PLANNING AND MANAGING FORESTRY RESEARCH: A SELF-LEARNING COURSE

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 5
DEVELOPING THE RESEARCH PROGRAM
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MODULE 5
DEVELOPING THE RESEARCH PROGRAM

Introduction to the Module

The development of a strategic plan for an organization (discussed in modules 2 to 4) should not be viewed as an end in itself. Rather, strategic plans are only a necessary first step in developing plans that will guide the ongoing work of the organization. Strategic plans provide a well-thought-out sense of direction, a shared mission, and a set of goals for the organization. They outline a set of broad strategies for achieving the organization's goals. However, they typically contain little specific information about how the organization will carry out its mission and achieve its goals.

Once a strategic plan is developed and approved, there still remains the task of developing and implementing a research program to achieve the objectives and goals outlined in the strategic plan. This module addresses the task of developing the research program. The task of implementing the research program is covered in Module 6.

Research program plans provide a framework for guiding research activities of the organization to ensure that they are directed towards the critical issues and objectives identified in the strategic plan. Program planning outlines how those goals are going to be achieved and the mission accomplished over a period of several years. Such plans, which can be developed at various levels in the organization, help managers systematically organize research programs and identify and justify resource needs. They can range from plans for broad research program areas, covering work planned for many scientists over a period of several years, down to narrowly defined individual research studies that may cover the work of one scientist for only a few months. Research program plans help managers anticipate future resource needs, and thus are useful in preparing budget estimates for future years. Research program planning is discussed in some detail in Study Unit 5.2.

In this module you'll review some of the strengths and weaknesses of various types of organizational structures. You also will learn about research program planning and the importance of linking research programs to strategic planning. Although relatively short, this module is important because it describes the planning that is needed to guide the implementation of the forestry research being conducted by the research organization.

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Initial Skill and Knowledge Assessment

Module 5 - Developing the Research Program

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 5. 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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<td>a) Identify and describe the various organizational models commonly used by public and private sector forestry research organizations.</td>
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<td>b) Identify three key desirable features of a forestry research organization's structure which enhance forestry research capacity, and explain how these three features contribute to improved efficiency and effectiveness of research implementation.</td>
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<td>c) Explain what research program planning is and why it is needed.</td>
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Study Unit 5.1
Developing an Effective Organizational Structure

The structure of your organization can influence its ability to conduct forestry research. It provides a framework that links research to the external policy environment and guides the processes of research management. This unit will give you a better understanding of how an organization's administrative structure affects its research capacity, and thus its ability to produce quality forestry research. You'll learn about different ways in which research institutions are organized and structured, and the advantages and disadvantages of each. We'll also point out several key features important to building research capacity in any research organization. Finally, we'll help you to review your own institutional environment and identify improvements which can enhance the research capacity of your organization.

Objectives

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

- identify and describe the various organizational models commonly used by public and private forestry research organizations;

- explain how the structure of a research organization can either enhance or limit the management and implementation of forestry research;

- identify three key desirable features of a forestry research organization's structure which enhance forestry research capacity, and explain how these three features contribute to improved efficiency and effectiveness of research implementation; and

- evaluate how your own organization's structure affects its performance in the planning and implementation of forestry research.
The Organizational Structure of the Research System

The way in which a research system is organized can significantly affect its productivity and effectiveness. Organizational structure refers to the institutional forms and mechanisms that govern how a research organization sets research priorities and mobilizes resources for implementing its research program.

The organizational structure thus provides a framework that links research to the external policy environment. It also guides the processes of research management (e.g., human resource development, establishment of scientific linkages and linkages with users, etc.). Organizational structure strongly influences a research institution's ability to use resources effectively and efficiently to generate information, and to promote vital interaction among scientists and between them and client groups. It should be viewed as an additional resource in research, which can either enhance or limit the effective use of other resources (human, physical, financial, and information resources) to achieve the goals of the research organization.

Basic Organizational Options

There are three basic models for organizing public forestry research (Ruttan 1982, Jain 1989): (1) the ministry model; (2) the autonomous or semi-autonomous institute; and (3) the university model. In addition to these public sector models, we can add private sector research organizations. These models differ mainly in governance structure or degree of autonomy they have, and in funding mechanisms. While these organizational models represent ideal types, each type can be found among the forestry research institutions included in the FAO "World compendium of forestry and forest products research institutions" (Hilmi 1986). The basic organizational approaches are briefly described below, highlighting differences in governance structure and funding.

The ministry model

*Governance structure*: In the ministry model, forest and forest products research responsibilities are placed within one or more line departments of a ministry. This is usually the ministry of agriculture or forestry, although other ministries such as natural resources, education, or science and technology could also be involved. This organizational approach is common in small countries and is usually a component of the integrated federal-state (or national-provincial) research systems in large countries (Ruttan 1982). For example, it is the model used in Zambia (figure 5.1.1). The essentially bureaucratic nature of the ministry can create problems for a research organization—research managers may have a low degree of control over policies and procedures concerning the management of personnel, finances, and other resources.
Funding: Direct allocations in the national budgets are the usual source of funds in this organizational form. Funding instability has been a common problem in many countries according to Trigo (1986). In times of financial crisis, the ministry's research budget is often the first to be cut. Jain (1989) notes that some of the larger agricultural research systems of this kind have been successful in introducing reforms into the existing organizational framework, without severing their links with the government ministry. For example, the Department of Research and Specialist Services in the Ministry of Agriculture and Land Development in Zimbabwe has its own line budget.
The autonomous or semi-autonomous institute

Governance structure: The autonomous or semi-autonomous institute is an administratively independent research organization. An example is the model used in Malaysia for the Forest Research Institute Malaysia (FRIM) (figure 5.1.2). A board of directors or trustees typically oversees the execution of the institute's mandate and has responsibility for policy guidance and management control. In some cases, a director general or chief executive officer may fill the role of the board of directors. In either case, the institute typically has formal reporting obligations to some public body (e.g., a ministry or research council) but it is legally independent of this body. A relatively high degree of independence results in greater control over internal organization, including criteria for recruitment, employee incentives, conditions of service, and separation from service, which are likely to differ from the country's civil service system.

A semi-autonomous research institute is legally independent of a line division of a ministry, but does not satisfy all of the criteria for definition as autonomous. The powers of the governing board of a semi-autonomous institute tend to be limited and basically advisory in nature. Semi-autonomous institutes are more directly linked with a particular ministry, which exercises considerable influence on policy (Jain 1989).

Funding: A special budget line in the national budget is the most common source of funding for this type of research organization. In some cases, funding may be tied to specific revenue sources such as a tax on timber production or exports. The autonomy of the institute results in greater control over the management of funds, and has allowed some institutes to attract significant support from international donors. Fully autonomous institutes have complete control over their research budget, while semi-autonomous institutes depend more on the ministry for budgetary support. However, neither autonomous nor semi-autonomous institutes are totally independent of the financial norms and audit requirements set forth by the government for publicly funded institutions. Further, by being independent from action program agencies within the government, an autonomous or semi-autonomous research institute runs the risk of losing the support of these agencies unless a special effort is made to develop research programs tied directly to their needs. An independent research institute may have a much harder job developing political support to obtain the government funding it needs for its research programs.
**Figure 5.1.2.** Simplified organizational chart for the Forest Research Institute Malaysia (FRIM), illustrating the autonomous institute model of forestry research organizations.

Fig. 5.1.2 has to be downloaded separately.
The university model: Integrated research and education

*Governance structure*: The key feature of the university model is the integration of research and education. Extension activities are sometimes included in the same organizational structure, as in the U.S. land-grant university system. This organizational form has a high degree of autonomy and decentralized decision making due to the nature of university systems. The university model is a researcher-oriented system, with a great deal of decision making power resting with individual researchers, who are often expected to take the initiative in developing and securing funding for their own research programs. A simplified outline of a typical research system in a land grant university in the United States of America, indicating the emphasis on research activities by individual professors, is shown in figure 5.1.3.

![Diagram of typical research system in a land grant university](image)

**Figure 5.1.3.** Typical research system in a land grant university of the United States of America, with responsibilities for teaching, research, and extension.
**Funding:** Funding flows through a variety of mechanisms from public and private, national and international sources. Some core funding may be available for research projects from regular university funding sources, or from special government programs designed specifically to encourage and support the development of forestry research capabilities. However, much of the funding for research projects may depend upon the ability of individual researchers to secure funding from various regional, national, or international granting agencies and organizations by submitting proposals for specific research projects. The amount of funding available for research may vary greatly among individual researchers and from year to year, depending upon the availability of donor funds, the types of research programs they choose to support, the number and size of the proposals submitted by the research staff, and the acceptability to the donors of the individual proposals submitted.

**Private sector research**

Forestry research in the private sector is currently very limited, yet is growing in importance in many developing countries. In developed countries, responsibility for certain types of research and research-related services has been transferred gradually to the private sector over the past 50 years. Jain (1989) states that developing countries will likely follow the same evolutionary route over time to achieve greater economy, accountability, and relevance in their research programs. In the developed countries, most adaptive research is carried out in private firms, which enables public research organizations to focus their limited resources on basic and applied research.

**Governance structure:** There are two basic types of private sector involvement in forestry research, although the second is very limited in developing countries: (1) research departments of forest products firms or firms producing inputs such as seedlings or wood processing equipment, and (2) research in industry associations or cooperatives. In both cases, research mandates tend to be narrowly focused with program policy subordinate to the firm or industry association. Research departments of firms have limited autonomy in setting program agenda and in administering programs. Research is closely linked to the firms' production and marketing strategies.

**Funding:** In some private firms, at least part of the research budget may be provided independently of the various operating divisions of the firm. Often research budgets are linked closely to company sales or profits, and research is the first area to be cut in a recession, creating instability in the research programs. In some firms, the source for research funding may be the various operating divisions within the company. Research may have to develop and present proposals to particular operating divisions in order to win their financial support. Operating divisions within a company, under constant pressure to cut costs and increase
financial returns, are unlikely to support long-term or basic research. The research they support is likely to be applied and directed towards solving immediate operational problems.

Desirable Features of the Organizational Structure

The fact that one organizational model has certain advantages over other models (e.g., greater autonomy) does not imply that it is superior in all circumstances. For example, a high degree of organizational autonomy may not fit well with a nation's system of government or culture. No one organizational approach can be considered optimal across all countries. The organizational structure of a forestry research institute should be consistent with the country's forestry conditions and a host of other national characteristics. Moreover, the most effective way to organize research within a country will likely change over time as the political system changes, the economy grows, the educational system develops, the private sector develops its own research capacity, and other changes take place. Flexibility and an ability to respond to change are thus important characteristics of the research organization.

Three desirable features of an institution's organizational structure are discussed here: (1) a sufficient degree of organizational autonomy; (2) an appropriate degree of centralization; and (3) congruence with national characteristics.

Sufficient degree of organizational autonomy

To be effective, research organizations need policies and procedures that are consistent with the special characteristics of the research process. It is highly desirable that research organizations have enough autonomy to establish such procedures. Because the ministry model has a relatively low degree of autonomy, research systems organized in this way usually are forced to use an unmodified civil service system that rewards researchers primarily on the basis of length of service and punctuality instead of the quality, creativity, and relevance of their research. The use of unmodified civil service systems for scientists in public forestry research institutes in some Asian countries has resulted in dissatisfaction among scientists and low research productivity (SEARCA 1982, Putti 1986).

Financial management practices is another area in which a degree of organizational autonomy is desirable. Practices designed to provide a high degree of financial control in large bureaucracies are likely to be too rigid for a research organization, where timeliness and flexibility are essential.

A lack of autonomy in financial management and control can create decision making bottlenecks, including delays in training programs, complex accounting systems that require considerable effort for what should be simple transactions, and lengthy delays in building programs (Iyamabo 1976).
Appropriate degree of centralization

Warnings against too much centralization in the organization of research are often heard. A research system with strong "top down" direction may be insensitive to local priorities. Since forestry research is often highly location specific, decision making should be responsive to local needs and priorities. Centralized research systems also may impose excessive bureaucratic constraints and burdens on researchers and managers.

On the other hand, some degree of centralization is necessary to coordinate programs, direct research toward national priorities, and efficiently provide support such as library and documentation services. It is generally recognized that a trade-off exists between the flexibility and responsiveness of a decentralized research system, and the stronger national budget support, more effective coordination and planning, and more efficient provision of support services in a system with a strong central direction. The appropriate balance between these opposing forces will depend largely on various national characteristics.

Congruence with national characteristics

Finally, the organizational structure of research should be consistent with a country's characteristics, especially the availability of resources and institutional and cultural characteristics. Resources devoted to forestry research must be in line with the importance of the forest-based sector and what the country can afford. Generally, administrative costs are likely to be proportionately higher in independent organizations that are highly autonomous. Trigo (1986) notes that decentralized research systems are more management intensive than centralized organizational structures. Therefore, an organizational structure with a relatively low degree of autonomy—as in the ministry model—may be most appropriate for small forestry research systems in small countries. Obviously, there may be a trade-off between congruence with national resources and desirable organizational features such as a high degree of autonomy and decentralization.

Congruence with social and cultural characteristics and with the existing political-administrative structure in a country also are important. Ruttan (1981) contrasts the organization and management of public agricultural research in the Philippines and South Korea. Both systems have substantial research capacity. But the Korean system employs a "concentrated" management style and highly centralized administration of research, while the Philippine system is more decentralized. A relatively centralized organizational structure for research might work well in hierarchical cultures, but may be less effective in countries in which vertical social relationships are not stressed.
Growing Trend Towards Privatization of Forestry Research

Although considerable research on forest products and utilization and some research on other aspects of forestry have been conducted by private firms and organizations, much of forestry research throughout the world has been conducted and supported by national and international public agencies. In recent years there has been a growing trend towards what has been termed the "privatization" or commercialization of forestry research. By this is meant the decreasing dependence on government or internal core funding to support broad programs of forestry research, and the increasing reliance on outside sources of funds to support forestry research programs. This includes seeking funding for specific research projects from national and international foundations and other donors, or from the clients that the research is supposed to benefit, or from the sale of products, new technologies, and special services produced by the research organization. There may be increasing use of joint funding of research projects and programs, with cost sharing between governments, private industry, and other donors.

In extreme cases, such as in New Zealand (see box 5.1.1), government forestry research organizations have been turned into government corporations that are expected to be essentially self-supporting through the sale of research services and results. In New Zealand, the two new forestry research institutes are not supported by a direct appropriation, but must compete with other scientific research institutes for funding from a central science funding foundation, and find other outside sources of funding. In a number of other countries, such as Nigeria (see Odeyinde and Abu 1992 in the readings for module 7) and Tanzania (Murira 1993), government support of forestry research has been declining over the past decade, and forestry research organizations have been forced increasingly to rely upon outside funding to support their research programs, and upon the generation of research funding through the sale of research results, technologies, goods, and services to the private sector.

The increasing commercialization of forestry research raises questions concerning the degree to which information generated for sale to private firms will be made freely available to other researchers through the media of scientific journals and other publications (O'Loughlin 1993). It also raises concerns about the funding of research, such as social forestry research, that is intended to benefit large numbers of poorer people in society, who cannot afford to pay for the use of research results. Such research cannot be easily commercialized, because the research benefits are likely to be relatively small and too dispersed to be easily captured by any formal market arrangements. If such research, aimed at individuals or small firms, is to continue, it will have to be supported primarily by public or philanthropic funding.

The trend towards privatization of forestry research is likely to force managers of forestry research organizations to learn new managerial skills involving salesmanship, marketing, and
Box 5.1.1. The privatization of forestry research in New Zealand.

"Since 1990 New Zealand's science sector has undergone major reform, which has dramatically changed the organization and funding of science. The creation of a new Ministry of Research, Science and Technology to provide policy advice, a Foundation for Research, Science and Technology to allocate government funding for research, and ten research companies or Crown Research Institutes (CRIs) to do the research, were key elements of the reforms.

Until the 30 June 1992 more than 85% of New Zealand's forestry and wood products research was carried out by the Forest Research Institute (FRI). On 1 July 1992, the FRI was transformed into two research companies or CRIs. In future, most of the R&D concerned with the growing, harvesting, processing, and marketing of radiata pine and other production species, will be carried out by the New Zealand Forest Research Institute (NZFRI) based in Rotorua. Those parts of FRI concerned with environmental protection and ecological forestry research have been transferred to another research company called "Landcare Research New Zealand" (LRNZ).

"The CRIs were established under special legislation ... and are set up as companies wholly owned by the government. They are to be run in a business-like manner and earn an adequate return on shareholders' funds. Compared to the old government department FRI, the new CRIs have more financial powers and are able to borrow, invest, and form joint ventures with other organizations and businesses to develop and commercialize new technologies. The CRIs are also free from many of the constraints and compliance costs associated with government department rules and regulations. The CRIs will pay tax on any profit they earn.

The CRIs will submit research program bids to the new Foundation for RS&T for funding from a 'Public Good Science Fund' totaling about $280 million. Funds will be allocated on the basis of a set of priorities set by the government."

Source: O'Loughlin 1993.

Research Advisory Committees

Some forestry research organizations make use of a formal research advisory committee (RAC) to provide independent advice on research priorities and directions. For example, the Forest Research Institute Malaysia (FRIM) has an advisory committee appointed by the Malaysian Forestry Research and Development Board (MFRDB). The RAC is charged with providing independent advice on the planning, execution and extension of research in FRIM (see box 5.1.2 for the RAC's terms of reference).
Box 5.1.2. Terms of reference for the Research Advisory Committee (RAC) of the Forest Research Institute Malaysia (FRIM), as outlined by the Malaysian Forestry Research and Development Board (MFRDB).

Terms of Reference:

1. to advise the MFRDB on the research programmes and projects of FRIM, especially to identify research priorities and future directions.
2. where practical, to examine in detail the research proposals of FRIM and advise on their appropriateness.
3. to advise the MFRDB on the outputs [research results] of research carried out by FRIM.
4. to advise the MFRDB on other R & D matters referred to them by the MFRDB.


Such research advisory committees vary widely in structure and function from country to country:

- They may be established by statutory authority, or formed at the discretion of the research organization.
- They may be advisory only, or exert strong direct control over the direction and conduct of research programs.
- They may make recommendations to a board of directors, or report to the director of the research organization.

**Improving Organizational Performance**

It must be recognized that a research manager within a given research organization may be able to do little to change the basic organizational structure of that organization. This is rarely an option available to the research manager. However, by understanding the basic strengths and limitations of the different types of organizations, and particularly those of the organization you manage, you may be able to better identify areas where it may be possible to improve the performance of your research organization. For example, if you manage a research organization within a ministry of the government, and must adhere to personnel policies that adversely affect the morale of your research staff, there may be ways to
overcome the adverse effects of these policies by providing special incentives or by other means. Some of these will be discussed in Study Unit 9.2 (Creating an appropriate environment and incentives).
Activities - Study Unit 5.1

Please read the situation analysis below and answer the questions that follow.
Situation Analysis

A developing country in the South has been conducting a modest but growing forestry research program for nearly three decades. The program is currently part of the Department of Forestry in the Ministry of Natural Resources and is funded primarily through the national budget. The research program has grown rapidly over the past few years, as public policymakers have recognized the growing contribution that forests make to national economic development. The nation has advanced quickly in most aspects of development, with a better educated, healthier population, a recent shift toward more democratically-based government, and an open, export-oriented economy.

The Division of Forestry Research is part of the overall bureaucratic structure of the government, being a division of the Department of Forestry. The Ministry of Natural Resources also has a number of other divisions, including personnel, purchasing, accounting, and facilities management, etc., which provide centralized support services to the forestry department and the Division of Forestry Research. Like all other divisions and departments within the ministry, the Division of Forestry Research must closely adhere to the extensive and complex procedures and paperwork in order to access the services provided by these support divisions. While these procedures were instituted over time to discourage the illegal use of government resources, they have become unwieldy and ponderous. Further, the heavy emphasis on monitoring and accountability has been adopted by the forestry department as well, with the imposition of extensive reporting requirements for all research division staff. Finally, the increased activity, funding (some of which comes from international sources), size, and visibility of the Division of Forestry Research has caused some of the top administrators of the forestry department to feel jealous, threatened, or view the division as an effective means to meet their own political and career aspirations. As a result, they have imposed even stricter administrative controls over the division, and have begun to seriously meddle with the internal operations and research agenda setting within the division, attempting to direct research efforts toward more politically visible and rewarding activities.

The gradual program expansion and increased forestry research activity by the division has exacerbated long-simmering organizational and administrative problems, creating something of a crisis in the division and the department. The manager of forestry research of the division has received a mounting number of complaints from field professionals that the research agenda is increasingly irrelevant to adequately address local needs. Scientists within the organization feel seriously hampered by what they describe as excessive financial reporting requirements, slow and inefficient hiring and purchasing procedures, and a lack of freedom to determine topics for research. Rumor has it that a number of scientists are advocating radical changes in the organization and direction of the research program to reflect the dramatic changes in their country, and to achieve more independence in forestry research agenda setting and implementation. International donors are also expressing concern over the lack of independence of the division, and the subordination of the research agenda (toward which the donors contribute) to the political needs and desires of certain administrators within the department.
Activity 1

How do you think the organizational structures of the Ministry of Natural Resources, the Department of Forestry and the Division of Forestry Research contribute to the problems described above? Circle the letters of all responses that you think best apply.

a. The support services provided to the research organization through other departments within the ministry are too centralized, and are overly bureaucratized.

b. Scientists are getting caught up with the rapid economic and political changes around them, and simply want change for change's sake.

c. Upper level ministry and department administrators view the scientist's desires for more freedom in setting the research agenda as a threat to their traditional areas of responsibility and authority. It seems the more the research staff pushes for change, the more the administrators resist.

d. Under the present system, division administrators have limited autonomy and authority in decision making and logistical matters.

e. While the research program has grown over the years, the supporting services of personnel, finance, and procurement have not grown nor have they been modernized to any significant extent.
Comment 1

a. This is correct. The service departments in the ministry are overly centralized and bureaucratized. The organization's structure was established when the ministry was a much smaller institution. This organizational structure worked well for many years. However, with the changing economic and political environment, and the rapid growth in the forestry sector, the ministry model may need some degree of decentralization to better address the needs of its departments and divisions.

b. While the spirit of change is pervasive and contagious, this is clearly not the driving force behind the requests for more efficient application of research resources to the solution of local problems. The loss of control over research agenda setting, mounting organizational and administrative bottlenecks, and increasing irrelevance of the research results are better motivators for change.

c. This is quite true. A great deal of resistance can be encountered whenever institutions which have been in existence for some time are pressured to change. People in upper level positions may fear a loss of stature or power, or even for their jobs, resulting in the system reacting too slowly to societal and economic changes. Further, forestry department officials have come to view the research division as a means to increase their political power, and will not relinquish this resource lightly.

d. Decentralization of authority and responsibility in areas of personnel, finance, and procurement can be an important means to energize a research organization, improve morale and performance, and enable more efficient delivery of research services.

e. Financial accountability, personnel, and procurement procedures put into place in the distant past may have outlived their useful lives and may need significant modernizing and streamlining to enable more efficient research management and implementation.
Activity 2

How would you suggest modifying (in a general way) the organizational structure of this research institution to address the stated concerns of field professionals and scientists, and to improve research efficiency? *Circle the letters of all responses that you think best apply.*

a. Change the ministry's administrative support service structure to modernize and streamline the personnel, finance, and purchasing divisions so they can provide better service to departments and divisions.

b. Take steps to decentralize the decision-making authority of the organization to enable the research institution's staff to better match their research programs to local needs.

c. Insist that responsibility and authority for forestry research be shifted from the Ministry of Natural Resources and the Department of Forestry to a newly established autonomous or semi-autonomous institute for forestry research.

d. Drastically decrease the extent of financial reporting requirements (which were originally instituted as safeguards against illegal use of funds) which scientists are currently required to meet.

e. Appeal to top ministry officials for help in reducing meddling from administrators in the Department of Forestry.
Comment 2

a. Changing the ministry's support service to provide better service would address concerns regarding the excessive reporting requirements and slow procurement, and would improve personnel procedures. However, as the manager of only one (perhaps small) unit within the ministry, you may have little or no authority to make changes in the administrative operations of the ministry. You can, of course, document any problems with current operations, and call attention to the need for change.

b. While updating services as described above (a) is an important start, concurrent actions to decentralize the overall organizational structure of the research institution would also be necessary to allow decision making to be made on a more local level. When programs are allowed to address local needs, they become much more efficient and effective.

c. This is a rather drastic change! Remember that the research institution's organizational structure must be congruent with national characteristics, particularly regarding the availability of resources, and the institutional and cultural characteristics of the country. While the country in this exercise may be headed in this direction, it might be better to slowly evolve towards this type of organizational structure, rather than abruptly switch to a new structure. People usually respond better to and will be more likely to cooperate in managing gradual change (see response 1c). And politically speaking, accomplishing gradual change within a complex organizational system such as this, with many actors and stakeholders, is more likely to occur than abruptly changing the entire system. On the other hand, organizations have built in mechanisms that strongly resist significant change. Thus, gradual, superficial change may do little to enhance the effectiveness of the organization, and thus more drastic measures might be warranted. There is clearly no right answer to this question!

d. To drastically reduce financial reporting requirements would most likely be warmly welcomed by most scientists. Financial managers might think otherwise, however, and would likely object to radical changes in financial reporting requirements. Thus, some sort of compromise reporting system might be agreed upon, utilizing a more streamlined approach which meets the financial officer's needs, while at the same time removing some of the reporting burden from the shoulders of scientists. Transferring financial accounting responsibilities to other nonscientific support personnel is also a common response to this problem.
e. Appealing to top ministry officials to gain relief from internal meddling by forestry department administrators may ignite major high-stake political battles. It might be better to first deal directly with those causing the problems, discussing the situation with them, clarifying your own position, and examining alternatives. A difficult task, to be sure!

Activity 3

Based on your own experience and knowledge, how would you expect the ministry’s upper level administration to react to the actions you selected under activity 2? Circle the letters of the response you think they are most likely to take.

a. They would welcome such changes with open arms, and would quickly implement the changes requested.

b. They would resist the changes with all the means at their disposal.

c. There would be disagreements between the upper level ministry and departmental administrators as to the best course to follow. Thus, they might decide to do nothing for the moment, and instead take a wait-and-see attitude.

d. They would decide that the problem needed further study, and would request that members of the ministry, the Department of Forestry, the Division of Forestry Research, user groups, and policy makers, form a task force to examine the issues in depth and to make recommendations for change.

Activity 4

In the space below, list the three organizational models most commonly used by public sector forestry research organizations, and identify the model upon which your own organization is based. If it differs from the three types described in the text, briefly describe your organization and how it differs.
Comment 3

a. This would be a rather doubtful response, as there is too much personal power and influence at stake. There are few obvious incentives for upper level ministry administrators in this situation to quickly implement major structural changes in their organizations.

b. This may be more likely to occur, particularly if the ministry administrators feel that their power, prestige, or influence will be threatened, or in some way diminished.

c. Some organizations might decide that this is the best approach, or in effect, decide not to decide. Of course, this lack of action just aggravates the problem, and will make it much more difficult to deal with in the future.

d. If top administrators clearly understand that there is a growing problem (that is, if the research manager has successfully communicated to upper management her or his assessment of the problem), they would be likely to choose to further study the issue. Such action will furnish them with a better picture of what their options are, and buys more time for them to carefully analyze the situation, prepare for eventual change, and maneuver so that they might be in a position to gain from the changes that might occur.

Comment 4

Just for review, here are the three organizational models described in the text:

1. the ministry model;
2. the autonomous or semi-autonomous institute; and
3. the university model: integrated research, education, and (perhaps) extension.

More than likely, your organization is based on one of these models or is a hybrid of several organizational approaches.
Activity 5

List below the three desirable features of a forestry research organization's structure that enhance forestry research capacity, and briefly explain how they contribute to improved research program implementation.

1.

2.

3.
Comment 5

The three key desirable features of a forestry research organization's structure are:

1. a sufficient degree of organizational autonomy;
2. appropriate degree of centralization; and
3. congruence with national characteristics.

These criteria are all rather broad, using words like "sufficient" and "appropriate." This is because cultures vary markedly between nations, resulting in differing relevance and appropriateness of the different organizational approaches. Further, the size of the research organization, its primary source of funds, and the length of time it has been active in forestry research all affect how the organization will embrace these three organizational features.

Nevertheless, these features are key to organizational success, and can be considered principles of organizational design. If you feel your organization has structural problems (as you may discover in responding to self-assessment activity 6), consider how these principles are being incorporated into the organization's administrative and managerial structure.
Activity 6

How does your organization's structure limit and enhance the implementation success of your forestry research agenda? Use the guide below to rate your own organization.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision making is too centralized.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I cannot make important day-to-day decisions without asking my superiors.</td>
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</tr>
<tr>
<td>There are too many layers of decision makers in the organization.</td>
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<tr>
<td>Scientists are not allowed to make their own day-to-day decisions in the field.</td>
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<tr>
<td>Scientists are often bogged down with financial and accounting paperwork.</td>
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</tr>
<tr>
<td>Scientists are often bogged down with administrative reporting.</td>
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<tr>
<td>Scientists are often too busy with meetings to schedule field visits.</td>
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<tr>
<td>Information does not flow freely and easily through the organization.</td>
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<tr>
<td>There are many extensive, complex, and confusing reporting requirements to funders and the government.</td>
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<tr>
<td>The organization is not addressing local needs very well.</td>
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<tr>
<td>When pressed, scientists are unclear of what users really need from forestry research.</td>
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<tr>
<td>The research organization has little internal autonomy over hiring or firing of personnel.</td>
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<tr>
<td>Information resources are scattered throughout the organization, and are not centralized.</td>
<td></td>
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<tr>
<td>There is always a shortage of vehicles, and those that are available are poorly maintained.</td>
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<tr>
<td>Constraints of cash flow often restrict research activities.</td>
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</tr>
<tr>
<td>There are turf battles over resources and activities within and between divisions and departments.</td>
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<tr>
<td>Job assignments and responsibilities are unclear.</td>
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<tr>
<td>Scientific equipment ordered takes a very long time to arrive, is often not what was ordered, and sometimes is missing parts.</td>
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<tr>
<td>Scientific equipment is poorly maintained and thus is rarely available for continuous use.</td>
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</tr>
</tbody>
</table>
How did your organization rate? We hope you checked the "disagree" and "strongly disagree" columns most often, and thus have few structural or administrative problems affecting your forestry research activities. However, if you have many checks in the "strongly agree" or "agree" columns, your organization has some severe structural and administrative problems that need immediate attention!

Comment 6

This was your chance to really look at the structure of your organization, and think about how it helps or hinders your efforts at implementing the research agenda. For instance, is decision making too centralized, restricting your ability to craft a relevant and appropriate research agenda? Do scientists and research managers have the freedom to act as they deem necessary to advance the goals and objectives of the organization? Does the organizational structure limit flexibility to respond to rapidly changing conditions? Does the administrative structure permit efficient resource use, and promote interaction between researchers and user groups?

Again, we hope you checked the "disagree" and "strongly disagree" columns most often, indicating few structural problems within your organization. However, if you have many checks in the "strongly agree" or "agree" columns, your organization is probably not functioning very well, and should address some of its structural problems.
Summary - Study Unit 5.1

The way in which an institution is organized strongly influences its ability to produce high-quality forestry research. Forestry research can be structured within a governmental ministry, as an autonomous or semi-autonomous institute, within a university (which integrates research and education), or as a research unit in a private sector corporation. Each type of organizational structure has certain advantages and disadvantages, and should be consistent with a country's characteristics, especially the availability of resources, and institutional and cultural characteristics. Three of the more important and desirable features of an institution's organizational structure are: an adequate degree of organizational autonomy, an appropriate degree of centralization, and congruence with national characteristics.

If you would like more information about organizational structure, we encourage you to obtain and review the interesting references identified in the literature cited and other references listed at the end of the module. A key article directly related to the topics covered in the module, and cited in the text, is reprinted for your use in the section on readings at the end of the module.
Study Unit 5.2
Research Program Planning

Program plans for a forestry research organization outline the program of research that the organization plans to conduct in order to carry out its mission and achieve its strategic goals and objectives. Program planning provides a linkage between strategic planning (which is long-term and broad in perspective, and provides an overall sense of direction for the research organization) and annual planning (which is short-term, very specific, and is closely tied to the budget process). The output of strategic research planning is a key input to program planning; the output of program planning is a key input to annual planning and budgeting.

In this study unit you'll learn why research program planning is needed, how it is carried out, and some special factors you need to consider when planning research programs.

Objectives

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

• explain what research program planning is, and why it is needed;
• describe three program levels commonly encountered in a forestry research organization that play important roles in program planning;
• describe three planning levels that correspond to the three research program levels; and
• develop outlines for project/work unit plans and study plans.
What is Research Program Planning?

Research program planning encompasses a series of research plans that describe and justify a program of research that an organization plans to carry out over a period of time, often several years. Research program planning can be carried out at several levels in the organization. Three research planning levels are frequently encountered: (1) plans covering research program areas; (2) plans covering the research projects included in each program area; and (3) plans for each individual study included in the research project. McLean (1988a) has defined programs and projects as follows:

"Programs are coordinated research activities whose combined scientific output addresses national research objectives. Programs are long-term and somewhat continuous, and are composed, in some cases, of sub-programs, and of projects. Projects address specific research problems, and have explicitly defined timeframes, resources, and targets."

These planning levels are closely allied to the way in which research programs are frequently organized within forestry research organizations. These will be discussed more fully later in the sections on the structure of research programs, and research planning levels. At each planning level there may be several plans, each covering a specific research program, project, or study. Not all research organizations will develop plans at all of these levels. However, regardless of the size and mission of the organization, some sort of research program planning is needed to help organize research activities.

Why is Research Program Planning Needed?

The impact of a research organization on society is largely determined by the relevance of its research program. If a research program addresses national development goals and important high-priority problems in the forest-based sector, then the organization has the potential to make a significant contribution to the development of that society. Of course, to do this, the program must have adequate resources, a favorable policy environment, and other factors that influence the effectiveness and efficiency of research. But without a relevant program of research, an organization has little or no chance for success in obtaining the resources it needs to carry out its proposed program of research. It is therefore worth spending a significant amount of management time and effort to ensure that a program of research is developed that is relevant to the organization's strategic plan.
A set of program plans can be used to inform legislators, policy makers, research users, and other stakeholders of the research that the organization plans to carry out, and the reasons why that work is being undertaken. Such plans also provide an approved framework and guidance for those planning and organizing research activities within the organization.

**Structure of Research Programs**

Most public research organizations, except perhaps for the very smallest, use a project-oriented approach to research planning and management. By this is meant that the researchers within an organization are organized under broad program areas, within subunits (often called research projects or research work units) that have the responsibility for conducting research on a particular problem area or within a specific scientific discipline. Each subunit typically has a project or research work unit leader, and one or more additional researchers and other personnel. There are many variations of the project-based approach, depending on the size and complexity of the organization and other factors.

As illustrated in figure 5.2.1, the structure of a project-based research program usually consists of three separate levels or components:

- a set of broad research program areas;
- a set of research projects or research work units under each program area; and
- a set of individual research studies within each project or work unit.

Research support services (not shown here) are also an integral part of the research organization. They often (but not necessarily) are administered separately from research program areas. Two types of research support areas, scientific support services (e.g., library and information services, computing and statistical services) and administrative support services (e.g., personnel services, budget and finance), are discussed in considerable detail in module 8.

**Research program areas**

Research program areas are broad subject areas or topics for research that an organization is pursuing or plans to pursue. They are often defined along disciplinary lines (e.g., forest products, silviculture, ecology, plant pathology), although defining program areas by broad problems that cut across scientific disciplines may be a more desirable approach. The number of research program areas varies greatly between organizations: small research organizations with narrowly-defined missions may have a single program area; large organizations with broad mandates may define ten or more program areas to pursue.
Research Program Areas

- e.g. Forest Products and Engineering
- e.g. Silviculture, Biology, Ecology
- e.g. Resource Assessment

Research Projects
(for each program area)

- e.g. Wood Properties
- e.g. Forest Products
- e.g. Forest Engineering

Individual Studies
(for each research project)

etc.

Figure 5.2.1. Generalized structure of a project-based research program.

Research projects

Research projects are often the building blocks of research programs. A project is defined as a self-contained area of investigation with specific goals and objectives which relate to a particular program area. Each research program area contains one or more projects. A research project is defined by its goals and objectives, and is strongly influenced by the individuals assigned to work within the project. These may consist of an experienced scientist designated as the team leader or project leader or director, who supervises other research scientists and support personnel attached to the project.

There is no set size for a research project. The size of a project or unit can vary greatly, depending on the scope of the project assignment and the availability of funding and qualified personnel. Under some conditions a project may consist only of a single person, the leader, with no additional staff. Other projects may consist of 10 or more researchers and a large support staff.
The duration of a research project may be fixed for a period of time, or it may be for an indefinite period of time, depending upon the outcome of periodic evaluations of its work. Depending upon the outcome of the evaluation, the project may be renewed for another period of time with essentially the same objectives, it may be redirected with new objectives, or it may be terminated.

**Individual research studies**

Finally, each research project, especially larger and more complex ones, may include a set of individual research studies designed to generate specific information needed to fulfill the goals and objectives of the project. The scope and duration of studies within a project are highly variable, depending on the type of research and the nature of the investigations being carried out. Individual studies may involve only one scientist, or it may involve several, together with teams of field, laboratory, and office assistants.

**Research Planning Levels**

The planning of a project-based research program usually includes the preparation of three types of key planning documents that correspond to the three program levels outlined above—program areas, research projects, and individual research studies. The three types of planning documents are: (1) program area plans; (2) project plans; and (3) research study plans. The relationship between research program levels and planning levels is illustrated in figure 5.2.2.
Figure 5.2.2. Relationship between program levels and planning levels in a forestry research organization.

Program area plans

Program area plans (sometimes referred to simply as program plans) generally provide an overview of what research is planned for a broad problem area or issue over a period of several years. They provide a framework for guiding more specific research activities by:

- describing the specific research areas and projects included within each program area over the planning horizon (often from three to five years);
- justifying why the research is needed, and what contributions the research can make to meeting the needs of science and society;
- defining the specific objectives and goals of the planned research, and indicate when they are expected to be achieved;
- summarizing the estimated resource requirements for the proposed research program; and
- outlining in general terms the expected accomplishments and outputs resulting from the research.

Program area planning at the research organization level has been called operational planning (Milne 1987), "level 2" planning (Dagg and Haworth 1988), medium-range planning (Bengston and Kaiser 1988), and mid-term planning. The scope of the program area plan will vary with the complexity of the research area or problem area under study, and the size of the research organization or subunit. It may encompass all of the research areas and major problem or issue areas that the research organization or subunit plans to pursue over the next few years. Or, it may focus on only one particular research area or problem. Typically it describes in general terms all of the individual studies and other research activities that the unit
or organization plans to implement within the scope of the program area covered by the plan. A program area plan also may include a description of the scientific and administrative support program areas such as library and information services, and personnel services that are needed for proposed program of research, or that are available to the organization. ISNAR (1987) provides an example of this type of planning document.

The typical planning horizon for program planning is three to five years. Program areas should be clearly defined, with goals and objectives explicitly stated and resource requirements (financial, human, and physical) specified to the extent possible.

To be effective, a program of research must be sufficiently focused, given the resources available for research and the capacity of the organization for conducting research. Research organizations that spread their resources thinly over too many program areas and projects will be less effective than one that is focused on critically important problem areas to which it can contribute solutions. A lack of focus in forestry research programs relative to research resources has been noted repeatedly (for example, Wadsworth 1968, Iyamabo 1975, Brunig 1982, Lundgren et al. 1986). This lack of focus may be due to the fact that in many developing countries, a single government institute often has responsibility for research on all aspects of forestry, including silviculture, tree breeding, pathology, soils, ecology, wildlife, forest products, and the social sciences, each with their own constituencies pressuring for targeted research. The combination of broad research mandates and severely limited resources implies the need for careful planning to develop an appropriately focused program of forestry research. The type of research program planning needed by an organization is closely tied to the way in which its research program is organized.

Program area planning should not be an isolated management activity. Effective research program planning is both a top-down and bottom-up process. Some guidance must be provided by top administrators to those preparing the program plan as to expected funding, personnel restrictions and opportunities, and other key strategic factors that are likely to affect the research program. Research program area plans are important documents, and require the detailed involvement of the research unit's senior management team. Preparation of such plans cannot be left to junior staff members. While the ultimate responsibility for program planning rests with senior research management, particularly the manager of the research unit for which the plan is being prepared, external stakeholder groups, team leaders, and researchers also have important roles to play. External stakeholders can help identify, define, and set priorities on research needs. Staff members and researchers can provide a realistic appraisal of the unit's potential capacity to carry out the desired research program. A program plan based on unrealistic expectations will lack relevance and be of little use to the research organization.
Program area planning often is viewed as a recurring one-time task, as something to be done every few years, and then put aside. However, research program areas may vary over time, as priorities and information needs change. A program planning process that is built into the structure and operating procedures of the research organization, and is subject to constant review and updating as conditions change, is likely to provide a more useful guide to the operations of the organization. For example, repeated interaction with and feedback from policy makers, the research advisory board, potential users of the research, and external and international research organizations, can help identify research needs and ensure that the program remains relevant, even as conditions change.

An important use of program plans is to provide a solid basis for monitoring progress and evaluating performance of the organization. It can be used to help determine if specific objectives outlined in the program plan have been accomplished on schedule, and if the anticipated impacts have been achieved. If they are to be used for this purpose, it is important that the objectives and goals and expected timing of accomplishments are clearly described in the program plan. A useful tool for this purpose is the Logical Framework, which provides a systematic framework for helping to describe goals, outputs, and inputs, and the indicators by which they will be measured. The Logical Framework is described in some detail in Study Unit 5.3.

Project plans

In addition to broad program area plans, detailed descriptions for each of the individual research projects that fall within the program are also important program planning documents. Project descriptions usually are prepared by the project team leader, in consultation with team members and with higher administrative levels, and should include:

- a statement of the project's mission;
- the justification for the project;
- identification of key problems to be addressed within the scope of the project and the approach to solving these problems;
- objectives and planned outputs;
- a plan of work that defines responsibilities of project members;
- staffing, equipment, and other resource needs;
- anticipated sources of funding, and approximate levels required for the work planned; and
- a reporting schedule that identifies indicators or milestones that reflect progress.

The Logical Framework, described later in this module, can be helpful in developing project descriptions.
Individual study plans

The third planning document is the highly detailed plan of study for individual research studies, prepared by the principal researcher(s) in collaboration with other researchers and the project team leader. A study plan should include:

- a statement of the research problem, and justification of the study in relation to the project in which it fits;
- importance of the proposed work and previous work in the field;
- a clear statement of the specific research objectives;
- a detailed description of how the work is to be carried out (methodology), including methods of data collection and analysis;
- cost estimates, including personnel needed and their skills, materials and facilities required, duration of the project;
- proposed coordination and collaborative arrangements with other scientists, organizations, or individuals;
- scheduling of the research and planned outputs; and
- planned technology transfer activities, including planned publications, reports, conferences, etc.

An example of the format and instructions used by the Forest Research Institute of Malaysia for developing its study plans is given in box 5.2.1.
Box 5.2.1. Format for study plans used at FRIM, the Forest Research Institute of Malaysia (FRIM 1993).

A study plan shall document the rationale for undertaking a specific line of work in research, development, or application of technology (RD&A). The study plan shall be written by the Study Leader and coworkers, reviewed by scientists within and outside of FRIM, endorsed by the Project Leader and approved by the division director.

A study plan shall follow this general outline:

**Title** - shall be short (no more than ten words) and descriptive. It shall start with an action verb - to describe, to improve, to understand, to determine. Avoid terms such as to study, to learn, or to test. It shall be phrased in terms of the problem to be solved or the expected outcome. It shall not mention the methodology or approach.

**Objective(s)** - shall be achievable, verifiable and tangible. The objective(s) shall relate to a goal that is either socioeconomic, technologic or scientific. Ideally there shall be only one objective for a study. Separable objectives usually point to the need for separate studies. Occasionally economy of effort may justify working toward two or more objectives via a single study.

**Justification** - shall explain why FRIM should direct its limited resources at achieving the foregoing objective. Who wants what, and why? What is the situation or problem? What would be the technological, social, or economic impact of success in achieving the objective(s)? It shall identify the audience concerned about this study.

**Review of literature or experience** - shall provide a technological framework for the work that is proposed. Only key documents shall be cited. An exhaustive review of literature shall not be included. Relevant practical experience may be summarized.

**Duration and plan of work** - shall provide detailed sections on approach to solve the problem; method and procedures; and location and timing of work. The section on approach puts this study in context with others and as part of the overall RD&A process. The section on methods and procedures gives detailed information on: sequence of activities; equipment, land, or facilities to be used; experimental designs; collecting, handling, and analyzing data; statistical analysis; illustrations needed to document the study or for publication. The section on locations and timing tells where and when each phase or step of the work will be done.

**Anticipated output and impact** - shall outline the intermediate output from the RD&A process, identify audiences for the output, and suggest how achievement of expected objectives will affect socioeconomic, technical, or scientific situations.

**Schedule of work and events** - shall provide time schedules and charts in a chronology by which progress of the study may be evaluated. The work schedule or chart shall show each phase of work on a monthly calendar. The expected time line shall start with the month when work should commence and continue through termination of the study.

**Staffing** - shall show the commitments of people required to accomplish the objective(s). Involved scientists shall be named. The amount of time committed to the study during each calendar year by each scientist shall be estimated (to 0.1 scientist years). Any special work to be done by research supporting services, e.g., a new computer programme, shall be identified. Unusual need for work by people in other grades shall be estimated.

**Financing** - shall show any cost for transport and travel, equipment, supplies or other expenses. Costs for the study during each calendar year shall be estimated by management using average costs per scientist-year.

**Cooperation and coordination** - shall identify other investigators or organizations working on the same or related problems and expected interaction with them during the study.
Activities - Study Unit 5.2

Please read the situation description below and complete the activities that follow.

<table>
<thead>
<tr>
<th>Situation Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Ghosa Division of Forestry Research is a successful forestry research organization that is currently investigating a number of topics relevant to the stability and sustainable use of forest resources in Ghosa.</td>
</tr>
<tr>
<td>Ghosa has been undergoing rapid change. The nation's pace of development is quickening, with the overall standard of living of many people increasing despite increasing populations and rural-to-urban migration of rural people in search of employment. Almost all the available agricultural land is already farmed using traditional methods, with associated high erosion rates and declining productivity. Forested areas protected by law are being encroached upon by landless farmers looking for a means to generate their own livelihood. Forests are under increasing pressures everywhere from the forest products industries, government-sponsored economic development and resettlement schemes, demand for agricultural land, and increasing human populations. On the other hand, forests are being increasingly viewed by top policy makers as resources deserving protection due to their vital contribution to the nation's economic and ecological health.</td>
</tr>
<tr>
<td>In response to these trends, and based upon surveys of key stakeholders of forests and natural resources, the division formulated a research program plan several years ago that attempted to meet the nation's needs. However, since the plan was written, many additional research projects have been undertaken. Thus, the rapid pace of change, the increasing complexity of the overall research agenda, and the growing size of the research organization have rendered the division's prior program plans increasingly obsolete. The research program lacks coherence, is difficult to manage, monitor, or evaluate. A list of current research activities (presented below) is available.</td>
</tr>
</tbody>
</table>
a. An investigation looking into the silvicultural aspects of producing *Acacia auriculiformis* in plantation and agroforestry configurations.

b. Research regarding the characteristics and marketing potential of oil made from the nut of a native palm.

c. Species/site matching investigations for *Eucalyptus camaldulensis* and *Acacia mangium*, and two native species.

d. Provenance trials of *Calliandra calothyrsus*.

e. Several investigations examining the differences between wood properties of several species of *Dipterocarps* grown in native, mixed forests or plantations.

f. A soil survey program to map major soil types in all forested public lands administered by the Department of Natural Resources.

g. A financial cost/benefit analysis comparing seedlings grown in rigid root trainer containers vs. those grown in polybags.

h. In-depth field studies examining the ecology, phenology, and seed characteristics of a number of important native tree species.

i. An examination of the reasons for *Casuarina* mortality 3 years after planting.

j. A series of studies examining the use and role of microsymbionts (mycorrhizae, Frankia, and Rhizobium) in the growth and post-planting survival of tree seedlings.

k. Silvicultural investigations examining the impacts of site preparation and plantation establishment techniques on the growth and yield of *Eucalyptus camaldulensis*.

l. A series of longitudinal studies examining the social and economic impacts of forestry extension and research on Ghosan society.

m. Ongoing longitudinal studies that examine the extent and decline of forest cover in Ghosa.

n. A socioeconomic research program attempting to identify small scale, low impact forest utilization industries that will help improve the standard of living of rural populations, while providing incentives to these people to protect their forest resources.

o. A research project funded by an external donor to test a number of tree species in a number of agroforestry configurations. Economic, soil conservation, and tree growth, site effects, and yield impacts are being examined.

p. Surveys to identify new species of plants or animals, and to develop measures of and baseline data for biodiversity.

q. Pharmaceutical surveys to identify new plant and animal derived compounds with potential commercial application.
Please respond to the following activities.

Activity 1

The research manager of Ghosa's Division of Forestry Research needs some assistance with organizing the division's current research agenda. Based on what you learned in this study unit regarding operational research planning levels, determine whether the above activities are research program areas, research projects, or individual studies. Then, identify the major program areas (we think there are five, one of which is resource assessment). For each program area, list the project associated with that program area. And next to each project, list the individual studies relevant to that project. We have included an example to help clarify the activity. Write your responses under the appropriate column headings below:

<table>
<thead>
<tr>
<th>Major Program Areas</th>
<th>Projects</th>
<th>Individual Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resource assessment</td>
<td>Forest assessment and status</td>
<td>m</td>
</tr>
</tbody>
</table>

2.

3.

4.
5. **Comment 1**

One way the research agenda of the Ghosa Division of Forestry Research can be organized into an operational planning framework is as follows:

<table>
<thead>
<tr>
<th>Major Program Areas</th>
<th>Projects</th>
<th>Individual Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Forest Products</td>
<td>Small-scale forest industries</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>Nonwood products</td>
<td>b</td>
</tr>
<tr>
<td></td>
<td>Wood products</td>
<td>e</td>
</tr>
<tr>
<td></td>
<td>Pharmaceuticals</td>
<td>p</td>
</tr>
<tr>
<td>2. Silviculture</td>
<td>Silvics of individual species</td>
<td>a, c, k, o</td>
</tr>
<tr>
<td>3. Ecology/Biology</td>
<td>Forest soils</td>
<td>f</td>
</tr>
<tr>
<td></td>
<td>Forest ecology</td>
<td>h, j, o</td>
</tr>
<tr>
<td></td>
<td>Pathology/Entomology</td>
<td>i</td>
</tr>
<tr>
<td></td>
<td>Biodiversity</td>
<td>p, q</td>
</tr>
<tr>
<td>4. Resource Assessment</td>
<td>Forest assessment and status</td>
<td>m</td>
</tr>
<tr>
<td>5. Socioeconomic Analysis</td>
<td>Baseline socioeconomic analysis</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>Forestry program impact analysis</td>
<td>l</td>
</tr>
<tr>
<td></td>
<td>cost/benefit analyses</td>
<td>g</td>
</tr>
</tbody>
</table>

This framework represents only one organizational viewpoint (ours!) regarding the various research activities presented, particularly at the program and project levels. You might have come up with different research program areas and projects. Don't worry if you did, as the point of this exercise is not for you to agree with us on how the division's agenda can be organized! We just wanted you to get some practice discerning the differences between program areas, projects, and studies, and to create a framework that provides the basis for operational planning.
Activity 2

*In your own words, define the following terms:*

research program area:

research project:

research study:
Comment 2

research program area: a broad subject area or topic for research that an organization is pursuing or plans to pursue. These often are defined along disciplinary lines, though using broad categories that cut across scientific disciplines may be more desirable for problems requiring interdisciplinary research.

research project: a self-contained area of investigation with specific goals and objectives which relate to a particular program area. Research programs often include one or more projects. Thus, projects are the building blocks of research programs.

research study: an individual research activity designed to generate specific information needed to fulfill the goals and objectives of the project. There may be one or more studies being implemented within a specific research project. Studies are the building blocks of research projects.
Activity 3

As the Ghosa Division of Forestry Research proceeds with the planning process, what items or topics should be included in the project plans? Write your responses in the spaces provided below.

1.

2.

3.

4.

5.

6.

7.

8.
Comment 3

*Project plans should include:*

1. a statement of the project's mission
2. the justification of the project
3. identification of key problems to be addressed within the scope of the project and the approach to solving these problems
4. objectives and planned outputs
5. a plan of work that defines responsibilities of project members
6. staffing, equipment, and other resource needs
7. anticipated sources of funding, and approximate levels required for the work planned
8. a reporting schedule that identifies indicators or milestones that reflect progress
Activity 4

As the Ghosa's Division of Forestry Research continues with the planning process, what items or topics should be included in the individual study plans? Write your responses in the spaces provided below.

1.

2.

3.

4.

5.

6.
Comment 4

Study plans should include:

1. a statement of the research problem, and justification of the study in relation to the project in which it fits

2. importance of the work and previous work in the field

3. a clear statement of the specific research objectives

4. a detailed description of how the work is to be carried out (methodology), including methods of data collection and analysis.

5. cost estimates, including personnel needed and their skills, facilities required, duration of the project,

6. interorganizational linkages and collaboration required to implement the research

7. scheduling of the research and planned outputs (reporting etc.)

8. planned technology transfer activities
Summary - Study Unit 5.2

Operational plans of forestry research organizations are medium-term plans of the activities the organization intends to implement in order to carry out its mission, and to achieve its strategic goals and objectives. Operational plans are closely linked to strategic plans, and detail in a practical way how the strategic plan will be implemented. The output of strategic research planning is a key input to operational planning; and the output of program planning is a key input to annual planning and budgeting.

By completing this study unit, you learned that operational planning can be structured into three distinct levels; research program areas, research projects, and individual studies, each with their own type of plan. By using the planning framework presented, we think you will be better equipped to guide your staff in its operational planning activities.

If you would like more information regarding operational planning, we encourage you to proceed to the next study unit which contains more detailed and practical information which can help you in your planning activities. We also suggest that you obtain and review the interesting articles identified in the literature cited and other references listed at the end of the module. Two key articles directly related to the topics covered in the module, and cited in the text, are reprinted for your use in the section on readings at the end of the module.
Study Unit 5.3
Links Between Strategic Planning and the Research Program

Within the three planning levels discussed in Study Unit 5.2 (research program areas, research projects, and individual studies), research program planning can be improved by:

- linking program planning and strategic planning;
- evaluating both staffing requirements and availability;
- incorporating monitoring and evaluation into key planning documents;
- including both external and internal input into the planning process;
- blending researcher interests and organizational goals;
- involving stakeholders in program planning; and
- recognizing existing knowledge and information.

This study unit takes an in-depth look at each of these activities. You'll also learn about a useful tool for program planning—The Logical Framework. By mastering the concepts explored in this unit, you will be better able to improve the quality and utility of your organization's plans.
<table>
<thead>
<tr>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you have completed this study unit you should be better able to:</td>
</tr>
<tr>
<td>- describe the factors that are essential to consider when conducting program planning;</td>
</tr>
<tr>
<td>- explain how each of these factors are incorporated into the program planning process;</td>
</tr>
<tr>
<td>- state the importance of linking program planning to strategic planning; and</td>
</tr>
<tr>
<td>- describe the logical framework and its application to program planning.</td>
</tr>
</tbody>
</table>
Linking Program Planning and Strategic Planning

If it is to be effective, research program planning should be designed to implement the strategies outlined in the strategic plan. This requires that plans for broad research program areas address specific strategic objectives and goals developed in the strategic plan. In turn, plans for research projects within a program area should address the problem areas identified in the program area plan. How research program areas are defined is often strongly influenced by the mission and research capabilities of the organization. The research organization's mission and mandates may prescribe certain types of forestry-related research, or deliberately exclude other types, and thus restrict the scope of problems it will address. Problem areas can be defined in many ways, often along organizational lines. For example, if the research organization has a research unit on the silviculture of natural forests, then a program plan may be developed for that subject area of research, and may serve as both a program area and research unit plan.

The size of the organization may influence the way in which research program areas are defined, and how program planning is done at other levels in the organization. For example, in a relatively small research organization, there may be only one program area plan for the entire organization, and no need for research work unit or research project plans. In contrast, for larger organizations there may be a need to develop some type of program planning at each organizational level, as illustrated in figure 5.2.2. Thus, there may be an overall strategic plan for the entire research organization, which sets the mission and broad overall goals for the organization, and develops a broad strategic framework within which its research program will be carried out. Within this framework there may be separate program plans developed for each research administrative area in the organization. Each of these program plans would identify and justify research problem areas, and set priorities for research and other activities of the unit for a given period of years, typically 3 to 5 years. The exact period to be covered may be flexible, or it may be spelled out by regulations. Each program plan would address the appropriate goals and objectives outlined in the organization's strategic plan and explain how those goals and objectives would be implemented during the next few years.

Within each program area, there may be several projects, each with its own mission, goals, and objectives spelled out in a research project description or plan. These project plans would be clearly linked to the research problem area identified in the program area plans, so that by reading the project plans one could see how the program area plan was to be implemented.
In turn, the research project plans are implemented by the individual studies that are carried out to address the specific problems identified. These individual study plans should clearly identify the specific problem being addressed, and relate this to the larger problem identified in the research work unit/project plan.

Regardless of the exact levels of program planning used within the organization, the program plans for the organization need to be clearly linked to the strategic plan. The strategic plan provides the framework within which program planning takes place. Program plans should indicate how the research activities planned for the particular problem being addressed will ultimately help to achieve the goals and objectives outlined in the strategic plan.

**Evaluating Staffing Requirements and Availability**

Program planning and priority setting must be related to the availability of trained scientific and support personnel. Program plans should contain a section on staffing requirements that include scientific and support skills needed to conduct the proposed research, an appraisal of available skills, and an action program to overcome any apparent deficiencies. If there are deficiencies in the required skills, then the necessary skill levels must be obtained by hiring new personnel, training existing personnel, continuing education, work experience, or by some other means. If there appears to be no way to make up the deficiencies, then the proposed research program will have to be modified. In conducting this appraisal of staffing needs, it is important to recognize and allow for the time required to achieve the required skill level.

In most developing countries, the research resource that is in shortest supply is trained and experienced researchers. In a survey of forestry research institutions in developing countries, research managers identified the level of training of researchers as the most important factor influencing the research capacity of their institution (Bengston and Gregersen 1988). Constraints imposed by lack of trained researchers are compounded by the fact that researchers cannot simply be transferred to wherever they are most needed the way other resources may be transferred. A person trained as a silviculturalist cannot fill a position for a forest products technologist. Moreover, the training of a new scientist to fill a particular position takes a long time (see Study Unit 9.3). As many research managers are painfully aware, the availability of human resources imposes severe limitations on program planning. The availability of trained personnel is a key parameter in program planning.

**Incorporating Monitoring and Evaluation Into Program Planning**

Monitoring and evaluation of research programs should be ongoing and built into all program, project, and study plans. Program plans, project descriptions, and study plans can be used to monitor progress and evaluate performance relative to the stated objectives, but only if research objectives and scheduling of activities are clearly stated in those documents. In many
research organizations, research managers periodically review each research project approximately every two years. Such reviews serve as an important input into program formulation, and include evaluation of research progress, staffing and training, program and budget development, support services, research facilities, and dissemination of research results (see Murphy 1985, Daniels 1987, McLean 1988a).

Monitoring and evaluation of research programs may include external review teams as they are needed (Ruttan 1978). Some of the most effective external reviews are participatory, and include senior research management personnel. They monitor progress, identify problems, and evaluate alternative solutions. Action plans for needed follow-up are developed and tracked until all items are completed (usually within one year after the review). External review teams can provide useful insights in evaluating an organization's broad goals, objectives, and strategies, and its capacity to effectively carry out its proposed program of research. Members of such external review teams are likely to be far more helpful to the research organization if they focus their review efforts on these broad strategic items, and resist the temptation to concentrate on operational details such as performance appraisals of individual scientists and reviews of research methodologies used in individual studies.

Monitoring and evaluation should be designed to go beyond checking on the successful completion of the planned research. It also should obtain information that could be used to judge how successfully the research results were disseminated to potential users, and were subsequently adopted and implemented. If enough time has elapsed, then monitoring and evaluation should also assess the potential societal, environmental, and other impacts resulting from adopting and implementing those research results.

**Including Both Internal and External Input In the Planning Process**

Research program planning includes planning for the research program areas, projects, and studies that are to be carried out by the organization. It also includes planning, whether formal or informal, for the research support areas that will be required to support the research programs of the organization. The development of a research program should reflect both internal and external input. Figure 6.2.1 identifies key internal and external influences on program planning.

Internally, the organization's strategic plan is perhaps one of the most important sources of input concerning the overall direction and nature of the research program. In addition, team leaders and researchers may propose research projects and studies for funding consideration. These are reviewed by the appropriate program managers, who may rely upon advisory
committees of researchers appointed by managers to review and evaluate such proposals. Conflicts among researchers and team leaders over the allocation of funds and other resources are likely to arise, especially if resources for research are severely limited, and favored studies or projects must be curtailed. Resolving such conflicts may test the leadership skills of research managers (see module 9). Involving those affected by resource allocation decisions early in the planning process, and attempting to reach a group consensus regarding an equitable distribution of resources, may go far towards reducing or avoiding such conflicts. An assessment of the existing capacity of the organization to conduct research provides important input into the planning process. The current capacity of the organization to initiate and carry out research may impose severe constraints on research programs in the short-run, and also in the longer-run, since building up research capacity is a slow process.

External Input

Client and Other Stakeholder Input
Anticipated Funding
External Forces and Trends

Research Program Planning
Program Areas, Projects, Studies

Current Strategic Plan
Researcher Input
Existing Research Capacity & Resources

Internal Input

Figure 5.3.1. External and internal influences on research program planning.

External input on research priorities and the nature of the research program should be actively
sought from clients and other stakeholder groups. An assessment of the level of funding and the capacity of the organization that can be anticipated throughout the program period must be obtained from higher administrative levels in the organization in order to set realistic constraints on the program.

**Blending Researcher Interests and Organizational Goals**

In planning research programs, a certain amount of tension exists between the interests of individual researchers and the need for publicly-supported forestry research organizations to be responsive to the most pressing needs of the forest-based sector and society. Researchers generally will have the highest morale and be most productive when they have a significant voice in selecting research studies to work on and projects to work within. Experienced researchers have invested a great deal of time and effort developing expertise in a particular area of research, and may be reluctant to work on projects outside of their area of specialization. At the same time, research activities must be geared to forestry and national development goals. Unless research is responsive to social goals, it will become increasingly difficult to mobilize the funds needed for research.

To reduce this tension, researchers should be partners with managers in planning and program formulation. Researchers have a particularly important role in planning how the research is to be implemented, and in carrying out this implementation plan once it is approved. As researchers are actively brought into the planning process, the likelihood of a good “fit” between researchers' interests and organizational goals increases greatly. There are a number of advantages in having researchers participate in the planning process.

First, researchers can generate high quality proposals for research studies, projects, and programs. Without good project proposals available, the most sophisticated methods for research planning and priority setting will be of little use. The researcher's own experience and research background suggest lines of research that are likely to be productive. Most experienced researchers can produce a number of research proposals that are relevant for their field of research, in which they have an interest and which they are qualified to do. They also are familiar with the practical capabilities of the available facilities, equipment, and staff. Scientists will be more interested and productive in pursuing research topics they have proposed. A certain amount of freedom in determining what to work on is an important internal reward for many scientists. Pelz and Andrews (1966) found that researchers are most productive when several people are involved in shaping research assignments, but the scientist retains significant input to the decision process. Pelz and Andrews also found that performance was low where the chief alone determined scientists' assignments.
Managers, therefore, actively seek the input of researchers on what scientific investigations could be carried out to address various goals of the organization. But rarely will there be enough resources to carry out all proposals received, and rarely will all of the proposals be relevant to national and organizational goals. Many researchers are driven more by the research needs determined within their own professional discipline, than by the research needs of society. Responsibility for ensuring that the research program is relevant to the needs of society rests squarely with managers. Managers must develop criteria for selecting research proposals, and provide clear guidance to research scientists on priority areas for research.

Second, researchers—especially top researchers and team leaders—can contribute by formally reviewing and evaluating proposed subjects for research, both project and study proposals. Researchers are in the best position to identify constraints and opportunities relating to improved practices, and they should have a good idea of what is already known nationally or internationally on proposed topics within their area of expertise. Information that researchers possess on the results of related research, expected costs of proposed research, and the probability of success is likely to be the main source of data on these important questions. Managers should form committees of scientists and managers to review and evaluate research that is proposed.

**Involving Stakeholders in Program Planning**

Some of the preceding modules stressed the importance of identifying and analyzing key stakeholders of a forestry research organization, and including them in some phases of the strategic planning process. (Stakeholders are people, groups, or organizations that have a claim on the organization's attention, resources, or output, or are affected by that output.) Forestry research stakeholders might include public officials, governing bodies, public land managers, interest groups, small farmers, indigenous peoples, extension agents and organizations, industries and businesses based on forest products, the general public who use forest products, goods and services, other research organizations, educational institutions, and international donor and technical assistance agencies, among others.

It is equally important to involve representatives of key stakeholder groups in program planning. While strategic planning provides overall direction for a research organization, more detailed input is needed to work out a specific program of research. In some countries, certain stakeholder groups are organized into research advisory boards, councils, or committees that meet periodically to develop recommendations to forestry research organizations on research priorities and programs. If a country has no forestry research council or similar advisory groups, it is important to actively seek input from key stakeholders and incorporate them into the decision-making process. Including key stakeholder groups in
the program planning process and, to the extent possible, accommodating their interests, will enhance the ability of a forestry research organization to generate financial and political support. Their participation will ensure that the research program of the organization will be more user-focused.
Recognizing Existing Knowledge and Information

To avoid wasting scarce resources on nonessential research, it is important to be aware of what technology is already available that could be adapted to local conditions. One way to do this is to keep track of what research has been and is being conducted in other forestry and nonforestry national and international research organizations. Some of the research being conducted elsewhere may meet the needs of your own clients, with relatively little modification.

One source of useful technologies often overlooked is indigenous knowledge. This is knowledge about appropriate technologies that has evolved out of the accumulated experience of local people interacting with their environment. Although this may not be formal scientific knowledge, in the sense that it has not gone through a formal process of scientific verification, it often is knowledge that has been successfully applied for many years. However, such knowledge must be gathered and used with caution. Not all technologies being applied in practice are necessarily successful or useful to others. It is necessary to screen local indigenous knowledge for its actual effectiveness and potential for large-scale diffusion. Nevertheless, the research community often can rely upon indigenous knowledge for an initial screening of alternative technologies in practice. Such knowledge can provide a good starting point for more systematic scientific research.

The Logical Framework: A Useful Tool for Program Planning

The Logical Framework (LF), sometimes called the Logframe, is a useful tool for designing and planning projects and programs of all kinds, including research (Delp et al. 1977, McLean 1988b). It helps the planner and manager systematically identify the objectives for some activity, plan for required inputs and desired outputs, and define indicators that can be used to monitor and evaluate performance. The LF is appropriate for any level of planning other than strategic planning, from the development of broad, long-term programs to individual research projects. It is often used by small groups of managers as a framework for planning and generating ideas.

The information required to plan and evaluate an activity using this technique can be summarized in a table such as figure 5.3.2 (figure 5.3.3 provides a generalized example of how LF can be applied to a research program).

The left-hand column in the table is a brief "narrative summary" of the stated goal of a research project or program, the purpose of the project/program, what outputs (results) it is expected to produce, and what inputs will be required to produce those outputs:
Figure 5.3.2. The "Logical Framework."

Fig. 5.3.2 has to be downloaded separately.
Figure 5.3.3. Simplified example of applying the "Logical Framework" to a fictitious tree improvement research project.

Fig. 5.3.3 has to be downloaded separately.
- the **goal** is the ultimate objective to which the research project or program contributes, e.g., a timber harvesting research program may help to achieve a national development goal such as self-sufficiency in wood products;

- the **purpose** of a research project or program is what it is expected to achieve upon completion, e.g., in the timber harvesting example, cited above, the purpose might be the productivity of timber harvesting operations through the development and adoption of more efficient harvesting technology;

- **outputs** are the desired results of the research project or program derived directly from management of inputs, e.g., a timber harvesting research program would be expected to develop new harvesting systems with specific characteristics and within an estimated time frame; and

- **inputs** are the human, physical, and financial resources required to produce the desired outputs. The quantity and quality of inputs should be specified, e.g., the number of scientists and technicians and their level of training, etc.

These four factors are represented by the rows of the table and are referred to in the jargon of LF as the "vertical logic." The idea is to systematically think through why the project or program is being undertaken, how it contributes to broader social goals, and the inputs needed to achieve the outputs, purpose, and goals.

One of the key assumptions of the LF method is that a direct cause and effect relationship exists between input, output, purpose, and goal (the items in the left-hand column of figure 5.3.2). It assumes that:

*If* we provide the following inputs, 
*then* we can produce the outputs.

*If* we produce the outputs, 
*then* the purpose will be achieved.

*If* the purpose is achieved, 
*then* the goal may be realized.

As we move across the columns of figure 5.3.2, we see the "horizontal logic" of the LF, indicating how we could determine whether or not we actually have achieved the targets described in the left-hand column. It lists verifiable indicators, means of verification, and important assumptions:
• verifiable indicators are things that could be measured to demonstrate that the desired results are being accomplished;

• means of verification specify where that evidence can be found and how it can be measured; and

• important assumptions qualify the other entries by listing those factors which may not be controlled by research managers, but which influence the success of a project or program. The assumptions column should help to keep managers realistic in their expectations.

The recommended procedure for completing the logical framework is to begin by working through the vertical logic. For a proposed research program, managers must determine at each lower level the conditions which are necessary and sufficient to achieve the next upper level, i.e., the inputs that are listed should be necessary and sufficient to produce all of the outputs; the outputs should be necessary and sufficient to achieve the purposes, and so on. Next, the horizontal logic is completed by first identifying the indicators, then the means of verification, and finally the assumptions for each of the vertical logic levels (i.e., the rows of the table).

One advantage of the LF as a planning tool is its simplicity—it is easy to understand. The LF guides the planning process by providing a structure and ensuring that the manager thinks through the fundamental aspects of a project design (but it is not a substitute for the considerable effort that is required to plan effectively).

The framework also is a useful tool in monitoring and evaluating a project or program. Evaluation requires clear targets against which performance is measured. The Verifiable Indicators column should provide such targets. The Means of Verification column specifies the actual data to be monitored for each level. Assumptions concerning inputs, outputs, and purpose define what external factors necessary for project success should be monitored and evaluated. Finally, impact evaluations—which deal with the contribution of research to national development goals—are concerned with the types of indicators specified at the goal level.

The Logical Framework, as presented here, also has some important limitations:

• it does not explicitly take external and secondary impacts of project activities into account;

• it does not take uncertainty into account;

• it does not consider potential alternative actions; and
the IF-THEN relationships assumed among the various project components and elements in the environment are an oversimplification of the real world.

Despite these limitations, the Logical Framework can be a useful tool in planning, monitoring, and evaluating research. For more detail on this tool, see Delp et al. (1977), USAID (1980), and McLean (1988c).
Activities - Study Unit 5.3

Activity 1

Simply organizing planning by using the tri-level framework examined in the previous Study Unit (5.2) will not guarantee the production of high quality program plans. There are other things managers of research can do to significantly improve the quality and utility of operational research plans. *List five of these activities below:*

1.

2.

3.

4.

5.

If you had trouble remembering these activities or actions, reread the introduction and text in this study unit; then complete the exercise above.
Comment 1

Some of the activities or actions that managers of research can take to significantly improve operational research plans include:

1. Strengthen linkages between program planning and strategic planning;

2. Evaluate both staffing requirements and availability;

3. Incorporate monitoring and evaluation into the key planning documents;

4. Include both external and internal input into the planning process;

5. Blend researcher interest and organizational goals;

6. Involve stakeholders in program planning; and

7. Recognize and tap existing knowledge and information.
Linking operational plans to strategic plans is essential for the efficient and effective operation of forestry research organizations. In an attempt to deal with the great changes that have occurred recently, Ghosa's Division of Forestry Research recently completed a strategic planning exercise which defined the organization's mission and goals. A brief summary of the main points of the division's Strategic Plan is presented below:

**Mission Statement**

The Ghosa Division of Forestry Research exists to provide the people of Ghosa with research results that address the needs of all forest users, and to discover ways to achieve sustainable use and development of forest resources that contribute to national economic development, for the benefit of current and future generations.

**Organization Goals**

1. To better understand the biophysical processes active in Ghosa's ecosystems.
2. To develop new means for sustainable use and development of the forest.
3. To determine the current status of forest use, condition, and extent, and make future projections regarding these variables.
4. To discover new forest-derived products, particularly those that could provide for small-scale, low-impact use of the forest.
5. To document forest based knowledge of indigenous forest dwellers, and scientifically validate this information.
6. To expand our knowledge and refine our practices regarding reforestation and ecosystem restoration.
Activity 2

Please review the operational planning framework you created in Activity 1, Study Unit 5.2. How does the division's current research agenda address its stated mission and goals? For instance, what is not being addressed by the current research agenda, and what areas of research are currently receiving too much emphasis? Write your response in the space below.
Comment 2

Actually, the research agenda relates well to the strategic mission and goals of the organization, particularly regarding basic biology, reforestation/restoration, and socioeconomic studies.

However, the current research agenda does not include any activities intended to explore, validate, or test indigenous knowledge of forest biology or forest resource use, a glaring omission. And only one study is devoted to resource assessment, an important goal of the division. Further, there are a number of studies devoted to nurseries and reforestation, perhaps too much emphasis considering the many demands on the research organization.

There is also a sense that this research agenda is a hodgepodge of interests and study plans, with little cohesion or emphasis at the research program level. It almost seems that the research agenda was developed solely from the bottom-up, with independent, discrete studies having little relation to one another. Finally, the research agenda does not encourage interdisciplinary research and collaboration because of its fragmented nature.
Activity 3

If you were manager of this research organization what would you do to better link the organization's research program to its strategic plan? Write your response in the space provided below.

Activity 4

Again referring to the Situation Analysis in Study Unit 5.2, how can the Division ensure that the viewpoints of key stakeholders are included into the planning process? Write your response in the space provided below.
Comment 3

It is clear that the current research agenda needs to be updated to better match the organization's mission and goals. To better link the research program to the strategic plan, as manager you might decide to institute new research programs or studies to address deficiencies, or to reduce the emphasis on other research activities that are currently well funded, yet are not major goals of the organization. Probably the primary goal of the research manager in this case however, would be to completely reevaluate the entire division's programs, projects, and studies, and develop mid-range program plans that better address the organization's mission and goals. By conducting such an exercise, the mission and goals would be better met, resources would be more efficiently distributed, and interdisciplinary collaboration and research quality would be enhanced.

Comment 4

Remember, stakeholders of forestry research organizations might include public officials, governing bodies, public land managers, interest groups, small farmers, indigenous peoples, extension agents and organizations, other research organizations, educational institutions, and international donor and technical assistance agencies, among others.

To ensure that stakeholder viewpoints are included in the program planning process, stakeholders can be organized into research advisory boards, councils, committees that meet periodically review current research activities and make recommendations regarding research priorities and programs. Regardless of the means by which stakeholder input is solicited, it is imperative that their views be considered when conducting research program planning. By doing so, not only will the organization produce more useful, relevant research results, but will enhance its ability to generate financial and political support.
Summary - Study Unit 5.3

Research program planning can be improved by:

- linking program planning and strategic planning;
- evaluating both staffing requirements and availability;
- incorporating monitoring and evaluation into key planning documents;
- including both external and internal input into the planning process;
- blending researcher interests and organizational goals;
- involving stakeholders in program planning; and
- recognizing existing knowledge and information.

This study unit examined each of these activities in detail, providing you with proven, practical information that you can use to improve the quality and utility of your organization's research program planning. You also learned of a useful tool for program planning—The Logical Framework, which is an excellent structured approach for use in program, project or study unit planning activities.

If you would like more information regarding research program planning, we encourage you obtain and review the interesting articles identified in the literature cited and other references listed at the end of the module. Two key articles directly related to the topics covered in the module, and cited in the text, are reprinted for your use in the section on readings at the end of the module.
Final Skill and Knowledge Assessment

Module 5 - Developing the Research Program

On the following page are listed a number of skill and knowledge statements derived from the objectives of the study units in module 5. 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 5, 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>
</tr>
</thead>
<tbody>
<tr>
<td>a) Identify and describe the various organizational models commonly used by public and private sector forestry research organizations.</td>
<td>1</td>
</tr>
<tr>
<td>b) Identify three key desirable features of a forestry research organization's structure which enhance forestry research capacity, and explain how these three features contribute to improved efficiency and effectiveness of research implementation.</td>
<td>1</td>
</tr>
<tr>
<td>c) Explain what research program planning is and why it is needed.</td>
<td>1</td>
</tr>
<tr>
<td>d) Describe three program levels commonly encountered in a forestry research organization that play important roles in program planning.</td>
<td>1</td>
</tr>
<tr>
<td>e) Describe five factors that are essential when conducting program planning, and describe how they can be incorporated into the program planning process.</td>
<td>1</td>
</tr>
<tr>
<td>f) State the importance of linking program planning to strategic planning.</td>
<td>1</td>
</tr>
</tbody>
</table>
Literature Cited - Module 5


Module 5 - Developing the Research Program


**Additional Sources of Information**


Readings for Module 5

The following readings have been selected to provide you with additional information related to the material covered in Module 5. We hope you will find them of interest.
