another?

Conclusions

This discussion paper has reviewed six assessment factors used to evaluate agricultural researchers. All have some utility in the process of evaluating researcher performance, but clearly, those that reflect output/results/ products have a high value for managers. Why is it that other factors like personal attributes are retained in performance appraisal forms and procedures? Perhaps it is because we have not made the shift from evaluating predictors of performance required for researcher recruitment and selection to actual activities and outputs required for effective performance assessments. Table 1 shows the relative usefulness of the six assessment factors for both selection and performance assessment.

An effective performance planning management process will provide enough information for management to take specific actions. It is important that all parties have reasonable expectations about the possibilities of actions resulting from the process. Further, it is important that managers communicate these actions effectively so that it is clear that the process is designed to actually improve the performance of the entire organization. Three types of management actions may be involved:

1. Those directed at the researcher, including transfer, promotion, training, awards, increases in compensation, etc.;

2. Those required of management, including provision of supplies, improved facilities, more technicians, etc.;

3. Those required of program planners such as the incorporation of individual plans into the overall plans of the organization.

These actions are the primary means by which human resources are guided to achieve program objectives, and they serve as the basis for future increases in researcher productivity. Performance management systems that emphasize both performance planning and assessment offer the best opportunity for motivating researchers to meet program objectives.

Table 1. Agricultural Researcher Performance: Usefulness of Factors for Selection and Assessment

Assessment Factors	Researcher Selection	Performance Assessment
Personal Attributes	M	L
Technical Knowledge	H	M
Professional Skills	H	M
Professional Behaviors & Activities	M	H
Products/Results	L	H
Impact	L	H

KEY: *L* = Low, *M* = Medium, *H* = High.
LESSON: We need to make a shift from predictors of performance required for selection to actual activities and output required for performance assessment.

CASE STUDY
ANNUAL PERFORMANCE ASSESSMENT AT NCRI*

Paul Bennell

Introduction

It was late August 1987. The most urgent task facing Francisco Madrid, the director of the National Crops Research Institute (NCRI), was to review and approve the annual performance assessments of the 18 research scientists he was directly responsible for. These assessments had recently been completed by the heads of the four departments within NCRI — agronomy, breeding, soil science, and plant protection.

For as long as Madrid could remember, individual performance assessment had always been a controversial issue among both management and staff at NCRI. And now a new scheme for professional performance assessment had been introduced by the Public Service Commission. Madrid had serious doubts, however, whether this would lead to any significant improvements in the appraisal process.

Dr. Mario Pavier, head of the Soil Science Department was expected to arrive shortly to discuss the results of his assessment of the scientists in his department. Pavier was a fine soil chemist but he had a reputation for being a rather authoritarian, no-nonsense manager. He expected a lot from his scientists and he was difficult to please.

Madrid felt uncomfortable about this meeting. Pavier had rated the performance of two of his scientists as "unacceptable" and "not fully up to requirements," and another high performer was unhappy about her assessment. Was Pavier being too tough on his staff? Certainly there seemed to be a lot of unhappiness within his department about the way he had undertaken the assessment.

*This case is designed to serve as a basis for class discussion, rather than to illustrate either effective or ineffective management practices or policies. It is based on information drawn from a variety of unpublished sources. Material herein is not to be quoted, cited, reproduced, or otherwise published in any form without the written permission of the author.

The Annual Assessment Process

Two years earlier the Public Service Commission had commissioned a management consultant to review the civil service's individual annual assessment scheme, which had remained virtually unchanged for over 30 years. The consultant strongly criticized both the criteria and the procedures that formed the basis of this scheme (see exhibits 1 and 2) and recommended that a new one be introduced.

Exhibit 1.
Management Consultant's Main Criticisms of Existing Annual Assessment Scheme of the Civil Service

- Top-down, centralized, and secretive. Reporting officers complete appraisal form and return for review by countersigning officer. Ratings not revealed to individuals, who do not participate at all in the appraisal process.
- Exclusively concerned with evaluating previous year's work performance without any regard to other appraisal functions, most notably individual development and performance planning and development.
- Vague and ambiguous performance criteria, many of which have little to do with on-the-job performance.

The PSC accepted the consultant's report in full. For professional civil servants, the new assessment scheme was comprised of five main stages:

1. completion of a performance assessment form by the individual appraisee's reporting officer (i.e., his/her supervisor or manager) using simple, straightforward performance-based assessment criteria;

2. an interview between the reporting officer and the appraisee to discuss the assessment, with each individu-

Exhibit 2.
Old Rating Form

Name: _____

Institute/Branch/Station: _____

Rating: 5 = outstanding
4 = good
3 = satisfactory
2 = poor
1 = very poor

Merit Criterion	Weighting Factor	Rating	Weighted Rating
Critical and creative faculties	4x		
Judgment	4x		
Professional competence	4x		
Organizing ability	3x		
Written communication	3x		
Oral communication	1x		
Output	2x		
Dependability	4x		
Self-reliance and drive	4x		
Human relations	3x		
Leadership	2x		
Enthusiasm	1x		
		Total	

Aggregate merit rating:

175-131 = outstanding
130-101 = good
100-71 = satisfactory
70-51 = poor
50-0 = very poor

Comments: _____

_____

_____

_____

Date: _____ Reporting Officer: _____

al allowed to read his/her assessment prior to the interview;

3. a written summary of the interview provided by the reporting officer;

4. the appraisee is allowed to make written comments on the reporting officer's assessment;

5. review of the assessment, if necessary, then modification and approval by the countersigning officer (who is normally the reporting officer's immediate manager — the countersigning officer can interview any appraisee if he/she so wishes).

The reaction of NCRI managers and scientists to the new assessment scheme had been very mixed. Criticism of the scheme focused on the danger of divulging assessment ratings and comments to individuals, the difficulty of conducting face-to-face interviews, and the right of the appraisee to make written comments. Dr. Soares, head of the Agronomy Department, summed up these criticisms: "This is some trendy foreign scheme which is basically incompatible with the way we do things here."

Pavier, on the other hand, was a strong supporter of the new scheme. "Part and parcel of the effective manager's job is to assess staff performance. This needs to be done in an open manner so everybody is clear where they stand. This is particularly important for the poor performers who need to pull their socks up. I'm not frightened to tell my people what I think of them — both the good and the bad news. . . . Providing written comments for each performance indicator provides a better basis for the assessment interview."

Pavier's Performance Assessments

Pavier had read the instructions that accompanied the new assessment schemes carefully (see exhibit 3), and he was well aware of how much importance was attached to an individual's annual assessment ratings in determining promotion to higher grades under the new scheme.

There were five scientists in the department (see exhibit 4). Pavier completed the rating scale and comment part of the assessment form for each of them in mid-June. The assessment interviews were conducted a few weeks later (see exhibit 5). At the time, he thought that with the exception of Francis Gomez, these had gone reasonably well. He was somewhat surprised therefore when he read the critical comments and disagreements expressed by some of the scientists in the department. When he submitted the completed assessment forms to Madrid as the countersigning officer, Pavier felt considerably less optimistic and positive about the new scheme than he had at first.

Conclusion

Madrid had only five minutes before Pavier arrived. Looking at Pavier's assessments, it certainly seemed to Madrid that he had been excessively stringent, especially in comparison with the assessments of the other department heads. More generally, Madrid was not happy with either the content or the way in which the assessments had been conducted. Pavier was well meaning but handling people was not his greatest asset. However, putting all the blame on Pavier seemed unfair since it was clear to Madrid that the scheme itself had fundamental problems.

Pavier was a long-standing colleague as well as a friend. Madrid would have to be very careful how he handled the meeting. Pavier was likely to jump down his throat if he felt he was being unduly criticized. But, as the countersign-

Exhibit 3.
Completing the Performance Assessment Report

There is a need for an accurate and vivid picture of individuals and their achievement in the job. You should make full use of the space for comments by each performance criterion. Be as precise and specific as you can.

The rating scales are meant to give shape and precision to your subjective judgments on the overall job and aspects of it. They should help focus attention on where the individual stands, in your view, as a member of a grade. The award of the overall performance rating should be based chiefly on how well the individual has done the job. This should be closely related to the efficiency and effectiveness in attaining research objectives as outlined in formally approved projects. Ultimately, it is the actual impact of an individual's research on the producers' welfare that matters. But remember that the rating scale refers to the standard expected of the jobholder's grade.

Your overall rating should not be an arbitrary toting up of the ratings for the separate aspects of performance listed. There are five boxes on the overall rating scale and you should be prepared to use them. If "outstanding" or "unacceptable" is merited, do not avoid using either of them.

Remember that all your staff have strengths and weaknesses. An effective member of staff may deserve marks at the lower end of the scale for some things, while a poor performer will have good qualities which should attract high marks in some areas. Do not be afraid to use the extreme markings where appropriate.

A. Work Activity

1. *Quality of Work*
An individual who consistently produces work at such a high standard that it needs little intervention from you should be given a high mark. Try to think not so much of how the work is written or presented as how far it meets objectives and the needs of the department and tackles tasks and problems in a constructive and effective way.

2. *Quantity of Work*
This refers to the amount of work or number of tasks completed. Here you should assess how fast an individual gets through his/her allocated work, but not the effort put it. In some cases, individual objectives may be linked to quantity of work, so it would be helpful to back your marks with specific examples if possible. Bear in mind the relationship between quality and quantity of work. Comment if one is sacrificed at the expense of the other.

3. *Planning of Work*
The person who plans work to ensure that priorities are dealt with and deadlines met will be given a high mark. If they are managers, you will also need to consider the way they plan and pull together their staffs' work. Individuals who are unable to judge how much time is spent on different tasks should be marked down.

B. Management

1. *Management of Staff*
Even if the individual has only partial responsibility for staff, or has acted as a manager for only part of the year, look for signs that may help assess future potential. Good managers will plan, organize, motivate, and control; they will be concerned with the needs of the individual in the job, will encourage and lead staff and so get them to give of their best. They will deal firmly but fairly with the inefficient. They will carry out the appraisal process effectively. Poor managers will not know the strengths and weaknesses of their staff, will upset or demoralize them, will intervene too much or too little.

2. *Effective Use of Other Resources*
This should be widely interpreted. It covers anything from managing a budget to managing accommodations, stores, and equipment. The key question is, Does the individual achieve value for money for resources controlled or influenced?

C. Communication

1. *Oral Communication*
You should be looking for confidence, conciseness, clarity, and the ability to be convincing. The individual who is readily understood rather than over-talkative or muddled will attract high marks. Take into account telephone conversations as well as face-to-face communication. Indicate the scope offered by the post and how the individual responds to the needs of the listener.

2. *Written Communication*
What is important is the ability to be clear, logical, and persuasive; to understand the needs of the reader. Inelegant style and bad handwriting should not be given weight unless they seriously interfere with the effectiveness of the job.

D. Working Relationships

1. *Relations with Other Staff*
The individual who commands respect and is able to appreciate other people's difficulties and suggest useful solutions to them will be marked highly. This person's relationships with others should be tactful and considerate, rather than amiable but insensitive. Try to identify whether the individual shows awareness of the problems of others.

2. *Relations with the Public*
Many of the qualities to watch for are those needed to deal well with other staff. Staff who treat members of the public with promptness, courtesy, tact, and patience will attract a high mark. Individuals who do not take account of the public's problems, who are needlessly brusque, or who ignore or belittle the needs of those they deal with will receive a low mark.

E. Application of Knowledge/Skills

1. *Professional and Technical Knowledge*
An individual's efforts to expand their knowledge and keep abreast of current thinking will tell you a lot about their motivation and approach to their job.

2. *Application of Knowledge and Skills*
Lack of application of knowledge and skills can be caused by staff not having enough confidence in their knowledge, or they may be unable to select and apply what is required. An individual with a limited amount of professional knowledge who applies it to good effect should get credit.

3. *Numerical Ability*
The ability required will vary according to the grade or the nature of work, so you should indicate the nature and amount of numerical work as well as the standard achieved. A high mark will be given to staff with a good understanding of figure work who are capable of interpreting and using numerical material readily and applying it to day-to-day problems.

Exhibit 4.
Background Information on Scientists in the Department of Soil Science

Name	Age	Years of Experience	Highest Qualification	Area of Specialization	Job Title	Grade
Maria Cuahepe	28	5	BS	Soil Chemistry	R.O. II	E6
Thomas Gonzalez	34	10	PhD	Soil Physics	R.O.I	E5
Carlos Brun	37	12	MSc	Soil Chemistry	Senior R.O.	E3
Elizabeth Trigo	42	15	PhD	Soil Chemistry	Principal R.O.	E2
Francis Gomez	45	20	BS	Soil Microbiology	Senior R.O.	E3

Exhibit 5.
Annual Performance Assessment Forms of Scientists in the Department of Soil Science

(Following pages)

Annual Performance Assessment

Name: Maria Cuahere **Department:** Soil Science NCRI

Definition of ratings

1	=	Outstanding	4	=	Performance not fully up to requirements, some improvement necessary
2	=	Performance significantly above requirements	5	=	Unacceptable
3	=	Performance fully meets requirements of the grade			

Give a rating from 1 to 5 for each relevant aspect of performance, making full use of the space for your comments

Work Activity	
[3] Quality of work	Significant improvement but still only normal for this grade. The commitment is there, though.
[4] Output of work	With only two small research projects, output is still not high enough.
[3] Planning of work	Heavily reliant on the assistance of senior colleagues in formulating research projects and implementing them.
Management	
[3] Management of staff	Management responsibilities limited to supervising two laboratory assistants, which she does well.
[2] Effective use of other resources	Very good. Is conscientious and efficient in use of resources.
Communication	
[2] Oral communication	An articulate and effective communicator.
[3] Written communication	Adequate.
Working relationships	
[1] Relations with other staff	She is very popular, supportive, and considerate. She is a good team member.
[1] Relations with the public	An excellent public relations person for the department.
Knowledge/skills	
[3] Professional and technical knowledge	Still urgently in need of postgraduate training. Until she receives this, her performance will show little improvement.
[3] Application of knowledge and skills	Lack of effective supervision has clearly been a major problem.
[3] Numeric ability	

[3] Overall rating	

Reporting Officer's Signature: _____ Date: 23/6/87

Interview Summary

Date of Interview: 23 June 1987

Good discussion of the assessment. General agreement on major points.
Provision of suitable postgraduate training continues to be the major problem.

Job Holder's Comments

I generally agree with my assessment.
It is difficult to do research when you lack the necessary training and supervision.

Signature: Marion Cushere Date: 7 July 1987

Countersigning Officer's Comments

Signature: _____ Date: _____

Annual Performance Assessment

Name: Thomas Gonzalez **Department:** Soil Science, NCRI

Definition of ratings

1	=	Outstanding	4	=	Performance not fully up to requirements, some improvement necessary
2	=	Performance significantly above requirements	5	=	Unacceptable
3	=	Performance fully meets requirements of the grade			

Give a rating from 1 to 5 for each relevant aspect of performance, making full use of the space for your comments

Work Activity	
[2] Quality of work	Two good-quality publications this year. He has continued to maintain a very high standard of research.
[3] Output of work	Adequate, but his perfectionism and desire to produce original research is a real problem at times. The relevance of much of this research is highly questionable.
[4] Planning of work	Still too much of an individualist with his own rather specialized research interests taking precedence.
Management	
[4] Management of staff	Continues to pay inadequate attention to his supervisory responsibilities. His staff are in urgent need of more supervision, but he seems unwilling to provide this.
[3] Effective use of other resources	Barely adequate, especially in view of the relatively high cost of his research and the present acute shortage of resources.
Communication	
[3] Oral communication	His argumentative nature presents some problems for effective communication with colleagues and others.
[3] Written communication	Satisfactory. Attending the PSC training course in writing skills has helped a lot.
Working relationships	
[4] Relations with other staff	He still remains too much of a loner who is unwilling to take a full and active part in the activities of the department.
[4] Relations with the public	He is a poor public speaker and his aloof nature tends to make for unsatisfactory relationships with outsiders.
Knowledge/skills	
[2] Professional and technical knowledge	As eager as ever to keep abreast of all major developments in his field. The lack of training opportunities, especially overseas, is frustrating for him.
[3] Application of knowledge and skills	Adequate, but shortage of chemicals and equipment often make it hard to effectively utilize his skills.
[1] Numeric ability	Excellent.

[4] Overall rating	

Reporting Officer's Signature: [signature] Date: 2/7/87

Interview Summary

Date of Interview: 2 July 1987

Long, one-hour discussion of assessment, in particular his attitude toward research and departmental research priorities. He tends to be overly sensitive to criticism and seems unprepared to change his work behavior.

Job Holder's Comments

I disagree strongly with much of this assessment. I work hard and produce top-quality research. I've had good feedback from extension personnel, so how can Dr. Parker say that its relevance is "questionable"? I do what I'm told. I am not a "loner" or "argumentative". Anyway, my behavior is irrelevant. It is what I produce that matters.

Signature: T. Gonzalez Date: 18 July 1987

Countersigning Officer's Comments

Signature: _____ Date: _____

Annual Performance Assessment

Name: Carlos Brun **Department:** Soil Science, NCRI

Definition of ratings

1	=	Outstanding	4	=	Performance not fully up to requirements, some improvement necessary
2	=	Performance significantly above requirements			
3	=	Performance fully meets requirements of the grade	5	=	Unacceptable

Give a rating from 1 to 5 for each relevant aspect of performance, making full use of the space for your comments

Work Activity	
[3] Quality of work	Above average but could be significantly higher given greater concentration and application.
[3] Output of work	Not as high as last year. He has spent too much time on maize fertilizer trials with limited benefits. The on-farm research, especially on the use of cow manure has suffered as a result.
[3] Planning of work	Project formulation satisfactory although still a tendency to be overly ambitious.
Management	
[2] Management of staff	Generally good supervision of technical support staff he works with.
[3] Effective use of other resources	Adequate but his own time management could be improved.
Communication	
[3] Oral communication	Lacks confidence as a public speaker but communicates effectively with colleagues.
[2] Written communication	Generally good -- clear and concise.
Working relationships	
[3] Relations with other staff	No complaints.
[4] Relations with the public	Needs to spend more time with extension personnel and out in the field with farmers. Expects them to come to him.
Knowledge/skills	
[3] Professional and technical knowledge	Tries hard to keep up to date on professional and technical knowledge despite continuing problems of access to journals and other literature.
[3] Application of knowledge and skills	Ok, but tendency to be unduly narrow in approach.
[2] Numeric ability	Good.

[3] Overall rating	

Reporting Officer's Signature: _____ Date: 3/7/1997

Interview Summary

Date of Interview: 3 July 1987

Reviewed assessment. He was concerned to point out some of the extenuating factors that have affected his work this year. Still eager to go for Ph.D. training despite his age.

Job Holder's Comments

I am doing my best under difficult circumstances. The on-farm research had to be heavily curtailed because of lack of vehicles and support staff.

It is up to management to make sure these resources are available for us!

I would have liked more time and opportunity to discuss these problems with Dr. Pavier. 20 minutes is not enough!

Signature: _____ Date: July '87

Countersigning Officer's Comments

Signature: _____ Date: _____

Annual Performance Assessment

Name: Elizabeth Trigo **Department:** Soil Science, NCRI

Definition of ratings

1	=	Outstanding	4	=	Performance not fully up to requirements, some improvement necessary
2	=	Performance significantly above requirements			
3	=	Performance fully meets requirements of the grade	5	=	Unacceptable

Give a rating from 1 to 5 for each relevant aspect of performance, making full use of the space for your comments

Work Activity	
[1] Quality of work	First rate.
[2] Output of work	Extremely hardworking, Elizabeth has maintained very high output.
[2] Planning of work	Well formulated projects in accordance with departmental priorities and highly relevant to farmers' needs.
Management	
[3] Management of staff	Bit of a taskmaster, but her staff respect her and know clearly where they stand.
[3] Effective use of other resources	Adequate.
Communication	
[3] Oral communication	Direct, unambiguous and economical.
[2] Written communication	Good, clearly written outputs.
Working relationships	
[3] Relations with other staff	Somewhat impatient and impetuous at times but generally good, supportive relationships with colleagues
[2] Relations with the public	Strongly committed to working with extension and farmers. Her long experience with on-farm research has made her a good communicator (and listener).
Knowledge/skills	
[1] Professional and technical knowledge	She is a recognized expert in her field.
[2] Application of knowledge and skills	Good.
[3] Numeric ability	Adequate.

[2] Overall rating	

Reporting Officer's Signature: _____ Date: 26/6/87

Interview Summary

Date of Interview: 26 June 1987

A little unhappy that she did not receive an outstanding rating, but I explained that this was a new scheme with more stringent criteria and that she could not expect to be outstanding every year.

Job Holder's Comments

I do not understand why I have received a 4 rating when he admits that my work is of a very high standard. I received "outstanding" last year under the old scheme. Nothing has changed since then, so why the lower rating?

Signature: Elizabeth [illegible] Date: 7/07/87

Countersigning Officer's Comments

Signature: _____ Date: _____

Annual Performance Assessment

Name: Francis Gomez **Department:** Soil Science, NCRI

Definition of ratings

1	=	Outstanding	4	=	Performance not fully up to requirements, some improvement necessary
2	=	Performance significantly above requirements	5	=	Unacceptable
3	=	Performance fully meets requirements of the grade			

Give a rating from 1 to 5 for each relevant aspect of performance, making full use of the space for your comments

Work Activity [5] Quality of work [ ] Output of work [ ] Planning of work	His work is entirely unsatisfactory for the simple reason that he is excessively preoccupied with running his family business. He is repeatedly late and absent during work hours.
Management [ ] Management of staff [ ] Effective use of other resources	
Communication [ ] Oral communication [ ] Written communication	
Working relationships [ ] Relations with other staff [ ] Relations with the public	
Knowledge/skills [ ] Professional and technical knowledge [ ] Application of knowledge and skills [ ] Numeric ability	

[5] Overall rating	

Reporting Officer's Signature: _____ Date: 30/6/07

Interview Summary

Date of Interview: 30 June 1987

He was even late for his interview!
He assures me that things will improve next year.

Job Holder's Comments

I accept that my outside interests have adversely affected my work this year – although not as badly as Dr Pano has made out. I think he could have been a little more sympathetic. My father died recently leaving me to run the business single-handed. I didn't really get a chance to explain this because I was being lectured to most of the time.

Signature: Trevor Gong Date: 10 July 1987

Countersigning Officer's Comments

Signature: _____ Date: _____

CASE STUDY
JOB EVALUATION AT PARI: TECHNICAL SUPPORT PERSONNEL*

Paul Bennell

Introduction

The sun was disappearing fast behind the distant hills. It had been a hard day for Professor Peter Akim, Director of the Pulat Agricultural Research Institute PARI). That morning he had met with a delegation of technical support personnel from the institute.

Members of the delegation had once again reiterated their various concerns about the role of technical support personnel in the institute.

Mr. Arthur Tomiki, a senior field technician with over 20 years of experience had neatly summarized these concerns:

"We feel that the value of our work as technical support personnel is not being given adequate recognition. You know very well that we are the ones who keep the institute going on a day-to-day basis. It is the technical support personnel who run the laboratories and supervise the hundreds of crop and livestock experiments. What is more, with such serious shortages of research scientists at many stations, we are saddled with many of their duties and responsibilities as well! There are just too few technical support personnel in PARI with the result that we are generally overworked.

"In short, our status and rewards do not correspond enough with what we actually do. Nor is there any meaningful career structure for technical support personnel. As you are aware, the highest technician grade is C1, which in salary terms is equivalent to A7 on the professional scale. This is what young scientists get after only three or four years! We thought that the situation would improve with the creation of PARI as a semi-autonomous institution. Certainly the research scientists got a better deal out of it but not us.

"At one level this is a historical problem. It is a legacy of the colonial period when scientists were mainly expatriates with nationals confined to technical support positions. But equally important is the fact that, quite frankly, management don't have a clear enough idea of what our present tasks and responsibilities are. Because there are no formal job descriptions, it is difficult to know what is expected of us. And, of course, this makes recruitment a headache as well. Agricultural research activities in Pulat have grown enormously in scope and sophistication during the last 20 years or so. Consequently, our tasks and responsibilities as technical support personnel have become more diverse and complex, and yet there have been virtually no changes in our grading and salary structures.

"So it is not simply a question of wanting better salaries. What we also want are carefully and logically designed jobs with clearly defined duties and responsibilities. We urgently request therefore that a comprehensive job evaluation exercise be undertaken as soon as possible — one that will form the basis for significant improvements in the career structure and the overall utilization of the technical support group."

Akim realized that his problem wasn't going to go away. He would have to do something about these concerns of the technical support personnel although he did not regard this as one of his highest priorities.

The Pulat Agricultural Research Institute

PARI is a semi-autonomous institution within the Ministry of Agriculture and Natural Resources. It has an overall mandate for all publically-funded crop, livestock, and forestry research in the Republic of Pulat (which had a total population of 44.7 million people in 1985). PARI has its own board of governors appointed by the President.

*This case was designed to serve as a basis for class discussion, rather than to illustrate either effective or ineffective management policies or practices. The case is based on information drawn from a variety of unpublished sources.

PARI was only granted semi-autonomous status in 1985. Prior to this it had been a department of the Ministry of Agriculture and Natural Resources (MANR). However, the government had been convinced by the research community and powerful external donors that an agricultural research institution needed considerable organizational and managerial autonomy. A key aspect of this autonomy was PARI's ability to devise its own career and salary structures for its personnel.

Overall employment in PARI was 1389 in December 1988, with a total of 150 separate job positions based on area of specialization and grade level. These jobs were distributed across six main grades, from *A* to *F* (see exhibits 1, 2, and 3).

Technical Support Personnel

Technical support jobs in PARI are heterogeneous and diverse in terms of both the type and level of tasks and associated skills required for their successful performance (see exhibits 2 and 3). These jobs are subdivided into two main groups, technician and technical assistant.

Technicians belong to job group *C*, which has three grades within it. Other than completing four years of secondary education, there are no formal qualification requirements for technician jobs. However, increasingly most technician recruits have undertaken two years of specialized post-secondary training in a relevant discipline and have obtained a National Technical Diploma.

Technical assistants in PARI perform lower-level technical support jobs. They are grouped into job group D, which again has three grades. Minimum educational requirements for technical assistant jobs are two years of postsecondary education. In the past, specialized training was provided on the job. As with technicians, however, increasing reliance is being placed on the acquisition of specialized training in the recruitment and promotion processes.

At any one time, the number of establishment positions are fixed for each area of specialization and level of competence and responsibility (see exhibit 3). Promotion to job positions in the next grade is on the basis of the availability of vacancies and the fulfillment of certain performance and

Exhibit 1. Numbers of Employees by Job Classification

		Establishment positions	In post	Different job positions
A	Professional Scientists	246	225	10
B	Professional Administrators	22	20	9
C	Technicians	130	110	42
D	Technical Assistants	174	135	54
E	Semi-skilled workers	215	204	23
F	Labourers, unskilled workers	602	592	12
	Totals	*1,389*	*1,286*	*150*

Exhibit 2. Grade Structure of Technical Support Personnel

Technicians

C1 Station Superintendent
Senior Technician

C2 Station Superintendent II
Field Technician I
Laboratory Technician I
Workshop Supervisor
Biometrics/computer technician I

C3 Field Technician II
Laboratory Technician II
Workshop Technician II
Biometrics/Computer Technician II
Technical Assistants

Technical Assistants

D1 Foreman I
Senior Technical Assistant

D2 Laboratory Assistant I
Artisan I
Foreman II
Field Assistant I

D3 Laboratory Assistant II
Artisan II
Chargehand
Field Assistant II

Exhibit 3. Main Areas of Specialization and Number of Established Positons by Grade Level of Technical Support Personnel

Specialization	C1	C2	C3	D1	D2	D3
Station Superintendent	3	4	—	—	—	—
Foremen/Chargehand	—	—	—	6	7	10
Soil survey/Cartography	4	6	8	4	3	7
Soil and Chemical Analysis	2	3	3	4	7	11
Agronomy and Breeding	4	6	10	7	9	13
Seed Analysis	1	1	2	0	2	3
Plant Protection/taxonomy	5	8	11	4	6	8
Instrumentation/electronics	0	2	1	0	1	0
Livestock Management	3	8	7	2	4	8
Livestock Breeding	2	3	3	3	2	6
Livestock Diseases	2	2	4	2	1	2
Mechanical Engineering	1	2	2	2	2	2
Computer Operations	1	1	0	1	2	0
Statistical Analysis	0	2	1	1	0	1
Information Services	0	1	0	2	1	0
Artisan-electrician	—	—	—	2	1	2
Artisan-mechanic/welder	—	—	—	4	3	2
Artisan-carpenter	—	—	—	1	2	0
Artisan-machinist	—	—	—	1	0	0

experience requirements (generally at least four years satisfactory performance in each grade) However, performance requirements are only vaguely specified for most job positions.

Technicians cannot be promoted to the professional *A* job group unless they have obtained a relevant university degree. In general, technical support personnel have relatively more years of work experience than their professional colleagues (see exhibit 4). However, their salaries are considerably less (see exhibit 5).

Akim's Response

Akim spent the following week mulling over how he should tackle the problems of the technical support personnel. In terms of the scope of the job evaluation exercise that could be undertaken, there appeared to four main options — namely, evaluate

- all 150 separate job positions;
- professional, administrative, and technical support jobs (i.e., skilled positions);
- technical support jobs only;
- only those technical support jobs that appeared to be particularly badly designed.

The delegation of technical support personnel had insisted that all jobs in PARI should be evaluated. However, Akim was unhappy about this because he believed that it would take too much time and effort and there was the danger of upsetting even more employees. He decided therefore to initiate a job evaluation analysis of just technical support jobs.

Akim had consulted with the head of the Personnel department, Mr. Walter Murane, who helped him clarify the main

Exhibit 4. Experience Profiles by Job Group (percent)

		Years of Work Experience in Job			
		0-5	6-10	11-20	20+
A	Professional	42	29	20	9
B	Administration	33	35	18	14
C	Technician	26	24	27	23
D	Technical Assistant	31	23	27	19
E	Semi-Skilled Worker	25	21	22	32
F	Unskilled Worker	23	19	24	34

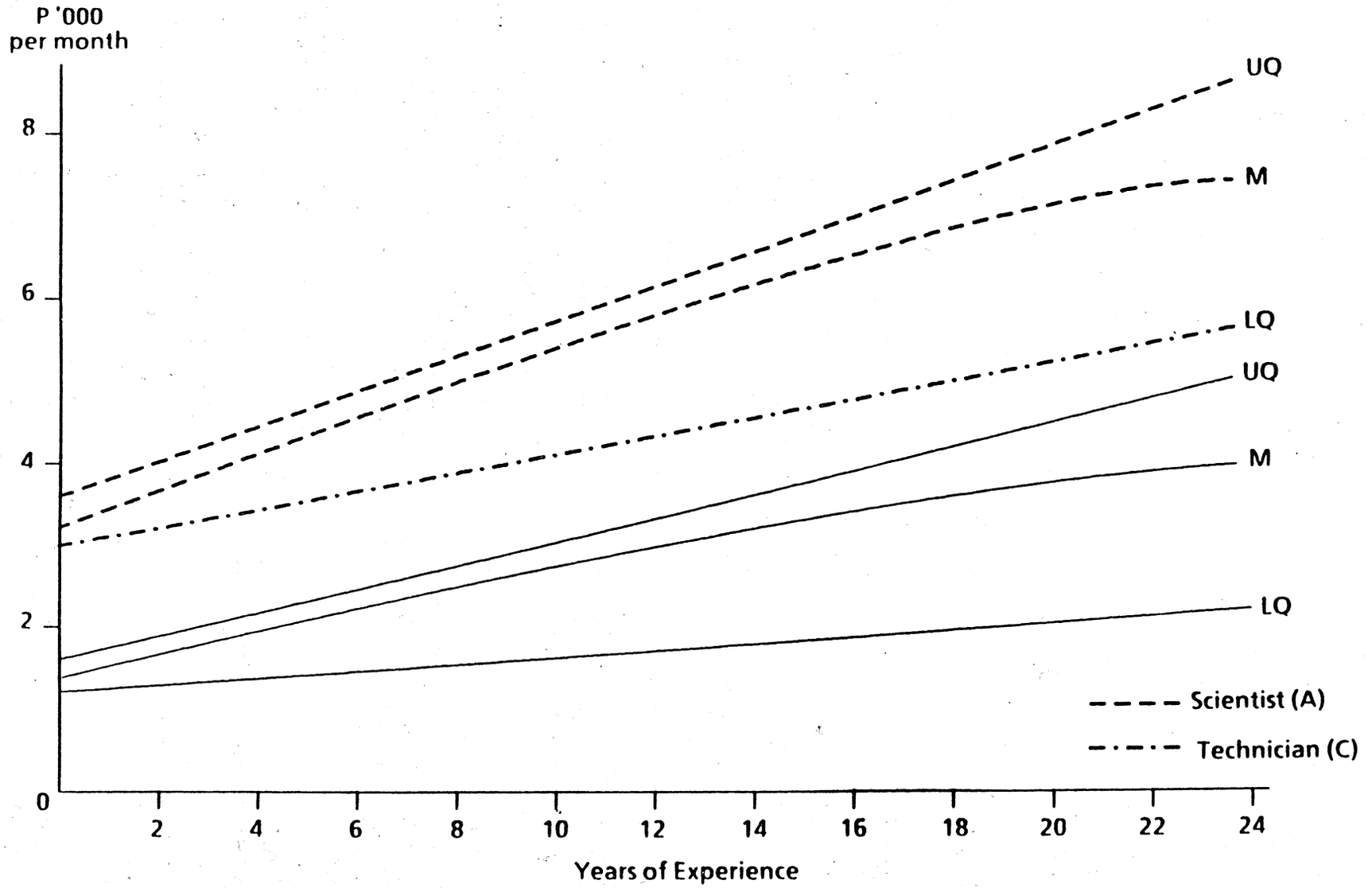


Exhibit 5. Upper and Lower Quartile and Median Salary-Experience Profile for Research Scientists and Technicians at PARI

sets of questions such an exercise should answer. They subdivided these into three groups:

1. JOB ANALYSIS OF CURRENT JOBS:

- What is done?
- What duties and tasks are performed?
- When and why are these tasks undertaken?
- How are they undertaken?
- What skills are required?

2. JOB DESIGN:

- What should be done?
- What skills are required?
- How should present jobs be modified?
- What new types of jobs (if any) should be created?
- How many people are required to perform each type of job?

3. CAREER STRUCTURE AND REWARDS:

- How should jobs be grouped and graded?
- What salary(or salaries) should be attached to each grade?
- How should people proceed from one grade to another?

Murane recommended that in order to answer these three sets of questions effectively, the following sequence of activities would need to be undertaken:

1. Preparation of job-analysis questionnaire — Murane consulted a standard text on the subject. He believed that the questionnaire in this book would, with minor modifications, be suitable for the job analysis of technical support personnel in PARI (see exhibit 6).

2. Completion of questionnaires by technicians, technical assistants and responsible managers — With over 300 technical support personnel, Akim and Murane decided that a random sample of 25% should be sufficient.

3. Analysis of questionnaires by the Personnel department and senior management.

4. Formulation of new job descriptions clearly specifying task and skill requirements (exhibit 7).

5. Derivation of estimates of the numbers of each job type required.

6. Comparison and ranking of each job type.

7. Development of appropriate grade and salary structures.

8. Discussion of proposed scheme with technical support staff.

9. Submission of scheme to Board of Governors for review and approval.

10. Assignment of existing technical support to new jobs and grades.

11. Recruitment of new personnel where necessary.

Conclusion

Akim hoped that the whole exercise (at least up to stage 9) could be completed in six months. The Personnel department would have the major responsibility for both the data collection and analysis. Neither Murane nor his other professional colleague, Mrs. Omini, had much prior experience of job evaluation techniques, but Akim was confident that with the proposed simple procedures they could cope.

Getting the questionnaire right was crucially important. He would need to go over it again with Murane before it was distributed to the technical support staff. But, apart perhaps from a few changes, it seemed o.k. to him.

Akim was well aware that getting it through the Board of Governors would not be easy. The man from the treasury would, as normal, be particularly worried about the cost implications of any changes to grade and salary structures.

But first things first. Akim had arranged another meeting with the delegation of technical support personnel for later that week in order to discuss the proposed job evaluation exercise. No doubt they would have certain things to say about it!

1 Last Name | First | Middle Initial

2 Official Title of Position

4. Department

5 Division

6. Section or Other Unit of Division

7. Place of Work (address, city, county)

3 Regular Schedule of Hours of Work

	From	To
Mon		
Tue		
Wed		
Thur		
Fri		
Sat		
Sun		

Length of Lunch Period

Total Hrs. P/Wk

Explain rotation of shifts if any

Hrs of "On-Call" Time per wk

8 Is your work: Full-time? Part-time? Year-round? Seasonal? Temporary? (Check each applicable circle)

If your work is seasonal, temporary or part-time, indicate part of year or proportion of full-time:

9. Do you receive maintenance (room, meals, laundry, etc.) fee, or pay in addition to your cash salary? Yes No

10 Describe your work in order of importance and estimate the amount or percent of time you spend on each task or group of tasks. Use additional sheets if necessary

TIME	WORK PERFOMED	LEAVE BLANK

11 Name and Title of Your Immediate Supervisor:

12 Give the names and payroll titles of employees you supervise, if five or fewer. If you supervise more than five employees, give the number under each title. If you supervise no employees, write "none"

13 Machines or equipment used regularly in your work. Give per cent of time spent in operation of each:

	%		%
	%		%
	%		%

14 What are the nature and extent of instructions you receive regarding your work?

15 What are the nature and extent of the check or review of your work?

16. Describe your contacts with departments other than your own, with outside organizations, and with the general public

Certification: I certify that the above answers are my own and are accurate and complete

Date _____ Employee's Signature _____

STATEMENT OF GENERAL SUPERVISOR

17. Comment on statements of employee. Indicate any exceptions or additions

18 What do you consider the most important duties of this position?

19 Indicate the qualifications which you think should be required in filling a future vacancy in this position. Keep the position itself in mind rather than the qualifications of the individual who now occupies it

	Basic Qualifications	Additional Desirable Qualifications
Education, general		
Education, special or professional		
Experience, length in years and kind		
Licenses, certificates of registration		
Special knowledges, abilities, and skills		

Date _____ General Supervisor's Signature _____

STATEMENT OF DEPARTMENT HEAD OR OTHER ADMINISTRATIVE OFFICER

20 Comment on the above statements of the employee and the supervisor. Indicate any inaccuracies or statement with which you disagree

Date _____ Department Head's Signature _____

Exhibit 6. A Standard Job Evaluation Questionnaire

Exhibit 7
Job Description Form

Job Group: _____

Descriptive Title: _____ Job Grade: _____

Summary:

_____

_____

_____

_____

_____

Duties/Responsibilities: **Percent of Time**

1— _____ _____

2— _____ _____

3— _____ _____

4— _____ _____

5— _____ _____

6— _____ _____

Distinguishing Features of Job:

_____

_____

_____

_____

_____

_____

Minimum Basic Requirements of Job:

Education/Training:

Experience:

Competence and Aptitude:

Additional Desirable Requirements:

Knowledge:

Abilities:

Personal Qualities:

Appendix

Country Reports

SACCAR/ISNAR WORKSHOP ON HUMAN RESOURCE MANAGEMENT

2 - 6 May 1989

Human Resource Management Country Reports*

In preparation for the workshop, please work together with the other participants from your country to prepare a brief report on human resource management in your organization. These reports will form the basis for linking workshop presentations with your experiences and will facilitate the exchange of ideas with participants from other countries.

The outline provided below follows the structure of the workshop. Develop your country report according to the outline, using the questions in each section as guidelines. Keep the report brief. Each of the seven sections should be no longer than one page.

When preparing the report, highlight the critical human resource management problems that you have encountered in each area. How did you solve the problems? What have you learned from your experiences in human resource management that may be useful to participants from other organizations?

Each member of the country team should bring a copy of the completed report to the workshop.

Outline by Management Topic

I. Human Resource Assessment

- Does your organization have a procedure for collecting and assessing information about its research scientists?
- How is information collected about the following:
  - Areas of researcher expertise
  - Skills and capabilities
  - Strengths and weaknesses
- Is researcher capability reviewed periodically or only in response to a particular inquery?

II. Strategic Human Resource Planning

Briefly describe the process used in your organization to develop a plan for human resource management.

- What is the objective of the strategic human resource plan?
- Who is involved in human resource planning? Researchers, planners, directors, managers?
- To what extent is human resource planning influenced by agents external to the NARS, such as other government ministries or departments, or donors?
- What is the planning period for strategic human resource plans? Short term (less than 5 years), medium term (5-10 years), or long term (more than 10 years)?
- What kinds of information are used in formulating the plan? Where does that information come from?
- Who gets information about the completed plan? In what form do they get that information?

III. Recruitment/Selection

- Does your organization have a procedure for filling vacant positions?
- How does your organization *identify and define vacancies*?
  - Who identifies vacant positions?
  - Who defines the skills required to fill a vacant position?
  - How are vacant positions defined? By function, administrative grade, educational requirements?
- How does your organization *identify candidates* for filling vacant positions (Recruitment Strategy)?
  - Where are candidates drawn from?
  - Are positions advertised? If so, where?
  - Are job descriptions used to advertise positions?
- How does your organization *select candidates* for positions (Assessment Strategy)?
  - How are candidates matched to positions?
  - Are candidates interviewed for positions?
  - What criteria are used to select candidates?

*This outline was sent to each participant prior to the workshop.

IV. Socialization

Once a candidate is selected for a position, how is he/she introduced to the organization?

- What kind of orientation is the individual given to the organization's
  - Structure
  - Strategy/objectives/vision
  - Physical resources
  - Operating procedures
  - Internal and external communication processes
  - Culture
- What kind of orientation is the individual given to his/her own position in terms of the following?
  - Job description
  - Function within the organization
  - Expected contribution to organization's objectives
  - Organizational support
  - Potential for future career development
  - Evaluation procedures
- Who is responsible for administering this orientation?
- Is there a reorientation program for staff members who have been away from the organization for some time?

V. Training/Development

- Does your organization have a training plan?
- Does the plan include training for all staff members?
- Who (training officer, colleagues, individual) is responsible for the following?
  - Identifying training needs
  - Identifying training opportunities
  - Selecting staff for training
- How are training needs identified?
- How are training opportunities identified?
- How are staff selected for training?
- What types of training programs are offered?
- How is training supervised?
- How is the impact of training evaluated?

VI. Career Development

- Is there a well-defined path for staff career development in your organization?
- Briefly describe the following:
  - Levels/stages along the career path
  - Requirements and procedures for moving from one level to another
  - Mechanisms for determining an individual's progress along the path
- How does the organization provide for problems in advancement, such as bottlenecks along the career path?

VII. Performance Management

- Does your organization have a formal procedure for evaluating and managing an employee's performance?
- Briefly describe the procedure for assessing/evaluating performance.
  - What are the objectives of individual performance assessment?
  - Who is involved in assessing an individual's performance?
  - How often is performance evaluated?
  - What criteria are considered?
- Briefly describe the procedure for managing an employee's performance.
  - What are the objectives of performance management in your organization?
  - How does the organization assist individuals in improving their performance?
  - What methods/rewards are used to manage individual performance?

COUNTRY REPORT
BOTSWANA

E. J. Kemsley, O. B. Mmolawa, and L. L. Setshwaelo

Human Resource Assessment

The annual assessment of public officers is used to appraise individual performance on the job during the year. The officers write a brief description of their jobs, thereby indicating their perception of the job and its responsibilities. Feedback on the supervisor's evaluations of each officer's performance is obtained through comments made by the officer and subsequent discussions where necessary. Officers are given a reward for merit in the form of an incremental increase in annual salary.

There is no formalized way to obtain information on the officers' expertise, skills, capabilities, strengths, and weaknesses. All this information should be clear to supervisors through day-to-day interactions with the researchers and also from the technical reports, both written and oral, they present in the course of their professional duties. No formal review of officers' capabilities is done, however. They can only be assessed on their expertise and capabilities in regard to the work they are doing.

Strategic Human Resource Planning

Along with its other responsibilities, the department of agricultural research is charged with building up local research expertise and capabilities through long- and short-term training to strengthen the staffing resources of the country. The government requires that all departments develop recurrent annual staffing budgets, and these are expected to take into consideration set ceilings in terms of the allocation of new posts. These staffing requests receive very careful scrutiny to avoid too a rapid build-up of the civil service. Requests for new posts are mainly based on a department's needs for new projects and to provide positions for returning trainees. Human resource planning is the responsibility of the director of agricultural research and the division heads, assisted by each department's senior administrative officers. However, input from research staff is obtained through staff representatives, who are members of the department's executive committee and key officers in various research projects.

Planning is influenced by government-imposed ceilings on staffing and long-term staffing plans that are supposed to be taken into account when the departmental budgets are prepared. Competition for returning trainees with other departments within the ministry or even with other ministries or the private sector is a serious problem, as is competition for the limited number of available scholarships for in-service training. Unfortunately, most of the long-term training is dependent on donor-funded scholarships.

Human resource planning at departmental level is mainly short-term in that recruitment and training are based on current needs. Current quality, staffing levels, and needs for new projects are considered when staffing plans are developed. This information is prepared by the department and then sent to the Department of personnel service and management through the ministry headquarters training division.

Recruitment/Selection

From time to time division heads are made aware of existing vacancies by the administrative section. They are then responsible for writing job descriptions and advertising the posts locally, and internationally where appropriate. Since positions are mainly defined by function, it is important that proper job descriptions be developed and that these also indicate the level of qualifications required. Applications, including curricula vitae, are evaluated by the director and division heads to select the two most suitable candidates. These two candidates will then be called in for an interview where possible. When the applicant can not be interviewed locally, an international agency (such as ODA) may be requested to hold the interviews on behalf of the department. In such cases the department has to give final approval to the candidate selected.

Socialization

It is the duty of the division head to ensure that the candidate is properly familiarized with the structural and functional organization of the department. The new officer will normally be handed over to one colleague for orientation after proper introduction to other members of the division.

No orientation is given to officers who have been away on training. Only a briefing is held to update them on new developments and activities in the department and what new responsibilities they are to assume. This also includes a discussion of what their own plans are. After this briefing, a new job description is often written specifically for the returning officer.

Training/Development

All government departments are expected to prepare annual training plans based on their staffing needs and current situation, addressing the needs in all catagories (long- and short-term). Division heads, together with the director, are responsible for identifying training needs, selecting staff for training, and identifying training opportunities. Individual sections within divisions are evaluated on the basis of their staffing status, as well as their training capabilities and priorities, with the help of key officers in charge of the projects.

Individuals selected for training from the various disciplines are chosen not only according to their potential for high performance in their studies but also on the job when they return. However, the availability of training opportunities is very limited, so there are constraints on who is actually selected to take part in training; sometimes whoever happens to be available at that point in time may be selected. Both long- and short-term training are offered for both professional and technical staff. Since most training is done outside the country, supervision is all but impossible.

COUNTRY REPORT
LESOTHO

P. Q. Cweba, P. Lekhotla, and T. Namane

Introduction

Following the era when Lesotho exported food to the Union of South Africa, a period of food shortages occurred. This eventually led to the establishment of agricultural research in the country, starting in 1952 as a small unit in the department of crops. The unit primarily focused on research in field crops (wheat, maize, and sorghum), some range management, and later, limited horticultural crops. Research staff in these early days was comprised of expatriates (primarily British) and local staff (agricultural demonstrators), who were trained in the Cape Province. In 1955 the Lesotho Agricultural College was established to train farm educators and researchers for the ministry of agriculture.

The division of agricultural research was established in 1979 with 10 research programs. Table 1 shows the staff in 1988, and table 2 shows the tentative staff-development plan for the division until the year 2000.

Human Resource Assessment

The organization does not have set guidelines for collecting and assessing information about its research scientists. However, some form of annual assessment is done on all public officers to determine their capabilities. The manager of the organization will then make comments based on this assessment, both to provide feedback to the officers and for record-keeping purposes.

Table 1. Staffing Situation in the Agricultural Research Division, by Current Research Programs, 1988

	Available Positions				In Training			
Discipline	PhD	MSc	BSc	Dipl	PhD	MSc	BSc	Dipl
Administration	1*	3	1	0	1	0	0	0
Agronomy	1*	0	0	2	1	0	2	0
Soils	1*	0	1	2	0	0	1	0
Seed Technology	0	0	1	0	0	0	0	0
Horticulture	1*	1	1	2	0	0	1	0
Plant Pathology	0	0	0	1	1	0	0	0
Entomology	0	1	0	0	0	0	1	0
Animal Science	1*	0**	1	0	1	0	1	0
Range	0	0	2	1	0	0	0	0
Human Nutrition	0	1	0	1	0	0	0	0
Marketing	0	0	0	0	0	2	0	0
Farm Management	1*	0	1	0	1	0	0	0
Rural Sociology	1*	1**	0	0	0	0	0	0
Agric. Engineering	0	1*	0	1	0	1	0	0
Extension	0	0	0	2	0	0	0	0
Farm Foreman	0	0	0	1	0	0	0	0
Library	0	0	0	1	0	0	0	0
Total	7*	8	8	14	5	3	6	0

*Expatriates with projects.
**Qualified person resigned.

Table 2. Projected Staffing Situation at Agricultural Research Division, 1990 to 2000

	1990				1995				2000			
Discipline	PhD	MSc	BSc	Dipl	PhD	MSc	BSc	Dipl	PhD	MSc	BSc	Dipl
Administration	1	3	1	0	1	3(1)	0	0	2	2	0	0
Agronomy	1	(1)	1	1	1(1)	(1)	1	1	2(1)	(1)	(1)	1*
Soils	0	1(1)	1	2	1	1	1(1)	1	1	1(1)	1	1
Seed Technology	0	0	1	0	0	(1)	1*	0	1	1	0	1*
Horticulture	0	1(1)	1	0	1	1	1	1*	1(1)	(1)	1	0
Plant Pathology	1	0	(1)	0	1	(1)	0	1*	1	1	(1)	1*
Entomology	0	1	0	1	0	1	(1)	0	(1)	0	1	1*
Animal Science	(1)	(1)	1	0	1	1(1)	0	1*	1	2	(1)	0
Range	0	(1)	1(1)	0	(1)	1	1	0	(1)	(1)	1	1*
Human Nutrition	0	1	1*(1)	0	(1)	(1)	1	0	1	1(1)	0	1*
Marketing	0	2	0	0	0	2	0	1*	(1)	1	(1)	1*
Farm Management	1	0	1	0	1	(1)	0	0	1	1	0	1*
Rural Sociology	0	1	1*	0	0	1(1)	0	1*	0	2	(1)	0
Ag. Engineering	0	1	(1)	0	0	1(1)	0	2*	0	2	(1)	1
Extension	0	0	0	2	0	0	(1)	0	0	1(1)	(1)	2*
Farm Foreman	0	0	0	1	0	0	0	1	0	0	0	1
Library	0	0	0	1(1)	0	0	(1)	1	0	0	1(1)	(1)
Total	4(1)	11(5)	10(4)	8(1)	7(3)	12(9)	6(4)	11	11(5)	15(6)	5(8)	13(1)

() = On training for the indicated degree.
*To be recruited for new position.

Information on the expertise, skills, strengths, and weaknesses of each researcher is collected from reports made by immediate supervisors and from other relevant documents like certificates and testimonials. Generally, no regular review is conducted.

Strategic Human Resource Planning

Human resource planning helps the organization meet its goals and objectives. And in formulating a human resource plan, the organization must base its information on available financial resources and the quality and quantity its current staff.

The agricultural research division has specific research programs, such as agronomy, animal science, range management, soil science, etc., for which goals and objectives have been set. This, in turn, helps determine staffing requirements for each of these programs.

Human resource planning is affected by requests from researchers for additional staff or further training. It is also influenced by funds from donor agencies and training programs that are only available abroad. Other government ministries, such as finance and management services, assist by creating and funding positions for returning trainees.

The period required to formulate a strategic human resource plan is determined by the needs of the organization at that time, whether short-term or long-term. In short, it varies with each situation.

When the plan has been formulated, it is sent to the office of management and finance in the ministry of agriculture in the form of a proposal.

Recruitment/Selection

The director of research and all other section or department heads are made aware of vacant positions through the personnel office of the ministry. This is done in order to give the organization an opportunity to hire employees with the right skills, training, and motivation to satisfy the aspirations of both the organization and the individuals themselves.

When preparing to recruit a new employee, the director or head of the department writes up a job description outlining the skills required, educational qualifications, previous experience, salary grade, and associated benefits. All this information is sent to the personnel office. The position is then advertised locally and/or internationally, depending on the caliber of the candidate required.

Applications are examined, and a short list is made of the most promising applicants. These individuals are then invited to come in for an interview. Public service interviews are used to assess the level of knowledge and competence of each applicants, and the successful candidate is then sent a letter of acceptance to his/her new job, stating when to assume duty.

Applicants are matched to positions based on academic qualifications, previous experience, and success in the interview.

Socialization

Socialization is a process by which new staff are assimilated into the organization. The aim is to improve their efficiency by getting them started in their new jobs with a solid base.

This is done by giving new employees a tour of the organization to familiarize them with the proper lines of communication, the equipment they will be working with, the operating procedures, the staff they are going to work with, and the general culture of the organization.

This may be done by the director himself or by other experienced staff members.

This should be done with staff returning from training as well as with new staff in order to get them back into the culture of the institute. It obviously takes less time to socialize returning staff than it does with new employees.

Training Development

Training is a formal activity aimed at improving the individual's skills. Training programs are based on projected requirements and the objectives of the organization. The agricultural research division is expected to prepare annual training plans for both long- and short-term training, depending on projected staffing needs.

Employees are normally selected for long-term training based on their academic qualifications, subject to acceptance by the training institute. Usually only short-term training is available for nontechnical staff.

Most training programs that include long-term training are sponsored by donor agencies. This results in most of the training being conducted outside the country, making supervision difficult except through reports from the training institution. The impact of training is evaluated by the organization after the employee has returned to work by means of a performance evaluation, i.e., through his/her attitudes, performance, efficiency, and output.

Career Development

Career paths are not clearly delineated in the organizational structure anywhere but at the employee's entry point, where entry level is determined by academic qualifications (certificate, diploma, bachelor's, master's, or doctorate degree). Additional academic training is usually required for moving up the career path.

Performance Management

Performance management aims to provide incentives to employees for better performance. The organization evaluates performance through confidential report forms prepared by supervising officers on their subordinates. These are reviewed and added to by the head of the department on up to senior administrators. However, this has not proven to be a fair way of performance assessment since it is subject to a great deal of bias.

Table 3. Summary of Professional Staff at Lesotho Agricultural College, by Department and Academic Qualifications

Department	Number	PhD	MSc	BSc	DIP	CERT
Agronomy	10	1*	3	3	3	0
Ag. Eng.	12	0	1	1	4	6
Animal science	8	0	2	2	4	0
Forestry Res. Cons.	7	1*	4	1	1	0
Home Economics	6	0	1	3	2	0
Sociology & Quantitative Studies	6	0	2	1	3	0
TOTAL	49	2	13	11	17	6

NOTE: This includes both national and expatriate staff.
*Expatriates with projects.

Table 4. Current Long-Term Training at Lesotho Agricultural College

Description	Degree	Sponsorship	Country of Training	Graduation Date
Home Economics	MSc	USAID	USA	1991
Irrigation	MSc	USAID	USA	1991
Agric. Eng.	BSc	USAID	USA	1991
Animal Science	BSc	USAID	USA	1990
Ag. Extension	BSc	USAID	USA	1990
Home Econonomics	BSc	USAID	USA	1990
Animal Science	BSc	USAID	USA	1990

Current Personnel at Lesotho Agricultural College (LAC)

LAC offers seven full, residential programs at the diploma and certificate levels. There are approximately 50 professional staff and eight administrative positions.

COUNTRY REPORT
TANZANIA – MALD

M. A. Kabatange, B. M. Kessy, J. M. Liwenga, A. S. Mgeni, R. J. Mlama, and J. B. Ndunguru

Introduction

The current structure of the national agricultural research system (NARS) is in a transitional stage following the recent major reorganization exercise that took place in February 1989. At this time, both the Tanzania Agricultural Research Organization (TARO) and the Tanzania Livestock Research Organization (TALIRO) were dissolved and amalgamated under the Ministry of Agriculture and Livestock Development (MALD). The human resource management information given in this paper is based on what was going on in TARO, TALIRO, the Tropical Pesticides Research Institute (TPRI), and Uyole Agricultural Center, Mbeya (UAC). The annex illustrates the case of UAC, Mbeya.

Human Resource Assessment

The agricultural and livestock research institutions in Tanzania have procedures for collecting and assessing information about their research scientists. This information is collected and assessed every year using performance appraisal forms, and also through quarterly progress reports on ongoing research projects performed by individual scientists.

In the case of performance appraisal forms, a scientists fills out one part of the form, giving personal particulars, responsibilities, and work performed during that particular year. The other parts of the form are filled out by the researcher's immediate supervisor, who gives an assessment of the researcher's general conduct, job knowledge, job performance, innovativeness, supervisory capability, and general output.

Supervisors' opinions about a researcher's strengths and/or weaknesses are requested, as well as their recommendations to either promote, reward, or penalize the researcher. Crop research supervisors have a golden opportunity to make their assessments during the annual research coordinating committee meetings, where scientists present their yearly progress reports and plans for the coming season. They are evaluated on the basis of the strengths or weaknesses of the presentation, i.e., initiative, imagination, interpretation of results, etc.

As a prerequisite to promotion, all scientists are required to publish a minimum of two to four scientific papers before they can be promoted to the next grade level.

Strategic Human Resource Planning

Not all of our former research organizations had human resource plans. For those that had them, the objectives were to enable researchers to acquire, maintain, and/or expand their knowledge and research capacity so that they could contribute to and benefit from the organization. The period covered by the plan was five years. The process of human resource planning starts from the level of the individual researcher up to the head of the institute/center and then to the organization's headquarters where the manpower development and training committee makes the final decisions.

The information used in formulating the strategic human resource plan is gathered in a survey conducted towards the end of the previous plan. The information contains biographical data on each research and the job specification. The completed plan is an open document, available to all interested parties.

Implementation of the human resource plan, like that of other plans, depends on the availability of physical and financial resources.

Financial support for research comes mainly from government subventions and external donors.

Recruitment/Selection

The research organizations have procedures to fill vacant positions. The head of the institute or center, in consultation with the relevant department or section head deter-

mines the areas that need strengthening in terms of human resources. The definition of vacant positions is derived from qualitative and quantitative analysis of the organization's human resource requirements. Therefore, according to the scheme of service, the functions to be performed in the position along with the administrative grade and educational requirements have to go hand in hand with the need to accomplish the organizational objectives according to the job descriptions of every cadre. The proposals are then discussed during the annual budget session, and the decision made on whether to approve or drop them.

Vacant positions are usually advertised in the local newspapers. In the case of posts at the bottom of the professional grade levels, which can be filled by new graduates, the National High Level Manpower Allocation Committee (NHMAC) is informed of the vacancies. Advertisements made in the newspapers contain job descriptions and job specifications. After screening all applications for the advertised posts, a shortlist of the applicants is made. The short-listed applicants are called in for interviews in which the candidates are matched to the advertised posts. The criteria used in making the final selection include educational/technical qualifications, working experience, and job knowledge.

Socialization

All new researchers get an orientation at the relevant research institutes. During the orientation, they are introduced to colleagues and familiarized with the organization's structure, research programs and set-up, operating procedures, and internal and external communication processes. They are also provided with the organization's scheme of service, which contains job descriptions, as well as the duties associated with each post and career paths. The scheme of service also spells out the evaluation procedures or conditions to be met before promotions are made.

Orientation within the Ministry of Agriculture and Livestock Development takes two years. There is no particular procedure for reorienting staff members who have been away from the organization for some time, except that they have an opportunity to get information on any changes that might have occurred while they were away. All relevant information on their new assignment is also made available to them in advance.

Training/Development

Some of the research organizations have a five-year manpower development program that includes a training component. The training plan normally includes all staff members at all levels. The manpower development program is drawn up by a committee made up of the director general, director of research, director of manpower development and administration and the training officer. This committee, in collaboration with the head of the relevant department and institute/center, determines the training needs of each staff member, as well as establishing priorities for action. Training needs are identified by gathering information and determining any gaps between what is and what should be. Training opportunities are identified by getting the details from MALD and from both local and external institutions. These provide us with brochures, pamphlets, and booklets on the courses offered. The manpower development committee selects staff for training in accordance with organizational priorities.

Staff for training are selected according to the following:

- individual capability and experience;
- a lack of qualified and/or competent personnel in a particular program or department;
- a deficiency in an individual's abilities, which calls for further training, if the individual is deemed trainable;
- an individual's desire to be trained.

Training programs are basically designed for field and support staff, i.e., administration, accounting, and planning. The training is assessed through reports from the training institutions; however, it is difficult to keep close track of an individual's performance under these circumstances.

The impact of training is evaluated by job behavior – changes in the researcher's performance are observed after the training. Also, training is evaluated by any change in research efficiency and output, of individuals and then of the organization as a whole.

Career Development

Career development paths are clearly defined in the organization's scheme of service. Each post in the NARS has two or three levels. Each level has its own requirements, but consideration is mostly given on the basis of academic/technical qualifications, work performance, and time of service for each grade. However, the mechanism to determine progress along a career path greatly depends on an individual's job performance rating after attaining the relevant qualifications.

During the annual performance appraisal exercise, each staff member's strengths and weaknesses are discussed, and wherever applicable, individuals are plainly informed of their weaknesses and are given necessary advice. If it is technical know-how that is missing, then appropriate training opportunities are made available to that individual. The best path toward career advancement for researchers is through training and publication of scientific papers. Staff have always been encouraged to adhere to this. For the un-

trainables – this remains a challenge to the organization.

Performance Management

We have a procedure of systematically evaluating or assessing employee job performance. The appointment committee reviews employee performance once every year. The objectives of this assessment are:

- to identify areas of strength and weakness in the employee's performance;
- to reward outstanding workers by promotions and salary increases;
- to identify employees who need remedial action, counselling, or training because of an unsatisfactory performance rating;
- to improve superior-subordinate relationships in order to improve working efficiency. This is achieved by using the counter signatures of more senior officers on the ladder.

The assessment exercise starts with the employee's immediate supervisor, then the head of the employee's institute/center, and finally the organization appointment committee. During the appraisal process, the employee's performance in terms of job knowledge and administrative abilities (where applicable) is evaluated.

Conclusion

What has been given here is a brief outline of the structure of human resource management in the Tanzanian NARS under the parastatal structure. Recently the NARS has been placed in the civil service under the Ministry of Agriculture and Livestock Development, where the human resource management procedures are more or less the same. The need for having a motivating scheme of service for researchers has been identified as an important input into the research master plan currently under preparation.

The Case of Uyole Agricultural Center

Introduction

Uyole Agricultural Center (UAC) was established by presidential order No. 170 in April 1976, under the Public Corporations Act of 1969. It is a center for agricultural research and training, and the head of the organization is responsible to the board of directors appointed by the Minister of Agriculture and Livestock Development.

Following recent structural changes in the Ministry of Agriculture and Livestock Development (MALD), the dissolution of TARO and TALIRO, and the subsequent setting up of zonal centers of research and training, UAC is being considered as a zonal center for the southern highlands of Tanzania.

Human Resource Assessment

The center has a procedure for collecting and assessing information on research scientists. The scientists are required annually to complete and update their curricula vitae, upon which promotions are based. These annual performance reports are compiled by the scientists themselves and assessed by their respective department heads. Department heads are, in turn, assessed by the director of the center.

Human Resource Planning

The objective of the strategic human resource plan is to enable the center to achieve its corporate goal. In order to do this, the center has a workers' education committee, a wing of the workers' council.

The committee is composed of department heads, representatives of party organs, and additional scientists elected by the center staff. The committee is responsible for planning, reviewing, and assessing the center's training needs.

The plans are based on individual departmental needs, the center's overall priorities, and available financial resources. The committee is responsible to the director of the center.

To some extent, foreign and local donor assistance does influence the plan in so far as availability of funds and training opportunities are concerned, particularly with respect to overseas training. Currently the center relies heavily on FINNIDA for funding of both long- and short-term staff training.

Recruitment

Vacant senior posts are filled through advertisements in the local press or by notifying the National High Level Manpower Allocation Committee. Technical posts and nontechnical junior posts are filled by direct employment of graduates from agricultural or technical schools.

Vacancies are identified by department heads in consultation with the center's top management (and consistent with corporate goals and manpower plans). The plans indicate jobs to be performed, skills or level of academic training required, as specified in the center's scheme of service, which is subject to periodic review. The scheme of service defines the function, grade, educational/professional level of training, career path, and salary. Candidates at all levels are subject to interview by appropriate appointing authorities. The appointing authority for graduates is the board of directors. Technicians are interviewed and appointed by the center's appointment committee.

Socialization

Newly appointed scientists are given an opportunity to study under experienced officers in their respective areas of specialization. During the orientation period, which takes about one year, individuals acquaint themselves with the administrative set-up, operational procedures, job specifications, and communication procedures within and outside the center.

Department heads are responsible for socializing individuals. Individuals are confirmed in their posts only after a year's successful orientation. Individuals who have previously served at the center and have been away for long periods are subject to reorientation.

Training and Development

As stated elsewhere, the center has a five-year staff development plan for all levels of staff. The implementation of the plan is subject to external and internal factors such as availability of funds (both local and foreign), suitability of available candidates, and availability of spaces in training institutions.

The center has a set of criteria for selecting recruits from available candidates: departmental needs, age, duration of service with the center, previous academic training, etc.

Training is supervised by the respective training institutions in-country or abroad, and the center often receives progress reports on individuals sent for training.

The impact of training is assessed in terms of how individuals perform in their work after having acquired new skills.

Career Development

The center has a comprehensive scheme of service with a clearly defined career path. The scheme of service has been subject to three reviews since the center was established in 1976. The current scheme of service was approved by the government (the Presidential Commission for Parastatal Organizations) in 1987. It currently has three levels: graduate, technical, and administrative.

The top management of the center (i.e., the director and department heads) have fixed scales of salaries, whereas others are graded, in some cases into as many as eight grades.

Requirements and procedures for moving from one level to another are provided for in the scheme of service, and mechanisms have been established for determining individual progress along the path, such as publication of scientific papers, release of varieties, etc.

The center does not have any provision for problems in advancement. Those who do not perform well enough to qualify for advancement are given a warning and, in unavoidable circumstances, have their services terminated so that more competent individuals can be hired.

Performance Management

Individuals' work performance is reviewed annually. The center has staff appraisal forms that individuals are required to fill out, which includes their curriculum vitae and the latest work accomplished during the year. Department heads rate their employees' performance on a scale from *A* to *D* against such factors as obedience, work aptitude, etc. Those who are rated below *C* are advised in writing of their weaknesses with a view toward assisting them in improving their performance. This exercise is useful to the center in creating a competitive attitude toward work and thereby improving the center's overall output. Those who do exceptionally well get cash or other material rewards and certificates of award.

COUNTRY REPORT
ZAMBIA

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Summary

This paper looks at human resource management in the Department of Agriculture in Zambia. It addresses the issues of planning, staffing, staff development, socialization, and assessment.

The department, through its three branches of research, extension, and irrigation and land husbandry, plans and recruits staff centrally. Employees are recruited mainly from local institutions and are deployed in the section of their choice. Due to this policy, an imbalance has developed resulting in some sections being understaffed. Donor support has also contributed to this situation. Efforts are now being taken to redress this imbalance.

Staff development is through long- and short-term training and on-the-job training in cases where experienced local and expatriate staff are available. Most formal post-employment training is done outside the country at universities that offer courses relevant to the Zambian situation. This has been done for some time through ad hoc arrangements. In an effort to improve the training of staff, a training unit has been set up in the department to oversee the training of technical and administrative staff.

Socialization and performance assessment are not adequately addressed by the present system of remuneration, monitoring, and evaluation.

Introduction

Manpower development and training (MDT) is programed, coordinated and monitored by the directorate of MDT, which is under the cabinet office. Each ministry has some staff seconded from MDT to coordinate MDT activities. The Ministry of Agriculture and Co-operatives (MACO) has four MDT officers who deal with all manpower development matters in the Ministry's six departments (agriculture, veterinary medicine and tsetse control service, planning, fisheries, cooperatives, and the national agricultural information services).

The directorate of MDT deals with all aspects of short- and long-term training for civil servants. The Department of Agriculture Training Unit (DATU) serves the department's three branches (research, extension, and irrigation and land husbandry) and complements the services of the directorate. Other aspects of human resource management (recruitment, performance assessment, conditions of service, promotions) are the responsibility of the personnel division, which is also under the cabinet office. Each department in the civil service has personnel officers seconded from the personnel division.

Therefore, two organizations deal with human resource management. In addition to the government manpower development program, the sole national party, the United National Independence Party (UNIP), also carries out a similar program. People trained under UNIP automatically expect to be employed in the civil service despite the fact that their training was not planned by the government.

Problems of human resource management in the Department of Agriculture can be appreciated after looking at different aspects of human resource management in detail.

Strategic Planning

Until 1989 there was no strategic plan in the civil service that included the Department of Agriculture. All planning and projections focused on patterns and trends in formal pre-employment education and training (i.e., the supply of manpower from universities and colleges). There were no plans regarding those already working. Since the country had an acute shortage of qualified and trained manpower at independence, the main priority was to train as many people as possible as quickly as possible. Very little of this planning was done by the Department of Agriculture,

which was responsible only for plans involving the colleges under its control.

The effect of this arrangement was lack of coordination between human resource development and the user agencies. Their efforts were fragmented and ended up being implemented in an isolated manner without overall policy guidelines.

Future Plans

At the national level, a national manpower council has been proposed to set policy on manpower planning and also to coordinate the implementation of programs for staffing development and utilization. The Department of Agriculture has made projections for:

- the number of extra posts to be created in order to cope with the increasing work load – for both professional and technical staff;
- the number of officers to receive long-term training for advanced degrees (MSc, PhD);
- the number and types of short courses (seminars, workshops, refresher courses, etc.) to be held;
- the financial resources required.

The plan is for five years, 1989 through 1993, and was prepared by Department of Agriculture staff. It is available, in an abbreviated version, as part of the Fourth National Development Plan.

Recruitment and Selection

Vacant Posts

The Department of Agriculture has an establishment register that shows authorized posts in each specialty and at each career level (professional, diploma, or certificate). The head of each branch identifies vacant posts. Posts are vacant either because they have never been filled or they have been vacated because of resignations, retirement, promotions, dismissals, death, etc. When there is no vacant post but a new one must be opened up, special authority must be obtained from the personnel division. Also, not all vacant posts are advertised.

Until 1987, the employment of graduates was automatic. However, due to restrictions on civil service expansion, this policy has been changed. Now, because of the economic situation, vacant posts are identified before any new graduate is employed. The present establishment register has 67 posts per branch, this being the number of established posts since 1968; however, the requirements of the department are much higher than that.[1]

Recruiting

All candidates apply to the director of agriculture, providing a copy of their curriculum vita and stating their field of interest. A committee of senior staff from the three branches considers the applications. Particulars of selected candidates are forwarded to MACO and the personnel division for final approval. New employees are subject to evaluation over a probationary period before they are put into permanent staff positions.

The department recruits candidates at three levels of degree (BSc or higher, diploma, and certificate). Most recruits have been trained in Zambia, with a minority trained outside the country. All certificate holders are trained locally.[2]

Selection

When candidates apply for employment, they fill in forms that give detailed information about themselves. They also supply a copy of their certificate and transcripts of their course work. Based on this information, selections are made according to the type and level of training the candidate has received, the candidate's interests, and academic achievements, as well as the department's available facilities, etc. Generally candidates are put in the area of their choice, although it is expected that some adjustments will be made later. In some cases, candidates call in person at the branch they intend to join and are interviewed there. These interviews are very useful to both the candidate the branch.

Socialization

This aspect of human resource management is progressively receiving less attention now than in the past, probably for two reasons: 1) there is a general shortage of funds for this important exercise since there are more recruits now than there used to be, when only a few joined each year.[3] 2) also, many of the professional staff responsible for taking care of the socialization of new recruits are themselves not trained in human resource management, since this was considered to be an administrative matter.

When recruited, new officers are given a letter of temporary employment that outlines the conditions of service of temporary employment.[4] They then report to the head of the section or research team where their final placement and posting are decided, and their supervising officer gives them the department's terms of reference. Orientation regarding other aspects of the department (channels of communication, operating procedures, organizational support, evaluation procedures, etc.) are acquired by assimilation. Many of the officers who are supposed to orient recruits are not familiar with the procedures. Some are expatriates who are not familiar with the Zambian system.

Each research station and province also has administrative staff who are supposed to orient recruits on all personnel matters, but this has been unsatisfactory.

Training

Long- and short-term training of staff was given high priority after independence because the country had very few trained people. Long-term training is done at the certificate, diploma, undergraduate, and graduate levels. Staff who deserve training are recommended for appropriate training after serving for at least two years.

Until recently, all graduate training was done outside the country with financial support from donor aid, which is usually tied to particular projects. Although many people have been trained in this way, it has created its own problems, the main ones being more training in certain fields than others and no training for administrative support staff. And in many cases staff were assigned thesis projects that were not relevant to the environment in which they would ultimately be working. This happened because there was no training plan, which resulted in ad hoc staff training.

Lately efforts have been made for staff to undertake broader-based studies in order to have the professional flexibility to face the many diverse problems that can arise in the normal research environment. To allow staff to be in touch with local conditions, some universities and sponsors have allowed trainees to do the data collection for their theses in Zambia.

Training of staff is done both on the job and formally. Intensive on-the-job training is done in cases where the trainee is working with experienced local and/or expatriate staff. The aim is to enable inexperienced staff to acquire skills and knowledge relevant to the programs in which they are working. This period varies depending on the availability of facilities and commitment of experienced staff.

Short-term training is accomplished in the form of seminars, workshops, professional meetings, study tours, etc. This is for both professional and technical staff.

The department of agriculture training unit has been formed to:

- draw up comprehensive training plans for all staff at all levels;
- select staff for training, in conjunction with senior staff, in all branches;
- solicit funds for training;
- supervise and coordinate training.

Career Development

One of the biggest staff problems in the Department of Agriculture is the extremely limited potential for advancement. This is mainly due to three factors: 1) very low salaries, 2) lack of promotion because of a limited number of senior posts, and 3) lack of career development within professional ranks. Because of this, it is difficult to retain qualified employees. This is the same at all levels. In fact so many people resign that the department is now regarded as merely a training ground for staff.

Staff in the department have the same conditions of service as all other civil servants. Individuals cannot advance in their own scientific discipline because there is no provision for that. In order to advance, they have to practically abandon their profession and take up administrative duties. Another problem is the shortage of administrative/managerial posts to which deserving officers can be promoted. Quite frequently new recruits are on the same salary scale with an officer with, say, 10 years of experience and, in some cases, a PhD. Seniority counts more than merit when it comes to promotions, and sometimes staff who are out on training miss out on promotions. These problems, coupled with the shortage of funds, have lowered staff morale considerably. To try to address the issue of low incomes, some experienced professional staff are allowed to take on consultancies. However, as a rule, staff are not permitted to engage in regular, part-time, income-generating activities outside their normal employment.

These problems have been discussed many times without a solution. Some suggested improvements include creation of separate salary scales for agricultural staff, equating salaries with those in parastatals, and bringing all research scientists from all ministries under one parastatal organization.

It should be pointed out that civil servants benefit in some respects apart from advanced training. These include subsidized housing and transport, a pension scheme, and job security. Staff are also allowed to go on paid study leave.

Assessment

Officers are expected to assess the performance of those they supervise. This is done annually and begins when the officer to be assessed fills in an confidential annual report form. Because of the problems stated above, many officers do not do this because they do not see its usefulness. It is generally agreed that this type of assessment is not very good for several reasons. One main drawback is that the assessing officers may have to report on too many junior staff, some of whom they may not know. The contents of the report are not shown to the officer being assessed, so unfair reports may go to higher authorities unchallenged. Sometimes the assessment is done on the request of higher authorities, especially in connection with promotion. There

has been talk of introducing a different system of performance assessment.

Conclusion

Human resource management in Zambia is carried out by three government institutions as far as the Department of Agriculture is concerned: 1) the personnel division, 2) the directorate of manpower development and training in the cabinet office, and 3) the department's own training unit. Hopefully, with the streamlining of the training program, there will be a strategic approach to the development of manpower in the department.

Socialization and performance assessment are the most neglected, despite their importance regarding staff performance. Career development and poor conditions of service are the major problems. It is hoped that the new assessment procedures that have been proposed will be more effective than the old ones. The requirement of identifying vacant posts before employing new graduates has created a problem in filling existing and proposed positions.

References

Government of the Republic of Zambia (GRZ). 1988. New Economic Recovery Program: Fourth National Development Program, 1989-1993. Vol. I and II. National Commission for Development Planning, Lusaka.

Government of the Republic of Zambia. 1988. Five-Year Action Program for Research. Royal Tropical Institute, Amsterdam and Euroconsult, Arnhem, Netherlands.

Government of the Republic of Zambia. 1985. Evaluation Study of the Ministry of Agriculture and Water development. Peat Marwick and Booker Agriculture International, Ltd.

Government of the Republic of Zambia. 1979. Third National Development Plan, 1979-1983. National Commission for Development Planning, Lusaka.

Government of the Republic of Zambia. 1981. Second National Development Plan, 1972-1976. National Commission for Development Planning, Lusaka.

Government of the Republic of Zambia. 1966. First National Development Plan, 1966-1970. National Commission for Development Planning, Lusaka.

International Institute of Tropical Agriculture. 1989. Training for Agricultural Research in Eastern and Southern Africa. Selected proceedings of the workshop on training needs for agricultural research in East and Southern Africa. Arusha, Tanzania, July 21-25, 1987. International Institute of Tropical Agriculture, Nigeria.

Lars-Erik, B. 1988. The Zambian Agricultural Research System – Issues and Problems. Swedish University of Agricultural Sciences. IRDC, Uppsala, Sweden. Issue paper.

Notes

1. The present number of graduates is 115 in research, 104 in extension, and 70 in irrigation and land husbandry. However, the number required for minimum satisfactory performance has been estimated at about 140 each for research and extension and 100 for irrigation and land husbandry.

2. Four institutions train agricultural staff in Zambia: the University of Zambia, the Natural Resources Development College (for the diploma in agriculture), and the two colleges of agriculture (which grant certificates).

3. For example, in 1971 the research branch had only three Zambian graduates, while extension had none. By 1988 there were 115 professional staff in research and 104 in extension.

4. During the 1960s and early '70s, the personnel division conducted six-month induction courses in public administration for all new professional and technical staff. This has since been discontinued.

COUNTRY REPORT
ZIMBABWE

R. J. Fenner, D. T. R. Ford, M. B. K. Hakutangwi, B. J. Mabhena, R. M. Mufandaedza, L. Muswere, T. N. Ngongoni, S. B. Stacey, and P. Tongoona

Preamble

The Department of Research and Specialist Services (DR&SS) was formally established in 1948, though some of its units are more than 70 years old. It is one of four departments or units within the Ministry of Lands, Agriculture, and Rural Resettlement, the other three being the Department of Agriculture Technical and Extension Services (AGRITEX), the Department of Veterinary Services, and Tsetse and Trypanosomiasis Control.

The DR&SS has three main divisions: crops, livestock and pastures, and research services. Each is headed by an assistant director. Central administration at the agricultural research center in Harare is the responsibility of a unit consisting of seven executive officers

Since DR&SS is a public institution, administrative procedures are determined by government rules and regulations. The public service commission and the treasury, therefore, have overall responsibility for matters relating to personnel and financial administration, respectively.

Human Resource Assessment

The procedures for collecting and assessing information about research scientists in DR&SS are outlined in the appointment and advancement procedures for the professional group in DR&SS. Confidential annual and narrative reports are submitted by office heads for each officer under their supervision. These reports outline areas of expertise, skills and capabilities, and strengths and weaknesses.

Strategic Human Resource Planning

The objective of the DR&SS strategic human resource plan is to produce effective, efficient officers for the improvement of agricultural industry. Along with division heads and heads of stations, institutes, and units, department heads are also involved in human resource planning. This is done in association with the public service commission which coordinates all human resource plans within the civil service. There is no external influence on the plan whatsoever. DR&SS is wholly responsible for it, and it is submitted to the public service commission through the ministry for approval.

The planning period for strategic human resource plans is five years. The department's requirements, in line with departmental policy and programs, are used as sources of information.

Recruitment/Selection

DR&SS has a procedure for filling vacant positions, as stipulated in the public service commission regulations. Positions come open as individuals resign. Identification of vacant positions is the responsibility of the senior executive officer in personnel. This is done through monthly establishment returns filled in by each station head. The skills required to fill a vacant post are defined by the relevant section/station head in consultation with the assistant director. Positions are defined by administrative grade, function, and educational requirements.

Vacant positions are advertised in all the national newspapers, with job descriptions and educational requirements stipulated. A few scientists join the department through the government bursary scheme whereby bursaries are allocated to the department for undergraduates at the university. These are advertised on the faculty notice board and interested students can apply. If they are selected and successfully complete their studies, they then have an obligation to serve the department for a period not less than the duration of the period during which they received support – provided the department has a vacant post to offer them.

Advertisements are also circulated within the ministry so that interested people can apply for a transfer (either laterally or on promotion) from sister departments or even within the same department.

The recruitment section of the public service commission can also refer applications to the department for cases they consider suitable for the position.

Most of the candidates come from the University of Zimbabwe and a few come on transfer from sister departments. The other resource for DR&SS personnel is universities outside the country, and these applicants generally have higher qualifications.

All candidates, including those in the bursary scheme, have to be interviewed by a panel, which should be made up of an expert in the specific field of the vacancy, the officer who will be responsible for the supervision of the new employee, the office head, and a personnel officer. The panel members record their observations on scoresheets in order to come up with an objective assessment of the candidates.

Socialization

When new employees join DR&SS, the station head is responsible for seeing that they are properly oriented. Social needs, mainly in the form of housing, belongings, and fulfilling the initial requirements of the station, department, and civil service, is handled by the personnel section of the station on behalf of the station head. The immediate supervisor sees to the on-the-job induction with the assistance of the new employees' colleagues. The supervisor orients them according to their job description, function within the department, career path and development, how they are expected to contribute to the department's objectives, and how their performance on the job will be assessed.

The DR&SS training section organizes a one-week induction course during February each year, since this is a time when a large number of new scientists will have been with the department a month, having entered from the University of Zimbabwe at the end of the academic year. Among other things, the structure, objectives, and functions of DR&SS; the communication process, relationship of the department with the ministry and sister departments; and linkages with farmers are all covered. The director and assistant directors have an opportunity at this time to address the new scientists so as to give them some idea of what is expected of them. The training officer conducts special induction courses for new employees who join at other times during the year.

Heads of stations/institutions informally reorient staff members who have been away form the station for some time.

Training/Development

DR&SS has a training plan for research officers and research technicians, as well as one for support staff. The training officer is responsible for identifying training needs and training opportunities in consultation with supervisors, station heads, and assistant directors.

Training needs are identified through questionnaires, interviews, and discussions with individual scientists, their supervisor, and the station head.

An outline of training needs is sent to the relevant universities, international agricultural research centers, training institutions, bilateral and multilateral cooperation agencies (such as the British Council and USAID) in the form of applications for training opportunities. When offers are received from donor agencies, they are matched with the needs of individual employees, but training organizations also have their own selection criteria.

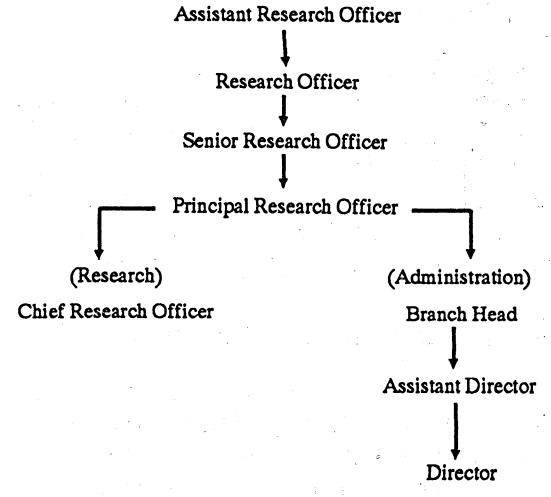
Selection criteria are outlined by the public service commission because the scientist will need to be paid while on study leave.

DR&SS offers a variety of training programs according to the needs of its employees. Stations and institutes plan their own programs to suit their needs. Departmental training programs include induction courses, public speaking, economic analysis of data, experimental design, data analysis, and result interpretation.

All training is coordinated by the training officer and supervised by the respective course director. Impact evaluation is carried out through on-the-job observation and by questionnaires.

Career Development

The path for staff career development in DR&SS is as follows:



Public service commission advancement procedures spell out conditions for advancement from one level to another. A departmental suitability board considers the advancement of each individual officer. Confidential narrative reports are made each year by the office head and are also used in the assessment process.

Performance Management

The performance of each research officer is formally evaluated each year through the confidential narrative reports. Informal evaluation, however, is continually implemented by the supervisor in order to correct mistakes and encourage good work. The objective of individual performance assessment is to identify strenths and/or weakness, determine the potential for greater responsibilities within the system, and correct the weaknesses before serious problems can develop. It also helps identify training needs, since some of the weaknesses can be corrected by training

The office head, in consultation with the individual's immediate supervisor, is responsible for assessing an officer's performance. The suitablility board makes decisions based on reports from the office head. Criteria are based on performance, innovativeness, leadership qualities, and intelligence.

Workshop Evaluation

WORKSHOP EVALUATION

The HRM Workshop in Harare went extremely well. First, it was well attended. Representatives from seven of the nine SADCC countries were there. While we had hoped and expected two representatives from Mozambique, they did not arrive. Nevertheless, the group was a good one, composed of the deans of the agricultural universities, directors of agricultural research divisions, research officers, extension directors, and national program coordinators.

Second, the materials had been adapted to the region. As with previous workshops, many of the presentations were done by local experts. In this case, papers had been contracted on strategic planning, recruitment and selection, and team building. Additionally, a local representative from ZIPAM presented the bulk of the material on organizational behavior. This regional orientation assisted in creating a unique atmosphere. It also provided a vested interest to participants and centered discussions on material that was more familiar and practical rather than theoretical.

Third, this was presented as a no-formula workshop. After the presentation of an HRM overview and an introduction to the files, participants then broke up into small groups. The group task was to review the material and discuss the relevance and importance of the various topics to their own respective systems. Each group constructed a scoring model, rated the topics, and achieved group consensus. We then met in plenary session to share the information. Upon agreement on topics, the schedule was revised accordingly, providing additional time for more important topics, and deemphasizing the less important.

The consensus of the participants was as follows:

Topic	Points	Average
Strategic Planning	4	1
Training and Development	13	3.25
Recruitment and Selection	14	3.5
Performance Management	17	4.25
Socialization	18	4.5
Career Development	19	4.75
Human Assets Framework	24	6

Fourth, this was a participatory workshop. Each country was required to prepare a country report prior to the workshop. These facilitated discussions and were formally reported by each of the countries. We also limited theoretical presentations to 30 minutes or less so that a majority of time was spent in small groups discussing the theories in light of practical, local realities.

Fifth, there was considerable local interest generated. There were a number of observers, and the local press (*The Herald*) provided very good coverage.

Finally, the workshop received an excellent evaluation (see following sections). It was excellent because the scores were high. But more important, the evaluation was taken very seriously in that the participants provided an extensive and informative list of the strengths and weaknesses of the workshop, as well as comments in general. The scores validate the effort, while the additional information provides feedback and direction for future workshops.

The old adage says that the proof of the pudding is in the eating. In our particular case, the proof is in the post-workshop discussion. There has been a regional HRM network established, workshop participants have become workshop trainers, and each country in attendance discussed having national workshops. For these national workshops, local trainers will coordinate with SACCAR, while ISNAR will provide backup. That is consistent with SACCAR/ISNAR plans and within the capabilities of the HRM Working Group.

Details of Evaluation

The evaluation form is attached to the end of this section.

Participants' comments on three strengths of the workshop:

1. Materials presented including videos.
   Participatory presentation sharing of experience from elsewhere in SADCC.
   Good timing.

2. Strictness on timing.
   Good preworkshop preparation.
   Good atmosphere.

3. Case studies were very useful.
   Examples/presentation from the region were excellent to illustrate theory/principles presented in the workshop.
   Well-prepared presenters — workshop was live.

4. No-formula approach.
   Participant-centered.
   Appropriate topics.

5. Good material.
   Good video tapes.
   Good working environment.

6. Excellent oral presentations.

7. Style of presentation was very good.
   Quality of material was of high standard.
   Construction of presentations, case studies, and films eliminated boredom.

8. Group participation and contact.
   Motivation to good management.
   Cooperation.

9. Use of video films.
   Use of local resource personnel.

10. Group participation.
    Presentations.

11. Exposure of managers to the key issues of managing human resources.
    Opportunity offered through indepth analysis of situations in NARS.
    Practical case studies and group discussion useful.

12. Well prepared in advance.
    Inclusion of national resource persons was very encouraging.
    Papers were relevant.
    Videos were very useful to reinforce some of the relevant topics.
    Workshop was very useful and need more of them in member states.

13. Presentations of the papers were very good.
    Papers/topics discussed were relevant.
    The discussions were very educating.

14. Resource persons well prepared.
    Good reading materials.
    Timing of all lectures good.

15. New information on human resource management.
    Information on how NARS operate in the different countries was quite valuable.
    Enabled participants to exchange information and know each other.

16. The workshop was well organized in that the resource persons and material presented were very efficient and of good quality.
    The interactive nature of the presentations made sure everybody had a chance to participate and kept people alert throughout.
    No long, boring talks.

17. The regional nature of the workshop (e.g., materials were mostly from the region and very relevant).
    It was interactive — not wholly dependent on lectures.
    Effective use of audio-visuals.

18. Organization and coordination of workshop and materials very good.
    Time utilization — very good.
    Lecturing notes well prepared and lecturing staff very effective.

19. Very good topics were eloquently covered.
    Case studies reflected real-life situations.
    Presenters did their task very well, generally.

20. High powered.
    Fuel participation by participants.
    Good reference material (literature).

21. High input calibre.
    Effective interaction with regional countries on agricultural research and extension.
    Resource materials very real.

22. Observing the timetable/program.
    Allowing participants to have a say in the programme.
    Varied methods of presentation.

23. Covered basic aspects of human resource management.
    Sharing of experiences between countries.

24. Organization.
    Content.
    Environment.

25. Presentation
    Visual aids.
    Participation — discussion.

26. A reasonable pace was maintained.
    Timetable adhered to generally.
    Well backed up with overheads and videos.

27. Excellent leadership.
    Well-chosen resource materials (good stuff).
    Good facilities/rooms/typing/xerox.

28. Covered topics of direct relevance to participant's work.
    Forum for solving felt problems.
    Brought together regional resource persons.

Participants' comments on three weaknesses of the workshop:

1. Some topics were not properly presented.
   Not enough time for reading all the documents.

2. Too many topics to cover.
   Since there were prepared materials, presenters took it for granted that most would be read; hence, spent little time in thorough discussion.
   One or two resource persons were below standard.

3. No visits to places of interest in Harare, e.g., University of Zimbabwe or on to the research stations.
   No entertainment in the evenings.

4. Program should be given to participants in advance to plan.
   Lacked educational tour.

5. The case studies could have been better presented.

6. Case studies were not well wrapped up at the end of discussions.

7. I do not feel any weakness.

8. N/A.

9. Too much material.

10. Not all topics were adequately covered.
    Limited time allocated for presentation and discussion of country reports.
    Some of the case studies were not adequately analysed.

11. In some topics there was too much rush with little reference to local situation.

12. The programme was very tight.
    Some papers presented were boring.

13. May be need for more small group discussion.
    Should have been human resource management workshop for NARS and national extension services.
    Workshop organization — Information was not communicated on feeding of participants who may not have received transit allowances in their countries of origin.

14. Many topics, time wasn't sufficient.
    Information on most topics was taken mainly from developed countries, and in most cases, related to management of industries.

15. Maybe some of the presentations were too brief.
    Case studies did not reach a logical conclusion or at least indicate what would have been the ideal course of action.
    It was left hanging with everybody's suggestions of what should have been done. IDEALLY WHAT SHOULD BE THE CASE?

16. For some topics, time allotted was too short even for the introduction of concepts.
    Perhaps the needs assessment done at the opening could have been done a little earlier.
    Some topics were left hanging after small group discussions.

17. Program rather too tight.
    More time required for group discussions.
    More case studies.

18. Have notification.

19. More time should have been give to deal with country situations.

20. Unpreparedness shown in some country reports.

21. Financial support to participants.
    Should be given freedom to choose hotel.

22. Late staring time in a.m. and extend tea/lunch breaks (could have been completed in four and not four and a half days.

23. Prior knowledge (communication/preparatory materials, possibly could have mailed out some agendas).
    Weak participation by those in attendance.
    Too long (for some of us).
    Small sessions seemed weak — needed to get to know each other better first?
    Possibly let people choose our groups — but avoid COUNTRY GROUP.
    Need "toastmaster" workshop for us? (not really!)

24. Country papers — no mention of presentation in provisional programme.

Participants' comments on general issues on the workshop:

1. The topic covered is very important for the group that was called.
   I recommend a follow-up even at in-country level.

2. The material in the file is excellent and should be used in the national workshops.
   Across the board, the NARS have had poor planning and this is understandable because all SACCAR countries are young independent nations. But there are signs for improvement in the light of ISNAR/

SACCAR assistance.
Donor assistance can sometimes cause problems rather than improvement when the donor country places its own interests above those of the host countries.

3. A good workshop which could really bring about fruitful changes in the NARS.

4. I am very much impressed with the quality, content, literature, and resource persons of the workshop. The workshop has motivated me much; very useful.
In the beginning, I felt the workshop may not be useful to me but at the end I felt it was extremely useful and is much of use in human agriculture resource management.

5. Resource persons adequately addressed themselves to the subject matter.
It would have been useful to include a visit to one or two research stations under Zimbabwe NARS.

6. More of this type of workshop should be conducted, both at national and international levels.

7. Booking for return trips to our countries should have been done better.
Many of us did not know what to do on the day of arrival since it was not made clear that we had to look after ourselves, particularly in feeding provisions.

8. More videotapes should be used as they elaborate on specific points more clearly, which would otherwise take a longer time for the participants to understand.

9. None!

10. Indeed all went well.

11. This has been a very useful workshop, in that experiences from different countries were shared.

12. A very useful workshop and there is need for its continuity within countries in the region.
Assistance will be asked for from SACCAR personnel in running the workshops locally.
Close follow-up on the implementation of resource materials information to be done.

13. Although the topics were well presented and the workshop properly organized, in future SACCAR should try and give a clearer picture of what the workshop is about. Some participants only received telexes inviting organizations to send participants to a "Human Resource Management Workshop".

14. Workshops of this nature should be encouraged because individual NARS examine their own systems with a view to recommending to higher authorities changes which are deemed important.
Universities seem to run on systems that are not exactly comparable to agricultural research systems. Such systems should also be covered adequately.

15. Follow-up workshop essential.
Behaviour modelling films to improve management techniques, particularly linguistic, in management.

16. The workshop was very good, particularly for participants in managerial positions at the moment.

17. Well done on running a very useful workshop.

18. Would like somehow to have learned more about fellow participants — more mixers, more introducing — smaller groups?
Public speaking skills of participants is weak. Country reports were boring (not just to me). Timekeepers should have been more vigorous.
Need further material on tests for selection — how can you tell personal characteristics?
Entertainment as cocktail party does not lead to enough mixing — but I have no solutions.
Videos as entertainment — excellent and relevant.
Was the group not too large?
I think for others might be OK, for me a group of about 20 might have enabled me to get to know others better.
Small group discussion did not work.

19. Good to use resource persons within the region.

Table 1. Workshop Scores (Overall = 3.9)

Content	Usefulness	Presentation	Time Allotment: Too short	Just right	Too long	
Strategic human resource planning	4.2	4.5	3.9	10	18	0
Recruitment and selection	3.8	4.0	4.0	4	23	1
Socialization into an organization	3.9	3.9	3.9	3	24	1
Concepts of training and development	3.7	4.1	3.7	8	17	1
Career development	3.9	4.2	3.7	9	17	1
Human assets framework	3.5	3.4	3.5	7	18	3
Performance management	4.0	4.3	3.7	7	20	0
Motivation	4.1	4.5	3.8	8	18	0
Leadership	4.1	4.4	4.1	6	19	0
Conflict management	3.9	3.9	3.6	10	14	0
Job evaluation: PARI	3.7	4.1	3.4	3	17	2
Team building: Maldano	3.5	3.9	3.5	2	16	3
Delegation	4.3	4.5	3.8	6	19	0
Annual performance: NCRI	4.0	4.2	3.4	3	18	0

Table 2. Other Features of the Workshop

		Very Good	Good	Fair
1.	Use of videotapes in instructions	24	2	1
2a.	Accommodation at Monomatapa Hotel	9	12	2
2b.	Meals at Monomatapa Hotel	7	13	3
3.	Entertainment	4	6	9
4.	Organization and management of workshop	18	10	

WORKSHOP EVALUATION

Your cooperation in completing this questionnaire will be highly appreciated as the information will be useful in planning future training events in Zimbabwe and other countries.

Resource persons, especially, will also benefit by improving on their materials and presentations.

A.

1. In general, I would rate the workshop as:

   5. Excellent 4. Very Good 3. Good 2. Fair 1. Poor

2. List three strengths of the workshop:

   _____

   _____

   _____

   _____

   _____

   _____

3. List three weaknesses of the workshop:

   _____

   _____

   _____

   _____

   _____

   _____

B. Please evaluate the topics covered and their effectiveness:

Where *5 = excellent* *4 = very good* *3 = good* *2 = fair* *1 = poor*

	Content	Usefulness to Work	Presentation	Time Allotment		
				Too Short	Just Right	Too Long
Strategic Human Resource Planning	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Recruitment/Selection	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Socialization into an Organization	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Concepts of Training and Development	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Career Development	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Human Assets Framework	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Performance Management/Reward Systems	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Motivation	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Leadership	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Conflict and Conflict management	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Job Evaluation: PARI	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Team Building: Maldano	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Delegation	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—
Annual Performance Evaluation: NCRI	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	—	—	—

C. Please rate the other features of the workshop:

	Very Good	Good	Fair
1. Use of videotapes in instructions	—	—	—
2a. Accommodations at Monomatapa Hotel	—	—	—
2b. Meals at Monomatapa Hotel	—	—	—
3. Entertainment	—	—	—
4. Organization and management of workshop	—	—	—

D. Please give comments on any issues you have on the workshop:

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