A SELF-STUDY COURSE ON THE
PLANNING AND MANAGEMENT
OF FORESTRY RESEARCH

Developed at the University of Minnesota
College of Natural Resources, Department of Forest Resources
St. Paul, Minnesota, U.S.A.

In Collaboration With
The International Union of Forestry Research Organizations
Special Programme For Developing Countries
Vienna, Austria

September 1994

MODULE 9
MANAGING HUMAN RESOURCES
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MODULE 9
MANAGING HUMAN RESOURCES

Introduction to the Module

It is essential to clearly understand that *people are the most important resource of any research organization*. As a manager of a forestry research organization, one of your most important responsibilities is to provide your staff with a structured organizational environment that encourages innovation and creativity. Your leadership and management style will determine to a great extent the performance of your research unit.

Forestry research managers and scientists are increasingly brought into contact with, and must learn to interact with, people from diverse cultures around the world. Working harmoniously in this multicultural global society requires sensitivity, adaptability, and diplomacy. Such skills cannot be easily taught in a self-study course. However, we can provide suggestions that may help you improve your skills in managing human resources.

By completing this module you'll learn to analyze your leadership ability and management style, and will better understand your impact on employee performance and motivation. We'll also show you what motivates scientists, and how to use this information to create incentive programs to stimulate researcher productivity and satisfaction. You'll discover (or perhaps better appreciate!) how having a well-trained cadre of people on your staff is crucial to research success. If you want to improve your personnel management and leadership skills, and be better able to build a more stimulating and satisfying working environment for your staff, then we think you'll find working through this module will be particularly rewarding.

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Initial Skill and Knowledge Assessment

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If you would like to find out how much you improve your skills and knowledge by studying this module, we suggest that you complete the exercise on the next page before you begin this module. This will establish your current level of skills and knowledge about the topics covered in this module. At the end of the module there is an identical skill and knowledge assessment form which you can complete once you have finished the module. By completing and comparing the before and after assessments, you can determine the extent to which you have improved your skills and knowledge.
Below are listed a number of skill and knowledge statements derived from the objectives of the study units in module 9. These are identical to those listed for this module in Study Unit 0.3 - Self-assessment of Training Needs, which you may have completed initially to guide your course of study. Please read each statement carefully and indicate with a checkmark the level that best describes your current skill or knowledge, from 1 to 5, using the following descriptions:

1 I cannot perform this skill, or I have not been exposed to the information.
2 I cannot perform this skill, but have observed the skill or have been exposed to the information.
3 I can perform the skill or express the knowledge with assistance from others.
4 I can perform the skill or express the knowledge without assistance from others.
5 I can perform the skill or express the knowledge well enough to instruct others.

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<th>Skill or Knowledge Statement</th>
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<td>a) List some qualities of a good leader.</td>
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<td>b) Describe several management styles and the circumstances where they are appropriate.</td>
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<td>c) Identify several types of incentives that can be used effectively to motivate forestry researchers.</td>
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<td>e) Prepare a staff recruitment plan to meet the present and future staffing needs of your organization.</td>
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<td>f) Evaluate individual scientist and staff performance, and take measures to correct deficiencies or improve performance.</td>
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<td>g) Assess training needs of the personnel you supervise to determine what knowledge and skills need to be enhanced to increase the effectiveness of your research organization.</td>
<td>1 2 3 4 5</td>
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<td>h) Identify obstacles within your organization that may impede the application of knowledge or skills newly acquired through training.</td>
<td>1 2 3 4 5</td>
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Study Unit 9.1
Providing Leadership

Your job as leader in a research organization is to provide a work environment and reward system that will motivate scientists to become self-directing and productive. We're sure you're not surprised that this is no easy task!

We structured this unit to help you to become a more capable leader. We'll show you what makes a good leader, and what makes a poor one. You'll discover that there are many different types of leadership styles, each appropriate to special situations and personalities. You'll learn that leadership has to be flexible, and that managers need to know what leadership style is best used to motivate individual researchers. You'll also review some suggestions for developing more effective working relationships with those in positions of authority above you. By the time you finish this unit, we hope you will better understand the complexities of leadership, and will be eager to put your new knowledge into practice.

Objectives

When you have completed this unit, you should be better able to:

• list some qualities of a good leader and identify where you can improve your leadership ability;

• describe several management styles and the circumstances where they are most appropriate;

• identify the management style you use and rate its effectiveness; and

• provide better leadership to your organization's staff.
The Importance of Research Leadership

The job of the research manager is to utilize the people, funds, facilities, and other resources at their disposal to achieve the goals of the organization and accomplish its mission. Ranftl (1986) suggests that a productive manager:

- is competent at staffing;
- directs the organization's efforts effectively;
- is competent at handling complexities and problems, and in dealing with new concepts;
- is a skillful communicator; and
- supports and guides subordinates in their work and encourages their full participation.

To achieve these skills, the manager must develop an appropriate style of management and provide effective leadership to motivate people within the organization to carry out their jobs. The manager's leadership and style of management can greatly influence the effectiveness and efficiency of the organization.

Providing effective leadership is one of the most important tasks of management. Leadership has been defined as:

"... 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)"
(Marcotte 1988, p. 168 and 170).

Chaudhuri (1986) describes the importance of leadership in successfully developing the Swaraj farming tractor in India.

"The success of the Swaraj project was to a very great extent due to leadership provided by the product champion who developed effective relationships with key persons, crusaded for the cause of indigenous technology and built a cohesive design team....the charismatic personality of the product champion ... was able to galvanize the members into a cohesive team."

To inspire people, managers must have a clear vision of where they are going, what it will take to get there, and why it is important to fulfill the mission, goals, and objectives of the organization. Father Theodore Hesburgh, former president of Notre Dame University, has said (Peters 1987):

"The very essence of leadership is [that] you have to have a vision. It's got to be a vision you articulate clearly and forcefully on every occasion. You can't blow an uncertain trumpet."
Leaders of forestry research organizations need to project a public image of leadership and competence by demonstrating:

- public speaking skills;
- ability to deal effectively with the various media;
- a grasp of key issues confronting society, particularly those relating to forestry; and
- ability to develop a wide range of personal contacts nationally and internationally.

**Principles of Leadership**

Managers can provide more effective leadership by adopting the following principles (adapted in part from Peters 1987):

- Develop an understanding of the organizational mission, its goals and objectives and what it stands for. Research managers must accept this mission, and use it as a guide to their activities.

- Develop a clear statement of the organization's mission. Mission statements should be simple and easily understood by everyone. This mission should be communicated to all employees of the organization, so that they understand what the organization is attempting to do, and who it is serving. There is no effective leadership if employees do not know where they are going, how they are to get there, or who it is that they are trying to serve.

- Manage actively and visibly. Employees should be made aware that someone is in charge of their work, and cares about the kind of job they do. Leaders should be visible and approachable, so that all employees know who is in charge and have some personal contact with them. Leaders should indicate by their actions the kind of work and level of performance they expect from their employees.

- Lead by personal example in carrying out job assignments. Employees are well aware of what their supervisors do, and on what issues, problems, and details they devote most of their time. What managers actually do reflects their priorities, and this is transmitted, consciously or unconsciously, to employees. Managers should determine what their top priorities are, and then devote most of their working time to those priorities. If managers devote little time to what they have declared to be urgent priorities, then employees are sure to interpret this as a sign that the other jobs on which the manager spends time are more important. By their actions, managers indicate to employees what their true priorities are, regardless of their stated priorities. This can lead to ambiguity and confusion among employees as to just what are the real priorities of the organization.

- Practice active listening. In today's rapidly changing world, managers must personally contact and listen closely to many different people to find out what is really going on in the world, to customers, employees, and others. For effective management there is no substitute for first-hand information.
• Delegate responsibility and authority to act. True leadership requires knowing when to relinquish personal control over some decisions, and delegate decision-making authority to subordinates. Competent employees must be given a chance to develop to their full capability by being given increasing levels of responsibility and decision-making authority. It is the responsibility of the leader to provide employees with a clear understanding of exactly what responsibilities they have, and to delegate authority to make decisions and take actions commensurate with that responsibility.

**Alternative Management Styles**

Several different styles of management are found within organizations. Two contrasting styles of management have been labeled Theory X and Theory Y (McGregor 1985). According to Marcotte (1988), at the one extreme are managers with a Theory X style of management, who tend to believe that people:

• lack integrity;
• are fundamentally lazy;
• avoid responsibility;
• are uninterested in achievement;
• are incapable of directing their own behavior;
• are indifferent to organizational needs;
• prefer to be directed by others;
• avoid decision making; and
• are not very bright.

In contrast, managers with a Theory Y style of management tend to believe that people:

• have integrity;
• work hard to achieve objectives to which they are committed;
• assume responsibility within these commitments;
• desire to achieve;
• are capable of directing their own behavior;
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- want their organizations to succeed;
- are not passive and submissive;
- will make decisions within their commitments; and
- are not stupid.

With these views, managers with Theory X beliefs will:

- exercise tight controls;
- not delegate;
- keep all information to themselves;
- not trust subordinates; and
- drive, push, and shove people to achieve greater production.

Managers with Theory Y beliefs will:

- relax controls with those who have demonstrated responsibility;
- delegate responsibility and authority;
- share information;
- put greater trust in subordinates; and
- facilitate, encourage, and coach people to achieve organizational goals.

Some management styles appear to be more effective than others in leading research organizations. Bennell and Zuidema (1988) suggest that a participatory style of management has been found to be most effective in agricultural research organizations. This style is more in line with the Theory Y approach to management, and emphasizes a concern for both the researcher and the task to be performed. Research managers using the participatory style of management seek to involve researchers in key decisions. They recognize that while managers have the strategic knowledge of what needs to be done, researchers have the technical knowledge of what can be done and how it can be done. Working together and sharing their knowledge, managers and researchers can develop a research program that can be carried out to meet societal needs within the capabilities and resource constraints of the organization. Participation in managerial planning and decisions can generate greater employee commitment to plans and decisions of the organization.
Types of Leadership

The style of leadership or management greatly influences the organizational environment. Marcotte (1988) describes four basic leadership styles, based upon the degree of direction and support given to employees by a manager. Direction refers to one-way communication from the leader to the subordinate to define the work situation and direct the subordinate. Support refers to two-way communication between the leader and the subordinate to communicate with, listen to, and encourage the subordinate. Marcotte suggests that different levels of direction and support may be appropriate in providing leadership in different situations:

1. **High direction, low support.**—A directing style of leadership, where the leader defines roles, makes decisions, and closely supervises. This style is most appropriate in supervising an enthusiastic beginner, who has high commitment, but low competence.

2. **High direction, high support.**—A coaching style of leadership, where the leader provides direction but attempts to incorporate the subordinate's input. This style is most appropriate where the subordinate has some competence, but lacks commitment.

3. **Low direction, high support.**—A supporting style of leadership, where the subordinate engages in problem solving and decision making, and the leader facilitates work and provides recognition. This style is most appropriate where the subordinate has competence, but lacks confidence.

4. **Low direction, low support.**—A delegating style of leadership, where the leader and subordinate jointly agree on problem definition and decision making is delegated to the subordinate. This style is most appropriate where the subordinate has competence and is motivated to achieve a high level of performance.

Successful leadership requires leaders to be flexible in their leadership approach. They must know their staff well enough to know which style of leadership works best with each staff member to achieve the desired level of performance.

Managerial leadership is the most important factor affecting an organization's productivity (Ranftl 1986). Although admitting that leadership is difficult to define, Ranftl (1986) developed a profile of desirable characteristics of an outstanding leader, based on a long-term study involving surveys of more than 3,500 managers in 59 major organizations in industry, government, and education in the United States.

According to Ranftl (1986), an outstanding leader sets a particularly positive example as a person by:

- being unusually competent;
- having quality and quickness of mind;
- being particularly creative, innovative, and nontraditional—a unique individual;
- being highly self-motivated, self-confident, and self-directing;
having extremely high integrity, values, and standards—standing above organizational
politics;
having unusually high motives, and a firm sense of purpose and commitment;
being dedicated, and never self-serving—avoiding gamesmanship;
having a strong positive orientation;
displaying total self-command;
having a high level of deserved self-respect and self-esteem;
being clearly accepted as a leader;
accepting and enjoying role of leader, but with humility;
being willing to work harder than other members of the team;
having particularly high vitality, stamina, and reserve energy;
being continually searching, learning, developing, expanding, evolving; and
being a "winner."

Takes a dynamic approach to activities by:

being action-oriented, with a compelling drive to accomplish and achieve;
being quick to size up merit of people, ideas, and opportunities;
using a persuasive personality rather than force of power to get things done;
being tenacious—persevering in the face of obstacles;
always seeing things through to successful completion;
making decisions and doing what has to be done, even if it is unpopular and may result in
criticism;
continually seeking new and better ways;
being visionary, skilled at predicting future technological and operational needs and
applications; and
always seeing new challenges and new fields to conquer.

Brings out the best in people by:

being strongly people-oriented;
exhibiting great respect for human dignity;
being particularly skilled in dealing with and motivating people;
having well-defined meaningful goals, and successfully inspiring associates to help achieve
them;
having confidence in people and effectively communicating that confidence;
bringing about dynamic synergism within groups;
being stimulating and catalytic—communicates a "can-do" attitude in all actions;
maintaining an exciting organizational climate and instilling enthusiasm; and
helping subordinates achieve their full potential.

Demonstrates great skill in directing day-to-day operations by:

cookently integrating all facets of the operation;
having a strong sense of timing and limits—accurately sensing "when" and "how much"
in each situation;
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- having an uncanny knack for cutting through complexity;
- sorting out irrelevancies and identifying real driving factors;
- providing practical solutions to difficult problems, and successfully communicating solutions to others;
- sensing what might go wrong and developing contingency plans;
- maintaining control of all situations;
- performing with relative ease during times of stress; and
- displaying an "elegant" simplicity in all actions.

Perhaps the most effective leadership of all is management by example (Peters 1987). Research managers, by the organizational vision they espouse, their attitude towards employees, their personal work habits, and a host of other practices, provide an example, whether intended or not, of what kind of person they want their employees to be. If research managers want to elicit a certain type of behavior on the part of their employees, then they should practice what they preach, and set an example for them to follow.

Few people possess all of the traits of outstanding leadership, but some people possess more leadership traits than others. An important job of research management is to identify as early as possible those people within the organization that show leadership potential, so that they can receive training and experience to enhance their leadership ability.

Jain and Triandis (1990) provide further discussion of leadership styles in research and development organizations.

The Special Challenge of Research Leadership

Leadership within a research organization faces special challenges. The research manager must motivate a diverse group of highly trained, potentially creative individuals to work together to achieve organizational goals and objectives. The style of leadership will depend on the personality, confidence, values, and motivations of the manager; on the researchers' motivation, education, experience, commitment, and understanding of organizational goals; and on the resources, mandates, and responsiveness of the organization itself (Bennell and Zuidema 1988).

Providing effective leadership for a research organization requires recognizing the special nature of scientists, who make up the most important element of research. Scientists require, and often demand, special treatment. The progress of science is uncertain and subject to failures. It requires a great deal of creativity. There is considerable art in the pursuit of science. Because science is an uncertain, creative process, scientists cannot be managed as one would manage other employees. Managers of research organizations cannot rely upon tight control to direct scientists and enforce strict adherence to predetermined plans. There is little of the repetitive and routine in science that lends itself to clear, task-oriented job specification and measurement. We also believe that scientists working on forestry problems tend to differ from scientists in many other
fields by being more field-oriented, applied, and interdisciplinary, reflecting the unique nature of forestry as a discipline.

Research does not lend itself to being governed by strong top-down direction and control. Yet, a research organization can benefit from strong leadership that understands scientific research and is sympathetic to its special problems. The job of leadership in a research organization is to provide a work environment and reward system that will motivate scientists to become self-directing and productive.

Special problems may be encountered when the manager is called upon to provide leadership to a multicultural work force. Increasingly, the world is becoming a world community, where people from a wide variety of national, racial, religious, and cultural backgrounds often find themselves working together. Where this occurs, managers will have to be particularly sensitive to the differences among people within the organization, and as to how they may perceive and act in response to their leadership. Special training programs targeted at specific working groups within the organization may help to encourage harmonious working relationships among people of different backgrounds.

**Working Effectively With Those Above You**

One key element of leadership is developing good working relationships with those in positions of authority above you. Effective managers are concerned not only about improving their relationships with subordinates, but also with improving their relationships with their bosses. Even top level managers of forestry research organizations find themselves in the middle of a chain of responsibility. Although they are responsible for and have authority over the personnel within their own unit of organization, they must report to and seek support from still higher levels of authority within the larger organization or government. These higher administrative levels may set policies and priorities, give direction, and provide administrative and financial support to your research organization. Learning to get along with and influencing those in authority above you, or who are in a position to influence your organization and its work, is an important part of the manager's job.

The following suggestions (adapted from suggestions by Gabarro and Kotter 1993 and Hegarty 1984), may help you improve your relationships with your immediate supervisor and other administrative superiors:

*Recognize the mutual dependence between a supervisor and a subordinate.* You depend upon your subordinates to carry out and support the various research projects and programs. They, in turn, depend upon you to provide the resources and the environment needed to do their assigned work. So, too, must you rely upon your administrative superiors to provide the resources and environment needed to support your research program, and they must rely upon you to achieve the declared goals and objectives of your organization.
*Improve your understanding of yourself and your supervisor.* By better understanding each other's goals and objectives, management and work styles, and strengths and weaknesses, you will be able to interact more effectively.

*Develop a clear understanding of mutual expectations between you and your supervisor.* Although many supervisors are careful to clearly state exactly what they expect from their subordinates, many do not. Discussions with your supervisor may not cover all of the important considerations in your work assignments. Or, there may be hidden agendas of which you are unaware. It is worth spending extra time to ensure that your understanding of your responsibilities, authority, and obligations coincides with that of your supervisor.

*Insist on getting authority needed to carry out assigned responsibility.* Accepting responsibility without having the authority to carry out that responsibility is a good recipe for failure. When assigned responsibility make sure that you have the authority to carry it out successfully. If authority is lacking, ask for it, pointing out the consequences of not having that authority.

*Adjust your personal work style when working with your supervisor.* Your own style of working may not always mesh well with your supervisor's style of working. When you work with your supervisor, adjust your way of working to make it more compatible with your supervisor's way of working so as to avoid conflicts that may erupt solely because of differing work styles.

*Keep your supervisor informed.* You like to be on top of things, to know what is going on. So does your supervisor. Keep your superiors well informed about things they must know. Don't let your supervisor be confronted by unpleasant surprises.

*Make good use of the time and resources available for interacting with your supervisor.* Your supervisor's time and your time are too valuable to waste. Use them wisely. Choose carefully the battles you want to fight. Fighting to change the status quo takes time and energy that must be taken away from other tasks. It also may generate ill will. One can draw upon obligations and good will of your administrative superiors for support, but only to a certain extent.

*Make your supervisor look good.* Contributing to your supervisor's success can contribute to your own. You and your supervisor are part of a management team within an organization. Often, the members of a team are judged by the performance of the team as a whole. To do this, you may have to allow your supervisor to take a substantial amount of credit for the work that you do. However, by making your supervisor and other administrative superiors look good, you can contribute towards your own success.

*Establish a partnership with your supervisor.* You are likely to develop a stronger support for your suggestions and proposals if your supervisor becomes personally interested and involved in some of your key activities. In this way, your supervisor becomes a partner with a personal stake in the outcomes.
Deal in solutions, not problems. Do not become a source of problems for your supervisor, but a source of solutions. Before going to your supervisor with a problem, take time to consider alternative solutions. Providing superiors with suggested solutions makes their job easier. It has the added advantage of giving you the opportunity to put forth the solutions you favor, without having your supervisor impose an unwanted solution on you.

Publicize your contributions. You cannot assume that your superiors fully understand just how your activities contribute to solving the problems they face. When appropriate, you must speak up for yourself, to make sure that your superiors are aware of your contributions. If you want their support, you must be visible, and they must be aware of your accomplishments and capabilities. You cannot assume that others will speak up for you.

Be friendly and sociable with people. Cultivating a wide circle of acquaintances and developing a network of friends is important to career advancement. Everything else being equal, when looking for candidates to fill a vacant position, people think first about those with whom they have had personal contact and like and respect. A wide circle of friends also helps to keep you informed about developments in your organization and professional sphere of interest that could affect your future career.

Establish a rapport with assistants to administrative superiors. Assistants to higher level administrative officers often develop a close working relationship with them. They are usually well informed about their time schedule, their preferences about how information is presented, and any personal idiosyncrasies. Dealing courteously and professionally with assistants to your administrative superiors can help you work more effectively with them.
Activities - Study Unit 9.1

Activity 1

Understanding your leadership actions.

Each of the following statements describes a leadership action. In the space in front of each statement item write:

5 if you always behave that way;
4 if you frequently behave that way;
3 if you occasionally behave that way;
2 if you seldom behave that way; or
1 if you never behave that way.

Rating of My Behavior When I am a member of a group:

_____ 1. I offer facts and give my opinions, ideas, feelings, and information in order to help the group discussion.

_____ 2. I warmly encourage all members of the group to participate. I am open to their ideas. I let them know I value their contributions to the group.

_____ 3. I ask for facts, information, opinions, ideas, and feelings from the other group members in order to help the group discussion.

_____ 4. I help communicate among group members by using good communication skills. I make sure that each group member understands what the others say.

_____ 5. I give direction to the group by planning how to go on with the group work and by calling attention to the tasks that need to be done. I assign responsibilities to different group members.

_____ 6. I tell jokes and suggest interesting ways of doing the work in order to reduce tension in the group and increase the fun we have working together.
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Rating of My Behavior

When I am a member of a group:

_____ 7. I pull together related ideas and suggestions made by group members and restate and summarize the major points discussed by the group.

_____ 8. I observe the way the group is working and use my observations to help discuss how the group can work together better.

_____ 9. I give the group energy. I encourage group members to work hard to achieve our goals.

_____ 10. I promote the open discussion of conflicts among group members in order to resolve disagreements and increase group cohesiveness. I mediate conflicts among members when they seem unable to resolve them directly.

_____ 11. I ask others to summarize what the group has been discussing in order to ensure that they understand group decisions and comprehend the material being discussed by the group.

_____ 12. I express support, acceptance, and the liking for other members of the group and give appropriate praise when another member has taken a constructive action in the group.

Comment 1

The purpose of this activity was to get your assessment of how you behave in a group situation, as a basis for judging your leadership style. We cannot predict how you will respond to this activity, but hope that you were able to evaluate your behavior patterns without too much trouble. The information you provided here is used in activity 2 to measure your personal inclination towards satisfying the demands of the task itself, or towards satisfying the needs and demands of the people working on the task.
Activity 2

Understanding your personal inclination to task or maintenance actions.

The statements listed in activity 1 characterize two types of actions, task actions and maintenance actions. Task actions emphasize getting the job done, and being strongly oriented toward the task. Maintenance actions are more concerned with the people working in the group, and with their interrelationships and individual needs. To see whether you tend to be task oriented or maintenance oriented, copy the score for each statement above into the appropriate blank. For instance, if you entered a "4" for #1 -"I offer facts and give my opinion...", enter "4" in #1 (give information and opinion) below. Then add the columns to get a total for your orientation toward task actions and maintenance actions. The higher the total score, the stronger is your orientation towards that type of action.

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<tr>
<th>TASK ACTIONS</th>
<th>MAINTENANCE ACTIONS</th>
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<tr>
<td>1. give information and opinion</td>
<td>2. encourage participation</td>
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<tr>
<td>3. seek information and opinion</td>
<td>4. facilitate communication</td>
</tr>
<tr>
<td>5. define direction and role</td>
<td>6. relieve tension</td>
</tr>
<tr>
<td>7. summarize</td>
<td>8. observe process</td>
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<tr>
<td>9. energize</td>
<td>10. solve interpersonal problem</td>
</tr>
<tr>
<td>11. check comprehension</td>
<td>12. support and praise</td>
</tr>
</tbody>
</table>

Total for Task Actions           Total for Maintenance Actions


Comment 2

The purpose of this activity is to measure your personal inclination towards satisfying the demands of the task itself, or towards satisfying the needs and demands of the people working on the task. Scores can range from 6, indicating a very low propensity toward this inclination, to 30 showing a very strong tendency in this approach. Thus, the higher the score, the higher is your inclination towards that behavior. Use the ranges below to help you gauge your own inclination toward task and maintenance approaches. Once you have determined your scores for the task and maintenance actions in question 3, use the information below to evaluate your own leadership style.

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Inclination</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 to 13</td>
<td>low</td>
</tr>
<tr>
<td>14 to 22</td>
<td>moderate</td>
</tr>
<tr>
<td>23 to 30</td>
<td>high</td>
</tr>
</tbody>
</table>

Your Score For Task, Maintenance

(low, low) Only a minimum effort is given to getting the required work done. There is general noninvolvement with other group members. The person with this score may well be saying, "I really don't want to work on this activity," or, "I don't want to work with this group of people." Or they may be so inactive in the group as to have no influence whatsoever on other group members.

(low, high) High value is placed on keeping good relationships within the group. Thoughtful attention is given to the needs of other members. The person with this score helps create a comfortable, friendly atmosphere and work tempo. However, the person may never help the group get any work accomplished.

(high,low) Getting the job done is emphasized in a way that shows very little concern with group maintenance. Work is seen as important, and relationships among group members are ignored. The person with this score may take an army-drillmaster approach to leadership.
Your Score For
Task, Maintenance

(moderate, moderate) The task and maintenance needs of the group are balanced. The person with this score continually makes compromises between task needs and maintenance needs. Though a great compromiser, this person does not look for or find ways to creatively integrate task and maintenance activities for optimal productivity.

(high, high) When everyone plans and makes decisions together, all the members become committed to getting the task done as they build relationships of trust and respect. A high value is placed on sound, creative decisions that result in understanding and agreement. Ideas and opinions are sought and listened to, even when they differ from one's own. The group as a whole defines the task and works to get it done. The creative combining of both task and maintenance needs is encouraged.
Activity 3

Determining your interpersonal pattern.

The following exercise focuses on your interaction with groups of people. It may help you to think about how you conduct yourself in a group.

The actions listed below describe some of the ways people feel and act from time to time while working in groups. How do you feel and act in groups? Check the five actions that best describe your behavior in groups as you see it.

_____ acquiesce   _____ disapprove
_____ advise      _____ evade
_____ agree       _____ initiate
_____ analyze     _____ judge
_____ assist      _____ lead
_____ concede     _____ oblige
_____ concur      _____ relinquish
_____ coordinate  _____ resist
_____ criticize   _____ retreat
_____ direct      _____ withdraw
Comment 3

The responses you checked in this activity will be used in activity 4 to describe your style of working within a group.

Determining your own interpersonal style can provide important insights into how you relate to others as you go about your work. It should be clear that the best leaders would be those who were characterized by both high dominance and high sociability. These people would interact most successfully with others, and would have a tendency to take charge (that is, to lead). People with both low dominance and low sociability are not likely to be strong, successful leaders, since they would have chronic problems in their interpersonal relationships with others, and probably would not take charge when necessary.

Leadership can be learned. If you found certain weaknesses in your own leadership potential, don't be discouraged. Once identified, you can consciously address and strengthen any weaknesses you may have to improve your leadership abilities.

Remember, there is no perfect leader or a leadership style that fits all occasions. In fact, different situations require different approaches to leadership, a characteristic most good leaders understand.
Activity 4

There are two underlying patterns of interpersonal behavior represented in the list above: dominance (authority or control) and sociability (intimacy or friendliness). Most people tend either to like to control things (high dominance) or to let others control things (low dominance). Similarly, most persons tend either to be warm and personal (high sociability) or to be somewhat cold and impersonal (low sociability). In the diagram below, circle the five actions you used to describe yourself in group activities (in activity 3). Add the number of actions circled in each row and put the totals in the right-hand column. These two boxes should add up to 5. Add the number of actions circled in each column and put the totals in the bottom row. The two boxes should add up to 5 also. The row and column with three or more actions circled represents your tendency in that pattern of interpersonal behavior.

To show you how this is done, here is an example where the actions picked are: assists, criticizes, initiates, judges, and leads. These are circled, and the number of actions circled in each row and column are totaled as shown below.

<table>
<thead>
<tr>
<th></th>
<th>HIGH DOMINANCE</th>
<th>LOW DOMINANCE</th>
<th>NUMBER CIRCLED IN EACH ROW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIGH SOCIABILITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advises</td>
<td></td>
<td>Acquiesces</td>
<td></td>
</tr>
<tr>
<td>Coordinates</td>
<td></td>
<td>Agrees</td>
<td></td>
</tr>
<tr>
<td>Directs</td>
<td></td>
<td>Assists</td>
<td></td>
</tr>
<tr>
<td>Initiates</td>
<td></td>
<td>Complies</td>
<td></td>
</tr>
<tr>
<td>Leads</td>
<td></td>
<td>Obliges</td>
<td></td>
</tr>
<tr>
<td><strong>LOW SOCIABILITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyzes</td>
<td></td>
<td>Concedes</td>
<td></td>
</tr>
<tr>
<td>Criticizes</td>
<td></td>
<td>Evades</td>
<td></td>
</tr>
<tr>
<td>Disapproves</td>
<td></td>
<td>Relinquishes</td>
<td></td>
</tr>
<tr>
<td>Judges</td>
<td></td>
<td>Retreats</td>
<td></td>
</tr>
<tr>
<td>Resists</td>
<td></td>
<td>Withdraws</td>
<td></td>
</tr>
<tr>
<td><strong>NUMBER CIRCLED IN EACH COLUMN</strong></td>
<td></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

The person represented by these actions has some tendency (3) towards high sociability, and a strong tendency (4) towards high dominance.
Now, in the following table circle the five activities you picked in exercise 3, and enter the totals circled in each row and column to see how you rate yourself.

<table>
<thead>
<tr>
<th>HIGH DOMINANCE</th>
<th>LOW DOMINANCE</th>
<th>NUMBER CIRCLED IN EACH ROW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advises</td>
<td>Acquiesces</td>
<td></td>
</tr>
<tr>
<td>Coordinates</td>
<td>Agrees</td>
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<tr>
<td>Directs</td>
<td>Assists</td>
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<tr>
<td>Initiates</td>
<td>Complies</td>
<td></td>
</tr>
<tr>
<td>Leads</td>
<td>Obliges</td>
<td></td>
</tr>
<tr>
<td>Analyzes</td>
<td>Concedes</td>
<td>5</td>
</tr>
<tr>
<td>Criticizes</td>
<td>Evades</td>
<td></td>
</tr>
<tr>
<td>Disapproves</td>
<td>Relinquishes</td>
<td></td>
</tr>
<tr>
<td>Judges</td>
<td>Retreats</td>
<td></td>
</tr>
<tr>
<td>Resists</td>
<td>Withdraws</td>
<td></td>
</tr>
</tbody>
</table>

Comment 4

See Comment 3.
Summary - Study Unit 9.1

The job of the research manager is to utilize the people, funds, facilities, and other resources at their disposal to achieve the goals of the organization and to accomplish its mission. To achieve these goals, managers must develop an appropriate style of management and provide effective leadership to motivate people within the organization to carry out their jobs. The manager’s style of management and leadership can greatly affect the effectiveness and efficiency of the organization.

In this unit, you have learned about the various approaches to leadership, and you have assessed your own interpersonal and leadership styles. Perhaps you have even identified some leadership skills which you need to improve.

If you would like further information on this important topic, we urge you to obtain and review the references in the literature cited and other references listed at the end of the module, and read the article on leadership by Iyamabo (1992), reprinted for your use in the section on readings at the end of the module.
Study Unit 9.2
Creating An Appropriate Environment and Incentives

"In a real sense the job of the R&D manager is to create the right climate for research" (Jain and Triandis 1990).

People must be motivated to work hard to help achieve an organization's goals and objectives. Your organization undoubtedly has a variety of incentives already in place to encourage superior performance. In this unit, we'll take a close look at these and other incentives, particularly those that motivate scientists. You'll learn that scientists pass through career phases, each with its own set of motivating incentives. And scientists themselves are different and respond differently to the same incentive program. Finally, the entire organizational environment (framed in large part by your own leadership and management approach) affects researcher morale and productivity.

If you would like to learn more about this rather complicated business of motivating people to improve their performance, then work through this module. We think you'll find it interesting and rewarding!

**Objectives**

When you have completed this unit, you should be better able to:

- identify several types of incentives that can be used effectively to motivate forestry researchers;
- evaluate your organization's incentive program, and suggest changes to better stimulate researcher productivity and satisfaction;
- describe the four career stages in the life of a research scientist; and
- improve your institution's organizational environment to increase scientist job satisfaction and work performance.
The Influence of an Organizational Environment

Organizations tend to develop an internal culture that reflects the past and current leadership and management of the organization, the mission and goals of the organization, formal and informal rules and regulations that have been established and have evolved over time within the organization, and other factors (Wilkof 1989). All these factors form an informal and formal environment within which the organization functions. This organizational environment can greatly affect employee performance. This is particularly true of scientist performance within research organizations. Managers of forestry research organizations, through their leadership and management style, affect the organizational environment within which all scientists and support personnel operate, and thus directly and indirectly affect the performance of the organization. Government and organizational policies establish incentive and career ladder systems that affect the motivation of scientists and other employees within the organization.

Managers often develop a strong loyalty to the organization for which they work, and their actions are governed by their acceptance and adherence to organizational policies and procedures, and by the norms arising from inside the organization. In many organizations managers can generate a similar sense of organizational loyalty and belonging among the employees they supervise. But scientists differ from other employees in ways that suggest the need for a somewhat different environment in research organizations.

Scientists are strongly influenced by the scientific community to which they belong and by other factors outside of the organization within which they work. Many scientists are driven more by the need to secure acceptance and approval by the community of scientific peers to which they belong, than by organizational loyalties. To a considerable degree, their actions are governed by norms that arise from these external sources. Thus, scientists generally are not as strongly committed to the organization for which they work as managers and other employees may be. A scientific organization must create an environment that recognizes this dual allegiance of scientists to ideals and rewards that arise both outside of and within the organization, and that provides incentives for scientists to direct their work towards organizational goals.

By their training and education scientists have been encouraged to critically examine the world around them, and to question, test, and challenge generally accepted paradigms and authority. Thus, they tend to question, challenge, or sometimes ignore organizational rules and procedures which they think are unnecessary. This may create additional supervisory problems for research managers. Managers may have to take particular care to ensure that scientists understand and accept the need for particular organizational rules and procedures that other employees may take for granted.

Research requires a high degree of innovation and creativity. To be effective, a research organization must develop an environment that encourages innovation and creativity in meeting the goals and objectives of the organization. This requires flexibility in planning research, and a willingness to change plans as new challenges and promising directions emerge from ongoing research.
Research also requires operating funds to cover the costs of supplies, equipment, travel, technical support, maintenance of facilities, and other expenses. Many research organizations in developing countries expend from 60 to 80 percent or more of their appropriations just for salaries, leaving little available for operating funds (Mook 1988). This lack of operating funds to conduct research can act as a disincentive to researchers. Without adequate funds to pursue their work, they may become so discouraged that they leave research and seek employment elsewhere. Research managers can affect the working environment by providing sufficient operating funds to conduct desired research programs, perhaps by controlling personnel levels or by other means.

Because managers are responsible for achieving the goals and objectives of the research organization, they must clearly communicate to their employees the need for working toward those goals and objectives. One way to do this is to work with each employee they supervise at the beginning of the year to develop a mutually acceptable list of specific accomplishments expected from that employee for the coming year. The accomplishments can be targeted towards the organization's goals and objectives. For scientists, such objectives may be in terms of specific study plans developed and approved, studies terminated and a final report written, experimental plots measured or installed, publications written, etc. Other employees would develop expected accomplishments in terms of their particular jobs.

Yet, managers also must be flexible in judging research accomplishments. Research is a risky venture with no assurance of success, particularly if the research is addressing important emerging problems or pioneering new frontiers of science. Despite the best planning, experiments go wrong and end in failure to achieve any useable result. Yet, scientists learn from failures. Research managers must recognize the inherent chances of failure in any research project, and allow for this in planning research, evaluating research performance, and establishing reward systems. Requiring success from every research project attempted, and requiring a fixed research output every year from every scientist, will almost certainly condemn a research program to mediocrity as scientists respond by proposing and pursuing a pedestrian program of research where success is almost certain.

Research managers need to create an organizational environment that generates an incentive system to reward achievement of organizational goals, that encourages and rewards creativity, innovation, and risk-taking, and that tolerates a degree of failure in the risky business of research.

**Motivation Through Rewards and Incentives**

People must be motivated to achieve an organization's goals and objectives. Organizations cannot motivate people. People can only motivate themselves. But organizations can provide appropriate incentives to motivate people to achieve organizational goals. These incentives may have to be both monetary and nonmonetary. To provide appropriate incentives, managers must understand what incentives are likely to be required to motivate the different kinds of people they supervise.

The basic question in the minds of scientists and other employees is, "If I am able to improve my performance, will this improved performance be recognized and rewarded in a way that is
meaningful to me?" Efforts to motivate scientists and other employees must address this basic question. Badawy (1988) outlines seven principles of effective motivation:

- desired performance should be clearly defined and stated;
- a clear distinction should be made between a need for training and a need for motivation;
- reinforced behavior tends to be repeated;
- feedback on performance is an important form of reinforcement;
- rewards should be given for movement toward the desired behavior;
- reward is more effective than punishment in motivation; and
- rewards should follow soon after the behavior to be reinforced.

A common mistake in managing R&D projects is to assume that scientists and engineers are driven to seek the same rewards that other people seek. Many employees are primarily oriented towards monetary rewards and organizational goals. Although scientists and engineers are motivated by these same goals, they also are driven by other incentives and career goals. Scientists are committed to advancing knowledge and gaining professional recognition by peers in their chosen field of science (Badawy 1988). These rewards come from outside of the research organization for which they work. Managers must recognize this difference between scientists and other employees, and the differences in motivating factors among different employees, and provide appropriate incentives for the various people working for them. According to Chaudhuri (1986), in developing countries "...national research laboratories cannot attract good technologists through material incentives but must retain them by inspiring them to achieve challenging goals."

Various types of incentives for researchers have been suggested (Badawy 1988). These include:

Organizationally-oriented incentives:
- merit salary increases;
- promotions within career ladders;
- improved office space;
- increased technical or clerical assistance;
- increased challenge in job assignment; and
- special recognition and/or monetary reward for superior performance.

Professionally-oriented incentives:
- encouragement to publish;
- time off and expenses to attend professional meetings;
- greater freedom to come and go;
- better scientific equipment;
• sabbatical leave for education; and
• expenses and tuition for continuing education.

Bengston (1989) reported on the results of two mail surveys of 91 public forestry research institutions worldwide (46 from developing countries, 45 from developed countries). He concluded that although salary levels are important in motivating forestry researchers, other rewards also are perceived as effective in stimulating researcher productivity. The six categories of nonsalary awards include:

1. financial awards for outstanding productivity, quality, etc.;
2. nonfinancial awards and recognition;
3. additional research funding;
4. other benefits such as housing or transportation;
5. international travel; and
6. career advancement in research.

Although respondents from developing countries rated five of these nonsalary awards as having from moderate to great effectiveness in stimulating researcher productivity, most were used only occasionally in practice (figure 9.2.1). Financial awards were perceived as one of the most effective methods, but were the least used.

In practice, the research manager should recognize that it may be necessary to provide a variety of rewards in order to motivate the different individuals on his/her staff (Jain and Triandis 1990).
Research managers should devote considerable attention to the broad array of incentive mechanisms that are available to stimulate improved performance among research scientists and other employees. Above all, if the organization wishes to achieve its goals and objectives, then its system of rewards and incentives should be based on an individual's contribution towards those goals and objectives (Brooks 1968).

**Career Ladders and Tenure Considerations**

Scientists in many fields gain the knowledge and skills necessary to become an effective researcher in that field only after many years experience as a researcher. Thompson and Dalton (1976) identified four career stages in the life of scientists, engineers, and managers in large research laboratories:

**Stage 1.** In stage 1 the scientist serves as an apprentice to a more senior scientist. This stage is characterized by:

a. the work is never their own;
Stage 2. In stage 2, the scientist:
   a. assumes responsibility for a definable part of a project or process;
   b. works with relative independence and produces significant results that are recognized as their own;
   c. begins to develop credibility and a reputation for competent work; and
   d. manages more of their own time and accepts more responsibility for outcomes.

Stage 3. In stage 3, the scientist:
   a. develops a greater breadth of technical skills and applies those skills in several areas;
   b. begins to deal with the external environment of the organization (clients); and
   c. becomes involved in the development of people, and stimulates others through ideas and information (may become a mentor to younger scientists, or become a supervisor or manager).

Stage 4. In stage 4, the scientist:
   a. exercises a significant influence over the future direction of the organization;
   b. engages in wide and varied interactions both inside and outside the organization; and
   c. sponsors and develops promising people who might fill key roles in the organization.

Not all scientists enter the organization at stage 1, the apprentice level. Some more mature and senior scientists may be recruited to fill positions at the stage 2, 3, or (in rare cases) stage 4 level. Some may enter the organization with qualifications for a stage 1 position, but be assigned responsibilities normally given only to those who have matured to a stage 2 position. This is especially true in small organizations, where there may be only one person in any particular scientific discipline assigned to any one problem area. In small organizations it may not be possible to serve an apprenticeship under a more senior scientist.

Not everyone is motivated to continue to advance through the four career stages described earlier. Some may remain in stage 1. Others may be content to remain in stage 2 or 3. If the research manager is to make effective use of people in the organization, they must identify those with the potential to advance further in their careers, and attempt to stimulate them to greater achievements.

As scientists gain experience and professional recognition, they expect to receive promotions and other organizational recognition for their growing competence. They expect to move from one stage in their career to another, steadily gaining more responsibility and authority.

Bennell (1988a) suggests that an optimal compensation scheme for agricultural researchers should:

- be simple and understandable;
Module 9 - Managing Human Resources

• have grades based on job analysis and evaluation, and job comparison surveys;
• include career-long effective promotion and financial incentives;
• include job titles that identify seniority and competence among colleagues;
• have clearly specified promotion criteria based on demonstrated job performance;
• have provision for accelerated advancement for exceptionally competent and motivated researchers with a proven record of performance;
• provide for dual career ladders, with provision for advancement in both administration and research; and
• provide for consistent increases in income over a career, based on demonstrated performance and achievement.

Such a comprehensive compensation scheme rarely exists in practice, but it does suggest an ideal to strive for. Many governmental research agencies have no career ladders for those choosing to stay in research. The only career ladders are for those in the more traditional administrative positions. Career ladders within government agencies often are determined by civil service or other departments of government, and are outside the control of the research organization.

A lack of research-oriented career ladders can lead scientists to abandon their research career in favor of administrative or other lines of work so that they can advance professionally and obtain higher compensation. This is a valid option for many researchers who, after several years in research, discover that they would enjoy and do well in an administrative career. Without an open career ladder for research scientists, managers of research organizations will find it difficult to keep good research scientists and motivate them to a high level of scientific achievement. The lack of career ladders within research is one of the greatest barriers to be overcome in building an effective forestry research organization.

In the absence of a research-oriented career ladder, the challenge to research managers is to motivate researchers by structuring their research jobs so as to increase job satisfaction. Hall and Louis (1988) found that a high level of job satisfaction by engineering and technical workers in industry was linked to the following factors:

• high levels of recognition for good job performance;
• high job challenge;
• high psychological success;
• high job involvement; and
• a strong sense of being valued, both inside and outside the company.

These are factors that research managers can control. In the absence of a research-oriented career ladder, it is up to research managers to make the job situation challenging and rewarding to those who choose to remain in a scientific career. Managers can increase the level of job satisfaction among scientists by improving the organizational environment. They can:

• provide a high level of recognition within the research organization for good research performance;

• stimulate recognition by outside groups for outstanding research performance that contributes to solving important scientific and societal problems, and make it possible for employees to accept that recognition;

• assign increased duties, responsibilities, and authority, so as to increase the challenge of a scientist's job;

• provide opportunities to develop personally and professionally and acquire new skills and interests, so as to achieve a high level of psychological success that contributes to job satisfaction; and

• communicate to scientists the strong sense of being valued by the research organization for their contributions to organizational goals and objectives.

Above all, research managers can greatly affect the research environment by their style of leadership, which was the subject of the previous study unit.
Activities - Study Unit 9.2

Activity 1

Research managers need to create an organizational environment that has an incentive system to reward achievement of organizational goals, that encourages and rewards creativity, innovation, and risk-taking, and that tolerates a degree of failure in the risky business of research.

*List below what you believe are some of the key factors in your organization's internal environment that help to motivate scientists. Please feel free to refer back to the text for ideas.*
Comment 1

An organizational environment that generates an incentive system should have at least some of the following elements:

- high levels of recognition for good job performance;
- high job challenge;
- high psychological success;
- high job involvement; and
- a strong sense of being valued, both inside and outside the organization.

Further characteristics might include:

- compensation schemes that are simple and understandable;
- compensation grades based on job analysis and evaluation, and job comparison surveys;
- inclusion of effective career-long promotion and financial incentives;
- inclusion of job titles that identify seniority and competence;
- clearly specified promotion criteria based on demonstrated job performance;
- provision for accelerated advancement for exceptionally competent and motivated researchers with a proven record of performance;
- provision of dual career ladders with potential for advancement in both administration and research; and
- provision of consistent increases in income over a career, based on demonstrated performance and achievement.

We hope that you listed at least some of these elements of the organizational environment that help to motivate scientists in your research organization.
Activity 2

Below is a list of incentives that are commonly used to stimulate improved performance of researchers. *Add any other incentives to this list which you believe are or would be important in stimulating the performance of researchers in your organization.*

Then rank each incentive in this list according to how desirable and important you think it is in stimulating improved performance among the researchers on your staff. Rank the most desirable incentive number 1, the next most desirable 2, and so on.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improved office space</td>
</tr>
<tr>
<td>2</td>
<td>Promotions within career ladders</td>
</tr>
<tr>
<td>3</td>
<td>Merit salary increases</td>
</tr>
<tr>
<td>4</td>
<td>Special recognition (internally and by outside groups) and/or monetary reward for superior performance</td>
</tr>
<tr>
<td>5</td>
<td>Increased challenge in job assignment</td>
</tr>
<tr>
<td>6</td>
<td>Increased technical or clerical assistance</td>
</tr>
<tr>
<td>7</td>
<td>Greater freedom to come and go</td>
</tr>
<tr>
<td>8</td>
<td>Better scientific equipment</td>
</tr>
<tr>
<td>9</td>
<td>Encouragement to publish</td>
</tr>
<tr>
<td>10</td>
<td>Expenses and tuition for continuing education</td>
</tr>
<tr>
<td>11</td>
<td>Sabbatical leave for education</td>
</tr>
<tr>
<td>12</td>
<td>Time off and expenses to attend professional meetings</td>
</tr>
<tr>
<td>13</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>
Comment 2

We can't predict how you will rank this list of incentives, as each organization is different. Remember, you were asked to rate the incentives according to how important you thought they were to your staff, not to you personally.
Activity 3

Using the same list of incentives, ask several of your researchers, individually or as a group, to rate these incentives themselves and, if possible, arrive at a consensus regarding the relative value and importance of each of the listed incentives. Do your research staff agree with your own assessment? Do you or they identify any other incentives that are of particular importance to your own organization? *If so, write them below.*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>____</td>
<td>Improved office space</td>
</tr>
<tr>
<td>____</td>
<td>Promotions within career ladders</td>
</tr>
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<td>____</td>
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<td>____</td>
<td>Increased challenge in job assignment</td>
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<tr>
<td>____</td>
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</tr>
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<td>Better scientific equipment</td>
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<tr>
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<td></td>
</tr>
</tbody>
</table>
Comment 3

Again, we can't predict how your research staff would rank this list of incentives. The purpose of this activity is to obtain information about the incentives from the point of view of the researchers, who are the ones who must respond to the incentives that are put into place.
Activity 4

Compare your ranking of incentives with the ranking given by your research staff, by listing the ranking from activities 2 and 3 below.

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Ranking By</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Improved office space</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Promotions within career ladders</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Merit salary increases</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Special recognition (internally and by outside groups) and/or monetary reward for superior performance</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Increased challenge in job assignment</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Increased technical or clerical assistance</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Greater freedom to come and go</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Better scientific equipment</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Encouragement to publish</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Expenses and tuition for continuing education</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sabbatical leave for education</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Time off and expenses to attend professional meetings</td>
<td>1</td>
<td>4</td>
<td></td>
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</table>

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Comment 4

These activities are designed to identify how well you are perceiving the incentives that are likely to motivate the performance of your research staff. If their ratings differ significantly from yours, then perhaps you need to be in closer touch with your staff, to listen better, and to be more sensitive to their expressed and unexpressed needs and frustrations. We also hope that you and/or your staff discovered other incentives particular to your own organization that were seen to be important. Capitalizing on these special incentives can be particularly effective.

In a practical sense, it may not be possible to implement some of the most desirable incentives. For example, we suspect that one incentive that undoubtedly received a high rating was that of merit salary increases. However, your organization's sources of income may be severely limited, with little opportunity to significantly increase compensation. Thus, while the importance of compensation is highly ranked, it may not be feasible to implement this incentive. Other incentives to stimulate researcher motivation will therefore need to be utilized.

In the meantime however, the compensation issue cannot be ignored, since researchers will gradually move to positions in other organizations with higher levels of compensation. Thus, to retain your scientific staff, you as research manager must address these funding limitations, perhaps via a long-term plan for increasing your organization's or research unit's funding base. For more extensive information regarding financial support, please see Module 7.

Remember, people will work hard and be highly motivated by a number of factors besides monetary income. As research manager, you have available to you a number of incentives, some of which can be implemented at little to no additional cost to your organization.
Activity 5

Are there any significant differences between your ranking and the ranking given by your research staff? *If so, briefly describe below what actions you might take to resolve those differences in order to arrive at a consensus regarding the relative importance of the various incentives.*
Comment 5

See Comment 4.
Activity 6

From activity 4, list the three most important incentives to improving research performance. For each incentive, briefly outline what actions would be needed to implement that incentive, what barriers to that action might exist, and what strategies might be used to overcome those barriers.

1. ________________________________
   a. actions needed:
   
   b. potential barriers:
   
   c. strategies to overcome barriers:

2. ________________________________
   a. actions needed:
   
   b. potential barriers:
   
   c. strategies to overcome barriers:

3. ________________________________
   a. actions needed:
   
   b. potential barriers:
   
   c. strategies to overcome barriers:
Comment 6

We don't know which incentives you and your researchers will choose to include here. The important point to be made by this lesson is that simply deciding on which incentives are most likely to motivate your people to a higher level of performance is not enough. It is the incentive itself, not its ranking, that motivates people. Unless the desirable incentives are actually implemented, they have no power to motivate people. This activity suggests the need to not only identify the key incentives, but also determine their feasibility and formulate a plan for implementing those that are feasible.
**Summary - Study Unit 9.2**

Motivating scientists is a complex and challenging job. Managers of forestry research organizations, through their leadership and management styles, affect the organizational environment within which all scientists and support personnel operate, and thus directly and indirectly affect the performance of the organization. Government and organizational policies establish incentive and career ladder systems that affect the motivation of scientists and other employees within the organization.

Your organization undoubtedly has a variety of incentives already in place to encourage superior performance. In this unit, we discussed how the importance of the organizational environment, the motivation of people through rewards and incentives, and career ladders and tenure considerations all affect the motivation and performance of scientists and support staff. Since scientists themselves are different and respond differently to the same incentive program, managers must be sensitive to the individual needs of their staff in order to maximize performance.

We hope that by working through this unit, you now have a better understanding of, and appreciation for, incentives and their effect on morale and productivity. By completing the exercises you now have a personalized list of incentives that are effective and appropriate, and which should be implemented to complement or improve incentive structures already in place.

For further information and discussion of the issues raised in this study unit, you may wish to read the papers in the readings by Bengston (1989), *Research incentives in public forestry institutions*; and by Bennell and Zuidema (1988), *Human resource management for agricultural research: Overview and issues*, found at the end of this module. You also may wish to consult some of the references listed in the literature cited section at the end of this module.
Study Unit 9.3

Managing Personnel Effectively

Managing people is perhaps one of the most challenging and difficult tasks you will face as a manager of research. But successfully managing people is the key to successfully achieving your organization's research goals. The two preceding study units (9.1 and 9.2) in this module discussed in some depth the importance of providing leadership and creating an appropriate environment and incentives for the personnel in your organization. This unit covers several additional topics that are important in managing personnel.

This unit is important! In it, you'll see how crucial it is to recruit the best people you can afford, and why it's so important to plan your recruitment far ahead of time. We'll show you ways to better manage the diverse personalities on your research staff, as well as how to assign duties and responsibilities, and delegate authority. You'll learn how to better manage individual and/or collaborative research efforts. And you'll learn how to evaluate scientist and staff performance, and how to help employees improve their performance. By the time you finish this unit, we hope you will have encountered a number of ideas and suggestions that will help you improve your skills in managing scientists and other personnel in your organization.

Objectives

When you have worked through this unit, you should be better able to:

- prepare a staff recruitment plan to meet the present and future staffing needs of your organization;
- assign duties and responsibilities, and delegate authority to your subordinates;
- evaluate individual scientist and staff performance using a performance evaluation format/system, and take measures to correct deficiencies or improve your employees' performance; and
- manage scientists working individually or collaboratively, and plan for the development of their individual capabilities.
The Challenge of Managing Personnel Effectively

People are the most important resource of any research organization. One of the most difficult and important tasks facing a research manager is managing and directing the human resources within the organization so as to achieve the goals and objectives of the organization. The challenge to managers is to recruit scientists and other staff who have the potential to carry out the planned research program, and then create an appropriate environment for doing research, assign appropriate duties and responsibilities, delegate the authority required to carry out those duties, and reassign people as conditions warrant.

Managers are responsible for developing the capabilities of the scientists and support staff within the organization so they can carry out their work assignments effectively and efficiently. They must plan and provide opportunities for training and education to enhance performance of researchers and support personnel. They also must evaluate the performance of research and other personnel, and take whatever corrective action is indicated by this evaluation.

Recruitment

Importance of planning for recruitment

The key to developing a productive research organization lies in recruiting the right kind of people, including both scientists and support staff. Considerable thought and careful planning should go into every recruitment. One would not buy an expensive piece of equipment, or build an expensive facility, without careful planning and without comparing estimated performance with desired performance. *One of the largest investments in any research organization is the investment it makes in people.* Ultimately, the people recruited to work in a forestry research organization will strongly influence that organization's capacity and capability to do effective research. Thus, to the greatest extent possible the responsibility for recruitment should reside with research managers, and should not be left to an isolated manpower office at ministry headquarters (Sachdeva 1988).

Recruitment of scientists must be closely linked to long-term strategic research program plans, the organizational structure proposed to carry out those plans, projections of the resources and facilities available, and expected future funding levels. Recruitment should be planned well in advance. It should be based on expected vacancies in positions that must be filled and on new positions that are to be created, and should be in line with detailed program planning (Bennel and Zuidema 1988). Systematic long- and short-term manpower planning is essential. Because recruitment of scientists takes time, it must be planned carefully well in advance of actual requirements.

Although recruitment should seek to fit in with the organization's mission, goals, objectives, and plans, some flexibility is needed. At times scientists or technical personnel with the skills needed to carry out a desired research program may not be available. Because scientists tend to be specialists, with particular skills, expertise and knowledge, they generally are not interchangeable. Thus, the scientific talents on a research staff dictate to a large extent the realizable goals and
objectives of the organization. The availability of special skills and interests at the time of recruitment may dictate a reformulation of objectives and plans, and strongly influence the program of research that can be carried out effectively by the organization.

Forestry research often requires recruitment of people with a particular blend of knowledge, skills, and experience. Rarely are such people sitting around waiting to be hired upon demand. Finding the right person, gaining their interest in applying for a position, allowing time for them to terminate their present work and move to the new job location, and making proper arrangements for them to be hired, may take from several months to well over a year, even under the best of conditions. Top quality candidates for some specialties may become available only every few years. Such unavoidable delays can greatly disrupt recruitment and funding plans for new positions, and have a major impact on the attainment of the research organization's goals.

In some cases it may be necessary to plan for future staffing far enough in advance to allow for special educational or training programs to produce scientists with the desired qualifications. However, some advanced education or training may take several years to complete. Thus, long-range planning is a necessary part of the future recruitment of scientists.

It must be recognized that in many government organizations stringent rules and regulations govern the recruitment process, leaving relatively little flexibility for the research manager in recruiting personnel. In some cases, other branches of the organization or government may hire people to staff your organization, with little or no input from you. You may have little or no control over the process, and may have to accept such hiring decisions as final. Then there may be little you can do to plan for recruitment, and your chief task will be to provide the training and leadership necessary to ensure that those who are hired can do their work effectively. It may even be necessary to adjust your research program to take advantage of the special talents of those who are hired. However, in those cases where you can influence hiring decisions, the following discussion may be of some help in guiding the recruitment of scientists and other personnel.
Importance of recruiting well-qualified people

In recruiting scientists for a research organization, their potential quality as researchers is of critical importance. Scientists vary widely in their interests, abilities, and skills. Studies of scientist productivity in many fields have shown that the productivity of scientists is a highly skewed distribution; a relatively small percentage of scientists in any field produce most of the publications (Moravcsik 1986).

A great deal of care and attention should be given to ensure that people of high research potential are recruited. The objective should not be just to fill an empty position with any available person. Wherever possible, recruitment should stress quality, not quantity. Otherwise, a research organization can become overloaded with people who contribute little or nothing to the research goals of the organization. Yet the recruitment of scientists usually is governed by the available supply. If a forestry research program is being developed in new directions, the supply of qualified candidates for any open position may be extremely limited.

One of the difficult decisions in recruiting is whether to recruit a more experienced researcher with a proven track record at a relatively high level of compensation, or a less experienced researcher at the apprentice level who shows considerable promise. Less experienced researchers generally are more readily available, will require considerably less investment in salary, and may have more flexibility in problem assignment with no long-term vested interest in a particular scientific subject or method. However, a younger scientist may require several years to gain the experience necessary to become an effective and productive researcher, and may lack the contacts within the profession that can facilitate research networking. And, to be realistic, many fail to develop into the productive and effective research scientist that research managers want to have on their staff. Because they have no proven record of past accomplishments, recruitment of young research scientists is always something of a gamble.

In contrast, the more experienced researcher can become productive in a relatively short time, recognize and be competent in attacking important research problems, attract funding and other scientific talent, and provide recognition for the organization through an established reputation in the field. But such a scientist does not come cheap, and may stretch the organization's budget to the limit. Further, the mature scientist may bring along a number of previous commitments that can take time away from a proposed research program.

In recruiting research personnel, public research institutes in some countries often face stiff competition from private industry and other organizations in terms of salaries and other job benefits, especially for those scientific and technical disciplines where the supply is low and the demand is high. In many developing countries it is difficult to compete with private industry and other organizations for well-qualified researchers. Government salaries and advancement potential are often far below those available elsewhere. But scientists are not motivated solely by monetary rewards. If the research manager can create a dynamic research group that provides an exciting atmosphere to work in, and which clearly contributes to change on a national scale, this may overcome some of the competitive disadvantages the institution has in pay scales and promotion opportunities.
A critical attribute to be considered in recruiting scientists in an expanding organization is their potential for becoming mentors for the younger scientists that will be recruited later (Wolff 1987). Learning how to do research is best accomplished by serving an apprenticeship under the guidance of a mature, competent scientist. A few experienced research scientists in a growing research organization can serve as a nucleus to attract other scientists seeking opportunities to work with a respected scientist. Mature scientists also develop considerable interaction with the world community of science and with scientists in other fields, thus increasing the potential for collaboration with other organizations.

Technicians, technical support staff, and administrative staff provide essential services to researchers. Without adequate support, a considerable portion of a scientist's time may be lost to tasks that could better be carried out by specially trained technicians and clerical staff. Research planning should include estimates of the number and kind of scientific support staff required. In recruiting people for such positions it is important to choose qualified people, or people who can be successfully trained for the job. People who cannot or will not do the job become a drain on the financial resources and morale of any organization.

Managers often are reluctant to remove a person from a job because of poor performance. Under many government civil service rules and regulations, reassignment or dismissal for poor performance is difficult, at best. Thus, once hired, many people remain with an organization for a large part of their career. The investment a company makes in a person, once hired, over a ten-year period can be very large, including the costs of salary, fringe benefits, training, travel and other expenses, etc. If the person hired does not perform up to the standards expected, or performs unsatisfactorily, a large investment may provide no payoff to the organization. This is why recruitment of well-qualified people is so important to organizational productivity.

**Funding and future budget constraints influence recruitment**

Funding considerations may dictate the area of research for which recruitment can be done, the entrance salary level and thus the qualifications of potential candidates, and the technical and operational support that can be given to the position being filled. In actual practice, funding limitations and the availability of qualified candidates severely constrain the research manager's options in recruitment.

In developing recruitment plans, the impact of recruitment on future funding obligations should be considered. If there is a provision for annual or periodic salary advancement and/or promotion of forestry research personnel, then in recruiting people, the future funding requirements to support future staff, including anticipated salary increases, should be compared to the expected availability of research funds in the future. The recruitment and retention of personnel in a growing organization must be governed by a realistic appraisal of the future budget outlook. It is easy to overlook the fact that as scientists and other personnel mature, they may become eligible for promotion or within-grade advances in salary. This can create an ever-increasing demand for funds to meet payroll requirements, and an ever-shrinking amount of funds available to meet the operational expenses of the organization.
Alternatives to recruiting forestry research scientists

For some research work it may not be necessary to recruit and hire research scientists. There are other options, such as contracting with university or other research personnel to conduct the research, or providing competitive research grants to qualified researchers. This is a particularly advantageous approach in utilizing "soft" funding that is available over a short period of time, with no guarantees beyond a specified time period. The difficulty with such arrangements is that research managers lose direct control over the conduct of the research. In the case of grants, usually there is little control over the performance of the work once the grant is made on the basis of a proposal. However, contracts can be written so as to require close working relationships between those funding the work and those performing the work. Considerable skill is needed in selecting qualified researchers, in drawing up agreements that are effective in specifying the work to be performed, and in administering contracts and grants to ensure they are carried out according to the terms of the agreement. But carefully controlled, contracting for specific research services is a viable alternative to the recruitment of additional personnel to the permanent work force of a research organization.

In seeking potential applicants for jobs, contracts, or grants, a forestry research organization should not overlook the considerable pool of talent that may be available in scientific fields other than forestry. In developing countries, and developed countries as well, considerable research that is directly related to forestry is carried out by scientists in disciplines other than forestry, and by nonforestry research organizations. Ecologists, wildlife biologists, anthropologists, hydrologists, agricultural economists, and many, many other scientific specialties often have expertise that has been devoted to research closely related to forestry. In the absence of qualified forestry personnel within a country, a forestry research manager should explore the use of scientists in allied disciplines that might be available, either through direct recruitment or through the use of contracts and research grants. This is especially important in considering research needs in the social sciences, because few forestry researchers have adequate training in these fields.

Assigning Duties and Responsibilities

In order to be effective, employees must have a clear understanding of their duties and responsibilities. It is the job of the employee's supervisor to ensure that:

• the employee has been assigned appropriate duties and responsibilities, and clearly understands them; and

• the duties and responsibilities assigned to employees are linked to the organizational mission, goals, and objectives.

Employees must have a clear understanding of what performance is expected of them in carrying out their duties and responsibilities. Preferably, they should participate in setting their goals and targets and the criteria by which their performance will be measured. A written job description, that clearly lays out what is expected of the employee, can greatly help both the supervisor and the employee to understand and agree upon the duties and responsibilities of the position. There
are any number of formats for such a job description. The outline given in box 9.3.1 is suggested as only one of many appropriate formats.

**Box 9.3.1. Format for a job description.**

**Identify the Job Context**
Current job title; department and division in which the job is situated; contribution the position makes to the overall mission of the division and department.

**Responsibilities**
Describe responsibilities or desired outcomes of the job clearly, quantifying wherever possible; record the means by which the responsibilities are to be accomplished.

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

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

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

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

**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?

**Rewards**
State grade, salary range, and benefits applicable.

**Career**
State the career prospects, including opportunities for promotion, lateral transfer, and relocation.

Duties and responsibilities should be assigned based not only on the job the employee occupies, but also on the employee's abilities. People vary considerably in their ability to accept and make effective use of responsibility. In assigning responsibilities, managers must recognize that not all employees have equal abilities to effectively utilize the responsibilities assigned to them.

Research managers can use the assignment of duties and responsibilities as a means of training an individual for career advancement. By increasing the level of responsibility and providing a new scope of duties, managers can challenge individuals to prepare for a move up the career ladder. But the performance of people with new duties and responsibilities must be monitored, and help should be provided when needed to assist people in better utilizing their new positions to achieve organizational objectives and their own personal goals.
According to Krebs (1971), the challenge facing research managers and administrators is:

"... to see to it that those who have proved themselves as productive research workers and have shown qualities of leadership are given full scope, above all sufficient time for research, and that those who, after having been given the chance, have not proved productive, as well as those who have lost their productiveness after an initial spurt, should be gently but firmly directed towards activities appropriate to their talent and inclination ..."

With a change in program emphasis or funding levels it may be necessary to reassign people to new areas of research or to new locations, with a change in duties and responsibilities. Such decisions are often difficult and may be resisted by the employees being reassigned.

**Delegating Authority**

Assigning duties and responsibilities to employees is not enough to ensure their effective performance. To be effective, employees need authority commensurate with their responsibilities. Authority refers to the extent to which the individual has control over work planning, methods of doing the job, approval for purchasing and travel, control of resources, flexibility of time, standards for acceptable performance levels, the hiring, assignment of responsibilities, and dismissal of subordinates, and many other factors.

The proper delegation of authority for carrying out responsibilities effectively was identified as an important component in developing an effective research organization at a recent conference of administrators of forestry research institutions in the Asia-Pacific region (Putti 1986). The research manager must delegate sufficient authority to each employee within the organization so that they can function effectively in fulfilling their responsibilities. A lack of authority may lead to employees refusing to accept assigned responsibilities in practice. Yet the delegation of authority beyond what is necessary may cause the manager to lose control of the organization.

Control over expenditures should be delegated to as low a level as possible. Blanket organizational restraints on travel, telephone use, supplies, personnel ceilings, use of computers, and other expenditures can lead to inefficiencies in research performance that can cost far more than the potential savings due to tighter control of expenditures (Brooks 1968). Some expenditure constraints may be imposed on the research organization by higher administrative levels or by funders, and may not be under the control of the research manager. But where they have the option, research managers should be wary of imposing such overall constraints as a way of controlling expenses. Rather, they can impose particular constraints on an individual basis where circumstances warrant, such as inexperience or abuse of expenditure privileges.

An effective way of delegating authority is to delegate a minimal amount of authority to new employees, closely monitor their use of the authority, and gradually delegate more authority as experience dictates. Under all conditions, there is a potential for the abuse of authority for personal gain. Research managers should continually monitor the use of delegated authority to control its misuse and abuse.
Performance Appraisal

Performance appraisal of each employee is a fundamental part of management. It is the key to evaluating how each employee is performing their assigned tasks. Although often considered distasteful and resisted by managers and employees alike, periodic performance appraisals provide one of the best means of monitoring and controlling the performance of employees in their assigned jobs. Such appraisals provide information useful for justifying promotions, identifying emerging problems, and developing training plans. The overriding concern in performance appraisal is to improve individual performance and productivity in a systematic and purposeful manner (Bennell 1988b).

The key to effective performance appraisal is for the manager to clearly enunciate well in advance what specific performance is expected of the employee during the forthcoming rating period. Working together, the manager and employee should develop a mutually-agreed-upon set of clear and realistic performance targets that are to be met during the rating period. This expected performance should be explained to the employee, and assurance sought that the employee understands and accepts the performance expectations. During the course of the rating period, such performance targets can be modified as conditions warrant, but again, it is important to involve the employee in any changes in performance standards.

Ideally, performance should be appraised continuously throughout the rating period, and corrective action taken as needed. At the end of the rating period, a formal performance appraisal should be completed. Such an appraisal should be in reference to the performance standards and targets established at the beginning of the rating period by the manager and the employee. Performance ratings should be based on the manager's judgement as to how well the employee completed the tasks agreed upon. It is unfair to rate an employee on the basis of unspecified expectations.

Zuidema (1988) suggests six factors that are useful in assessing the performance of researchers:

1. personal attributes—what they are;
2. technical knowledge—what they know;
3. professional skills—what they can do;
4. professional activities, behaviors—what they actually do;
5. outputs/results—what they accomplish; and
6. outcomes/impacts—consequences.

The first three factors are predictors of performance; the last three are more direct measures of actual performance. Criteria can be established in each of these categories to evaluate an individual's performance, but the evaluation of scientists poses particularly difficult problems.
Module 9 - Managing Human Resources

Quantitative performance criteria can be readily established for routine, repetitive work. But much of scientific research is nonroutine, nonrepetitive, highly creative work, for which qualitative criteria are most appropriate. The danger of attempting to apply quantitative criteria for measuring scientific performance, such as number of publications produced, or number of studies completed, is that such criteria may lead scientists to avoid attempting high-risk research, and instead concentrate on safe, sure, pedestrian problems. Managers must balance the desire for quantitative criteria by which to measure scientific performance, with the need to encourage creativity and risk-taking among scientists.

In evaluating scientific research performance, a research organization should first of all be concerned about whether or not scientists are working on important and critical problems. Although the quality of scientific methodology is important, it matters little how good the methodology is if it is being applied to unimportant problems. Yet, important problems are often difficult problems. Scientists who work on difficult problems run the risk of failure. Science is a risky business. Research organizations should not expect every research project to be successful. Some failures are inevitable. Performance evaluation standards that penalize scientists for research failures, may doom an organization to a program of mediocre research. In evaluating scientists, managers must find some way to tolerate occasional failures when scientists tackle difficult problems.

In evaluating scientists, managers may be forced to rely upon peer review for judging the scientific aspects of their work, because only scientific peers in a particular field of science are capable of judging scientific performance in that field. Yet, peer review usually provides only a partial evaluation of a scientist's performance. Managers should be aware of the overwhelming tendency of scientific peers to critique scientific work only on the basis of scientific method, technique, or logic (Maslow 1970). Rarely are scientists criticized for working on unimportant or irrelevant problems. It is the responsibility of managers to ensure that an important part of a scientist's performance appraisal includes a judgement as to the importance of the individual's research contributions to science or to society. An equally important evaluation criteria is the extent to which an individual's research contributes to the goals and objectives of the research unit and of the research organization.

**Taking Corrective Action**

The results of performance appraisals should be discussed with the person being appraised. Such a discussion should emphasize the strengths of employee performance, so the employee knows what was done correctly and is given recognition for positive performance. Discussions of performance present an opportunity to plan for employee development through advanced education, training, or special work assignments. Both supervisor and employee need to discuss employee short- and long-term goals and training needs, and jointly agree on specific actions to be taken to develop employee skills and knowledge during the next rating period.

Appraisal discussions also should focus on deficiencies in performance, where future performance needs to be improved. For many managers, criticizing the performance of employees is the most difficult part of performance appraisal. An important reason for performance appraisals is to
identify weaknesses in employee performance, communicate these to the employee, and suggest means of improving performance in the future. In appraising performance, supervisors should not focus on fault-finding, but on pin-pointing what went wrong and what can be done to correct potential performance deficiencies in the future. The exact approach taken in appraising performance and planning corrective actions may vary from one culture to another.

It is essential to remember that supervisors should speak with employees about their performance in private. Corrective action or direct criticism of an employee’s behavior or performance in public should be avoided. This will only cause the employee to "lose face" before fellow workers, and is likely to result in further declines in performance. It also may result in the supervisor losing the respect of the employee, as well as others who witness the corrective action.

Supervisors should communicate to the employee specific deficiencies in performance in such a way that the employee recognizes the deficiencies. Encouraging self-appraisals of performance by employees may stimulate individuals to improve their performance on their own. However, managers must recognize that at times it may be necessary to take corrective action to force individuals to change their performance in desired directions, or to discipline employees for failing to improve up to expected standards.

Employees should be given a chance to correct observed performance deficiencies. Based on the performance appraisal, the supervisor should develop, preferably with the help of the employee, a plan to correct deficiencies within a given period of time through a series of specific actions. Proposed actions to correct performance deficiencies must be closely monitored, and decisive action taken to ensure that each deficiency is promptly remedied.

Weaknesses in employee performance indicate the need to improve employee/supervisor communication and interaction. Supervisors must take the initiative in stimulating more frequent contacts with the employee to discuss job performance. Managers need to ensure that there is increased communication between the supervisor and the employee. Considering the investment an organization makes in training an employee for a particular job, every effort should be made to improve employee performance so that they can contribute more effectively to the organization's goals and objectives. However, it must be recognized that there will be times when, for one reason or another, the performance of an employee declines too far to be tolerated by the organization, without disrupting its program of work. At that point, it may be necessary to reassign the employee to another job, transfer to another organization within the government, or (in extreme cases) terminate employment.

Recognizing Differences In Scientific Personalities

Experienced research managers recognize that scientists exhibit a variety of personality types and different basic approaches to research. For example, Maslow (1970) differentiates between means-centered scientists and problem-centered scientists in approaches to research:

"Means-centered scientists tend, in spite of themselves, to fit their problems to their techniques rather than the contrary. Their beginning question tends to be, Which
problems can I attack with the techniques and equipment I now possess?, rather than what it should more often be, Which are the most pressing, the most crucial problems I could spend my time on?"

In supervising scientists, research managers need to be aware of such differences in scientific approaches to insure that not only is the research being done well, but that the problems selected for research are meaningful and important to science and to society.

In recruiting scientists, research managers should recognize the need for both analytical and creative abilities in people. Often, there is a tendency to evaluate the analytical skills of potential employees, and neglect the importance of creative skills. The experienced research manager recognizes that people utilize both a rational and an intuitive approach in dealing with the world. For a long time a myth has persisted, among scientists and nonscientists alike, that science relies on only one aspect of human nature--the logical-rational side. What often has been ignored is the important role of intuition in solving problems of science (Brown 1977). Albert Einstein wrote:

"I believe in intuition and inspiration ... at times I feel certain that I am right while not knowing the reason.... Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution" (Barry 1986, p. 14).

Scientists use intuition to develop the leaps of imagination needed to break out of conventional modes of thinking about the world and develop new hypotheses to explain the world. Scientists utilize the rational mode of thinking to logically analyze and test proposed hypotheses. Successful scientists exhibit both a strong intuitive ability to imagine possible solutions to scientific problems, and a strong analytical ability to rigorously analyze and test those solutions. In other words, they successfully integrate all of their capacities as a human being, both rational and intuitive.

Creativity is one of the key personality traits of successful researchers. In describing the creative personality, Austin (1978) states that successful scientists are always curious and "... intellectually restless, not satisfied with what is already well known.” Austin suggests that the five most important personality traits of successful scientists are: curiosity, imagination, enthusiasm, discrimination, and persistence.

To enable research scientists to reach their full potential, research managers need to provide a working environment that encourages the full development of both the analytical and intuitive/creative traits of people.

Developing Individual Capabilities

Encouraging individual growth

Managers are responsible for encouraging and providing opportunities for continued professional and personal development of all of the people within the organization. This is done not only to
satisfy the basic needs of individuals for continued growth and development, but to increase the performance of the organization.

Most educational systems emphasize problem solving, and most young scientists are competent in using the latest methodologies and tools to solve particular types of problems. Yet one of the most important tasks in research is identifying or finding important problems that can be researched successfully. For this task, the young scientist receives little or no training in formal educational courses (Dillon 1982). Problem identification skills are usually gained by experience, and by working with mature scientists who have developed special skills in identifying critical problems.

Scientific knowledge, technologies, and skills need to be enhanced continually throughout the working life of individual scientists. Science changes rapidly, and established fields of science often expand in new and productive directions. It is increasingly difficult to keep up with the rapid pace at which new technologies and new methodologies in science appear. Keeping abreast of such developments, and developing the skills to utilize new developments in science, is essential for all scientists.

**Providing appropriate training**

If individuals are to grow and improve their capabilities, they must be provided with opportunities for acquiring new skills and knowledge. It is the job of the research manager to provide appropriate training to enhance job skills so that the organization's performance can be maintained or improved. This is a job that needs to be done carefully. Training can be very expensive in terms of productive job time lost, as well as the costs of particular training programs as well. These costs may be justified if the training improves skills and knowledge, if the results are then applied on the job, and if this leads to improved job performance. It is the manager's responsibility to weigh the potential usefulness of various training opportunities that might be available, and decide which employees are most likely to benefit from the particular training that might be offered.

Following any training activity, the manager has the responsibility for ensuring that the new knowledge and skills that employees gained from the training are applied on the job. The benefits to the organization from training will be lost if, for whatever reason, the results cannot be applied within the organization. Informal plans for implementing training results should be considered in selecting and developing training programs for personnel.

**Overcoming mid-career slumps**

A major challenge to research managers is to find ways to encourage scientists to maintain and expand their research capabilities as they mature. Mid-career training and education are essential in providing new knowledge and capabilities to maturing scientists and, at times, in stimulating lagging careers. To avoid stagnation, continue their professional development, and increase their
competence, scientists must be given regular opportunities to interact with colleagues and professional peers. This can be done through travel to make personal contacts with peers; attendance at seminars and workshops, short courses, national and international professional meetings and conferences; temporary reassignments to work with colleagues; job reassignment and/or transfer of station; special training courses; sabbatical leave; and in other ways. Such professional development can be costly, but the alternative, stagnation of promising professional scientists and plateauing of careers, can be even more costly to the organization in the long-run.

Many scientists, fearing change, fall into an unchanging routine approach to research. It is easy to continue to use the same problem-solving techniques that were successful in the past. For scientists, there are always endless loose ends to be attended to, additional tests of well-established principles to be made, additional trials to reconfirm previous findings, etc. Research on even the most limited subject can be endless. Yet, given the challenges facing forestry today, research managers cannot afford the luxury of having much of their scarce scientific talent addressing problems of limited importance to science and/or society. At times, to overcome individual inertia the research manager may have to prod scientists into accepting opportunities for continuing self-development and for tackling critical new problems, using incentives to stimulate participation. Often, research in a new area can have a stimulating effect on a scientist's career, even though it may at first be an unsettling experience to the individual.

Managing Research Teams

Although many scientists prefer to work alone on problems of their own choosing, they often are confronted by problems for which they have neither the knowledge nor the technical skills to satisfactorily resolve. Also, many if not most of today's most pressing problems involve a multidisciplinary effort in order to develop effective solutions. In seeking to solve these multidisciplinary problems, scientists often must seek out and collaborate with other colleagues who have the special talents or knowledge that they need. There is increasing use of research teams in forestry research.

Teamwork is especially important when taking a problem-oriented approach to research, rather than a tool- or technique-oriented approach. A problem-solving, applications-oriented research approach often requires a team of researchers that represent different fields of knowledge, or that have different technical knowledge and skills. Managing multidisciplinary teams of scientists is difficult, particularly if the team assembled to work on a given problem has no experience in working together. Such teams often undergo considerable social strain in learning to talk with each other, in getting to understand each other's point of view, and in learning to work together (Hagstrom 1964). Conflicts arising among team members can require considerable managerial time to resolve.

The use of research teams introduces several problems into the management of research. Within a team, individual performance may be strongly influenced by the achievements of other team members. Thus, the evaluation of individual performance within a team may present more problems than evaluating the performance of individual scientists working alone, where research accomplishments are more clearly identified with a specific individual. One of the chief rewards
in science is peer approval and acceptance within a particular scientific discipline. Peer recognition is typically given for accomplishments in advancing the frontiers of a scientific discipline. Those who work on teams to solve real-life problems may have less opportunity to gain stature within their discipline. Much of the team output may not be published in refereed scientific journals, and if it is it may have multiple authorship. Since many performance appraisal systems rely on peer approval, those scientists working on multidisciplinary problem-solving teams may not get the recognition they deserve.

Another concern managers must face in managing multidisciplinary research teams is the continuity of job assignments for team members, once the job assignment is completed or the team project is completed and the team is disbanded. The International Service for National Agricultural Research (ISNAR 1984) suggests that a long-term research capacity is best developed and maintained by having a research institution organized by scientific disciplines. This facilitates scientific networking, peer review, and personnel evaluation systems. Such a system is in common use among forestry research institutions today. Under such a system, scientists from a particular discipline are assigned temporarily to problem-oriented research teams for a specified period of time, with the knowledge that they will return to their discipline-oriented groups when the team project ends.

To effectively manage multidisciplinary teams, the director and team leader must rise above their own scientific discipline and learn to manage broadly to understand and motivate scientists from other disciplines, who must learn to work together. The leader must identify the comparative advantage of each team member, and find ways to utilize that ability for the advantage of the team's output.

Although the management of research teams presents special challenges, such multi-disciplinary teams can be an effective way to direct research towards solving critical problems in the management and use of forest and related resources.

**Resolving Conflicts**

Inevitably, when people work together, or otherwise interact, conflicts arise. One of the most important yet frustrating jobs of the research manager is dealing with and resolving conflicts among various people and groups, both within and outside of the organization. Conflicts can arise between research scientists and technicians, between research scientists and administrative staff, between supervisors and subordinates, and between almost any individuals and/or groups of people that interact (Jain and Triandis 1990).

There is no single best approach to dealing with conflicts within organizations. Each individual manager is likely to have their own particular style of conflict resolution with which they feel most comfortable (Jain and Triandis 1990). Further, the most appropriate style may vary from one situation to another, depending upon the context of the conflict. In general, however, conflict resolution can be approached as a six-step process:
Step 1. *Identify and define the problem.* Objectively discuss the problem with those in conflict, and describe behavior without blaming or judging. Be sure the problem is clearly defined to everyone’s satisfaction.

Step 2. *Brainstorm possible solutions.* Be creative and nonjudgemental as possible at this stage, and bring out as many potential solutions as possible from all who are involved in the conflict.

Step 3. *Evaluate the various solutions.* Assess the resources and constraints. This may produce alternatives or may modify solutions generated in step 2. Aim for a win-win solution, that is, a solution where everyone feels that they have gained.

Step 4. *Decide on a mutually acceptable solution.* Be absolutely sure there is a consensus among all participants so that they will actively support the solution.

Step 5. *Implement the solution.*

Step 6. *Evaluate the solution.* The accepted solution may need modification when someone has difficulty implementing the agreement, or if conditions change. Set a time and a place for reevaluation, as necessary.

At all stages, it is imperative that all participants are provided adequate time for providing input, so that they come to understand the opposing points of view, and can claim "ownership" for any solution that is proposed and mutually agreed upon.
Activities - Study Unit 9.3

Activity 1

More than likely your organization already has some sort of system to characterize positions or jobs existing within the organization. There are many ways to describe a position and its duties, activities, and responsibilities. Use the model position description below\(^2\) to describe a position (perhaps your own!) within your organization and compare with position descriptions currently in use.

**Job Description Form**

1. **Identify Job Context**

   Current title.
   Department and division in which the 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.

---

\(^2\)The exercises and their responses regarding delegation are derived from Recruitment and Selection, ISNAR Training Series, Human Resource Management no. 4, by Paul Marcotte 1990.
3. **Working Relationships**

List the working relationships with supervisors, clients, colleagues, subordinates, and people of other departments that affect 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 committees, 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 opportunities for promotion, lateral transfer, and relocation.
Comment 1

How does this model position description, adapted from ISNAR, compare to position descriptions currently in use in your own organization? If you find that this model format is helpful, we have reproduced it in an abbreviated format on the following page to assist photocopying.
JOB DESCRIPTION FORM

1. Identify Job Context

2. Responsibilities

3. Working Relationships

4. Resources

5. Supervision

6. Wider Context

7. Physical Conditions

8. Rewards

9. Career
Activity 2

Determine your current success at assigning work by completing the exercise below. This activity is designed to help you assess your own approach to delegation and the assignment of duties.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do I do things my subordinates should do?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do I bypass my subordinates when making decisions which are a part of their responsibilities?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do my subordinates feel more could be delegated to them? What could be delegated?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do my subordinates know specifically what results they must achieve?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do they agree with me on performance standards established?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is my follow-up adequate?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Am I accessible when my subordinates need to see me?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do they feel they have sufficient authority to accomplish their assignments?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do they exercise their authority without checking with me?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do my subordinates seek additional responsibility?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do I grant my people the right to be wrong and to learn from their mistakes?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Behavior

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>If I were detailed to another job temporarily, could someone take my place?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the development of people a major consideration when I delegate?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Do I really know the strengths and weaknesses of my people?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Have I delegated enough to them to justify this judgement?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are my subordinates consistently qualified for promotions when promotion time comes?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have I asked each subordinate what I could do, refrain from doing, or do so differently which could help them do their job better?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Comment 2

By completing this exercise, you may have some insights into your own personal style or approach to delegation. When trying to decide what tasks to delegate, ask yourself:

What could I delegate that is related to what the employee is doing now?

Which duties, if delegated, would have the most rewarding results?

What kind of experience do I want to give this particular employee to develop their fullest potential?

What can I delegate that will best utilize this employee's particular strengths and interests?

What duties can I delegate that will provide a challenge and a course of job satisfaction?

What sequences of tasks can I delegate to assure that each employee realizes some sense of achievement?

Remember, the best things to delegate include:

- repetitive tasks (e.g., reports that are periodically due);
- routine tasks (of not too great complexity); and
- tasks in which you are least well qualified and where one of your employees may have the required expertise.

To decide what degree of delegation is appropriate, consider such factors as your personality, the personality and capability of your subordinate, the nature of your relationship with the employee, the type of work or problem at issue, the time available, and the amount of top management interest in the matter.
Activity 3

Managing people inevitably involves managing conflict. Each manager has a different style or approach for managing conflict; complete the exercise below to determine your own conflict management style.

Read each of the proverbs carefully. Using the following scale, indicate how typical each proverb is of your actions in a conflict.

- 5 = very typical of the way I act in a conflict
- 4 = frequently typical of the way I act in a conflict
- 3 = sometimes typical of the way I act in a conflict
- 2 = seldom typical of the way I act in a conflict
- 1 = never typical of the way I act in a conflict

My Score

____ 1. It is easier to refrain than to retreat from a quarrel.
____ 2. If you cannot make a person think as you do, make them do as you think.
____ 4. You scratch my back, and I'll scratch yours.
____ 5. Come now and let us reason together.
____ 6. When two quarrel, the person who keeps silent first is the most praiseworthy.
____ 7. Might overcomes right.
____ 8. Smooth words make smooth ways.
____ 9. Better half a loaf than no bread at all.
____ 10. Truth lies in knowledge, not in majority opinion.
____ 11. One who fights and runs away lives to fight another day.
____ 12. One hath conquered well that hath made their enemies flee.
____ 13. Kill your enemies with kindness.
____ 15. No person has the final answer but every person has a piece to contribute.
____ 16. Stay away from people who disagree with you.
____ 17. Fields are won by those who believe in winning.
____ 18. Kind words are worth much and cost little.
____ 19. Tit for tat is fair play.
____ 20. Only the person who is willing to give up their monopoly on truth can ever profit from the truths that others hold.
____ 21. Avoid quarrelsome people as they will only make your life miserable.
____ 22. A person who will not flee will make others flee.
____ 23. Soft words ensure harmony.
____ 24. One gift for another makes good friends.

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4 This exercise and its response are from Johnson and Johnson (1991) pages 304-308, with the permission of the authors.
Module 9 - Managing Human Resources

____ 25. Bring your conflicts into the open and face them directly, only then will the best solution be discovered.
____ 26. The best way of handling conflicts is to avoid them.
____ 27. Put your foot down where you mean to stand.
____ 28. Gentleness will triumph over anger.
____ 29. Getting part of what you want is better than not getting anything at all.
____ 30. Frankness, honesty, and trust will move mountains.
____ 31. There is nothing so important you have to fight for it.
____ 32. There are two kinds of people in the world, the winners and the losers.
____ 33. When one hits you with a stone, hit them with a piece of cotton.
____ 34. When both give in halfway, a fair settlement is achieved.
____ 35. By digging and digging, the truth is discovered.

Now score your conflict strategy by using the table below:

<table>
<thead>
<tr>
<th>Withdrawing</th>
<th>Forcing</th>
<th>Smoothing</th>
<th>Compromising</th>
<th>Confronting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2.</td>
<td>3.</td>
<td>4.</td>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
<td>7.</td>
<td>8.</td>
<td>9.</td>
<td>10.</td>
</tr>
<tr>
<td>16.</td>
<td>17.</td>
<td>18.</td>
<td>19.</td>
<td>20.</td>
</tr>
<tr>
<td>21.</td>
<td>22.</td>
<td>23.</td>
<td>24.</td>
<td>25.</td>
</tr>
<tr>
<td>26.</td>
<td>27.</td>
<td>28.</td>
<td>29.</td>
<td>30.</td>
</tr>
<tr>
<td>31.</td>
<td>32.</td>
<td>33.</td>
<td>34.</td>
<td>35.</td>
</tr>
</tbody>
</table>

Total ____ Total ____ Total ____ Total ____ Total ____

The higher the total score for each conflict strategy, the more frequently you tend to use that strategy. The lower the total score for each category, the less frequently you tend to use that strategy.
Comment 3

According to Johnson and Johnson (1991), "dealing with a conflict is like going swimming in a cold lake. Some people like to test the water, stick their foot in, and enter slowly. Such people want to get used to the cold gradually. Other people like to take a running start and leap in. They want to get the cold shock over quickly. Different people use different strategies for managing conflicts."

This exercise helped you identify your general style of conflict management. The following statements characterize each style of conflict management:

**Withdrawing.**—Withdrawers seek to avoid conflicts. They give up their personal goals and relationships. They stay away from the issues over which the conflict is taking place and from the persons they are in conflict with. They believe it is hopeless to try to resolve conflicts. They feel helpless. They believe it is easier to withdraw (physically and psychologically) from a conflict than to face it.

**Forcing.**—Forcers try to overpower opponents by forcing them to accept their solution to the conflict. Their goals are highly important to them, and relationships are of minor importance. They seek to achieve their goals at all costs. They are not concerned with the needs of others. They do not care if others like or accept them. They assume that conflicts are settled by one person winning and one person losing. They want to be the winner. Winning gives them a sense of pride and achievement. Losing gives them a sense of weakness, inadequacy, and failure. They try to win by attacking, overpowering, overwhelming, and intimidating others.

**Smoothing.**—To smoothers, the relationship is of great importance while their own goals are of little importance. They want to be accepted and liked by others. They think that conflict should be avoided in favor of harmony and that people cannot discuss conflicts without damaging relationships. They are afraid that if the conflict continues, someone will get hurt, and that would ruin the relationship. They give up their goals to preserve the relationship. They say, "I'll give up my goals and let you have what you want, in order for you to like me." They try to smooth over the conflict out of fear of harming the relationship.

**Compromising.**—Compromisers are moderately concerned with their own goals and their relationships with others. They seek a compromise; they give up part of their goals and persuade the other person in a conflict to give up part of this goals. They seek a conflict solution in which both sides gain something—the middle ground between two extreme positions. They are willing to sacrifice part of their goals and relationships in order to find agreement for the common good.

**Confronting.**—Confronters highly value their own goals and relationships. They view conflicts as problems to be solved and seek a solution that achieves both their own goals and the goals of the other person. They see conflicts as a means of improving relationships.
by reducing tension between two persons. They try to begin a discussion that identifies the conflict as a problem. By seeking solutions that satisfy both themselves and the other person, confronters maintain the relationship. They are not satisfied until a solution is found that achieves their own goals and the other person's goals. And they are not satisfied until the tensions and negative feelings have been fully resolved.

Each conflict strategy is useful for certain situations. To effectively resolve conflicts within your organization, you will need to vary your actions according to the situation at hand.
Activity 4

The performance review and appraisal process is normally conducted as six interrelated sets of activities, allowing the manager to review past and current performance, and plan for future performance. These activities are listed in a random order below.

- Communicate the assessment
- Set goals
- Jointly decide on a course of action
- Define job responsibilities
- Gather information
- Assess performance

In the space below, put the activities in what you think is the best order to maximize the effectiveness of the process.

1. 
2. 
3. 
4. 
5. 
6.
The proper order for performance review and assessment activities is:

1. Define job responsibilities
2. Set goals
3. Gather information
4. Assess performance
5. Communicate the assessment
6. Jointly decide on a course of action

We hope you found this question relatively easy. Our purpose was simply to reinforce the point that performance review and assessment is a process of interrelated sets of activities, conducted in a step-by-step manner. Utilizing this process can enhance the productivity of both you and your staff.
People are the most important resource of any research organization. One of the most important tasks facing a research manager is managing and directing the human resources within an organization so as to achieve the goals and objectives of the organization. Managers are thus challenged daily to maximize the productivity and effectiveness of their staff.

Personnel management is of critical importance to the successful operation of a research organization. Managing people takes considerable skill and knowledge. This study unit was able to present only a broad overview of some of the more important aspects of personnel management. We intentionally presented this study unit in a broad, general manner so that you can apply these personnel management activities to any job or position class within your organization. By completing this unit, we hope you have improved your skills and understanding of staff selection and recruitment, delegation of authority, the assignment of duties and responsibilities, managing conflict, and conducting performance appraisals and evaluations.

For more information on personnel management, you may wish to consult ISNAR Working Paper 15, "Human resource management for agricultural research: overview and issues," by Bennell and Zuidema (1988), that is included in the readings at the end of this module, together with some of the literature cited and other references listed at the end of the module.
Study Unit 9.4
Providing Training and Education

It's no secret that well-trained staff are essential for the production of high-quality forestry research. In this study unit, we'll try to give you some basic tools and procedures which you can use to determine the status of your organization's staff training needs. We'll show you how to evaluate whether offered training courses are relevant to your organization's needs, and how to gauge the potential impacts of training programs. You'll learn ways to pinpoint obstacles that employees may encounter when they attempt to apply what they have learned, and how to overcome these obstacles. And finally, you'll learn how to assess the impact of training on your organization's operations.

Objectives

When you have completed this study unit you should be better able to:

• assess training needs of the personnel you supervise to determine what knowledge and skills need to be enhanced to increase the effectiveness of your research organization;

• systematically review staff training options that are available within or outside your organization;

• identify obstacles within your organization that may impede the application of knowledge or skills newly acquired through training; and

• develop a training plan for your organization that includes steps to monitor training activities and their resulting impacts on your organization.
Providing Training and Education

The term *education* is used here to mean acquisition of the base of knowledge that is needed by a competent scientist or by an effective manager. We most often associate education with formal programs in secondary schools, colleges, and universities. *Training*, on the other hand, is interpreted here to mean teaching specific functions and skills to those who will be, or already are, working with specific research activities or management and support functions.

Forestry research managers have indicated in a number of surveys that the lack of adequately educated and trained scientists is one of the key barriers to more effective research (Bengston and Gregersen 1988; Iyamabo and El Lakany 1988; ITFFR 1988). As indicated in table 9.4.1, research managers in all regions of the world, and government and university research administrators, ranked training of scientists as the most important training and interactive activity, with training of technicians ranking second or third, along with development of networks.

Table 9.4.1. Priorities for increased investment in training and interactive activities.

<table>
<thead>
<tr>
<th>Training and Interactive Activities</th>
<th>All LDC</th>
<th>Africa</th>
<th>Asia</th>
<th>Latin America</th>
<th>Institutions</th>
<th>Universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training of scientists</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Training of technicians</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Research networks</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Travel, meetings, and seminars</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

* Insufficient number of respondents.

Developing Individual Capabilities

Managers are responsible for encouraging and providing opportunities for continued professional and personal development of all the people under their supervision. This is done not only to satisfy the basic needs of individuals for continued growth and development, but also to improve the performance of the organization.

Young scientists need training to become effective and self-motivated scientists. Effective research is an art as well as a science. It is learned over time by doing, preferably under the direction and close supervision of a successful scientist (Bennell and Zuidema 1988). Having young scientists serve an apprenticeship under a more mature, competent, and productive scientist, who is able and willing to serve as a coach to help young scientists develop skills in identifying and solving scientific problems, is one of the most effective methods for developing competent scientists.
Most educational systems emphasize problem solving, and most young scientists are competent in using the latest methodologies and tools to solve particular types of problems. Yet one of the most important tasks in research is identifying or finding important researchable problems. For this task, the young scientist receives little or no training in formal educational courses (Dillion 1982). Problem identification skills are usually gained by experience and by working with mature scientists who have developed special skills in identifying critical problems.

Scientific knowledge, technologies, and skills need to be enhanced continually throughout the working life of individual scientists. Science changes rapidly, and established fields of science often expand in new and productive directions. New technologies and new methodologies are being developed continuously. Keeping abreast of such changes, and building up the skills to utilize new developments in science, is essential for all scientists.

A critical training need among forestry research scientists, particularly with younger ones, is to develop and improve the skills necessary for writing scientific papers for publication. Preparing papers for publication that will be subject to careful review and scrutiny by their peers, both before and after publication, can be an intimidating assignment for young professionals. But publishing the results of their research, and exposing their ideas and work to possible public criticism, is a necessary part of being a scientist. Young scientists may need special help and encouragement from more experienced scientists to get started preparing and submitting such papers, and selecting appropriate scientific and technical outlets for their publication. This is a critical step in a scientist’s career. Those who learn to successfully publish the results of their research become productive members of the research organization and of the scientific and technical communities. Those who do not may remain unproductive throughout their career. A special training effort may be needed to ensure that all research scientists have the skills, help, and encouragement necessary to write papers acceptable for scientific and technical publication.

A major challenge to research managers is to find ways to encourage scientists to maintain and expand their research capabilities as they mature. Mid-career training and education are essential in providing new knowledge and capabilities to maturing scientists and, at times, to stimulate lagging careers. To avoid stagnation, to continue their professional development, and to increase their competence, scientists must be given regular opportunities to interact with colleagues and professional peers. This can be done through travel to make personal contacts with peers; attendance at seminars and workshops, short courses, national and international professional meetings, and conferences; temporary reassignments to work with colleagues; and in other ways. Such professional development can be costly, but the alternative, stagnation of promising professional scientists and plateauing of careers, can be even more costly to the organization in the long-run.

On-the-job training is necessary to provide all employees with the knowledge and skills they require to function effectively. Such training may range from relatively informal instruction in office procedures and the use of office equipment by supervisors, to highly structured courses on scientific writing, the use of statistics in research design, word processing on computers, and similar subjects. The value of such training must be weighed carefully against the time lost from productive work during the training period. For such training to be effective, the manager must
Module 9 - Managing Human Resources

**Study Unit 9.4**

*insures that the organizational framework is designed to facilitate the use of new methods and technologies acquired by training.* There is little point in expending human and capital resources in training if the results cannot be applied on the job after the training is completed.

Those researchers who have managerial or administrative talent should receive opportunities to develop those skills. In many developing countries, forestry research managers lack experience in management, and thus could benefit from training in management skills (Bennell and Zuidema 1988). In those countries, a special effort needs to be made to provide research management training for promising management candidates in forestry research organizations.

It is equally important to develop the capabilities of the scientific and administrative staff. They, too, need on-the-job training to function effectively in their positions. They may need additional training to acquire new skills needed by the organization. Those who are being considered for or have been given supervisory and/or managerial responsibilities should be given some form of management training. Research performance is not likely to be up to expectations if the personnel who provide scientific and administrative support for that research are inadequately trained for their jobs.

**Developing a Training Plan**

A research organization needs a training plan in order to determine training requirements, the best deployment of training resources, and the logistics of training activities. Figure 9.4.1 provides an overview of what should be included in a forestry research training plan.

The first step in developing a training plan is to determine needs. These depend on the skills and disciplines needed to accomplish the organization's research objectives and goals, and the scientist and staff skills currently available to the organization.

The second step is to assess what resources are available for developing and implementing training activities and the types of activities which are most appropriate to accomplish the needs. Various types of training and education can be used. These include basic scientific education for researchers, technical training for technicians, general staff training for office personnel, and training in procedures for all personnel. In addition, of course, there is the basic education—both at the high school and the college and postgraduate levels—for the future scientists and managers of a country. All of these different options should be considered in developing the plan.

These two steps are discussed in more detail in the following sections.
Training needs assessment

A training needs assessment is the first step in planning a formal training program. At the same time, of course, assessment of training needs should be an ongoing process. For example, any time that new procedures are adopted, new equipment is purchased, new personnel join the organization, or some problem of performance is identified, there will be a need to reassess training requirements.

Training needs are determined by what the organization wants to accomplish, what it needs to do to accomplish its objectives, who it has available to accomplish its objectives, and what skills and abilities those people have. The gap between what skills it needs to accomplish its objectives and what skills and talents it has available provides an indication of potential training needs. We say potential in the sense that: (1) the organization may be able to go out and hire people with the skills to do what needs to be done, or (2) the gap between needed and available abilities may be caused by other factors influencing personnel performance and ability, e.g., incentives, work conditions, and supporting equipment.
An information needs and skill requirements table can be a useful tool in organizing training needs in relation to topics of importance, and types of individuals within an organization. The rows of such a table are the basic elements in a management by objectives framework, and show general categories of information and skill requirements for a forestry research organization. The columns indicate general categories of personnel in the organization. Table 9.4.2 provides an example of such a matrix for the knowledge and skills related to management required by administrative and scientific staff. (A similar matrix is needed for other types of training and for technicians, office, and other staff.) This type of table helps to define training needs in an organization by identifying which groups of people need what kind of information and skills.

As an example of how this can be applied, table 9.4.3 shows an assessment of the level of information and skill related to management needed by administrators, managers, and researchers in forestry research organizations in Africa. It is based on input provided by directors of research in some 16 African countries, at the 1989 IUFRO Workshop on Management of Forestry Research in Africa in Nairobi, Kenya. For example, the table indicates that the director general and other top administrators need understanding and skill in external relations, research program managers need some understanding and perhaps some skill, while researchers need perhaps only be aware of this topic with perhaps some general understanding. In contrast, researchers need understanding and skill in research methodology, but research managers and top administrators primarily need understanding.

Such matrices help to determine what types of information and skills are needed by various people within an organization. The next step is to appraise the existing knowledge and skill levels within the organization, and identify any gaps that should be filled by training. Such an appraisal can often be done informally by well-informed administrators and managers.
Table 9.4.2. Information needs and skill requirements for administrators, managers, and researchers in forestry research organizations, for identifying training needs.

needs by type of trainee:  
1 = understanding and skill  
2 = general understanding only  
3 = none or awareness only

<table>
<thead>
<tr>
<th>Categories of Knowledge and Skills Related to Management</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Director General and Other Administrators</td>
</tr>
<tr>
<td>1. Setting goals and objectives</td>
<td></td>
</tr>
<tr>
<td>external relations</td>
<td></td>
</tr>
<tr>
<td>mission and goal formulation</td>
<td></td>
</tr>
<tr>
<td>setting internal policies</td>
<td></td>
</tr>
<tr>
<td>2. Program planning</td>
<td></td>
</tr>
<tr>
<td>monitoring performance</td>
<td></td>
</tr>
<tr>
<td>assessing research capacity</td>
<td></td>
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<tr>
<td>assessing research needs</td>
<td></td>
</tr>
<tr>
<td>identifying gaps in capacity</td>
<td></td>
</tr>
<tr>
<td>programs/project design</td>
<td></td>
</tr>
<tr>
<td>financing</td>
<td></td>
</tr>
<tr>
<td>3. Implementation and management</td>
<td></td>
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<tr>
<td>procurement (purchasing/contracting)</td>
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<tr>
<td>budgeting/accounting</td>
<td></td>
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<tr>
<td>operational mgt. (equipment/facilities)</td>
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<tr>
<td>people management</td>
<td></td>
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<tr>
<td>training procedures</td>
<td></td>
</tr>
<tr>
<td>networking</td>
<td></td>
</tr>
<tr>
<td>research methodology</td>
<td></td>
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<tr>
<td>4. Dissemination of results</td>
<td></td>
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<tr>
<td>documentation and information</td>
<td></td>
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<tr>
<td>extension and communication</td>
<td></td>
</tr>
</tbody>
</table>

Note: This table deals with training for management; other types of personnel need training of a different type.
Table 9.4.3. Information needs and skill requirements for administrators, managers, and researchers in forestry research organizations, as identified at the 1989 IUFRO Workshop on Management of Forestry Research in Africa, Nairobi, Kenya.

needs by type of trainee:  
1 = understanding and skill  
2 = general understanding only  
3 = none or awareness only

<table>
<thead>
<tr>
<th>Categories of Knowledge and Skills Related to Management</th>
<th>Personnel</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Director General and Other Administrators</td>
<td>Research Program Managers</td>
<td>Researchers</td>
</tr>
<tr>
<td>1. Setting goals and objectives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>external relations</td>
<td>1.0</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>mission and goal formulation</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>setting internal policies</td>
<td>1.0</td>
<td></td>
<td></td>
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<tr>
<td>2. Program planning</td>
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<td></td>
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</tr>
<tr>
<td>monitoring performance</td>
<td>1.0</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>assessing research capacity</td>
<td>1.5</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>assessing research needs</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>identifying gaps in capacity</td>
<td>1.5</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>programs/project design</td>
<td>1.5</td>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>financing</td>
<td>1.0</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>3. Implementation and management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>procurement (purchasing/contracting)</td>
<td>2.0</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>budgeting/accounting</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>operational mgt. (equipment/facilities)</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>people management</td>
<td>1.0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>training procedures</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
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<tr>
<td>networking</td>
<td>1.5</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>research methodology</td>
<td>1.5</td>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>4. Dissemination of results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>documentation and information</td>
<td>1.5</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>extension and communication</td>
<td>2.0</td>
<td>1.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Note: This table deals with training for management; other types of personnel need training of a different type.
A useful tool to identify the current level of skill or knowledge of an individual is the rating scheme used in rating skills and knowledge for each module of this course. Each person with managerial functions in the organization could be rated on the categories of knowledge and skills related to management shown in table 9.4.2, using the following five levels of skill or knowledge:

1. Cannot perform this skill or has not been exposed to this information.
2. Cannot perform this skill, but has observed the skill or been exposed to the information.
3. Can perform the skill or express the knowledge **with assistance from others**.
4. Can perform the skill or express the knowledge **without assistance from others**.
5. Can perform the skill or express the knowledge **well enough to instruct others**.

A management skill and knowledge assessment could be conducted for individuals using a form such as is shown in table 9.4.4. The results of this assessment for an individual in the organization can be compared with the general level of information needs and skill requirements for a person in the appropriate category of personnel shown in table 9.4.2. Such a comparison may indicate specific gaps in skill or knowledge levels that could be addressed by training.

Specific training needs will vary from one organization to another, and from time to time within the same organization as personnel and responsibilities change and training is completed.

To help develop an overview of training needs in forestry research organizations in Africa, the directors at the 1989 IUFRO workshop in Nairobi were asked to identify what they considered to be the most important management training needs in their organization. The results of this survey are summarized in table 9.4.5. Overall, the directors indicated that training on program and project design and planning ranked first, with training related to budgeting and finance and training related to identifying research needs and priorities ranking a close second and third. Fourth and fifth were training related to internal relations and motivation, and training related to performance measurement and evaluation.
Table 9.4.4. Individual assessment of existing levels of skill and knowledge related to the management of forestry research organizations.

<table>
<thead>
<tr>
<th>Categories of Knowledge and Skills Related to Management</th>
<th>Your level of skill or knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>1. Setting goals and objectives</strong></td>
<td></td>
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<tr>
<td>external relations</td>
<td></td>
</tr>
<tr>
<td>mission and goal formulation</td>
<td></td>
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<tr>
<td>setting internal policies</td>
<td></td>
</tr>
<tr>
<td><strong>2. Program planning</strong></td>
<td></td>
</tr>
<tr>
<td>monitoring performance</td>
<td></td>
</tr>
<tr>
<td>assessing research capacity</td>
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<tr>
<td>assessing research needs</td>
<td></td>
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<tr>
<td>identifying gaps in capacity</td>
<td></td>
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<tr>
<td>programs/project design</td>
<td></td>
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<tr>
<td>financing</td>
<td></td>
</tr>
<tr>
<td>writing research proposals</td>
<td></td>
</tr>
<tr>
<td><strong>3. Implementation and management</strong></td>
<td></td>
</tr>
<tr>
<td>procurement (purchasing/contracting)</td>
<td></td>
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<tr>
<td>budgeting/accounting</td>
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<tr>
<td>operational mgt. (equipment/facilities)</td>
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<tr>
<td>people management</td>
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<tr>
<td>training procedures</td>
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<td>networking</td>
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<tr>
<td>research methodology</td>
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<td><strong>4. Dissemination of results</strong></td>
<td></td>
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<tr>
<td>documentation and information</td>
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<tr>
<td>extension and communication</td>
<td></td>
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<tr>
<td>scientific and technical writing</td>
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</table>
Table 9.4.5. Priority topics for management training in forestry research organizations of Africa: The views of African research directors.

<table>
<thead>
<tr>
<th>Topic for Training</th>
<th>Priority Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program and project design and planning</td>
<td>1</td>
</tr>
<tr>
<td>Budgeting and finance</td>
<td>2</td>
</tr>
<tr>
<td>Identifying research needs and priorities</td>
<td>3</td>
</tr>
<tr>
<td>Internal relations and motivation</td>
<td>4</td>
</tr>
<tr>
<td>Performance measurement and evaluation</td>
<td>5</td>
</tr>
<tr>
<td>Recruitment procedures</td>
<td>6</td>
</tr>
<tr>
<td>External relations</td>
<td>7</td>
</tr>
<tr>
<td>Planning</td>
<td>8</td>
</tr>
<tr>
<td>Specification of rules and regulations</td>
<td>9</td>
</tr>
<tr>
<td>Monitoring and control functions</td>
<td>10</td>
</tr>
<tr>
<td>Dissemination of research results</td>
<td>11</td>
</tr>
<tr>
<td>Training of staff</td>
<td>12</td>
</tr>
<tr>
<td>Management of facilities and equipment</td>
<td>13</td>
</tr>
<tr>
<td>Management of input supplies</td>
<td>14</td>
</tr>
</tbody>
</table>


Options for meeting training and education needs

Once needs have been determined, the options for education and training programs are many. Which ones are chosen depends on, among other things: (1) resources available, (2) extent to which the organization can afford to be without key personnel while they are in training, and (3) the training and education institutions available in-country. In most developing countries, all three of these factors present a challenge to the research manager attempting to develop an adequate training program.

Table 9.4.6 provides an overview of different types of training for researchers and other staff that can be, and have been, used in national forestry research organizations. It also provides information on the types of objectives for which different types of training are appropriate, and it provides some additional information on typical durations, targets, and locations for different types of training activities.
Table 9.4.6. Typology of training in research organizations.

*Table 9.4.6 has to be downloaded separately.*
Funding for training often is tied to international technical assistance and investment programs. In this case, the manager should carefully weigh the advantages and disadvantages of foreign education, often required to be in the donor country. Such education may be good in an academic sense; it will expose the employee to different viewpoints, approaches, or cultures; and it will make professional contacts that may prove useful in the future. However, it may not be relevant in terms of the problems facing the country. This often can be overcome through the use of split programs, where the scientists obtain their formal graduate education in the host country, but return to their own institution to conduct their required research. To do this successfully requires close cooperation, planning, and supervision between both the research and educational institutions. In the case of foreign supported programs, it may be possible to get temporary expatriate replacements for key people while they are in training. This has the double advantage of filling critical gaps and providing a ready source of inhouse training, if the foreign replacement is an experienced researcher.

Continuing education of researchers is a key factor in forestry research success. Ideally such continuing education might involve a short period out of the country or incountry, but away from the home organization, coupled with seminars or workshops in the home organization.

Using the Results of Training Most Effectively

A serious problem arising time and time again is the return of a newly trained, skilled researcher to a work environment where they will not be able to adequately utilize the newly learned knowledge and skills. This may be due to a lack of appropriate facilities, equipment, or other resources needed to apply the training. Or, the training may not be applied because the trainee is transferred to another location or type of job to which the training does not apply. The problem also can arise from the lack of adequate support funding, adequate incentives to apply the training, or an appropriate career ladder (related not only to promotion, but also to salary advances). The reluctance of supervisors or other research administrators to change established methods and procedures may also be a barrier to applying new skills. These issues all have to be considered in looking at training needs.

Evaluation of Training Programs

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.
other words, evaluation attempts to establish whether the right (training) action was taken (Abe 1988).

All training activity should be evaluated in some way, including an evaluation of how well the results of the training activity have been applied in practice, and what effect the application had on organizational performance (Abe, Marcotte, and Raab 1990). Too often, evaluation stops when the training activity is completed. It needs to continue after the training is completed if one really wants to assess the effectiveness of training. After all, the purpose of training is to get people to change what they are doing or how they are doing something. The training can only be thought of as successful if the anticipated changes do take place.

For a complete assessment of what training has accomplished, evaluations should be conducted before, during, and after the training (figure 9.4.2). These include evaluations of: initial levels of skills and knowledge to be imparted by the course; trainee satisfaction with the training; improvements in skills and knowledge; subsequent application of skills and knowledge on the job; and improved personal and organizational job performance.

One of the first steps (and, alas, sometimes the only step) in evaluating training activities is to survey those being trained to obtain their level of satisfaction with the contents, method of instruction, and trainers of the course (or other training activity), and obtain their comments and suggestions for changes. Such course evaluations may be conducted at intervals during the training course, perhaps at the end of each training unit as it is completed, or at the end of the entire course. This information can be used to improve the design of future courses to make them more satisfactory to those taking such courses. Such course changes may include changing the material presented, the way in which it is presented, the instructors, and even the type of trainees to which the course is presented. One important advantage of obtaining frequent feedback during the course from participants is that it provides instructors with the opportunity to make changes in the course as it progresses. However, this does require flexibility on the part of instructors. It does not work well where the curriculum of the course is fixed in advance, and the instructors cannot deviate from the prepared material.

Regardless of how satisfied trainees may have been with the training to which they were exposed, what really counts is whether or not they gained any skills or knowledge from the course. Thus, a key step in evaluating training activities is to determine after completion of training activities, what specific improvements in skills and knowledge were brought about by the training. This implies that the objectives of the training have been clearly identified prior to the course. Participants in training activities should be tested for skill and knowledge levels prior to the course to
establish a baseline against which changes are to be measured. Immediately following the course participants can be tested again to determine what specific improvements were brought about by the course. Similar tests conducted some time after the course can be used to determine how well the skills and knowledge were retained.
Figure 9.4.2. Five levels at which training outcomes should be evaluated (adapted from Abe, Marcotte, and Raab 1990).
Training is conducted to help people improve the ways in which they carry out their current jobs within an organization, or to prepare them for a new job assignment. Thus, to determine training effectiveness it is necessary to determine not only how well skills and knowledge are improved by training, but also whether or not they subsequently are used on the job. Post-training surveys of participants can be used to determine whether or not they have had the opportunity to apply their training on the job. This also points out the importance, when selecting candidates for training, of determining whether or not the skills and knowledge to be imparted by the proposed training activity are a necessary part of that person's current or prospective job assignment, and whether they could be and are likely to be applied on the job after the training is completed.

A final step in determining training effectiveness is to assess how personal and organizational performance changed as a result of the training. This is often one of the more difficult tasks in evaluating the outcomes of training. Many factors other than training may contribute to changes in personal behavior and organizational success. It may be difficult to single out the specific contribution of a training activity to changes in personal and organizational performance. Nevertheless, some attempt should be made to document, to the extent possible, those changes that can reasonably be attributed to the training.
Activities - Study Unit 9.4

The following exercises will give you some practice in using a structured procedure for assessing and planning for your organization's training needs. Despite the fact that you are conducting this exercise by yourself, remember that developing an organizational training plan is best done by working with others who represent the various groups within the organization who will be affected by the plan. A broad participation in the planning process encourages individual and group acceptance (and thus ownership) of the results, ensures the inclusion of a variety of viewpoints, and reduces the potential for conflict.

There are six basic steps in designing and implementing a training program for research organizations:

1. Reviewing the organization's mission and goals (see study unit 2.5)
2. Assessing training needs
3. Determining available resources and potential training impacts
4. Identifying obstacles to implementing new skills and techniques
5. Monitoring training effectiveness and impact on the organization
6. Developing the organization's training plan

Each of these steps are covered in the activities that follow.
Activity Step 1. Reviewing the organization's mission and goals

You must be sure that any training considered is in accordance with the overall mission and goals of your research organization.

_In the space provided below, write down your organization's mission statement. If your organization does not have a mission statement, go back to study unit 2.5 and follow the procedures to develop your own version of your research organization's mission statement._
Comment 1

Be sure to complete this step! Remember, your organization's mission statement is the overall guide to your research orientation and direction. A review of this mission statement will help you define and determine your organization's training needs.
Activity Step 2. Assessing training needs

Use the following table to rate the relative importance of each of the following management training needs by each employee category in your organization. When completed, the table can tell you at a glance where to direct your training resources and efforts. For an example of how this table is used, see table 9.4.3.

Management training needs by type of trainee:
1 = none or awareness only (low)
2 = general awareness only (moderate)
3 = understanding and skill (high)

<table>
<thead>
<tr>
<th>Training Topics</th>
<th>Directors and Other Top Administrators</th>
<th>Research Program Managers</th>
<th>Researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and Skill Categories Related To Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Setting Goals and Objectives</td>
<td></td>
<td></td>
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<tr>
<td>managing external relations</td>
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<td></td>
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<tr>
<td>formulating mission and goals</td>
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<tr>
<td>setting internal policies</td>
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<tr>
<td>other</td>
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<tr>
<td>2. Program Planning</td>
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<tr>
<td>monitoring performance</td>
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<td></td>
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<tr>
<td>assessing research capacity</td>
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<tr>
<td>assessing research needs</td>
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<tr>
<td>identifying gaps in capacity</td>
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<tr>
<td>designing projects/programs</td>
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<td>financing</td>
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<td>other</td>
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<tr>
<td>3. Implementation and Management</td>
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<tr>
<td>procurement (purchasing, contracting)</td>
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<td>budgeting/accounting</td>
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<tr>
<td>operational management (equipment/facilities)</td>
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<td>people management</td>
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<tr>
<td>training procedures/methods</td>
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<td>networking</td>
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<td>research methodology</td>
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<td>other</td>
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</table>
Module 9 - Managing Human Resources

<table>
<thead>
<tr>
<th>Training Topics</th>
<th>Category of Personnel</th>
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<tbody>
<tr>
<td></td>
<td>Directors and Other Top Administrators</td>
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<tr>
<td>Knowledge and Skill Categories Related To Management</td>
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<tr>
<td>4. Dissemination of Results</td>
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<td>documentation and information</td>
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<tr>
<td>extension and communication</td>
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<td>other</td>
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This table can also be easily adapted to assess the training needs of other employees (including technicians, office, and other staff) simply by changing the training topics and the categories of employees to be trained.
Comment 2

This is the heart of the training planning process. This table enables you to quickly assess your organization’s training needs by training topic, and target group to be trained. It can help you to effectively determine organizational weaknesses that can be addressed by training or education. Remember that you can easily adapt this table to your own situation to assess the training needs of other groups of employees in topics appropriate to their responsibilities.
Activity Step 3. Determining available resources and potential training impacts

Once the training needs have been determined, you will need to analyze the options and opportunities available for education and training. To do so will require that you consider at least three factors presented as questions below. Answer these questions in the space provided regarding your own research organization.

A. What resources (financial etc.) for training or education are available?

B. To what extent can your organization afford to be without these key personnel while they are in training?

C. What training and education institutions are available in-country?

What other factors that affect options and opportunities for training and education do you think are important to your organization?
Comment 3

A. Financial resources available for training could be drawn from local funds or core funding, or local sources of external funding. International technical assistance programs often include funds for training, or for temporary expatriate personnel that can fill key positions while the local personnel are in training.

B. Determining which key positions can be temporarily vacant due to training induced absences can be a difficult and sensitive issue. In order for training and educational opportunities to be fully exploited, staff members need to know that their positions are secure while they are in training, and that they can return to work once training is completed. Key positions occasionally can be temporarily filled inhouse by several people sharing duties, or by utilizing international programs that provide expatriate personnel on a temporary basis.

C. We expect that you would list local universities, research centers, and commercial training services (particularly in management or training). When considering local institutions, however, don't forget the considerable human resources and expertise available in your own organization! Staff members who have recently completed continuing education or training should also be encouraged to provide inhouse training to other staff members.
Activity Step 4. Identifying obstacles to implementing new skills and techniques

Let's assume that some of your organization's employees are receiving training. Obstacles within the organization that impede the implementation of techniques or skills gained in training frustrate trainees, waste organizational resources, and squander potential improvements in organizational effectiveness. Thus, it is important to identify these obstacles and develop realistic means to overcome them. We have listed some common organizational obstacles to the implementation of skills, techniques, and methodologies newly acquired by training below:

- lack of equipment or facilities;
- lack of computer hardware or software or other technical facilities;
- lack of time;
- reassignment of newly trained personnel to unrelated duties;
- supervisor or peer reluctance to accept the new methods or technologies;
- lack of adequate support funding; and
- lack of adequate career incentives and/or an appropriate career ladder.

In the space below, list some other obstacles that may keep people in your own research organization from implementing new knowledge and skills they may gain from training. You may want to relate this to specific kinds of training.
By identifying the obstacles to putting new knowledge and skills to work, you now have a much better chance to remove these barriers so that the new skills or techniques gained in training can be applied.

Each staff person trained should prepare a brief plan for implementing newly gained skills or techniques soon after they have finished their training program and resumed their job-related activities. This plan should include an analysis of barriers that the employee anticipates will inhibit application of the newly learned skills or techniques. Management personnel and the employee can then jointly review the plan and take specific steps (as appropriate) to encourage introduction and acceptance of the new techniques. The implementation plan also can be used as a monitoring and evaluation tool to gauge long-term training impacts on the organization (see step 5).

Comment 4

We have already listed a number of potential organizational obstacles to the diffusion of newly acquired skills and techniques. Perhaps you listed others, such as:

- Inappropriate techniques learned in training that have limited utility in your organization (that is, the training itself was not relevant to the overall needs of your organization).

- Lack of organizational mechanisms or structures by which a newly trained employee can attempt to change current procedures and implement the new techniques, skills, or knowledge.

- Lack of opportunity for the employee to use the newfound abilities due to training which was not matched to the employees day-to-day responsibilities and activities.

Did you think of other barriers to implementation particular to your own organization?
Activity Step 5. Monitoring training effectiveness and impact on the organization

All training activity should be subject to some form of evaluation, including how well the results of the training activity have been applied in practice, and what effect the application had. The implementation plan developed in Step 4 can also be used as a monitoring and evaluation tool to gauge long-term training impacts on the organization.

For instance, after a period of time (perhaps 6 months), the plan could be reviewed by both the employee trained and management personnel to determine whether the skills and techniques gained in training have been implemented, and if not, why not. If the skills have been applied they can try to identify what changes in personal and organizational performance have resulted. The information gained from such an assessment can be used to improve implementation, or to make changes in future training to ensure greater relevance and effectiveness.

In the space below, write down some of your own ideas on how your organization could effectively monitor training implementation success, and its impact on your operations.
Comment 5

We really can't anticipate what methods you recorded regarding training program monitoring and impact assessment. However, assessments periodically conducted by supervisors and others can be made to determine:

- progress of training and satisfaction level of trainees;
- evidence of improved employee knowledge, skills, and attitudes;
- application of new knowledge, skills and attitudes by the employee; and
- changes in organizational performance following training (impact).

In all cases, training evaluations should take place over time as the training activity progresses, and should involve trainees, trainers, supervisors or those administratively responsible for the trainees upon resumption of job activities, or outside evaluators.
Activity Step 6. Developing the organization's training plan

By completing steps 1 to 5, you now have all the tools and information you need to develop a training plan for your own organization. The training plan includes an analysis of the following five factors:

1. review of organization mission and goals (see study unit 2.5);
2. training needs assessment;
3. determination of available resources and potential training impacts;
4. identification of obstacles to implementation of new skills and techniques; and
5. monitoring training effectiveness and impact on the organization.

In the space below, briefly summarize the information you generated in steps 1 to 5 to create a training plan for your own organization.
Comment 6

Now that you have developed a training and continuing education plan for your own research organization, the challenge is to ensure that it will be implemented. Of course, your plan is just that, YOUR PLAN, and reflects only your opinions and viewpoints.

Remember, training and continuing education activities affect everyone in your organization. Training activities are often viewed as important benefits of employment, and thus can be volatile, and sometimes divisive issues in an organization. Planning training and education programs for your organization's staff should be a group effort in order to guarantee participation, encourage ownership, reduce conflicts, and ensure that the plan represents a variety of viewpoints and interests acceptable to all.
Summary - Study Unit 9.4

Clearly, training and continuing education are essential for producing high quality forestry research in today's rapidly changing world. By following the six steps outlined in this study unit in planning a training and education program, you will ensure that your organization's training requirements have been thoroughly reviewed. The plan will address the overall mission and goals of your organization. By assessing training and resource needs, and evaluating their potential impacts on organizational performance, it will help your organization focus and target its training efforts. Organizational obstacles to implementing newly acquired skills, knowledge, and techniques gained from training and education can be identified and overcome. And continued monitoring and evaluation, conducted both during the training process and after the employee has returned to work, improve future training efforts and enhance the success of your organization's research program.

The article by R. Z. Callaham (1989), *Training and education for management of RD&A activities*, included as a reading at the end of this module, provides additional information on this topic, as do several of the references cited at the end of this module.
Final Skill and Knowledge Assessment

Module 9 - Managing Human Resources

On the following page are listed a number of skill and knowledge statements derived from the objectives of the study units in module 9. These are identical to those listed in the initial skill and knowledge assessment at the beginning of the module.
Now that you have completed module 9, please read each statement carefully and indicate with a checkmark the level that best describes your current skill or knowledge, from 1 to 5, using the following descriptions:

1. I cannot perform this skill, or I have not been exposed to the information.
2. I cannot perform this skill, but have observed the skill or have been exposed to the information.
3. I can perform the skill or express the knowledge with assistance from others.
4. I can perform the skill or express the knowledge without assistance from others.
5. I can perform the skill or express the knowledge well enough to instruct others.

<table>
<thead>
<tr>
<th>Skill or Knowledge Statement</th>
<th>Your Level of Skill or Knowledge</th>
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<tbody>
<tr>
<td>a) List some qualities of a good leader.</td>
<td>1 2 3 4 5</td>
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<tr>
<td>b) Describe several management styles and the circumstances where they are appropriate.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>c) Identify several types of incentives that can be used effectively to motivate forestry researchers.</td>
<td>1 2 3 4 5</td>
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<tr>
<td>d) Describe the four career stages in the life of a research scientist.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>e) Prepare a staff recruitment plan to meet the present and future staffing needs of your organization.</td>
<td>1 2 3 4 5</td>
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<tr>
<td>f) Evaluate individual scientist and staff performance, and take measures to correct deficiencies or improve performance.</td>
<td>1 2 3 4 5</td>
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<tr>
<td>g) Assess training needs of the personnel you supervise to determine what knowledge and skills need to be enhanced to increase the effectiveness of your research organization.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>h) Identify obstacles within your organization that may impede the application of knowledge or skills newly acquired through training.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
**Literature Cited**


Bennell, P. 1988b. Performance review and development in agricultural research organizations. In *Human resource management in national agricultural...*


**Additional Sources Of Information**


Readings for Module 9

The following readings have been selected to provide you with additional information related to the material covered in module 9. We hope you will find them of interest.


