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IN INNOVATION**

Michigan State University

Ph.D. 1981

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MICHIGAN'S STATEWIDE FOREST RESOURCES PLAN:
A CASE STUDY IN INNOVATION

By

Karen Potter Olson

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Forestry

1981

ABSTRACT

MICHIGAN'S STATEWIDE FOREST RESOURCES PLAN: A CASE STUDY IN INNOVATION

By

Karen Potter Olson

The Forest Management Division of the Michigan Department of Natural Resources has been implementing its Statewide Forest Resources Planning process (SFRP) since early 1978. The SFRP is a comprehensive plan which assesses all forest resources in Michigan and recommends directions for forest management statewide. Michigan's Statewide Forest Resources Plan as a case study of innovation in an organization is examined in this dissertation.

A review of innovation diffusion literature is used to develop a framework for analyzing the factors that influence the successful adoption of an innovation. The factors which influenced the development and implementation of Michigan's Statewide Forest Resources Plan are described using this framework. The development and implementation of Michigan's Statewide Forest Resources Plan is then critiqued with respect to how effective the strategies used to implement the SFRP were at various stages in the process. The support of the chief executive of the Division, the use of outside aid and the use of special teams for each stage in the SFRP process are assessed as being especially important in the development and implementation. Suggestions for future implementation activities are also made.

ACKNOWLEDGEMENTS

The author would like to express her gratitude to Dr. Robert S. Manthy for his guidance, aid and encouragement throughout this research.

The Michigan Department of Natural Resources, Forest Management Division is also due thanks for enabling the author to work on Michigan's Statewide Forest Resources Plan from 1978 to 1981. Special thanks are given to Henry Webster, Jim Olmstead, Gerald Rose, Gerald Thiede and Gordon Terry of the Division.

Grateful acknowledgement is also made of the funds made available from the U.S. Forest Service, Northeastern State and Private Forestry Branch for their part in the funding of the author's research assistantship.

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CHAPTER I

INTRODUCTION

Problem Statement

Statewide forest resources planning (SFRP) is an innovation in state level planning. Like the planning done under the federal Resources Planning Act (RPA, PL93-378), it assesses and plans for timber, recreation, fish, wildlife, range and all other forest resources. The guidelines for state level planning, however, have been much less rigorous than for federal RPA planning. Each state that has undertaken comprehensive forest resource planning has, therefore, developed its own, particular, approach. These state planning efforts vary by the agency doing the planning, the level in the bureaucracy in which it is done, the level of detail in their plans, how quantitative they are, and the audience at which they are aimed. The organizational situation and environment in which the plans are done also varies. Statewide forest resources plans vary as to the level of state support they have, the dollars, time and workforce allocated to the project, and the attitudes toward the plan by agency personnel and personnel of other agencies affected by the plan.

Despite the differences in statewide forest resource planning efforts, there are common elements in the organizational and environmental situations faced by state forest resource planners. Planners who must develop and implement an innovative planning process may not

recognize that many of the problems they encounter are common to all cases where an innovation is brought into an organization. Recognizing these problems and examining them as problems in the diffusion of an innovation is a major step toward their solution. Planners can then choose among strategies specifically designed for cases of implementing an innovation and use them to solve their planning problems.

Goals

The goals of this dissertation are:

- 1) to provide a documented case study of a statewide forest resources planning process and
- 2) to illustrate the usefulness of innovation diffusion theory applied to this planning.

It is hoped that this examination of a case study of statewide forest resources planning (SFRP) in Michigan will enable other planners to learn from Michigan's successes and shortcomings. Michigan's Statewide Forest Resources Plan is used to illustrate the types of situations and organizational environments that are likely to be faced by planners who must implement innovative planning. Innovations which are introduced into organizations will meet resistance. This resistance arises for various reasons and varies as to strength and manifestations. This study, thus, also illustrates some of the innovation diffusion strategies available to planners to prevent or overcome resistance, and provides guidelines for the use of these strategies.

Methods

In order to meet the goals defined above, the history of Michigan's Statewide Forest Resources Plan is described from late 1977 to early 1981, research on the diffusion of innovations is reviewed and the merits and deficiencies of the execution of Michigan's SFRP in light of innovation diffusion research are discussed.

The SFRP history described below includes both objective and subjective portions. The author was one of the principals of the SFRP from April 1978 to March 1981. During this time a log book was kept of procedures, major events, activities and milestones in Michigan's SFRP. This log book is used as the primary source for the case history detailed below.

Two devices are used to examine subjective views of the history of Michigan's SFRP. Interviews of principal Michigan Department of Natural Resources (DNR), Forest Management Division and Michigan State University staff were conducted. These interviews were designed to establish what the principals' perspectives were of the need for a SFRP and what were important events, activities, personnel and work arrangements in its development.

A survey of twenty-one DNR and U.S. Forest Service personnel who had been directly involved in the development of the SFRP was also taken. This survey recorded and analyzed perceptions of the characteristics of Michigan's SFRP which might make it easier or more difficult to implement.

Statewide forest resources planning is an innovation in forest management at the state level. The application of innovation diffusion theory can provide statewide forest resource planners with valuable

tools. It can help them anticipate resistance to innovation and to develop procedures and use activities which will facilitate the success of the innovation. The discussion of innovation diffusion below concentrates on the environmental and organizational factors, which if unrecognized or treated inappropriately, can cause an innovation to be rejected or can impede its adoption. Also described herein are types of innovation diffusion strategies and the conditions under which each are effective.

The critique of Michigan's Statewide Forest Resources Plan illustrates how some approaches and strategies are or are not effective in a given situation. The environmental and organizational factors which influenced Michigan's situation, the important characteristics of the SFRP itself, and the strategies used in the SFRP process are described. The progress of Michigan's SFRP is then evaluated as to the strategies which were or were not effective and the strategies which might have been more effective are identified.

It is recognized that case studies in which the author was a participant have the possibility of bias. Effort has been taken in this research to limit this bias as much as possible. It is the author's belief that the insight gained through participation in the SFRP process outweighs the associated problems of bias. It is this insight into the problems of statewide forest resources planning that should be valuable to other planners and resource economists.

CHAPTER II

THE HISTORY OF MICHIGAN'S STATEWIDE FOREST RESOURCES PLAN

Introduction

Michigan's Statewide Forest Resources Plan (SFRP) is a process to develop and recommend forest policy for Michigan and direction for all public forestry programs in the state. The SFRP process has three phases: (1) gathering information on the size, extent, condition and use of the forest resources of the state and on the programs which affect the resources, (2) determining the major areas of controversy over the use or management of the state's forest resources and, (3) recommending policy and program direction for forest management in the state based upon the results of the first two phases of the process.

Begun in late 1977, the SFRP is being conducted by the Forest Management Division of the Michigan Department of Natural Resources (DNR). Financial and Technical Assistance to the plan has been provided by the U.S. Forest Service. Through a cooperative agreement with Michigan State University substantial assistance from members of the MSU Forestry Department was provided to the DNR for the SFRP project.

The two major documents produced in the SFRP are an assessment of Michigan's forest resources and a recommended program for forest resource management in the state.

Michigan's Forest Resources 1979--An Assessment, published in 1979, is the first in a series of assessments planned to be repeated

at 10-year intervals. The Assessment examines Michigan's forest resources (wildlife, timber, fish, water, and outdoor recreation). For each resource, descriptions and data are provided on what is known about the supply (or condition) of the resource and the demand for (or use of) the resource.

Michigan's Forest Resources--A Recommended Program (Draft February 1981) when completed, will be the first in a series of program documents to be repeated at five-year intervals. This draft program discusses five major forest resource issues, summarizes the use and condition of the forest resources timber, wildlife, fish and recreation, analyzes the relationship of these resources and the issues and, based upon this analysis, recommends forest policy direction and courses of action. Like the Assessment, the Recommended Program is statewide in scope. The issues it identifies--economic development, energy, nonindustrial private forests, urban forestry, and public forests--are relevant to the entire state and, together, they span all forest ownerships. The recommended policy direction is intended to give a common sense of direction to all those involved in forest management in Michigan. The recommended courses of action, or goals and strategies, which follow from this policy direction are meant to more specifically guide forest management statewide.

By design, Michigan's SFRP uses public and other agency participation including that of: (1) DNR divisions other than the Forest Management Division, (2) other public agencies, (3) public interest groups, (4) forest industries, (5) private forest landowners, and (6) universities. These individuals and groups reviewed several drafts of the Assessment and the draft Recommended Program, participated in

workshops, recommended and ranked issues, and in some cases provided technical information. In addition, the state's Natural Resources Commission, a governor appointed policy making body, will be asked to approve the Recommended Program presented to them by the DNR.

Pre-Planning

In the pre-planning phase of the SFRP decisions were made on how support for the SFRP process would be developed, how work on the SFRP would be structured, and what technical expertise would be required. These steps are summarized in Figure 2.1 under the heading of pre-planning.

At least as early as 1977, Forest Management Division Chief Webster had decided that the Division should develop a statewide forest resources plan. In late 1977, the Division compiled a "Forest Goals and Issues Statement" as part of Michigan's participation in the U.S. Forest Service's 1980 RPA Assessment. Division Chief Webster also announced that the Division would use this information in the preparation of its Statewide Forest Resources Plan. The participation of 26 representative agencies, organizations and individuals interested in forest management in the state was used by the Division to draft the statement. This group of participants formed the base upon which much of the later SFRP public involvement was built.

Although the Forest Management Division was to develop the plan, the cooperation and support of other divisions in the DNR was necessary for the SFRP to be comprehensive. Support was, thus, also sought from high levels of the DNR. By arrangement, in March of 1978 Howard Tanner, Director of the Department of Natural Resources, announced that

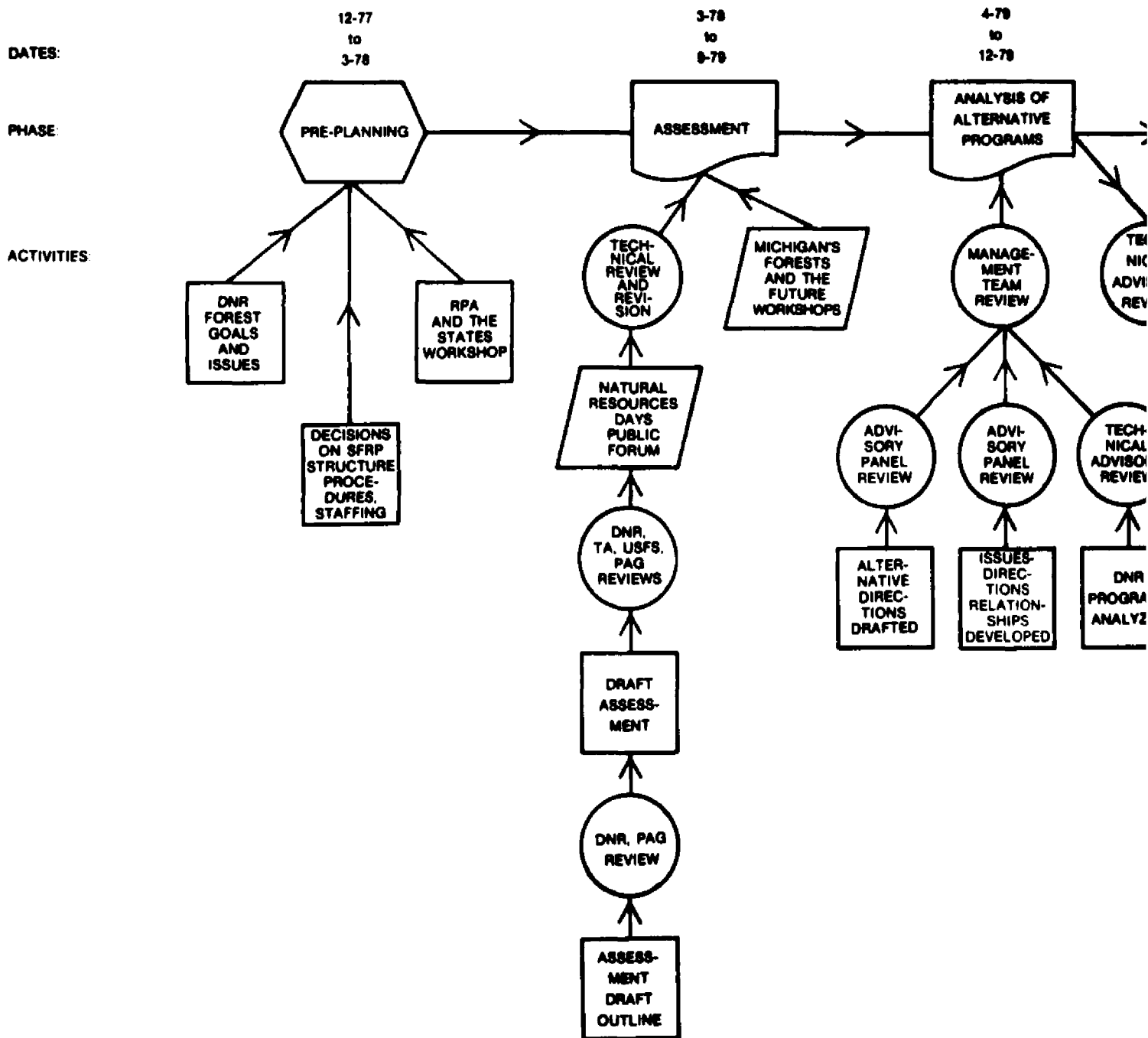
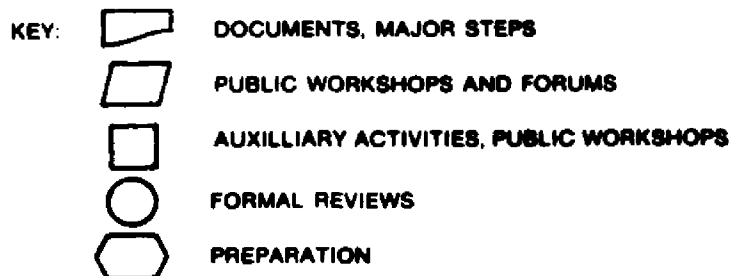
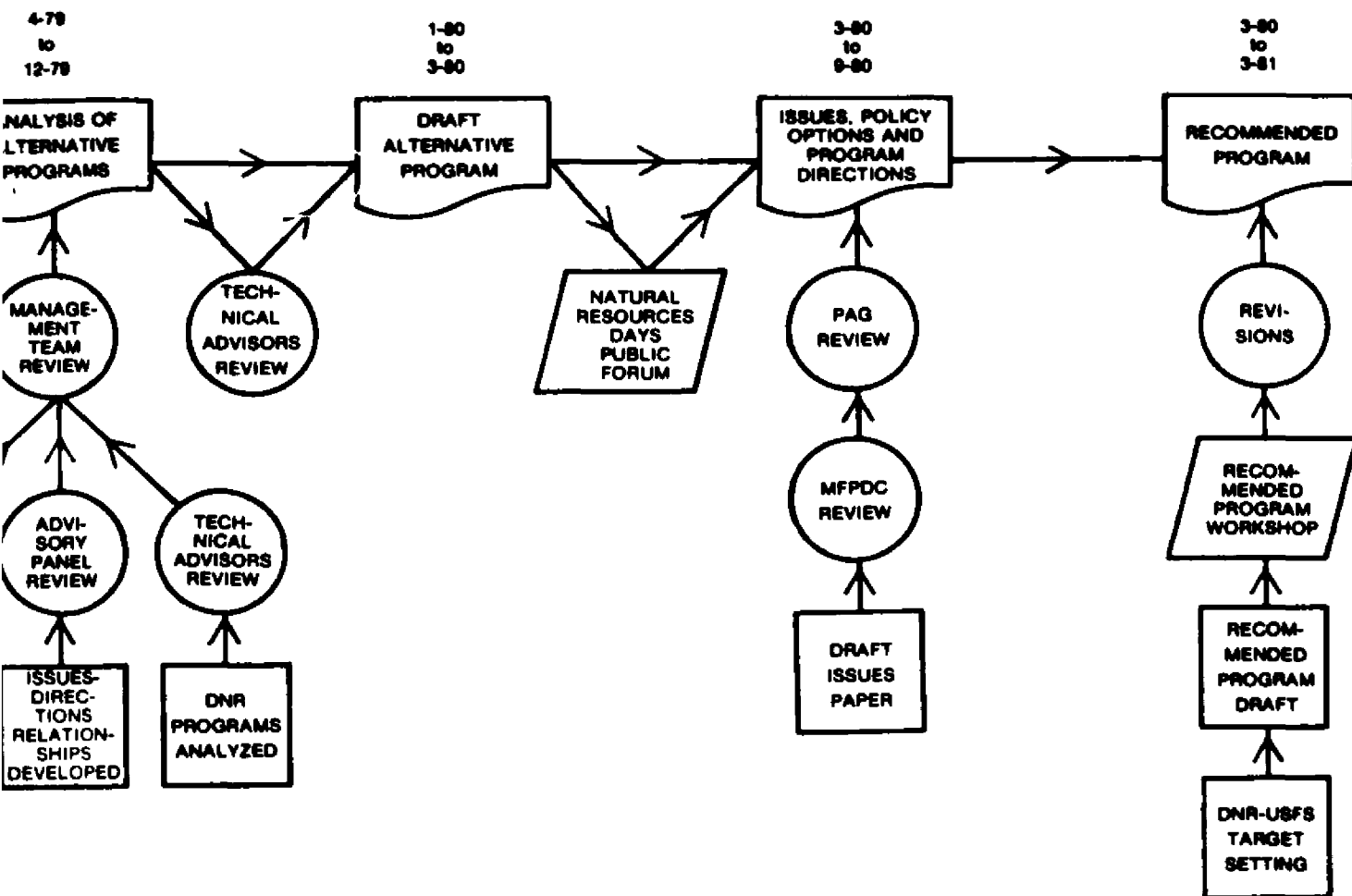


Figure 2.1 Michigan's Statewide Forest Resources Plan Process, December, 1977 to March



1977 to March, 1981.

preparation of a Statewide Forest Resources Plan for Michigan had begun. He also appointed M. L. Petosky, Assistant Chief of the DNR's Bureau of Renewable Resource Management, to be responsible for coordinating the plan (refer to Figure 2.2 for the Division's included on the Bureau).

Director Tanner also announced the establishment of a cooperative agreement between the DNR and the Forestry Department of Michigan State University. Through this agreement Dr. Robert Manthy of Michigan State University was to work with the Forest Management Division in the development of the SFRP. Director Tanner invited Manthy's participation because of the latter's experience with the U.S. Forest Service's RPA planning.

Shortly thereafter, the structure of the SFRP work was determined. A team which would include members from the Division's Planning Unit (refer to Figure 2.3) and the MSU Forestry Department was to be the primary work group. Under the leadership of Chief Webster, Gerald Rose, then Planning Unit Leader in the Division was to co-direct the SFRP with Professor Manthy. They were to guide the progress of the SFRP and have primary responsibility for its development. Jim Olmstead, Planning Analyst in the Division; and the author of this dissertation, then specialist in resource assessment at MSU's Forestry Department, were to coordinate the day to day activities of the SFRP. Gerald Thiede, Forest Resource Analyst in the planning unit was to give technical assistance to the team as needed. This five person team will be referred to as the "management team" (see Table 2.1).

Table 2.1 Statewide Forest Resources Plan Participants by Group

1. DNR Forest Management Division

- a. Division Chief. . . Project Chief

Management Team Members

- b. Planning Unit Leader (1978) . . . Project Director
(became Assistant Chief, Resource Development and
Planning in 1980)
- c. Planning Analyst, Planning Unit . . . Project
Coordinator
- d. Forest Resource Analyst, Planning Unit (became
Planning Unit Leader in 1980)

Other Team Member

- e. Cooperative Forest Management Section Leader

2. Michigan State University, Forestry Department

Management Team Members:

- a. Professor, Resource Economics. . . Project Director
- b. Specialist, Resource Assessment . . . Project Coor-
dinator (later Research Assistant)

Other Team Members

- c. Proseminar participants

3. Consultants for Program Analysis

Management Team Members

- a. Program Analysis Director . . . Project Director
(same as 2a)
- b. Program Analysis Leader . . . Project Coordinator
(same as 2b)

Other Team Members

- c. Resource Analysts
- d. Resource Specialists

Table 2.1 (cont'd.)

4. DNR Technical Advisors

Representatives from the:

- *a. Wildlife Division
- *b. Fisheries Division
- *c. Recreation Services Division
- d. Land Resource Programs Division
- e. Parks Division
- f. Lands Division
- g. Waterways Division
- h. Geological Survey Division
- i. Water Management Division
- j. Water Quality Division
- *k. Office of Surveys and Statistics

5. Public Advisory Group

- a. representatives from public agencies
- b. representatives from forest resource user groups
- c. representatives from forest resource related industries
- d. representatives from environmental and other interest groups

6. Advisory Panel

- a. representative from Michigan State University Forestry Department
- b. representative from University of Michigan School of Natural Resources

*these divisions played a more active role in providing assistance to the SFRP project.

- c. representative from Michigan Technological University, School of Forestry and Wood Products
 - d. representative from the Forest Industries Council
 - e. representative from the Upper Peninsula Environmental Council
-

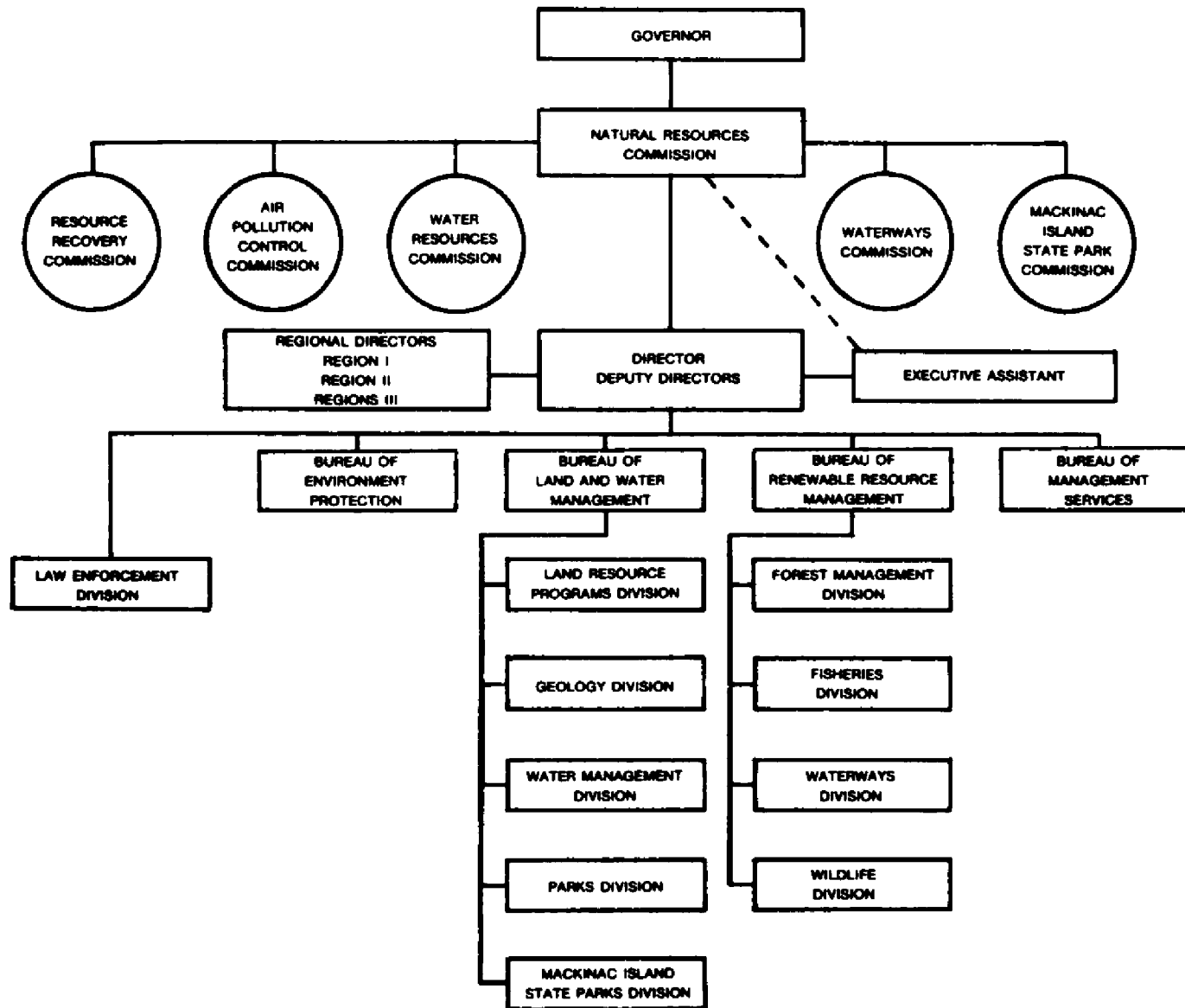


Figure 2.2 Michigan Department of Natural Resources Organizational Chart.

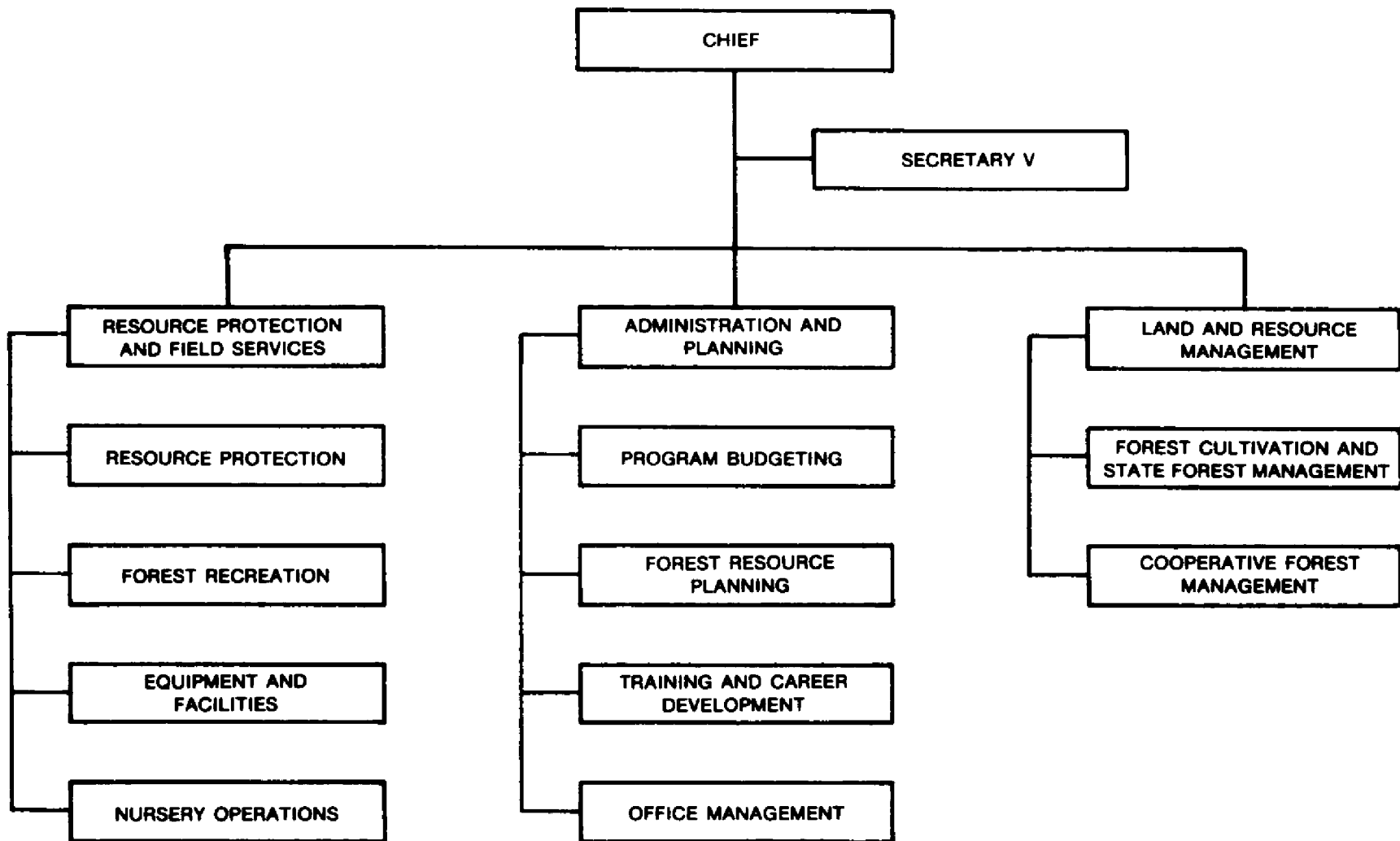


Figure 2.3 Forest Management Division Organizational Chart, 1978.

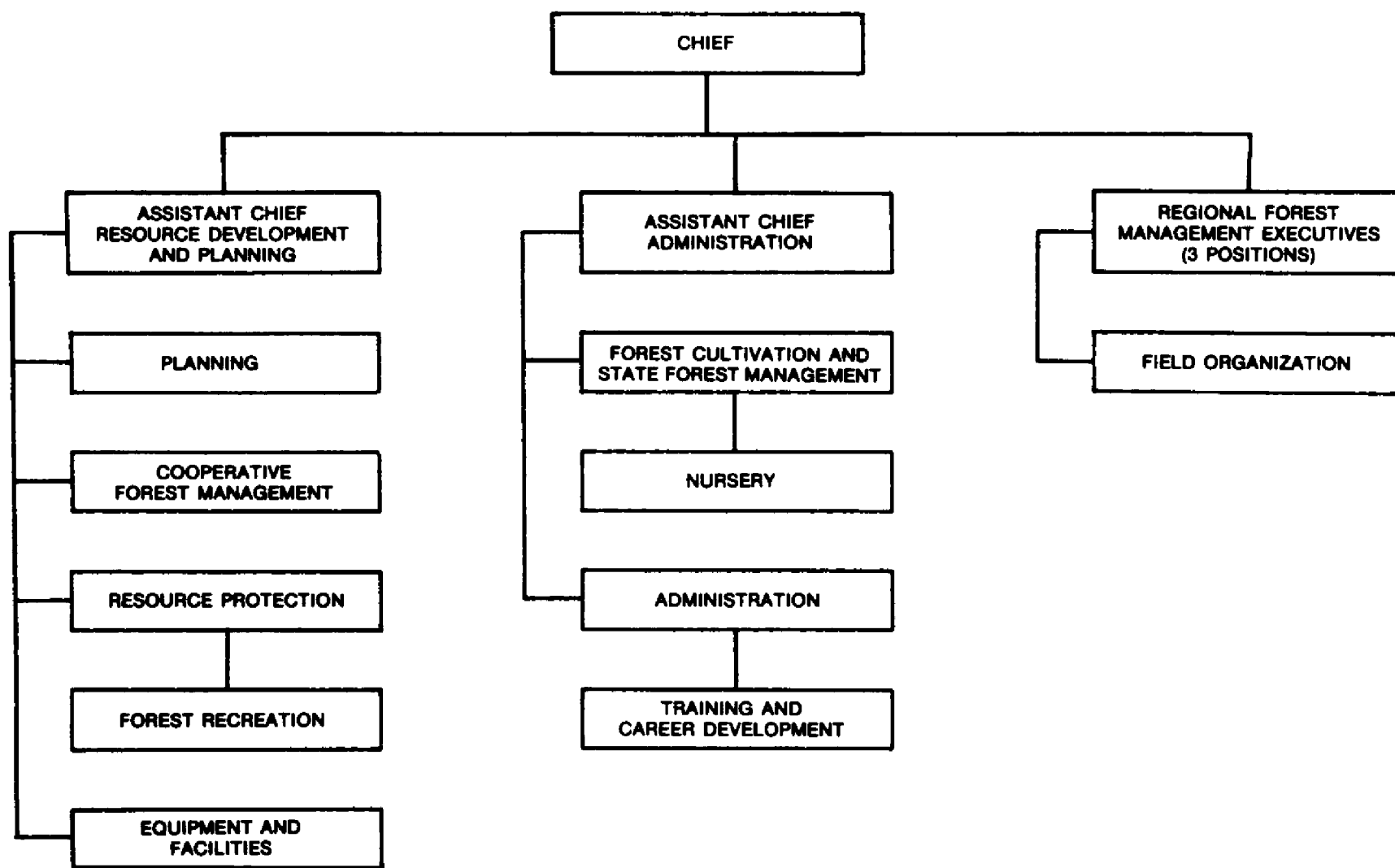


Figure 2.4 Forest Management Division Organizational Chart, 1980.

It was decided that additional technical expertise and work force was to be required for the first phase of the SFRP--the assessment phase. The assistance of Dr. Richard Alston, visiting Professor at Michigan State University, and resource economics doctoral students in his proseminar course was enlisted for this purpose. These proseminar courses, offered in the Forestry Department are designed to give students hands-on experience with a resource economics problem while assisting the cooperating organization.

The management team and the MSU proseminar participants formed what will be referred to as the "SFRP team" in the assessment phase. Table 2.1 which lists the participants in the SFRP process, and Table 2.2 which indicates SFRP participants by activity, summarize the work arrangements developed during this pre-planning phase.

One of the first activities of the management team and the MSU proseminar members was participation in a week long workshop on comprehensive forest resource planning. The workshop, "Comprehensive State Forest Planning and the RPA" was sponsored by the U.S. Forest Service, Northeastern State and Private Forestry branch and the Michigan State University Forestry Department. It was designed to familiarize state forest resource planners with the U.S. Forest Service RPA process, with state level comprehensive forest resource planning, and with the links between them. Other participants in the workshop included forestry personnel from most of the northeastern states; and U.S. Forest Service, State and Private Forestry Branch staff. Workshop topics included an overview of RPA and comprehensive forest resource planning, their purposes and opportunities for their use, problems that might be encountered and possible solutions, and methods for resource assessment and

Table 2.2. Statewide Forest Resources Participants by Activity.

Activity	Principal Participants		Public
	DNR	Outside Aid	Involvement (group code)
	(group and project title code from Table 2.1)		(from Table 2.1)
Preplanning			
Direction	1a, 1b	2a	
Coordination of Activities	1c	2b	
Public Information	1a, 1b	2a	5
Assessment			
Direction	1a, 1b	2a	
Coordination of Activities	1c	2b	
Data Compilation	1c, 1b	2b, 2c	
Editing and Production	1c, 1b	2b, 2a	
Reviews	1a-d,4	2a, 2b	5
Analysis of Alternative Programs			
Direction		3a	
Coordination of Activities	1c	3b	
Analysis		3b, 3c	
Editing and Production		3b	
Reviews	1a-d,4	3a	6

Table 2.2 (cont'd.)

Draft Alternative Programs

Direction	1a, 1b	2a	
Coordination of Activities	1c	2b	
Compilation	1c, 4	2b	
Editing and Production	1c,	2b	
Reviews	1a, 1b, 4	2a	5,6

Issues, Options and Policy Directions

Direction	1a		
Coordination of Activities	1b, 1c		
Development	1a-3		
Editing and Production	1c		
Reviews	1a-c	2a, 2b	5,6

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Recommended Program

Direction	1a, 1b	2a	
Coordination of Activities	1c	2b	
Compilation	1c, 1d, 1e	2b	
Editing and Production	1c	2b	
Reviews	1a-d, 4	2a, 2b	5,6

program development. Workshop speakers were recruited for their experience in RPA or state planning and expertise in planning methods.

Two public workshops were also held over the next several months to introduce the SFRP to interested individuals and groups. Entitled "Michigan's Forests and the Future" these forums introduced the SFRP process to interested members of the public and were sponsored by the West Michigan Environmental Action Coalition. The workshops included presentations and group discussions on forest resource issues, forest management practices, and plans for Michigan's Statewide Forest Resources Plan. Participants in these workshops, as well as participants in the "Goals and Issues Statement" development were kept on file for reference for future public involvement.

The Assessment

The first phase in Michigan's SFRP process, the production of an assessment of current and likely future conditions and uses of Michigan's forest resources, began in the spring of 1978. The structure of the assessment was to be similar to that used by the U.S. Forest Service in their RPA assessments. The size, condition and extent of each major forest resource in Michigan: timber, wildlife, fish, and outdoor recreation was to be determined. An overview of the size, geographic distribution and description of Michigan's forest lands and waters was included. The steps followed in the assessment phase are illustrated in Figure 2.1 under the heading "Assessment." Tables 2.1 and 2.2 identify the participants and their roles in this phase.

Each proseminar student was assigned one of the resource categories to research. Following research procedures outlined by the MSU SFRP

Project Director, team members first identified and contacted resource specialists in the DNR and the U.S. Forest Service. The specialists identified sources of secondary data on Michigan's forest resources and, in some cases, served as direct sources of information themselves. The DNR specialists in wildlife, recreation, fisheries, geology, and waterways also served as technical reviewers of the research prepared by the proseminar students. This group will be referred to as the "Technical Advisors". Although no primary data was collected for the Assessment, much of the secondary data and information had to be specially compiled by SFRP team members. The cooperation and support of the specialists was, thus, crucial.

It was determined that the assessment phase must also be used to inform people and organizations interested in forest management in Michigan of the SFRP and to involve them where appropriate. At the same time DNR specialists were being contacted for technical assistance with the Assessment, contacts were being established with administrators in the DNR and U.S. Forest Service. A meeting in early May 1978 was held with representatives from other DNR divisions to inform them of plans for the SFRP, work being done on the Assessment, and to ask for their cooperation.^{1/}

U.S. Forest Service regional and Michigan National Forest planners were visited by the author during the spring and early summer of 1978. These visits were used to inform U.S. Forest Service planners of Michigan's SFRP efforts, to coordinate these with the Forest Service's RPA

^{1/}These divisions are listed under Group 4 in Table 2.1.

process, and to gather information for the Assessment. Later that summer the author visited the offices of the U.S. Forest Service, Northeastern State and Private Forestry Branch and Southeastern State and Private Forestry Branch to gather information on their state planning activities and to report on the progress of the SFRP. The co-directors of the progress of the SFRP held informational meetings with the regional staffs of the DNR during this same period.

Other public administrators, private individuals, and private organizations were also involved early in the assessment phase. While information on Michigan's forest resources was being collected, a proposed outline for the Assessment was drafted for review. Forty people, including DNR staff, public interest representatives who had been involved in developing the "Goals and Issues Statement," and members of additional public interest groups and public agencies were sent the proposed outline for the Assessment. At this time they were asked to serve as members of a "Public Advisory Group" to the Statewide Forest Resources Plan.^{1/} As their first act they were asked to comment on the proposed outline, judging the relevance of what was to be contained in the Assessment and to recommend any additions or deletions. A final Assessment outline was composed based upon the comments received from the review. The comments themselves were also compiled and sent back to the Public Advisory Group for their information and as recognition of their contributions.

During the summer of 1978 the research submitted by the proseminar

^{1/}These representatives are listed under Group 5 in Table 2.1.

students underwent intensive review by the DNR resource specialists. A series of revisions were made in the assessment information based upon these technical reviews. Considerable editorial work was also done by the management team to build a consistent and comprehensive document from this research. The management team devoted the remainder of 1978 to preparing a draft Assessment for public review. The importance of maintaining contact with SFRP cooperators during this period was recognized. Continuing progress reports to DNR administrators and technical advisors, and to U.S. Forest Service personnel were, therefore, made during this period.

After review by Division administrators, and a subsequent revision, the draft Assessment was released for public review in March of 1979. As well as being made available to the public the draft, Michigan's Forest Resources--An Assessment, 1979 was sent to:

1. DNR department and bureau level administrators
2. DNR division level representatives
3. FMD division staff
4. U.S. Forest Service State and Private Forestry, Northeastern and Southeastern branches
5. U.S. Forest Service National Forest staff in Michigan
6. U.S. Forest Service Washington Office Staff
7. the "Public Advisory Group"
8. various other public agencies in Michigan

A public forum on the draft Assessment was then held during Natural

Resources Days at Michigan State University.^{1/} The forum, entitled "Michigan's Forest Resources Plan: A Status Report", included: (1) a keynote address by Rupert Cutler, then Assistant Secretary of Agriculture; (2) reports from the Assessment on Michigan's forest resources; (3) and a forum on concerns about the future of these resources. This forum had several purposes. The first was to invite public comment on the draft Assessment and to distribute it to additional interested publics. Just as important, the forum informed the participants of the DNR's plans for the second phase of the Statewide Forest Resources Plan, the "recommended program phase," and invited their expression of what they thought forest management in Michigan should be concerned about in the future.

To ensure broad public representation at the forum, all those who had been sent drafts of the Assessment were invited to attend the forum. Members of many of these public interest groups and other organizations participated in the program and several were joint sponsors of the forum.

The draft Assessment was revised based upon this public review. A final version of Michigan's Forest Resources 1979--An Assessment was published and distributed the summer of 1979.

^{1/} Sponsored by the College of Agriculture and Natural Resources, Natural Resources Days is part of Michigan State University's Farmer's Week event which brings people from all over the state to programs and exhibits on agriculture and natural resources. The Michigan's Forest Resources Plan program was jointly sponsored by the Michigan Association of Timbermen, Michigan United Conservation Clubs, Michigan Forest Association, and the Society of American Foresters, Lower Michigan Chapter.

The Recommended Program

Work began on the recommended program phase of Michigan's SFRP in early 1979. Two major efforts were identified as being necessary to develop a recommended program. These were: (1) an analysis of forest resource issues in Michigan, and (2) a quantitative analysis of alternatives for forest resources programs in Michigan. The steps followed during the "program" phase are illustrated in Figure 2.1 under the headings "Analysis of Alternative Programs; Draft Alternative Programs; Issues, Policy Options and Program Directions, and Recommended Program."

As with the Assessment, a team approach was used in developing the Recommended Program. Gerald Rose, Jim Olmstead and Gerald Thiede of the Forest Management Division of the DNR, and Robert Manthy and Karen Olson as outside cooperators, again formed the management team. Division Chief Webster again served as Project Chief. Three consulting resource analysts were recruited to work on the quantitative analysis. Two resource specialists from Michigan State University, a specialist in wildlife and fisheries and a specialist in outdoor recreation, were added as advisors to the SFRP team for the program phase. The working structure of this phase is summarized in Tables 2.1 and 2.2.

The team began by concentrating on identifying and examining major areas of concern, or issues, that should be addressed by the program. Several sources of information were used in this step. The "Goals and Issues Statement" prepared by the Division in 1977, comments received from reviews of the Assessment, and results of the Natural Resources Days forum provided much of this information. It was decided that more information on forest resource issues from other DNR divisions

divisions would also be helpful. A group meeting with the DNR Technical Advisors was followed by discussions between individual advisors and various team members. Also, materials from other divisions, state policy making bodies, the U.S. Forest Service and others were reviewed for additional information on forest resource issues relevant to Michigan.

Shortly after beginning work on the program, the management team asked five members of the forestry community to serve on an "Advisory Panel" to the Statewide Forest Resources Plan.^{1/} The panel was asked to function as the first line of reviewers for interim and final results in the development of the Recommended Program. The panel was, thus, to help the management team ensure that as the recommended program developed it was reasonable and feasible.

The first task of the Advisory Panel was to review the results of the SFRP team's analysis of forest resource issues. The panel was given a paper describing the role the issues would have in the development of the Recommended Program and the major issues that appeared to be of concern to the forestry community. These five major issues were: (1) energy cost, production and conservation, (2) economic stability, growth, and development, (3) the role of the public sector, (4) provision of market versus nonmarket goods and services, and (5) environmental quality. The Advisory Panel expressed general agreement with these results.

The management team next devoted their efforts to developing and

^{1/} The panel composition is listed in Table 2.1 under Group 6.

analyzing alternative programs.^{1/} To begin this process, five general alternative directions for forest resource programs to take were chosen for analysis. These directions are briefly described in Figure 2.5 below. The criteria used in the selection of these directions were their relevance to the major issues, their desirability to one or more interest groups, their representation of a range of options, and their physical and political feasibility. The Advisory Panel also reviewed the results of this step.

The management team determined that the development of alternative programs from these general directions would require several steps. First was the identification of all current programs which contributed to the production of forest resources in Michigan and the documentation of the costs and benefits of these programs. The second step would need to be the development of information on what DNR programs and activities would be required to produce a range of higher or lower levels of forest resources, as indicated by the alternative directions, and the costs and benefits of these sets of programs. Third, the relationship of the alternative directions to the major issues would need to be determined and the impacts of the alternative directions, if followed, would need to be estimated. Fourth, measures of the impacts of following the alternative directions upon the issues would need to be included in the analysis.

The outside consultants on the team, Group 3 in Table 2.1, performed this four-step analysis over the next several months. This

^{1/} An alternative program is a set of information which includes a general direction for forest management, the activities needed to follow the direction, and the resulting outputs and impacts.

- A. This alternative would moderately increase all forest outputs in the State. The relative mix of outputs would remain at current proportions.
- B. This alternative would maintain forest outputs at current levels with no programmed increases. The limiting of public programs would be emphasized.
- C. This alternative would significantly increase timber, motorized and developed recreation, hunting and fishing outputs. Forest resource development would be emphasized while maintaining current levels of environmental quality.
- D. This alternative would moderately increase wilderness, visual quality, threatened and endangered species and dispersed recreation outputs. Emphasis would be placed on nondevelopment with timber, developed recreation, hunting and fishing outputs to remain at current (1978-79) levels.
- E. This alternative would slightly decrease all forest outputs from public lands and programs. The relative emphasis on forest outputs would remain as it is currently.

Figure 2.5 Draft Alternative Directions, August 1979.

analysis is labeled "Analysis of Alternative Programs" in Figure 2.1. The continuous cooperation of the DNR Technical Advisors was used throughout the analysis. The management team established procedures to ensure that this cooperative relationship with other divisions was maintained and that new contacts within the DNR were made as necessary. Periodic consultations with the wildlife, recreation and technical specialists were made to ensure that the analysts' results were reasonable and complete.

In the fall of 1979 a review draft which documented the analysis was produced by the consultants for in-house use by the management team and the Division Chief. The document contained major sections on: (1) current DNR and U.S. Forest Service programs which influenced forest resource production and use in Michigan; (2) description of five alternative programs; (3) resource output targets under these alternative programs; (4) activities, costs and benefits of DNR programs under each alternative program; and (5) the relationship between alternative programs and the issues. Based upon reviews by the Division Chief, the management team and the specialist advisors, this draft was revised and produced as a working document entitled "Analysis of Alternative Forest Resource Programs for Michigan."

The next task of the management team was to develop comprehensive alternative program packages or "policy options: from the information contained in the Analysis. This step is labeled "Draft alternative Programs" in Figure 2.1. Recommendations of the Division Chief, the DNR Technical Advisors, and the Advisory Panel were sought over the next several months. These recommendations indicated that a stronger emphasis on forest resource issues was needed and that alternative

programs should encompass activities by the private sector as well as DNR and U.S. Forest Service activities.

In March of 1980 the DNR presented a draft of Alternative Forest Resource Programs for public review at a forum during Natural Resources Days at Michigan State University. Entitled "Michigan's Forest Resources Plan: A Public Review," the forum included a keynote speech by DNR Director Howard Tanner and presentations by public and private forest resource managers. A progress report and a presentation of the draft alternative programs were then presented for public comment.

As with previous public reviews, members of the Public Advisory Group were sent invitations to the forum and advance copies of the review draft. All drafts that were mailed or that were distributed during the forum included a reviewer response sheet to be mailed to the Division with written comments. This review draft was also made available to the public.

The comments received from these reviews indicated that most reviewers preferred a "balanced" forest resource program for Michigan. Reviewers were, however, dissatisfied with the concentration on numerical presentation of the alternative programs. Some reviewers indicated that the ties between the alternative programs and the issues were not clear or strong enough. The consensus of the reviewers appeared to be that they needed another way to judge the merits of an alternative program in addition to the detailing of activities, costs and outputs that would result from an alternative program.

As a result of these reviews, the Forest Management Division decided that considerably more effort should be devoted to development of the issues. It was also decided that a better format for presenting

alternative programs and additional information in some program areas were needed. The management team spent the summer of 1980 on these two tasks. A group of Forest Management Division staff members directed by the Division Chief drafted discussion papers on each of these issues. This step is labeled "Issues, Policy Options and Program Directions" in Figure 2.1. These papers included the relationship of forest resources and forest management programs in Michigan to the issues,^{1/} and conclusions as to how forest management programs should respond to these issues in the future.

Members of the management team developed a new format for presentation of alternative programs which included additional discussion of the issues and which indicated how management activities directly influenced or were influenced by the issues. A representative of the Wildlife Division was added to the management team late in the summer of 1980 to participate in all phases of the team's activities.

In the fall of 1980 the Division presented a working draft of a paper entitled "Michigan's Forest Resources Plan: Overview of Issues and Policy Options" to the Michigan Forestry Planning and Development Committee. The paper discussed the five major issues, indicated several policy options as possible responses to each issue, recommended one of these policy options for each issue, and discussed three alternative, overall, policy directions. Upon the approval of the paper by the Committee, a revised and expanded version of the paper, "Michigan's

^{1/}The issues by this time had changed somewhat from the original five and were: (1) economic development, (2) public forests, (3) non-industrial private forests, (4) energy conservation and development, and (5) urban forestry.

Forest Resources Plan: Issues, Policy Options, and Recommended Overall Program Direction" was distributed for public review. Reviewers included: (1) the Michigan Forestry Planning and Development Committee, (2) the Public Advisory Group, (3) the Advisory Panel, (4) other DNR division chiefs, and (5) the Northeastern State and Private Forestry branch of the U.S. Forest Service. This review draft went one step further than the working draft had, in that it recommended one of the overall policy directions for adoption. This recommended policy direction was to "focus on a major effort to carefully manage and use forest resources for the purpose of regional economic development/diversification." As well as pursuing economic development for Michigan and the Lake States, the goals of the recommended policy direction would include a "modest increase in the overall intensity of public land management, ... a substantial strengthening of programs for nonindustrial private forests,... and the pursuit of a constructive effect on both energy demand and supply."

Responses to the review draft were very favorable, and supported the recommended policy direction. The next step was to develop a recommended program for forest management statewide, based upon this recommended policy direction. The management team proceeded by setting a recommended, nonnumerical goal for each issue. These goals stated what forest management in Michigan should do about the issues, given the recommended policy direction. Sets of strategies (particular activities) which could be used to reach these goals were then developed with the assistance of other DNR team members. These strategies were taken from comments received from public involvement throughout the SFRP process, from recommendations of various recent reports on

Michigan's forest resources and from recommendations of resource specialists in the DNR.

Using the "Analysis of Forest Resource Programs for Michigan" and the cooperation of National Forest supervisors and planners in Michigan, the team developed forest resource output targets for each forest resource, statewide and by landowner or provider class. These targets were determined to be desirable in light of the recommended goals for the issues. They were also determined to be feasible based upon the production capabilities of the landowner or provider. Information from the "Analysis" as to specific DNR programs, program activities, and costs which would be required to reach the recommended targets was then compiled.

In February of 1981 Michigan's Forest Resources--A Recommended Program, Draft was produced for public review. This draft contained three major sections: (1) overall program direction, (2) forest resource issues, and (3) forest resources. The section on forest resource issues discussed each issue, and the policy options available in response to the issue. It also recommended one of the policy options, the management goals that indicated how to carry out this policy and the strategies required to meet the goals. The section on forest resources discussed the supply and demand for each resource, how the issues influence the resources and how the resources influence, or could influence, the issues. Statewide output targets and landowner or provider output targets were also recommended for each resource.

This document served as a basis for an intensive public review of the Recommended Program at a workshop sponsored by the Forest Management Division. Members of the Public Advisory Group, National Forest

staff, representatives from other forest resource management agencies in the state, and DNR technical advisors were participants in the workshop. As well as reviewing and commenting on the overall program contents and direction, the 23 attendees met in small workgroups to discuss the issues, goals and strategies. Led by management team members and other DNR team members, the workgroups made significant revisions in the goal statements and the strategies.

The author's involvement with the SFRP ended shortly after this workshop. This case study, of necessity, ends at this point. Preparation of the final Recommended Program, to be presented to the Natural Resources Commission, was done solely by Forest Management Division, Planning Unit staff.

CHAPTER III

INNOVATION IN AN ORGANIZATIONAL CONTEXT

Introduction

This chapter presents a theoretical framework for analyzing the introduction, acceptance and use of an innovation in an organization. This framework draws on what is generally called "diffusion of innovation theory."^{1/}

Diffusion of innovation theory has had multidisciplinary origins in rural sociology, communications, geography, marketing, organizational behavior and management. For this reason a variety of labels are given the theory and its components. The theory has also been researched in a variety of applications and research areas (Orr and Wolfe, 1979; Rogers and Shoemaker, 1971). Much of the diffusion of innovation research has been done on the diffusion of a new technology in lesser developed countries. Marketing scientists have studied the diffusion of new consumer products. Management science research has focused on the diffusion of technology in an organization and on organizational change. Although the research emphasis has been on the diffusion of new technology, the theory also encompasses the diffusion of new ideas.

^{1/}Diffusion of innovation theory is encompassed by what has been labeled the theory of planned change. The latter theory is more general in that change may or may not involve innovation, something new, while innovation always involves change.

It is the diffusion of new ideas or concepts that will be the focus here.

Diffusion of innovation theory is a contingency theory. It proposes that if the goal of the individual or organization is to implement an innovation and if a certain situation exists within the environment or organization, then certain actions are more effective than others. Effective actions are those which speed the adoption of the innovation, broaden its adoption or both. The theoretical framework presented below has three major components. First is the examination of factors in an organizational situation which can influence the acceptance and use of an innovation. Second is the identification of a variety of types of actions, or "strategies," which can be used to introduce and implement an innovation in an organization. Third is the presentation of guidelines for strategies that are appropriate to the organizational situation, i.e. that are most effective.

Factors Influencing Innovation in an Organizational Structure

The organizational situation in which one attempts to implement an innovation affects both the length of time it takes to have the innovation accepted and used, i.e., the rate of adoption; and the number of people accepting and using the innovation, i.e., the adoption success. Innovation diffusion theory has identified several factors for use in analyzing any situation in the context of diffusing an innovation. These factors are: (1) the nature of the problem the innovation is to solve, (2) the key actors available to introduce and implement the innovation, (3) the physical and social environment of the organization, (4) the characteristics of the innovation itself, and (5) the stages

of adoption from introduction to use.

Nature of the Problem

An organization proposes the adoption of an innovation; e.g., a new machine or new management system, because someone in the organization, explicitly or implicitly, recognized a problem. These problems have been labeled performance gaps (Downs, 1967). A performance gap exists when there is a perceived difference between how or at what level the organization is performing in some area and how or at what level the organization should be performing (Zaltman, Duncan and Holbeck, 1973; Bennis, 1966). A change, in this case specifically an innovation, is proposed to close this performance gap. For the innovation to actually close the gap and solve the problem, the problem must be analyzed and defined correctly.

There are too many barriers to correct problem definition to give an exhaustive list here. Several, however, are worthy of special mention. "Technological bias" (Bennis, 1966) is a barrier which is thought to be common enough to deserve a label. Technological bias occurs when a particular technological solution is proposed regardless of the situation or problem (Zaltman and Duncan, 1977). A second, related, barrier is the failure to examine a problem from more than one perspective. In this case one person attempts to define and solve a problem from her or his perspective alone. This can lead to failure to perceive the other symptoms of the problem and its roots.

Zaltman and Duncan (1977) propose that by making the process of problem definition more explicit and less intuitive, incorrect problem definition can be avoided. Although their model may seem obvious to

physical scientists, the authors state that this systematic, mechanical process of problem definition is neglected in applied social research.

The authors describe their systematic approach as a metatheory perspective. It involves four basic steps. The symptom(s) of the problem are first identified and stated. These symptoms should be measurable indicators of whether an organization or system is moving closer or farther away from the relevant goal. Next, the causal factors of the problem are determined. Causal factors are variables; such as particular personnel, equipment, or work arrangements in the case of an organization; whose interaction and functioning are actually the source of the problem. In the third step this interaction of the causal factors is analyzed and outlined. In the final step the reasons why the causal factors interact the way they do is determined. Those factors which can be influenced by the organization and those which cannot are also identified. This system leads the problem solver to look beyond the symptoms of a problem so that the causes may be treated, and so that efforts are devoted only to causes that the organization can control.

Similar approaches have also been developed in what is known as structural functionalism as illustrated by Korzenny (1978) and in the systems approach typified by Churchman (1968).

Key Participants

Diffusion of innovation theory distinguishes several major sets of participants in the process of bringing an innovation into a system or organization. The label "change agents" is given to that person or group of people which are responsible for implementing the innovation.

Change agents include the initial advocates of the innovation and those who carry out the mechanics of implementation. Those people who are the objects of the change, who are introduced to the innovation, and, it is hoped, will accept it and use it, are labeled "change targets." Change agents may be external or internal to the system (Bennis, 1966). Not all members of an organization or system adopt an innovation at the same time, and therefore, not all change targets will adopt at the same time. Research summarized by Rogers and Shoemaker (1971) indicates that the distribution of adoption by members of a system is bell shaped and approaches normality. Various categories of adopters have been labeled and studied based upon this distribution. The most widely used classification uses five categories of adopters in order of earliness of adoption: (1) innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards.

Again by reviewing and summarizing research in innovation diffusion, Rogers and Shoemaker (1971) have compiled a lengthy list of characteristics of these five categories. These characteristics can be summarized by comparing earlier adopters to later adopters. In terms of socioeconomic characteristics, earlier adopters do have more years of education and higher social status than later adopters. In their communication behavior, earlier adopters participate more in social activities, have a broader social reference group, greater exposure to mass media and greater interpersonal communication. As would be expected, earlier adopters thus have greater knowledge of innovations and greater contact with change agents. Earlier adopters also exhibit a higher degree of opinion leadership than do later adopters.

"Opinion leaders" are key members of an organization or social

system. Communication research has indicated that certain individuals are "able to influence informally other individuals' attitudes or overt behavior in a desired way with relative frequency" (Rogers with Shoemaker, 1971). These opinion leaders serve as gatekeepers of information for their followers and as sources of opinions. As such, opinion leaders affect the adoption of an innovation by influencing awareness of, knowledge about the attitudes toward an innovation. It is important to note that opinion leaders are more innovative than their followers but they are not necessarily the most innovative members of a system. The key characteristic of opinion leaders is that they conform more closely to the norms of a system than do their followers. Thus, if the norms of a system favor maintenance of the status quo so will the opinion leader. If the system's norms favor change opinion leaders will be more innovative. Opinion leaders also exhibit the characteristics of earlier adopters described above (Rogers with Shoemaker, 1971).

It should be apparent that change agent contact with and use of opinion leaders is crucial. Communications research indicates that mass media may influence what issues people think are important but only interpersonal communications influence peoples' attitude toward an issue (Roberts and Roberts, 1977). Opinion leaders are, thus, the change agents' primary avenue to inform and influence the majority of the targets of change. Success in having an innovation adopted is much more likely, ceteris paribus, if the opinion leader(s) in a system are favorable toward it and are kept informed.

Stages in the Adoption of an Innovation

The adoption of an innovation in an organization or system does not occur instantaneously with its introduction. The innovation will be adopted quickly by some individuals, more slowly by some, and not at all by others. Understanding this process is necessary to acting appropriately in bringing the innovation to an organization. One way to arrive at this understanding is to examine how individuals decide whether or not to adopt an innovation and how the interaction of these individuals influences the adoption on the organizational level.

Various models for the diffusion of innovations have been proposed in the literature. These include those specific to a particular subject area (Alves and Morrill, 1975), those specific to organizations (Knight, 1967; Wilson, 1966) and general models (Rogers with Shoemaker, 1971; Hassinger, 1959; Zaltman and Duncan, 1977). The general models are similar and have been found to be appropriate in a variety of cases (Taylor and Miller, 1978; Teece, 1980). Rogers and Shoemaker present modifications of their model for various types of decisions: (1) individual, (2) collective or (3) authoritative. Their model, thus, appears to be most useful for the purposes of this discussion. The model of the individual's innovation decision process is presented below, followed by a discussion of the authoritative innovation decision process.

Individuals go through a four phased process in deciding whether or not to adopt an innovation (Rogers with Shoemaker, 1971). These four stages have been labeled: (1) knowledge, (2) persuasion, (3) decision and (4) confirmation.

Knowledge stage. In the knowledge stage the individual becomes aware of the innovation and learns something about it. For an individual

to become aware of and learn about an innovation information about the innovation must be available to him or her. Availability of information, however, is not enough to ensure that someone will read or listen to, i.e., expose themselves to, that information. The tendencies of individuals to selectively expose themselves to messages and selectively perceive messages act so as to limit what the individual hears or reads.

The term selective exposure has traditionally been used to refer to the tendency for individuals to expose themselves only to messages which are consistent with their own attitudes and beliefs. This pattern, however, is not well supported. There is support for the influence of an individual's education, their experience in past exposure on a subject and their perception of the usefulness of the information on what messages they prefer to expose themselves to and how often (Sears and Freedman, 1977). Thus, individual's exposure to information does tend to follow certain patterns. The first two determinants, education and past exposure, cannot be influenced. An individual's perception of the usefulness of a certain message, however, can be influenced. As is discussed below in this chapter, this becomes important in developing innovation diffusion strategies.

Selective perception is the tendency of an individual's interpretation of messages or information to be influenced by his or her beliefs and attitudes. Klapper (1960) reports that processes of selective perception have been detailed in interpersonal and mass communication studies. He notes, however, that in many of these studies selective retention of information may also be involved. Since subjects are asked to report their perceptions of an event or message, it is difficult

to separate the effects of selective perception from that of selective retention and from that of their interaction.

Rogers and Shoemaker's studies indicate that individuals who know about an innovation earlier than other members of a system have certain characteristics. These characteristics are similar to those of the innovator class of adopters described above. Those who know of an innovation early generally are more educated, have a higher social status, have more exposure to mass and interpersonal communication and have more social participation than do those who later know of an innovation.

Persuasion Stage.^{1/} It is in this stage that an individual forms an opinion about the innovation. Once he or she is aware of the innovation they seek enough information to form a favorable or unfavorable attitude toward the innovation. Selective exposure and perception of messages is just as, if not more, important in this stage than in the knowledge stage. These tendencies will influence how much information is sought, from where it is sought and how it is interpreted (Rogers with Shoemaker, 1971).

How an individual perceives the characteristics of an innovation is determined in this stage as well. The several characteristics of an innovation which have been determined to be influential in its adoption are discussed below in a later section of this chapter.

^{1/} Persuasion here does not necessarily imply an intent by some source to induce an individual to form some opinion but rather that the individual is forming an attitude toward the innovation in this stage.

It is also thought that in the persuasion stage the individual mentally tries the innovation. That is, he or she speculates as to how it would affect his or her present situation favorably or unfavorably (Rogers with Shoemaker, 1971). With some individuals this may take a more formal form of trial such as a benefit-cost analysis.

Interpersonal communication is especially important in this stage as the individual seeks information to confirm or deny his or her early attitudes (Rogers with Shoemaker, 1971). It is likely that the individual seeks this information from others similar to his or herself and from opinion leaders. Communication research supports this pattern of what is called "homophilous communication." Communication between individuals is likely to be less distorted and more enjoyable when those involved are similar in beliefs, values, education and social status. Homophilous communication is more effective than communication between dissimilar individuals (Zaltman and Duncan, 1977). Individuals do seek information from opinion leaders who, as discussed above, are different from their followers in many characteristics. The pattern that has been found to exist, however, is that individuals choose opinion leaders they perceive as being more, but not too much more, competent than themselves in a certain area^{1/} (Rogers with Shoemaker, 1971). Too much difference is a barrier to interaction and communication.

^{1/}This phenomenon has been found in modern social systems. In traditional social systems followers seek opinion leaders who are perceived as less or no more competent than themselves.

Decision stage. In the decision stage the individual decides to either adopt or reject the innovation. If the innovation can be adopted on a trial basis and the individual's attitude toward it is favorable, a small scale trial may be part of this decision process. Innovations which can be sampled or experimented with without much risk are generally adopted more rapidly than those which cannot. If the innovation appears to be even slightly better than the present practise or situation, individuals decide to adopt it after a trial (Rogers with Shoemaker, 1971).

Confirmation stage. The decision stage does not end the innovation decision process. Just as an innovation may have been rejected in any of the previous stages, an innovation may be rejected after an individual has made the decision to adopt it. In the confirmation stage, the individual seeks information to reinforce his or her decision to adopt or reject and may reverse his or her decision.

The confirmation stage may continue indefinitely as the individual tries to avoid what is labeled dissonance (Rogers with Shoemaker, 1971). Dissonance occurs when an individual's attitudes and actions are not in accord with each other. If the dissonance is strong enough an individual may seek to change his or her knowledge, attitudes or action, to reduce the dissonance. In the case of dissonance in regard to an innovation decision, new information may cause an individual to discontinue the use of the innovation or to adopt it when it had been previously rejected. If the previous decision is difficult or impossible to reverse the individual may selectively seek information which will only support his or her decision. Rationalization of the difference

between the individual's attitudes and his or her behavior is another way that dissonance is reduced.

Since dissonance regarding the decision to adopt an innovation can occur at any time, so can its discontinuance. It, therefore, cannot be assumed that once an innovation has been adopted its use will continue indefinitely.

Length of the innovation decision period. The length of time required for an individual to pass through the four stages in the decision period varies. Studies of innovation adoption indicate that the relative rate at which individuals pass through various stages does follow a pattern. It is thought that the entire process follows an S-shaped curve. The rate of the knowledge stage also follows an S shaped curve but its rate is more rapid than the rate at which the innovation is adopted.

As might be expected, earlier adopters take a shorter period of time to go through the process than do later adopters. Earlier adopters are earliest to adopt an innovation not only because they become aware of an innovation sooner than other individuals but also because they finish the innovation-decision process sooner (Rogers with Shoemaker, 1971).

Type of Innovation Decision

The decision to adopt or reject an innovation is not always up to the individual alone. These decisions may be made completely by the individual; as part of a group, i.e., collectively; or be forced upon the individual by an authority. The adoption of an innovation

may involve a combination of types of decisions as in the case to be studied in Chapter 4 where both individual and authority innovation-decisions are involved. Although the model discussed above is the most general, the innovation-decision processes do differ somewhat by the type of decision. Some discussion of how the authority-decision process varies from this model is, therefore, necessary (the collective-decision process not being of interest for the purpose here).

The innovation decision process model for authority decisions has five stages: (1) knowledge, (2) persuasion, (3) decision, (4) communication and (5) action (Rogers with Shoemaker, 1971). These steps are similar to those in the individual innovation decision model. The process, however, is more complex for authority decisions. The communication step is added since instead of only one individual making the decision, the decision must involve communication between those who have the authority to decide the organization should adopt the innovation and those who must accept this decision.

In the knowledge stage those in authority, the "decision unit" generally become aware of the innovation first and become knowledgeable about it. This knowledge is used to make the target group of subordinates aware of the innovation. There is also some support for the reverse case where subordinates pass knowledge about an innovation upward to their superiors in an organization (Rogers with Shoemaker, 1971). Current research on innovation in organizations indicates that the most important sources of information about innovations are those outside the organization (Zaltman and Duncan, 1977; Utterback, 1971; Corwin, 1972).

This would indicate that those with greater mass media exposure

and social participation are likely to learn of innovations earlier and serve as sources inside the organization (Wilson, 1966). Upward communication, however, is hindered unless the organization fosters an environment of trust and open effective communication (Rogers with Shoemaker, 1971). In organizations with authoritative structures the information that flows upward is selectively filtered to avoid passing on negative information concerning organizational performance (Katz and Kahn, 1966; Likert, 1961). Persons in positions of low power in an organization will also filter out this type of information to higher levels of the organization (Porter and Roberts, 1976).

The decision unit weights the merits of the innovation in the persuasion stage. In doing this, more information on the innovation is sought and evaluated. This step may include feasibility studies or benefit cost analysis.

In the decision stage the decision unit decides to adopt or reject the innovation. The participation of the target group in this decision is thought to be important in later acceptance of the innovation. Based upon evidence from small group and organizational studies, Rogers and Shoemaker (1971) propose that an organization member's acceptance of and satisfaction with an innovation is positively related to his or her involvement in the innovation decision. An individual's attitudes toward the innovation are likely to determine whether the innovation is actively supported and used or merely outwardly accepted but covertly fought.

The success of the implementation of an organizational change (Huse, 1975) or innovation (Cartwright, 1980) will depend upon whether or not the target group shares the perception that there is a need for change. Huse also proposes that perceptions of the plans for and

the consequences of change must also be shared. Participation by the target group in the early stages of the decision process can help create these shared perceptions and is, thus, important in the successful implementation of the innovation.

Information about the adoption or rejection of the innovation is communicated from the decision unit to the target group in the communication stage. How effectively this information is communicated and how it is accepted will depend upon the organization. The more homophilous the individuals communicating are, the more open the communication (Rogers with Shoemaker, 1971). It has also been proposed that messages from superiors will be viewed with suspicion by subordinates in organizations which operate authoritatively (Likert, 1961). Subordinates in organizations in which there is more participation in decision making are more accepting of messages from superiors.

If the decision is made to adopt, the innovation is implemented in the action stage. It is in this stage that the attitudes of the organization's members toward the innovation are likely to become manifest (Rogers with Shoemaker, 1971). As in the individual innovation decision model, individuals may experience innovation dissonance if the actions they are required to take differ from their attitudes toward it. The individual may change his or her attitude so that it matches his or her behavior. Given an authority decision, however, the individual may not have the option of changing behavior if the change would mean not complying with the decision. In this case the individual complies with the decision overtly but rejects the innovation attitude internally and continuing supervision will be required to insure continuing compliance (Rogers with Shoemaker, 1971).

Organizational Environment

The environment in which an organization operates will influence whether or not an organization adopts an innovation, the rate of adoption, and how innovation decisions are made. In their study of innovation in the public sector Feller and Menzel (1977) identify eight factors in the organization's environment which influence the diffusion of innovations. These are: (1) the nature of the perceived performance gap, (2) the supply of innovations, (3) the relationship between the agency and the executive branch, (4) the marketing activities of the suppliers of innovations, (5) the resources available to the agency, (6) the knowledge infrastructure in the agency, (7) the influences of other governmental bodies and (8) the demands of citizens. These factors are not mutually exclusive. Rather, their interaction is an additional factor in the organization's environment.

Nature of the perceived performance gap. There is little information about how performance gaps are identified in public agencies (Roesner, 1974; Feller and Menzel, 1977). Indeed the nature of public agencies may preclude the identification of many performance gaps. The lack of knowledge about agency programs and their performance and a lack of program controls, reporting and evaluation is a problem in many agencies (Hayes, 1972). Without information to develop measures of program performance, managers cannot identify differences between how a program is performing and how it should be performing. This situation results in less pressure to become and remain efficient than would be applied to private organizations. Lack of information about agency performance among the public it serves decreases potential

pressure from outside the agency as well (Feller and Menzel, 1977).

Several methods of identifying performance gaps are available to public agencies (Feller and Menzel, 1977). The agency might compile statistics on the magnitude of an undesirable situation or the frequency of an undesirable event as a measure of a problem. For example, fire management agencies would count number of acres on which fire occurred. Some measure of agency activity could be compiled and compared to some benchmark. These benchmarks could be established by having managers, members of the public or some other relevant group explicitly setting a desired performance level, or by using the performance level of an agency with similar programs. Future performance could also be judged by setting the level present performance measures as a benchmark.

Supply of innovations. New techniques are often adopted because they are clearly an improvement over previous techniques (Feller and Menzel, 1977). Not only must new techniques or products be developed which solve a problem or improve production but organizations must be looking for these solutions and improvements.

Relationship between the agency and the executive branch. One factor that may lead the organization to search for innovations is pressure from the executive branch which it is under. These pressures often arise as a result of increased demands upon the agency for services or from increases in the costs of providing services when its budget is constrained. Pressures may be put on the agency to increase productivity. Pressure to increase productivity may also be the result of rewards the organization gives executives who show productivity

improvements in the programs they oversee. Feller and Menzel (1977) also found a tendency in municipal governments for executives to pressure agencies to adopt a specific innovation. The authors propose that executives view this as necessary in overcoming the traditional conservatism of the agencies.

Activities of suppliers. Although it has received little study, it is thought that the activities of suppliers influences the diffusion of specific innovations and which organizations adopt an innovation (Feller and Menzel, 1977). How intensively and extensively a supplier markets an innovation influences how many and which potential users learn of an innovation and consider adopting it. How many suppliers of innovations there are is also a factor. The existence of many suppliers increases the changes that an organization will learn of innovations. Where there are too many suppliers, however, the agency may not be able to become knowledgeable about all the innovations available to it.

Resource availability. The availability of slack resources within an agency is cited as a positive influence on agency innovativeness (Hayes, 1972). The frequent lack of these resources is thought to be a particular barrier to innovation in bureaucracies (Hoffman and Archibald, 1968). The innovativeness of an organization has been shown to be positively correlated with size, wealth or availability of resources (Mohr, 1969) and with asset size (Becker and Stafford, 1967). New ideas are thought to move slowly through an organization when staff, information and other resources are unavailable except to maintain

current operations.

The relative availability of resources in one state versus another has been found to correlate with innovativeness (Gray, 1973). States that ranked high in a measure of innovativeness in the adoption of education, civil rights, and welfare laws also ranked highest in relative wealth.

Knowledge infrastructure. The diffusion of an innovation within an agency requires that a sufficient knowledge base exists within the agency and that a communication network exists to spread information and insure its effective use (Feller and Menzel, 1977). In fields where many private and public associations are active, innovation diffusion is aided (Feller and Menzel, 1977; Rowe and Boise, 1974). Feller and Menzel (1977) propose that these associations serve as means for agency members to gain information needed to evaluate innovations. Correlations have been found between the percentage of professionals in an organization and its innovativeness (Wilson, 1966) and the outside professional activities of scientists and their research and development performance (Pelz and Andrews, 1976).

Fields in which there is a highly developed knowledge infrastructure will also tend to have performance standards established at the national level. The existence of these nationally set standards decreases the efforts suppliers must make in contacting individual potential users and decreases the importance of the role of opinion leaders and of interaction among adopters and potential adopters (Feller and Menzel, 1977).

Lateral ties to other divisions within an organization are also

proposed as important in successful development and implementation of innovations (Sayles, 1974). This allows for divergent views and sources of information on organizational problems to be shared. Knowledge must also be shared between the potential users of the innovation and the developers of the innovation throughout the process.

Influence of other governmental bodies. The actions of other governmental bodies may influence the adoption of an innovation by an agency directly or indirectly. State or national legislation may set new requirements the agency must meet or may allocate new funds in a specific program area. Feller and Menzel (1977) found that federal pressures on state agencies accompanied by federal funds is a major influence on agency innovation. These federal funds can create the slack resources cited earlier as an important factor in innovation diffusion in an agency. In a study of state administrators, Light (1978) found a significant correlation between the state agency's dependence on federal funds and a high ranking of federal government as an important source of innovations to the agency. In natural resource agencies other states were ranked highest as a source of innovations.

Whether certain states or regions are innovative across a variety of policy areas has been argued extensively in the literature (Walker, 1969; Rose, 1973; Gray, 1973; Menzel and Feller, 1977; Savage, 1978; Foster, 1978; Light, 1978). This discussion also disagrees on the relative influence of the state itself versus the multi-state region on state innovativeness.

Weimer (1980) has studied the disfunctional aspects of federal intervention in innovation in public agencies. Federal supply of

knowledge, technical assistance and funds may restructure the agencies' incentives. Federal sources of knowledge may be biased toward the benefits of a particular innovation, while neglecting cost information. Technical assistants to public agencies may tend to be overly optimistic about an innovation without fully considering its appropriateness for the particular agency. Federal funding of innovations may skew a benefit/cost analysis of the innovation, since its total social costs are not borne by the public agency and may not be accounted for in the analysis. Federal assistance in public agency innovation may, thus, lead to inefficient agency behavior.

Demands of citizens. The demands of citizens have little influence on innovation in state agencies (Feller and Menzel, 1977). This has been attributed to the difficulty of assessing agency performance by citizens. Alternatively, citizens may judge that the costs of acquiring the necessary information and using their voice may outweigh any benefits they would receive from their efforts (McKean, 1972). Citizen involvement does, however, appear to act to impede change if the agency anticipates a negative reaction. The exclusive alliance of a public agency with a particular clientele or public interest group may limit innovation within bounds dictated by the clientele (Diamant, 1967).

The influence of citizens on budget allocations may indirectly influence innovation (Feller and Menzel, 1977). As seen above, agencies which are relatively more affluent will also be relatively more innovative.

Characteristics of the Innovation

How an innovation is perceived by potential adopters has been found to be a predictor of the rate of adoption of the innovation (Evan and Black, 1967; Rogers with Shoemaker, 1971; Zaltman and Lin, 1971; Wasson, 1960; Ostlund, 1974). Several classifications of the characteristics of innovations have been suggested in the literature (Zaltman, Duncan, and Holbeck, 1973; Zaltman and Lin, 1966; Zaltman and Duncan, 1977; Rogers with Shoemaker, 1971). The classification suggested by Rogers and Shoemaker is supported by their survey of empirical innovation research, as well as being the most succinct classification. Their classification of the relevant characteristics of innovations consists of: (1) relative advantage, (2) compatability, (3) complexity, (4) trialability, (5) observability. These five characteristics have been determined to explain from 49 to 87 percent of the variance in the rate of adoption of the innovations researched and surveyed (Rogers with Shoemaker, 1971).

Relative advantage. The perceived relative advantage of an innovation is the degree to which a potential adopter thinks the innovation will be an improvement over the current situation or practice. The potential adopter may judge this improvement as an increase in monetary benefits, a reduction in costs, a reduction in the difficulty of performing a job, or as an increase in some other measure of the quality of his or her life. Zaltman and Lin (1966) suggest that initial and continuing cost, return on investment and risk and uncertainty are relevant measures. They found that high initial cost was highly positively correlated with the adoption of an innovation. High initial

cost may be associated with high quality in the perception of the potential adopter. As might be expected, Rogers and Shoemaker's (1971) survey shows that a perception of the relative advantage of an innovation is positively related to its rate of adoption.

Compatibility. The degree to which an innovation is perceived to be consistent with certain aspects of the potential adopters' social system is labeled compatibility. How well an innovation is perceived to fit with the norms and values of the social system, with the needs of potential adopters and with their past experiences contribute to compatibility. The perceived compatibility of an innovation is positively related to its rate of adoption (Thio, 1971; Ide, 1969; Schiff, 1966). It, however, is less important a predictor than other characteristics (Rogers with Shoemaker, 1971).

Complexity. The characteristic of complexity is used to describe the perception of how difficult an innovation is to understand and to use. Innovations whose meanings are difficult to convey or which require many or difficult instructions to learn how to use are likely to be perceived as complex. Perceived complexity is negatively related to the adoption of an innovation (Rogers with Shoemaker, 1971).

Trialability. The degree to which an innovation can be tried on a limited or experimental basis is labeled trialability. Innovations which are higher in trialability are those which the potential adopter can mentally try, can use a sample of or can use for a short time and discontinue use with little cost. Although the importance of

trialability is less supported than that of other characteristics, there is evidence that perceived trialability is positively related to the rate of adoption of an innovation (Rothman et. al., 1973). The inability to test administrative innovations on a trial basis may hinder their adoption (Teece, 1980).

Observability. Observability is used to describe how visible the results of an innovation are to potential adopters. Innovations that can be readily demonstrated or for which pilot operations are established are generally more observable. It has been suggested that ideas that are easier to communicate will be adopted more readily (Menzel, 1960) and that material innovations are more observable, and thus more readily adopted, than are nonmaterial innovations (Roger with Shoemaker, 1971). Empirical innovation research indicates that perceived observability is positively related to the rate of adoption of an innovation (Rogers with Shoemaker, 1971; Rosner, 1968; Menzel, 1960).

Strategies for Implementing an Innovation in an Organization

The above discussion described the theory of the diffusion of innovations and the various factors which influence the diffusion of an innovation in a social system or organization. This section will describe the basic strategies used to diffuse innovations and discuss how these strategies should be used and adapted to a particular innovation diffusion problem.

Innovation diffusion strategies should depend upon the type of innovation decision being made, the organizational environment, the

stage in the innovation decision process and the characteristics of the innovation. Strategies should vary as to type, the roles of key participants and the types and levels of participation according to these factors. It is likely that no single strategy will be sufficient for the entire innovation process. Strategies, rather, should be flexible and change as the innovation situation changes.

Types of Strategies

Several typologies of change strategies or programs have been suggested in the literature (Bennis, 1966; Zaltman and Duncan, 1977). Zaltman and Duncan's categorization is much more succinct than is Bennis. While Bennis identifies types of change programs, he does little to develop a systematic discussion of the appropriateness or effectiveness of various strategies in different situations. Zaltman and Duncan's four basic types of strategies for change are: (1) facilitative, (2) reeducative, (3) persuasive, (4) power. Since innovation diffusion is a special kind of change these strategies also apply to innovation diffusion cases. Their approach assumes that change will be resisted due to cultural, social, organizational or psychological barriers. Indeed, if change or innovation was not resisted there would be no rationale for strategies since innovations would be accepted as soon as they were known about.

Facilitative strategies. Facilitative strategies are those which are used to make it easier for the target group to adopt an innovation. The supply of special skills and staff, legal or technical aid, administrative assistance, and funding are examples of this type of strategy.

For facilitative strategies to be effective the target group must already have recognized a problem, decided that it should be solved and be open to outside help. The more agreement there is among the target group as to the problem, its solution and the means toward problem solution; the more effective will be facilitative strategies.

Facilitative strategies are effective if the target group does not have sufficient resources to implement an innovation but they are available through the change agent. These resources must be available for a long enough period that the target group can develop its own resources to sustain the innovation. Change agents should encourage the development of this capacity for the target group to sustain the innovation. This type of strategy is not appropriate unless the system is very open to change or time is not crucial.

When the innovation would cause large changes in the organization or social system, facilitative strategies are especially important. Facilitative strategies, for example, would make an innovation easier to try or decrease the risk to the individual in using it. Simplifying a complex innovation is also an example of a facilitative strategy. If there is strong resistance or low motivation to change, however, facilitative strategies alone will be ineffective.

Reeducative strategies. Reeducative strategies are designed to bring about change through the presentation of information to the target group. The information is intended to be objective and unbiased. It is assumed that individuals, being rational, will act appropriately based upon the provision of this information. Examples of reeducative strategies include public forums on particular problems, informational

mailings, and mass media presentations. These strategies are not meant to persuade the target group to adopt a particular solution to a problem. Rather they are intended to educate the target group about a problem and open communication about it so that the group can arrive at its own solution.

Reeducative strategies are effective when little commitment is required of the target group to implement a change or innovation and there is a low perceived need for change. These strategies can create an awareness of a problem and may help establish a long-term commitment to the change.

When the innovation or change requires special knowledge or skills to adopt reeducative strategies are required. These strategies, however, work slowly and often require the change agents to commit their resources for long periods. Reeducative strategies are also especially effective when the innovation is being resisted because the individuals are misinformed about its characteristics, when the innovation would be a radical change from present practices or from the present situation, or where there is a great deal of uncertainty about the complexity or relative advantage of the innovation.

Persuasive strategies. Persuasive strategies use biased means to bring about change or innovation. The content of what is presented to the target group and the manner in which it is presented are designed to elicit a specific response from the group. These strategies may include appeals in which a highly credible source advocates the change, threats of loss of something of value to the target group if it does not change, or presentations of the pros and cons of the change with

an appeal to "rationality", the "rational choice" being the change advocated.

Persuasive strategies have the potential to create conflict if the target group is aware of the strategy. If applied in a manner that is not obvious, however, these strategies can create an openness to change.

When there is little commitment to or perceived need for change, persuasive strategies are effective. By stressing the benefits of an innovation or the costs of the current situation, persuasive strategies can create recognition of a problem and commitment to change among the target group.

The use of persuasive strategies is not effective if the target group does not have the resources available to adopt the innovation. The target group may, however, be persuaded to reallocate resources to adopt the innovation if they are persuaded that the need is great enough. Persuasive strategies are also effective in convincing the target group to allocate resources to continue the use of the innovation.

When the change agent has relatively few resources and the time allowed for adoption is relatively short, persuasive strategies are appropriate. Persuasive strategies produce results in relatively less time than do facilitative or reeducative strategies.

The larger the change, the more complex and incompatible the innovation, the less relative advantage it offers, the less trialable the innovation, the more persuasive strategies may be needed. Persuasive strategies can be used to stress the benefits of the innovation or to offer incentives for its adoption despite the risks involved to

the user. Misrepresentation of the characteristics of the innovation can, however, lead to later discontinuance when the adopter discovers that his or her early perceptions of the innovation were faulty.

Power strategies. Power strategies use coercion to force the target group to change or adopt the innovation. The change agent has power over the target group in as much as the target group is dependent upon the change agent for some relevant reward or the avoidance of punishment. The change agent will incur costs in using his or her power through dispensing the reward or administering the punishment. If the change agent is also dependent upon the target group, e.g., for rewards to be gotten if the group adopts the innovation, the target group has some amount of power which may be used against the change agent. This power may be used to counter the change agent's use of power, making the agent incur further costs.

Power strategies are typically used where the target group is not very committed to the change, and the perceived need for it is low. If power strategies alone are used the target group may comply but the change will not be self-sustaining.

Sufficient resources to implement the innovation must be available within the target group or from the change agent for power strategies to be effective. These strategies may be used to force the target group to allocate resources to the change. In addition, change agents must have sufficient resources to allow them to reward or punish the target group.

The larger the change required of the target group the greater the degree of power the change agent must have if this type of strategy

is used. In the long run it is likely that if major change is required re-educative and persuasive strategies will be more successful. The larger the change, the greater the resistance to it that can be expected. Power strategies can be used to quickly suppress resistance and induce change. The change will be in the behavior of the target group, but not necessarily in their attitudes toward the change.

Power strategies are appropriate for innovations which are trial-able and for which the results of the trial would be readily observable. The strategy is used to force the initial trial of the innovation so that its relative advantage can be seen by the target group.

Behavioral change as a result of power strategies happens quickly. Because attitudes are not necessarily changed and commitment to change created, pressure on the target group to continue the new behavior must be applied as long as the change is desired.

Strategies for the Innovation Decision Stages

The strategies used to diffuse an innovation should be varied according to the stage in the innovation process. Surveys of innovations in organizations and social systems indicate that various characteristics of innovations are more important than others in different stages (Rogers with Shoemaker, 1971) and that some types of strategies may be more effective than others in different stages (Zaltman, Duncan and Holbeck, 1973; Zaltman and Duncan, 1977). Studies of innovation in organizations indicate that strategies should vary as to how broad the involvement in the process is, how flexible the approach is and how complex the involvement is depending upon the stage in the innovation process (Zaltman, Duncan and Holbeck, 1973).

Knowledge stage. How easy the innovation is to communicate is important in the knowledge stage (Zaltman, Duncan and Holbeck, 1973). This is related to Rogers' and Shoemaker's characteristic of complexity. The more difficult an innovation is to understand (and to use) the more difficult it will be to communicate information about it and the less likely are individuals to become aware or knowledgeable about the innovation.

Reeducational strategies are often appropriate in this stage to create awareness of a problem and to diffuse information about possible solutions.

Persuasion stage. In the persuasion stage the compatibility and complexity of the innovation are important (Zaltman, Duncan and Holbeck, 1973). If the innovation is very incompatible with the individual's values, past experiences and needs, it is thought that the innovation will be rejected at this point. The complexity of the innovation will determine how easily an individual can mentally try the innovation and weigh its costs and benefits. It is likely to be more difficult for an individual to form a positive attitude toward the innovation if it is too complex to analyze.

The perceived relative advantage and the observability of the results of the innovation are most important in this stage (Rogers with Shoemaker, 1971) as the individual weighs and evaluates the possible results of adoption.

Persuasive strategies are effective in this stage in influencing the individuals in the target group to form a favorable attitude toward a particular solution to a problem (Zaltman and Duncan, 1977), i.e.,

toward a particular innovation. Persuasive strategies in this stage might deliberately stress the positive aspects and relative advantage of the innovation.

Decision stage. The trialability of an innovation is important in the decision stage since a limited trial of an innovation is often part of the decision to adopt the innovation (Rogers with Shoemaker, 1971).

Facilitative strategies are often used in the decision stage to enable the target group to adopt the innovation or to perform a trial run.

Confirmation stage. All the characteristics of the innovation are important in the confirmation stage as the individuals seek information to reinforce their decisions. If individuals' perceptions of the innovation after adoption differ greatly from their perceptions in the previous stages they may reverse their adoption or rejection decision. Dissonance between perceptions prior to adoption and those after adoption may also cause individuals to filter out or rationalize information which is causing the dissonance.

Either reeducative or persuasive strategies could be used to reinforce adopters' decisions in this stage. Power strategies may be used to reverse individuals' decisions to reject the innovation if earlier reeducative and persuasive strategies failed (Zaltman and Duncan, 1977).

Organizational Strategies in the Innovation Process

Organizational structure. Management and organizational scientists have studied the optimal organizational structure for and approach to innovation. The flows of information and people across organizational boundaries are thought to influence the innovativeness of an organization (Utterback, 1971; Ettlie, 1980). Systems which are open to the external environment (Griffiths, 1964), which are organic (Burns and Stalker, 1961) and use flexible development processes (Sayles, 1974) are more likely to be innovative, especially in a changing environment, than are more closed, mechanistic and rigid systems. The optimal structure, however, will depend upon the requirements placed upon the organization by the environment and should not be so open as to disrupt the functions of the organization.

The influence of diversity, formalization and decentralization on organizational innovativeness has also been studied. The diversity of people and specialty areas involved in the innovation process is proposed to positively influence innovation (Katz and Kahn, 1966; Gol-embiewski, 1964). Decentralized structures are also thought to foster innovation by allowing freer information flows (Porter and Roberts, 1976). The degree of specification of the activities of the members of the organization, or the formalization of procedures, has been found to negatively influence innovation (Rosner, 1968).

Other research argues that the affect of diversity (Wilson, 1966; Sapolsky, 1967) and the affects of diversity, centralization and formalization (Shepard, 1967; Hage and Alken, 1967; Sapolsky, 1967; Rowe and Boise, 1974; Zaltman and Duncan, 1977) will vary with the stages in the innovation process.

In the early stages of the innovation decision process the high degree of uncertainty and lack of information about the innovation indicates that the information gathering capacity of the organization should be increased (Zaltman and Duncan, 1977). The organization should, in the initial stages, use a relatively more complex and less formal and centralized process.

Increasing the diversity of the organization by involving a greater number of people, different functional areas, and occupations increases the information available to the organization. Diversity has also been found to be a positive influence on the number of innovative proposals made by members of the organization (Sapolsky, 1967).

Decreasing the formalization of the organization by removing constraints on the process and relaxing or decreasing the number of rules and procedures allows the organization to be more flexible and open to more information and alternative solutions.

Broader participation in the decision process is the important factor in decentralization (Hage and Aiken, 1967). This may be related to the positive role that the creation of shared perspectives on the need for, plans for and consequences of change plays in innovation adoption. Authoritative organizations will tend to have restricted upward information flows (Katz and Kahn, 1966). Centralized structures tend to cause negative information about jobs and needs for change to be suppressed by lower level members (Likert, 1961). The more centralized an organization, the more channels through which an idea must channel and the more likely it is to be screened out (Zaltman, Duncan, and Holbeck, 1973).

These same factors are reversed in the implementation stage. The

less complexity, the more formalization and centralization the more implementation is facilitated (Hage and Aiken, 1967). A large diversity of people involved in implementing an innovation potentially creates more conflicts (Sapolsky, 1967).

Specific procedures are also needed to successfully implement the innovation. Formalization is proposed to reduce ambiguity surrounding the innovation and its use and to facilitate communication of specific information needed to use the innovation.

There is less support for the need for centralization in the implementation stage (Zaltman and Duncan, 1977). Centralization in implementing the innovation is likely to make communication about the changes that will occur more clear and, as with formalization, reduce ambiguity and uncertainty as to the results of the change. Centralization also is thought to make it possible for the organization to gather enough influence over its members to implement the innovation and to decrease the extent of disagreement about implementation actions (Wilson, 1966).

Organizational support. Zaltman and Duncan's (1977) survey of innovation research indicates that support for change among the top levels of an organization is a strong predictor of the successful implementation of change. In addition to having the formal power to implement change, top level members may be able to support change and innovation without being perceived as deviating from the norms of the organization or system. This top level support is likely to motivate other members to change. While top level support may be necessary to organizational innovation it is not sufficient (Shepard, 1967). Top level control of the innovation may also be important and the lack

of it has been cited as a possible barrier to innovations in bureaucracies (Roessner, 1977).

Several other types of support have been shown to influence the adoption of innovations. Strong political leadership for the innovation, advocates of the innovation within the organization and organizational members interested in the continuous refinement and implementation of the innovation may be critical in its successful adoption (Pack and Pack, 1977).

Use of an innovation team The use of a team (Zaltman and Duncan, 1977; Alderfer, 1976) or coordinating group (Hayes, 1972) has been advocated as an effective means to diffuse an innovation in an organization. Teams which are built with a variety of types and levels members are naturally diverse, nonformalized and decentralized. The team, thus, has an optimal structure for the early phases of the innovation process. As the team works together it begins to share common perspectives and understandings, develops rules for its activities, and a commitment to team goals. This decrease in diversity and decentralization and increase in formalization is optimal for the later stages of the innovation process (Zaltman and Dunca, 1977). Innovations which involve more than one unit of an organization may require a team or coordination group to ensure that the required activities of all the units are performed (Hayes, 1972).

Outside aid. The use of an innovation team is also a means to bring outside expertise to the organization. A team which includes members outside the organization allows more effective flows of

information to and from the organization (Alderfer, 1976). Outsiders also bring needed, fresh perspectives to bear on the organizational situation and environment. Outsiders combined with organizational members inside knowledge of and empathy for the organization form an effective means for innovation diffusion. Outside aid also helps relieve organizational constraints on procedures and staff which may hinder innovation (Hayes, 1972).

CHAPTER IV
THE DIFFUSION OF MICHIGAN'S STATEWIDE
FOREST RESOURCES PLAN

Introduction

The development and implementation of Michigan's Statewide Forest Resources Plan will be described and critiqued in this chapter. The framework developed in Chapter 3 is used to structure this discussion.

Three methods were used to develop the information needed for this discussion. Personal logs kept from April 1978 to March 1981 were used to record progress on the SFRP and specific events and tasks related to the process. Interviews were conducted with five of the principals of the SFRP: the DNR Forest Management Division's Project Chief, Project Director, Project Coordinator, and Planning Unit Leader (Project Advisor) and the Project Director from the Forestry Department, Michigan State University. These interviews covered the perceived needs for the SFRP, the importance of types of institutional support received, the influence of the work structures used in the process, the importance of any specific events in development of the Assessment or the Recommended Program, and the role of public involvement in the process. The results of the interviews are used to describe the perceived performance gap and the organizational environment sections of this chapter. A 100 per cent survey of Department of Natural Resources personnel who had been directly involved in the SFRP, the

consultants to the SFRP and the three U.S. Forest Service National Forest Planners is used to objectively describe the perceived characteristics of the SFRP as an innovation^{1/}. Descriptions and results of the survey and interviews are contained in Appendices B and C, respectively.

Factors Influencing Innovation in the Forest Management Division

Nature of the Problem

The performance gap. The idea of comprehensive planning for forest resource management in Michigan, specifically a statewide forest resources plan, arose as a proposed solution to a perceived gap between desired performance of the Forest Management Division and the level of performance that existed. The specific nature of this gap was the subject of the first interview question asked of the SFRP principals. As might be expected, there was some agreement as to perceived need for the SFRP although there was a variety of responses.

Four of the principals cited the need for coordination of the outputs of the State Forest System or the Forest Management Division. This coordination needed to consider the total demands for all forest resources, statewide, and the roles of the various forest management agencies and forest landowners. The need for an overall sense of direction for the Division was also cited in two of these interviews.

Just as frequently mentioned was the need to develop budgetary

^{1/}The author, although a principal in the SFRP, did not answer the interviews or survey, to avoid introducing bias into the critique.

support for forestry and, specifically, Forest Management Division programs. After the passage of the Resources Planning Act of 1976 (PL93-378) there was an indication that all federal funding of forestry programs would be tied to the RPA process and possibly to state comprehensive forestry plans. The need to develop public support as a means to develop budgetary support for forestry programs was also cited.

Three of the interviews mentioned the need for a common or unified sense of direction for all forestry programs in Michigan. Two of these indicated that this direction should specifically relate to economic development and diversification. It is thought that forest resources can make a contribution to the strengthening of Michigan's economy. The Forest Management Division was mentioned as needing to develop this statewide direction in its role as the lead agency in forest management in the state.

Goals of the Statewide Forest Resources Plan. As evidenced by the variety of needs perceived for the Statewide Forest Resources Plan, it would be expected that the goals of the SFRP would vary depending upon whose perspective is taken. The explicit goal of the SFRP, also evolved somewhat over time as indicated in the samples below:

The "Statewide Forest Plan (will)periodically assess all factors which influence the use and condition of Michigan's forests... anticipate probable future demands for the forest and its various outputs...(and) recommend forest policy for Michigan and direction for public forestry programs."

Forest Management Division Program
Description 12/77

"...the major goal (of the Statewide Forest Resources Plan is) to establish a common sense of direction among citizens and organizations for the protection, management, and use of its forest resources, both public and private."

Michigan's Forest Resources Plan:
Overview of Issues and Policy
Options 9/80

The audiences to which each of these statements were addressed are different. These statements are, however, indicative of the change in emphasis from more narrowly specified goals for the assessment of Michigan's forests and forest policy recommendations for Michigan to broad direction setting for forestry in Michigan. Although not explicit in the above quote, this direction was to be very much influenced by state level issues not necessarily specific to forestry.

Key Participants

Three major groups were identified as targets for adoption of the SFRP: (1) the DNR Forest Management Division personnel, (2) other DNR and other public forestry resource management agencies and (3) forest resource users and interested publics. The first group directly participated in and helped prepare the SFRP. Other agencies, the second group, participated in the cooperative setting of program goals and supplied data for program development. The forest resource users or publics participated in developing forest resource issues to be addressed by the SFRP, and in developing and selecting a program to be recommended to the Natural Resources Commission.

Primary change agents for the SFRP have been the Chief Forester (Project Chief), the Assistant Chief for Natural Resources Development (Project Director), and the Planning Analyst (Project Coordinator) and the Planning Unit Leader from the Forest Management Division; and Professor of Forest Economics (Project Director) and graduate assistant (Project Coordinator) from the Michigan State University of Forestry Department. In addition, a private consultant in public involvement assisted in the SFRP during 1980 and part of 1981.

Type of Innovation Decision

The innovation decision process for the SFRP is not entirely authoritative. The Chief Forester and, to some extent, the DNR Director made authoritative decisions to adopt the SFRP process. Full adoption, however, is contingent upon individual decisions which are somewhat optional. The Chief Forester does have the power to force individual adoption but this would insure only behavioral, and not attitudinal, adoption. In addition, full adoption of the SFRP is dependent on individual adoption to be fully comprehensive.

The Environment of the Forest Management Division

As discussed in Chapter 3, various aspects of an agency's environment influence its adoption of an innovation. The environment of the Forest Management Division is discussed below in light of these factors.

Nature of the perceived performance gap. Feller and Menzel (1977) note that in state and local agencies the sources of the performance gaps are rarely described. Public agencies may be insulated from demands for efficiency, and citizens and agency personnel themselves may not have the information to judge efficiency. It is the existence of this situation that has been identified by the Michigan DNR, Forest Management Division as one need for a statewide forest resources plan. Neither the agency nor the public had a mechanism to measure agency performance, but the agency perceived a need for one.

Responses to the interviews indicate that the primary performance measure was that relevant to managerial objectives. The potential performance gaps with respect to securing funding of Division programs

and serving as leaders of forestry policy in the state would be narrowed with a statewide forest resources plan.

Supply of innovations. The supply of alternatives to existing agency practices was fairly large. In the past decade systems such as Program Planning and Budgeting (PPB) and Zero Based Budgeting (ZBB) had been developed and adopted in many federal and some state agencies. These served as early models of comprehensive program evaluation. Most notably, the federal resources Planning Act process was initiated in the U.S. Forest Service in 1974. The RPA as a planning model had been available to forest resource managers since that time. Its basic components of an assessment of all forest resources and a program which set goals for the provision of these resources formed a basis for the SFRP. Michigan also followed the RPA process in incorporating extensive public involvement in determining desirable packages of agency programs and the issues that should be considered by the process. Two of the responses to the interviews of SFRP principals indicated that the passage of the Resources Planning Act was an important external influence on the development of the SFRP.

Agency-executive relationships. Pressure from the executive branch of the agency to reduce costs and improve productivity may provide an incentive for the agency to search for innovations. Pressure from the Department of Natural Resources Director's Office was not mentioned in the interviews as presenting a need for a statewide forest resources plan. DNR Director Tanner's letter^{1/} introducing the SFRP to DNR Bureau

^{1/} March 8, 1978 Memo from Howard A. Tanner to All DNR Bureau and Division Chiefs.

and Division Chiefs did, however, cite the need for natural resource programs to demonstrate cost effectiveness for federal-state cost sharing funding. While pressure from the Director's office may not have been an influence on the inception of the Statewide Forest Resources Plan, Director Tanner's support of the plan was mentioned in one interview as being very important.

Activities of suppliers. One of the missions of the State and Private Forestry Branch of the U.S. Forest Service is to supply state forest management agencies with technical and financial assistance. As part of this mission State and Private Forestry has been active in promoting statewide planning. As well as supplying information on this innovation through regional workshops, such as the one held at Michigan State University in April, 1978, State and Private Forestry has been providing grants and personal technical assistance to states engaged in statewide planning. In this role they have been intensive marketers of the innovation, which has likely had an influence on the specific techniques of statewide planning adopted, as well as the extent of adoption. The support of the U.S. Forest Services Northeastern State and Private Forestry Branch was cited as being important in four of the interviews.

The amount and type of assistance the U.S. Forest Service supplied was not the same throughout the SFRP process. State and Private Forestry supplied more technical assistance and direction in the Assessment phase than in the Program phase due to their having relatively more experience with assessment development than program development. The influence of the State and Private Forestry Branch on the Program phase

was also reduced by the acquisition of additional SFRP funding from the Washington Office of the U.S. Forest Service. It became apparent to the SFRP Project Chief and Directors that the assistance available from State and Private Forestry would not be sufficient to support the level and type of analysis that Michigan required in its program phase. The SFRP Project Chief and Directors, thus, sent a proposal to the Washington Office U.S. Forest Service Area Planning staff for additional funding. The proposal was accepted. This additional funding allowed the SFRP team to use more analytical expertise in development of the Recommended Program and it reduced pressure from the State and Private Forestry Branch which had been recommending a less rigorous analysis.

Resources available. As mentioned above the U.S. Forest Service's, State and Private Forestry Branch and the Washington Office gave financial assistance to the DNR's Forest Management Division for statewide forest resources planning. This assistance provided for some of the activities of the Division's planning staff as well as allowing the Division to contract for the staff of outside analysts and consultants. The number of contracted staff ranged from one to five people, depending upon the needs during various stages of the process. All five interviews indicated that this outside staff was critical in developing the Plan. The Division staff would not have been adequate due to constraints on their time and their commitments to other Division functions. In as much as U.S. Forest Service funding made possible the contracting for outside staff, then their resources were also critical in the process.

There has also been a correlation noted between the relative affluence of the agency (Feller and Menzel, 1977) or of the state (Gray, 1973) and innovation adoption. Gray notes that Michigan ranked ninth among all states on a scale of "innovativeness" with respect to the adoption of education, civil rights, and welfare laws. She indicates that this correlates with Michigan's relative wealth. As discussed in Chapter 3 there is disagreement over the importance of regional, state or policy area influence on the innovativeness of a state agency. The Upper Midwest, however, has been found to be particularly innovative (Foster, 1978) and Michigan, in particular, has been found to be consistently innovative over time (Savage, 1978). In a study of state administrations by policy area, Michigan was ranked second of all states in outstanding programs in the area of land resources. There, therefore, seems to be some evidence that the fact that the process was taking place in Michigan was influential in developing and implementing this natural resources innovation.

Knowledge infrastructure. The element of knowledge infrastructure includes both the knowledge base and the network for information dissemination. The existence of many private and public associations is conducive to rapid diffusion of innovations.

It is likely that Forest Management Division personnel's active ties with the Society of American Foresters, the Association of State Foresters, and with the Michigan State University, University of Michigan and Michigan Technological University communities were and are conducive to the diffusion of SFRP in Michigan. The importance of the Division's ties to the academic community was mentioned in four of

the interviews with the principals involved in the Plan.

The knowledge infrastructure existing in the public environment is less developed. Several public interest groups, most particularly the Michigan United Conservation Clubs, do serve as sources of information to individuals interested in natural resource management in Michigan. Early in the SFRP process the West Michigan Environmental Action Coalition was active in disseminating information on the Statewide Forest Resources Plan. Due to conditions internal to the Coalition, however, their activity in this area ended late in 1978. Where the knowledge infrastructure is less developed, the role of opinion leaders is that much more important (Feller and Menzel, 1977).

What has been labeled "local media," i.e., speakers at local political and special interest group meetings are also a powerful source of information on innovations for members of the public (Lin and Burt, 1975).

Intergovernmental relationships. Other governmental agencies may influence adoption through passing legislation requiring performance standards or through allocating funds to agencies for specific programs. As mentioned earlier, the adoption of the RPA process by the federal government did lead to funding for state agency planning. Informally, the U.S. Forest Service also provides leadership for other forest resource management agencies.

The need to coordinate intergovernmental forest resource activities was cited as a perceived need for the SFRP in three of the interviews. It was also mentioned that other agencies in the State had expressed a need for this coordination.

Citizen demands. Feller and Menzel's (1977) conclusion that public users of agency goods and services are seldom directly influential in the adoption of innovations by state agencies is borne out by the interviews of SFRP principals. No interview directly mentioned public pressure for comprehensive forest resource planning in their discussion of the need for a statewide forest resources plan.

Characteristics of the Statewide Forest Resources Plan

The characteristics of complexity, relative advantage, trialability, observability and conformity were determined from a survey of all members of the Forest Management Division and the U.S. Forest Service National Forests in Michigan who had been involved in the SFRP to date. For the purposes of brevity, this group will be referred to as the "agency target group" in the discussion following. This group was questioned as to their perceptions of the SFRP and their opinions as to the opinions of how members of the public perceived these same characteristics. The survey methods and results are detailed in Appendix B.

Relative advantage. The SFRP is clearly perceived as offering a relative advantage over current agency(ies) procedures by the agency target group. Ninety-five per cent of the group thought their resource management job would be better with a SFRP. This suggests that efforts to promote SFRP as an improvement for agency personnel as well as for the public have been successful. Future diffusion strategies should take advantage of this perception.

The SFRP is also thought to be perceived by the public as

advantageous to forest management, although not as strongly as is perceived by the agency group. Strategies aimed at the public target group might, therefore, be designed to strengthen and improve the public's perception of relative advantage.

Conformity. The compatibility of the SFRP with the norms and values of forest resource management was ranked very high by the agency target group. This is somewhat surprising in light of research done on the innovativeness of the forestry profession. From his study of forestry research and administration in the United States Schiff (1966) concludes that foresters' value orientation toward change was that it should be gradual and not upset the continuity or balance of a system. It is possible that the agency personnel surveyed did not perceive the Statewide Forest Resources Plan as producing major changes in their organization or their jobs. Whether or not this major change will occur as a result of the SFRP cannot yet be determined. If major change does result, however, there is likely to be a conflict between perceptions before and after implementation of the Plan. This would be a significant source of resistance in implementation of the Plan.

The respondents did think, however, that the public might perceive the SFRP as conforming less to its values of forest management. It was noted that this might be due to a perception on the part of some of the public that the SFRP was too "big government" or intrusive in private interests. It may not be possible to resolve this trade-off between perceived improvement in forest management through comprehensive planning for all agencies and ownerships versus perceived intrusion in private affairs. Diffusion strategies should, however,

strive to clarify the impact of the SFRP on private interests and the role of private ownerships in the SFRP process. Dispelling some uncertainty as to the intrusiveness of the SFRP might improve some public's perception of its compatibility.

Complexity. The SFRP is perceived as varying from very easy to somewhat difficult to understand and use by the agency target group. Many of the group perceived the SFRP as somewhat complex, i.e., difficult to use and understand, although just as many perceived it as very or somewhat easy to use and understand. This suggests that no single approach can be used in the diffusion strategy aimed at the agency group.

The SFRP is, however, thought to be difficult for the public to understand and to participate in. This opinion of the SFRP agency participants suggests that a diffusion strategy for the public target group be designed to overcome this barrier.

Trialability. Most of the agency target group thought it would be somewhat difficult to implement the SFRP on a trial basis. They thought that the public perceives that it would be slightly easier, but still difficult. Because of the comprehensive nature of the SFRP, it is unlikely that the SFRP could be implemented on a trial basis or as a pilot program in Michigan. Comprehensive forest resource planning (RPA) has been implemented at the federal level and is being implemented in other states. The SFRP concept is thus undergoing several trials.

It is possible that those involved in these efforts can learn from

each other, those farther in the process serving as demonstration projects for others. In this respect Michigan is at a disadvantage since it is one of the earliest states to adopt statewide forest resource planning. The RPA process was also limited as a demonstration for Michigan due to the manner in which it was developed. The RPA's 1975 Assessment and 1975 Program were done simultaneously and by separate staffs. Michigan desired to compile its Assessment first such that this information could be used in the Recommended Program. Michigan also recognized the benefits of using the same core of staff throughout the process to give the SFRP continuity and consistency (which was somewhat lacking in the 1975 RPA).

Observability. The results of the SFRP are anticipated to be somewhat difficult to see in the short term by the agency group and in their opinion of the public's perception. Although the nature of the SFRP dictates that many of its results will be rather long term in nature, there are short-term results which could be stressed. A diffusion strategy for the SFRP could include some emphasis on the shortrun benefits of almost immediate increased Forest Management Division interaction with other agencies and the public as well as early, large gains in the information available to agencies and the public about Michigan's forest resources and Forest Management Division's role in providing them.

Critique of the Strategies Used in the Diffusion of Michigan's Statewide Forest Resources Plan

Approach

Diffusion strategies for the SFRP based upon the stages of the innovation decision process, the adopter environment and characteristics, the characteristics of the innovation, and the nature of the decision process will be discussed in this section. This discussion will rely on general theories of innovation diffusion and on findings from research on innovations in public bureaucracies discussed in Chapter 3. Discussion of strategies for each stage will critique work already done in the SFRP process and suggest strategies for future work. Tables in Appendix D outline specific communication strategies that would be effective for each stage in the innovation process. Also contained in Appendix A is an outline of SFRP public involvement.

Overall Diffusion Strategy

Throughout the process of developing the Statewide Forest Resources Plan, a facilitative strategy in combination with other strategies was used to diffuse the innovation within the Division. As indicated by the interviews, the four principals in the Division perceived a need for the innovation and had a strong commitment to its adoption. The Division, however, did not have sufficient resources nor some of the technical skills required to adopt the innovation. A facilitative strategy was, thus, very appropriate for work within the Division.

No power strategies had, of this writing, been used in the diffusion of the SFRP. Power strategies were inappropriate for the public change target group since little power is available to bring to bear on this target. Power strategies were also not likely to be necessary

with the Division group since there was some commitment to and perceived need for the innovation, time requirements are not short term, and the objectives of the innovation were for more than simply behavior change. Although DNR Director Tanner formally requested the cooperation of other divisions, there was no pressure from that office to ensure compliance with his request. A member of his office was given responsibility for coordinating the participation of the DNR divisions in the SFRP. This formal, executive, level supervision ended early in the SFRP process, however, upon the resignation of the staff member from the DNR. Because of the SFRP team's need for detailed information in compilation of the Assessment, and later the Recommended Program, power strategies used in connection with other divisions would not have been appropriate. Power strategies would potentially have created too much conflict and hindered the establishment of information flows between the Forest Management Division and the cooperating divisions.

Strategies for the Innovation Decision Stages

It is important to use diffusion strategies which are suited to the stages in the innovation decision process. Resistance to any innovation by some or all of the members of an organization should be anticipated in each stage. The strategies which will best overcome this resistance in any particular stage are those which are based upon (1) an understanding of the organizational environment at the same time, (2) the characteristics of the innovation most important to potential users in that stage and (3) the resources available to the innovation team.

The Statewide Forest Resources Plan is an innovation that developed as it was being implemented. The stages in its innovation decision

process are, thus, not discrete but can be identified as covering approximate periods of time.

Knowledge Stage

The knowledge stage of the SFRP began when members of the Forest Management Division and the MSU Forestry Department first became aware of statewide forest resources planning sometime prior to late 1977. This stage was concentrated in the pre-planning and early assessment phases of the SFRP, approximately from January 1978 to mid 1978 (refer to Figure 2.1 and Table 2.2). During this period the SFRP was actively informing organizational members, other agencies and organizations, and the public of its plans to develop Michigan's Statewide Forest Resources Plan.

Because in the knowledge stage people are being introduced to the innovation, how easy it is to communicate about the innovation will be influential. Two key aspects of this are the communicability of the innovation and the communication or knowledge infrastructure of the organization and its external environment. Opinion leaders as a channel for information are important if the knowledge infrastructure is poorly developed. The task of spreading knowledge of an innovation, thus, should begin with identifying the communication infrastructure and, where necessary, the opinion leaders in a system.

Agency target group. Members of the Department of Natural Resources were notified of the beginning of the SFRP process through formal channels. Director Tanner notified DNR Bureau and Division Chiefs via a memo which also asked for their cooperation in the SFRP. A meeting

of all DNR Division Chiefs was then held in April of 1978 to discuss plans for the SFRP.

In addition to these formal communications, members of the SFRP team met with members of each Division which had been identified as being necessary sources of information for compilation of the Assessment. In addition to developing contacts for information to the SFRP team, these informal meetings also served to disseminate knowledge about the SFRP in other divisions. This set of contacts was used throughout the Assessment phase of the SFRP and became known as the "Technical Advisory Group" (Group 4, Table 2.1).

In most cases, the divisions selected who in their staff would be contacts for the SFRP. These contacts served as opinion leaders for the SFRP in their respective divisions. The self-appointing of these contacts was probably a better strategy than if the SFRP team had selected contacts based solely on their judgment. Opinion leaders are not always those who hold positions of authority or who control the formal communications of a system.

The SFRP team used a combination of facilitative and reeducative strategies in this phase. The former was appropriate for work within the Division given that there was some perceived need for and commitment to the innovation within the Division especially since the Division Chief was very strongly and visibly supporting the SFRP. There was, however, a low perceived need for and commitment to the innovation within the other Divisions. In addition, the relatively long time period, two years, allowed for completion of the plan indicates that persuasive strategies were not initially needed.

Public target group. In diffusing knowledge about the SFRP to the public, the team did identify opinion leaders as targets of the earliest information dissemination phases. Although not labeled "opinion leaders," key people within other public agencies and in public interest and user groups were identified. Members of this "Public Advisory Group" (Group 6, Table 2.1) were sent information on the SFRP and were asked for their continuing participation in the process. The group was also periodically given feedback and progress reports.

This strategy was sound but was lacking in one respect. It is possible that valuable opinion leaders in the public target group were missed since the SFRP team identified the opinion leaders based on their collective perception. Creating the opportunity for other opinion leaders to identify themselves would also have been useful. An additional strategy which used mass media might have reached these additional opinion leaders. Use of the Information and Education Division of the DNR to disseminate announcements to the general and specialized natural resources press would have been effective. The source of these messages could have been the same as that for the personal communications; i.e., the Chief Forester and the DNR Director.

Results of the interviews indicated that none of the principals thought that the public involvement done early in the process, during the assessment phase, was crucial in its development. One principal did think the public involvement was helpful in this stage. The development of an assessment of Michigan's forest resources was, however, used to create an awareness among some of the publics of the Statewide Forest Resources Plan. Because the Assessment was likely to be of interest to many public groups and individuals the publicity generated

by the team concerning the development and publication of the Assessment was an effective strategy to create awareness and knowledge of the SFRP.

Persuasion Stage

The persuasion stage in the SFRP began toward the early part of the assessment phase, mid-1978, and continued through the presentation of "Draft Alternative Programs," early 1980 (refer to Figure 2.1 and Table 2.2). Those who were asked to participate in the SFRP were forming their attitudes toward the SFRP as they reviewed early products of the Assessment, such as the "Draft Outline," and in the case of the Technical Advisors, as they worked with team members in compiling data for the Assessment. Because the Assessment was a relatively incontrovertible part of the SFRP, participants were still likely to be forming opinions of the SFRP well into the controversial program phase.

Interpersonal communication is thought to be most important in the formation of opinions toward an innovation. The use of mass media is, thus, relatively ineffective as a strategy in the persuasion stage. Opinion leaders, on the other hand, can be very influential and useful in diffusion strategies in this stage. The perceived characteristics of the innovation are also very important in the persuasion stage. As a potential adopter forms an opinion of the innovation he or she "tries on for size" the innovation. How favorably the innovation's characteristics are perceived during this trial will influence the potential adopter's opinion.

Agency target group. Survey results indicated that agency members had generally favorable perceptions of the attributes of compatibility and relative advantage. Their somewhat unfavorable perceptions of complexity, observability and trialability suggests that early work in the knowledge stage and in the persuasion stage might have focused on making the SFRP less difficult to understand and to participate in. Several respondents also indicated that the long-term nature of the results of the SFRP should have been stressed since short-term results were perceived as being difficult to observe.

Division and agency opinion leaders could have conducted person to person contacts with their "followers" to relate their experiences, understanding of, and attitudes toward the SFRP. Meetings between the SFRP team and the Technical Advisors as a group did occur relatively frequently early in the process. The SFRP team, however, had little influence on what the technical advisors communicated to their Divisions.

The Michigan State University doctoral students (Group 2c, Table 2.1) who compiled information for the Assessment had frequent contacts with the Technical Advisors. Their role in diffusing information about the SFRP was, therefore, a large one. This had a negative effect in at least one instance. The Wildlife Division expressed their dissatisfaction with students per se participating in the Assessment. Any distinction between undergraduates and doctoral students did not appear to be meaningful to Wildlife Division technical advisors. More early personal contact between the SFRP team directors and Technical Advisors, using a more persuasive strategy might have alleviated this situation.

One source of influence within the Division, unfortunately, could

not be used in the diffusion of the SFRP. The Assistant Division Chief for Administration was not a supporter of the SFRP team's efforts. From personal observation, this staff member is a strong opinion leader within the Division, for both staff and field personnel. Although the Assistant Chief for Administration had no formal authority over the team's activities his support of the process would likely have been effective in creating positive attitude toward and commitment to the SFRP among other members of the Division.

Public target group. Re-educative strategies were appropriately used in this stage. One public sector opinion leader, the West Michigan Environmental Action Coalition, initially served as a source for interpersonal communication for the public change target group. In the pre-planning phase, two workshops were held on forest resource planning, including SFRP, with planned small group and person-to-person interaction (see Figure 2.1). An extension of this channel using other, similar, sources would also have been useful. Members of these groups can serve as local media, more effectively gaining support for an innovation than can agency members.

Educative workshops held by opinion leaders also meet requirements noted by other researchers. Regional workshops increase the assessability of the innovation and reduce the opportunity costs of learning about and using it (Kotler and Zaltman, 1971). The use of different opinion leaders as workshop leaders for segmented publics is also recommended. It is notable that several survey respondents remarked that they recognized a segmented market for the innovation. The public is not a single body but consists of various publics, each of which

may have differing perceptions of the innovation. These workshops might also create important shared perceptions concerning the need for change, the plans for change and the consequences of change.

The Forest Management Division used public user and interest groups later in the process in the development of forest resource issues. These issues will be a major focus of the Recommended Program. The issues format could have been used earlier in stressing the relative advantage of the SFRP and in improving perceptions of observability and compatibility of the SFRP. This reeducative strategy would use issue development as a way to discuss, in more depth than was done, SFRP's advantages in helping statewide forest management address issues and its compatibility with the values of forest resource management. The long-term nature of the results of SFRP should also have been stressed, so as not to create unwarranted expectations of observable short-term results. A renewed effort in the development of the issues which took place in the fall of 1980 indicated that this is an effective strategy in arousing interest in and support for the SFRP process.

Decision Stage

In the decision stage a potential adopter decides whether or not to use, in this case accept and support, an innovation. In the innovation decision process for the SFRP some potential users decided very early in the process that they would or would not support the SFRP. It is likely that many potential adopters waited to make a decision until some of the results of the program phase were available (early 1980, see Figure 2.1). Actually the entire SFRP itself cannot

be accepted or rejected until the final Recommended Program is presented. There will be some people, however, who made their decisions before the SFRP was completed.

The perceptions of and the actual trialability of an innovation are the most important characteristics in this stage. The ability and opportunity to use an innovation on a trial basis reduces the uncertainty of risks and costs associated with adoption of the innovation by giving the potential adopter information as to the likely outcome of their adoption. Strategies which concentrate on making the results of adopting an innovation clear to the potential adopter are very useful in the decision stage. The perceived difficulty, as indicated by survey results, of implementing the SFRP on a trial basis is likely to be a barrier to adoption by both target groups.

Agency target group. A form of vicarious trial of the SFRP was available through observing other comprehensive forest resource plans at the federal level and in other states. This in fact was done by several members of the SFRP team. Meetings of state forest management planners sponsored by the U.S. Forest Service, State and Private Forestry probably served this function for some of the agency target groups (See Figure 2.1, Pre-Planning). Mechanisms for trial runs for most of the agency target group are, however, limited. Various individuals have expressed a largely unmet need to see what the SFRP would "look like." Because this was new process and experience for all involved, what the SFRP will "look like" is relatively indeterminate until the process has been completely implemented. Indicating

the U.S. Forest Service's RPA process or other states' processes as models of what the SFRP would look like would restrict the flexibility of the SFRP process.

Michigan's Statewide Forest Resources Plan evolved as it was being implemented. The basic model for the plan was developed in early 1978. The structure of the plan and the steps considered necessary for its implementation changed over the three-year process. This flexibility was important to the Division and in fact was actively defended against pressures from the U.S. Forest Service, Northeastern State and Private Forestry Branch.

The continuing evolution of the SFRP, however, made it difficult to communicate what the process was and what would comprise the Program phase of the Plan. This became a major problem when a public review of "Draft Program Alternatives" was conducted in March of 1980 (refer to Figure 2.1 "Draft Alternative Programs"). Criticism received as a result of this review was one reason plans for the Recommended Program were essentially postponed a year. The Division decided to concentrate efforts on the discussion of forest resource issues and policy options in response to the issues during the remainder of 1980.

It is possible that this problem need not have become as great as it did. From personal observation, there was a reluctance of the Division's chief and project director of the SFRP to specify the structure and contents of the Program. This was accompanied by the attempts of other SFRP team members to periodically define and redefine these same aspects. Some relinquishment of flexibility for process definition might have been desirable in this case.

The SFRP was trialable in a temporal sense. Change targets were

introduced to the innovation in a gradual fashion. Their participation in the process was first invited through the compilation and distribution of the Forest Resources Assessment. The assessment phase of the SFRP was probably much easier to participate in, since it was better defined, than was the subsequent program phase. If the target's experience with the Assessment was a favorable one, it could serve as a useful trial or pre-test of the SFRP process as a whole. The assessment phase thus served as an appropriate re-educative strategy toward later adoption of the entire SFRP process.

Public target group. The difficulty of communicating the SFRP mentioned above probably also influenced individual members of the public in their decision whether or not to support, i.e., adopt the Statewide Forest Resources Planning process. Some individuals did have knowledge of the federal RPA process and their attitudes toward it were likely to have influenced their decision about the SFRP.

One possible means of giving the change targets a view of what SFRP would mean recently became available. The film, "Choices," produced by the Nature Conservancy for the U.S. Forest Service, shows several views of comprehensive planning and of various plans or processes in the U.S.A. Showing of this film could at least give members of the public a concept of similar planning processes. Demonstrations of this type might substitute for an actual trial run of the SFRP. As with the agency group, experiences in the assessment phase formed a basis for members of the public's attitude toward the plan as a whole.

Communication Stage

When an innovation is decided to be adopted as a result of an authority decision, this decision must be communicated to the rest of the organization. Because the SFRP was an innovation that developed as it was implemented, the communication stage as such was not present. As phases of the innovation developed and were completed there was communication within the DNR (agency target group), and with major developments, with the public (target group).

The interviews of the SFRP principals indicated that public involvement, which includes involvement with other divisions and agencies, was influential in the program phase of the process. Communications between the SFRP team and the target groups influenced the structure, content and emphasis of the Recommended Program presented in late 1980 (See Figure 2.1), "Recommended Program"). The results of the public review of "Alternative Programs" in March, 1980, which led to the production of a report on issues and policy options, and of the public workshop on the draft Recommended Program in February, 1981, which recommended additions to and restructuring of the document, were major influences on the form and structure of the innovation.

Confirmation Stage

In the confirmation stage, an adopter goes through a process of reconciling his or her perceptions of the innovation with messages from various sources about the innovation. If the adopters' perceptions differ sufficiently from the source's messages, cognitive dissonance occurs. To remove this dissonance, the adopter will either discontinue use of the innovation, or filter out or rationalize conflicting

messages or both. It is, therefore, important that adopters' perceptions of the innovation are supported in this stage.

Strategies for both target groups should be essentially the same in this stage. Prevention of misconceptions developed in earlier stages is one strategy which averts discontinuance. Stressing the positive results of the innovation, such as improvement in goods and services supplied, is also an effective strategy in the confirmation stage.

There might be a tendency within an organization to decrease diffusion efforts once the SFRP is essentially complete, i.e., when the Recommended Program has been presented to the public and the Natural Resources Commission. It is important, however, to actively foster any support of and positive attitudes toward the SFRP generated in earlier phases. Strong advocates of the innovation agency and in the public can serve the purpose of continuing reinforcement of the adoption decision. Continuing progress reports and news releases can serve a similar function to remind adopters of the benefits of the SFRP and to maintain the visibility of the results of their efforts in participation in the innovation. This continuing information feedback of performance to the target groups is especially beneficial (Huse, 1975). Forest Management Division plans for SFRP news releases should not be neglected at this stage.

If efforts in previous stages developed commitment to the innovation, and the resources needed to sustain the innovation, the change agents' efforts at this stage can be largely facilitative. Persuasive strategies are appropriate if there are individuals whose support is essential but who are resisting the innovation. Power strategies can also be used to overcome resistance in this stage. Pressure on the

individual or group to support the innovation must, however, continue as long as their support is required.

Organizational Strategies in the Diffusion of Michigan's Statewide Forest Resources Plan

Organizational Structure

The Forest Management Division is a relatively large bureaucracy. As of this writing the Division had ten staff sections, each supervised by a section leader and one of the two Assistant Chief Foresters. Field personnel consisted of three regional managers who supervised the personnel on the six state forests in the northern two-thirds of Michigan, and the Division's field activities in the southern one-third of the state (refer to Figure 2.4).

The design of innovation strategies for public bureaucracies must recognize the particular barriers to change that exist in such organizations. Bureaucracies have been accused of being less innovative than private organizations. The empirical evidence comparing innovativeness in public versus private organizations is, however, inconclusive (Roessner, 1977).

As discussed in Chapter 3, the rigidity of the operations, conformity to formal rules and procedures and lack of surplus resources are cited as barriers to organizational innovation. This is thought to be especially true in bureaucracies (Hoffman and Archibald, 1968; Hayes, 1972). The discussion which follows describes the use of three strategies by the SFRP team which other research has been shown to be effective in public bureaucracies.

Top Level Support

The presence of strong advocates of the innovation in the bureaucracy may be a determining factor in the adoption of the innovation. This advocacy is especially important if its source is the chief executive of the agency.

The Chief of the Forest Management Division was a strong advocate of the Statewide Forest Resources Plan. He was responsible for bringing the ideas of a SFRP to the agency and for securing the agreements necessary for its development. In addition, throughout the SFRP process he spoke to public and DNR groups concerning the need for the Plan and its merits. All interviews of the SFRP principals indicated that the Division Chief's support was especially important.

The importance of the support of the executive level of the DNR and the Washington office of the U.S. Forest Service was also cited in the interviews. This support was cultivated by the efforts of the Division Chief and the Project Director from M.S.U. They and the Division Project Director were also responsible for gaining the support of other natural resource agencies, private organizations and the forestry academic community. This external support was thought to be influential by all of the principals interviewed, although not all mentioned each source.

The M.S.U. Project Director's active support of and participation in the SFRP was indicated as being important or critical by three of the principals interviewed. As well as his own expertise, his involvement made possible the assistance of students, specialists and experts from Michigan State University and from consultants.

Use of a Statewide Forest Resources Planning Team

From April 1978 to March 1981 the Forest Management Division used a SFRP team to develop the planning process and produce the Assessment, the Recommended Program and interim products. As discussed in Chapter 3, a team approach to innovation is thought to be especially effective. It combines a variety of perspectives on projects and fosters exchange of ideas and communication in the early innovation stages where this is important. The process of working together as a team causes these perspectives eventually to be shared as well as creating common goals for the innovation process. Teams, thus, differentiate their structure. They are relatively complex and informal in their early stages and share perspectives and become more formal in their later stages.

Logs kept of the activities of the SFRP team indicate that this differentiation did occur. In the early stages of the assessment phase and of the program phase there was considerable discussion of and disagreement over approaches to the SFRP process. Part of this complexity was built into the team. In the initial stages of the assessment phase and, later, the program phase additional analysts were added to the team. These analysts were, however, not involved in the final stages of drafting and revising the Assessment and the Recommended Program. By expanding and contracting the SFRP team the process was allowed to be complex and informal or simplified and formal where necessary. The continuity of the efforts of the team were controlled by the project directors and the project coordinators.

Outside Aid

The absence of slack resources is often a barrier to organizational innovation. The importance of the U.S. Forest Service's Northeastern State and Private Forestry Branch and Washington Office in providing financial assistance for the SFRP was cited in four of the interviews.

All five of the interviews stated that the outside technical assistance and expertise provided by Michigan State University and private consultants was critical in the development of the SFRP. The constraints of time and lack of specific expertise were cited in the interviews as reasons outside aid was critical. One interview also mentioned that public acceptance of the SFRP might be increased as a result of this outside involvement.

Other researchers mention that outside consultants serve to decrease the perceived risk of innovation by agency members. Outside aid may result in perceptions of shared risk or increased chances of success given the additional resources.

Personal observation indicates that, in addition, outside team members may be more effective in gathering information from other agencies whose cooperation with the sponsoring agency is required. This outside member must, however, be perceived as being competent and trustworthy by those contacted.

The use of outside aid or consultants is a frequently used facilitative strategy. If, however, the ability of the agency or organization to sustain the innovation has not been developed during the process the innovation may be discontinued when the outside aid is withdrawn. As of this time, outside aid in the SFRP process is minimal. The Forest Management Division is developing the Recommended

Program to present to the Natural Resources Commission, the Michigan Forestry Planning and Development Committee, and to the public. Future developments are, therefore, required to determine whether or not the Division has developed the capacity to sustain the use of the State-wide Forest Resources Plan.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The Forest Management Division of the Michigan Department of Natural Resources has been implementing a statewide forest resources plan since early 1978. Michigan's Statewide Forest Resources Plan (SFRP) is similar to the RPA process used by the U.S. Forest Service. The SFRP has two phases, an assessment of Michigan's forest resources and a program recommending directions for forest management in the state. The SFRP differs from the RPA planning in that its assessment and program were done sequentially and by the same team of people throughout. The SFRP also gives a larger role to forest resource issues than did the 1975 or 1980 RPA Program. The SFRP program, while sponsored by the Forest Management Division, recommends policy directions for all forest management in the state, public and private.

Michigan's Statewide Forest Resources Plan as a three year case study of innovation in an organization was the subject of this dissertation. The goals of this dissertation were:

- (1) to provide a documented case study of a statewide forest resources planning process and
- (2) to illustrate the usefulness of innovation diffusion theory applied to this planning.

The first goal was met by documenting the history of Michigan's

SFRP in Chapter Two. This documentation included a description of the plan of work for the SFRP process, the key participants in the SFRP, and the major activities undertaken in its development and implementation. The history was written from log books kept by the author from April 1978 to March 1981. The logs included interdepartmental and interdivisional memoranda, materials distributed to participants and participants' reviews of the various products of the process.

The second goal was met through the development of a framework for the analysis of innovation adoption in an organization in Chapter Three, and the application of this framework in an analysis of the SFRP process in Chapter Four. The framework for analysis was based upon a literature review of empirical studies of innovation in organizations, especially public agencies, and of the theory of innovation adoption. This review indicated that: (1) the process of problem definition, (2) the identification of the key participants in innovation diffusion, (3) the stages in the innovation process through which an individual or organization goes and (4) the type of innovation decision are important in analyzing the adoption of an innovation in an organization.

The factors in an organization's environment which influence whether or not an organization adopts an innovation and the rate of its adoption were also examined in Chapter Three. The characteristics of the innovation itself which also influence the adoption decision and rate of adoption were described. Chapter Three concluded with: (1) an identification and discussion of the basic types of strategies used in the diffusion of innovations, (2) the importance of using strategies which are appropriate to each innovation process stage, and (3) some key

strategies which have been found to be effective in organizations, especially public agencies.

Personal logs, SFRP records, interviews with the five other principals in the process, and a survey of DNR and U.S. Forest Service participants in the SFRP were used as material for the analysis contained in Chapter Four.

The nature of the problem, the key participants in the SFRP process and the type of innovation decision were discussed in the beginning sections of the chapter. This was followed by descriptions of the influential factors in the environment of the Forest Management Division and their influence on the diffusion of the SFRP. The results of a survey of the perceived characteristics of the SFRP by those directly involved in the process in the DNR and the U.S. Forest Service were then presented.

The findings of this study as to the nature of the problem, the key participants, the type of innovation decision, the environment of the Division and the characteristics of the SFRP were then used to critique the strategies used to diffuse the SFRP within the DNR and to attain public participation in the process. These findings also suggested that the several key organizational strategies found effective in other public agencies were used in the SFRP process. Chapter Four was concluded with a discussion of the use of these strategies in the SFRP process.

Conclusions

The Environment of the Forest Management Division

The environment of the Forest Management Division was very conducive to the adoption of the SFRP (refer to Table 5.1). A variety of DNR and Forest Management Division Staff perceived that there was a performance gap between existing and desired divisional performance. The SFRP was seen as being able to close these performance gaps and meet the needs for program coordination and improved Division performance.

There were also active supporters of the SFRP outside the organization. The U.S. Forest Service, Northeastern State and Private Forestry Branch acted as a supplier of the innovation in some respects. They provided some technical assistance in statewide planning, although the assistance they could supply in the later, program phase, was limited. More importantly the Northeastern State and Private Forestry Branch and the Washington Office, area Planning Unit provided funding to greatly increase the resources available to the Division for the SFRP. Although the DNR executive office did not overtly pressure the Division to adopt statewide planning, they did support the innovation.

Members of the DNR staff through their professional activities had developed a knowledge infrastructure with strong outside communication links. This increased the amount of information available to the division about statewide forest resource planning. Division members were also aware of outside expertise and assistance available to them in doing this planning.

Table 5.1. Summary of the Influences of the Environment of the Forest Management Division on the Diffusion of the Statewide Forest Resources Plan.

Environmental Factor	Influence
Perceived performance gap	positive, there was a perceived need for the SFRP to fill a performance gap
Supply of innovations	positive, the RPA served somewhat as a model
Agency-executive relationships	positive, especially early in the process when the DNR Director's support was vocal
Activities of suppliers	positive, although there was greater influence by S&PF through financial, than technical, assistance
Resources available	positive, through USFS financial assistance and the outside aid thereby made available.
Intergovernmental relationships	positive, USFS provided some leadership
Citizens demands	Not influential

Characteristics of the Statewide Forest Resources Plan

Some of the characteristics of the Statewide Forest Resources Plan were positive influences on its adoption while others probably hindered its adoption (refer to Table 5.2). The relative advantage and compatibility of the SFRP were perceived favorably by those directly involved in the Process. The trialability and observability of results were, however, generally perceived unfavorably. Perceptions of the complexity of the SFRP were mixed, with slightly more respondents perceiving this characteristic favorably.

Relatively long-term results are inherent in comprehensive planning, and thus perception that the results of the SFRP were difficult to see could probably not have been changed. More favorable perceptions of the trialability and complexity of the SFRP, however, could have been created. This could have been accomplished by a more concrete and earlier definition of the structure and scope of the SFRP by the principals involved. Although allowing the SFRP to evolve over several years was perceived as having advantages, some of the costs of this approach may not have been recognized. An innovation which is continually changing is difficult to form a mental image of and is, thus, difficult to evaluate or mentally "try on for size." Such an innovation is also difficult to understand, i.e. complex, simply because it is not static.

Type of Strategies Used

The types of strategies used by the SFRP team to gain participation in and support of the SFRP were, on the whole, appropriate given the internal and external environment and the characteristics of the

Table 5.2 Summary of the Influences of the Characteristics of the Statewide Forest Resources Plan on its Diffusion.

Characteristics	Influence
Relative advantage	positive, the SFRP was perceived as offering an advantage over current procedures
Conformity	positive, the SFRP was perceived as being compatible with the norms and values of forest management by agency personnel although the public(s) may not perceive it as such
Complexity	uncertain, perceptions of the complexity of the SFRP varied. The public(s) may find the SFRP difficult to understand and participate in
Trialability	negative, the SFRP was perceived as being difficult to try on a trial basis
Observability	negative, the results of the SFRP were perceived as being difficult to see except in the long run

SFRP (refer to Table 5.3). The SFRP team also used different types of strategies for different groups of SFRP participants as is recommended by innovation diffusion research. This research also indicates that strategies should be changed or replaced as the innovation process progresses or when initial strategies fail. This changing of strategies was also done to some extent by the SFRP team.

A combination of facilitative and reeducative strategies were used throughout the SFRP process. Several factors within the Forest Management Division indicate that facilitative strategies were appropriate for work within this group. The administration of the Division was committed to and perceived a need for the SFRP. One of the interviews with the SFRP principals also mentioned that there was a perceived need for comprehensive planning for the Division's programs among the field staff. The Division also had resources available to sustain its outside assistance for a long period and had allocated a long period for SFRP development. Resistance to the SFRP within the Division also appeared to be low.

The use of reeducational strategies in addition were appropriate since it is likely that some Divisional members were not committed to the SFRP and might be somewhat resistant to it. The use of the Assistant Chief for Administration as an opinion leader probably would have been a powerful strategy in gaining support for the SFRP among the field staff of the Division. Unfortunately, this particular strategy was not available to the SFRP team.

The situation in other DNR divisions indicates that a combination of reeducative and persuasive strategies was called for in working with this group. Their commitment to and perceived need for the SFRP

Table 5.3 Summary of the Effectiveness of Strategies Used in the Diffusion of Michigan's Statewide Forest Resources Plan.

Strategy	Effectiveness
Facilitation of the process through funds and staff assignments	good
Use of opinion leaders within the Forest Management Division	fair, an important opinion leader could not be used
Use of opinion leaders within the Department of Natural Resources (Technical Advisors)	good, opinion leaders were self appointed
Use of opinion leaders with the publics (Public Advisory Group)	fair, public advisory representatives were selected, more should have been allowed to appoint themselves
No use of mass media in beginning of process	poor, slowed and restricted knowledge of the SFRP
Periodic mail and personal contacts with Technical Advisors, Public Advisory Group, Advisory Panel, U.S.F.S. and others	good, maintained awareness of the SFRP
Maintenance of SFRP as a flexible process	good, allowed the SFRP to evolve to suit Division's needs poor, resulted in inconsistent messages to other participants
Promoting the SFRP in connection with solutions to Michigan's economic problems	good, increased perceived relative advantage and observability of results of the SFRP
Cultivation and use of top level support	good, DNR Director, FMD Chief, MSU Forestry Department and Governor's support were key

Table 5.3 (cont'd.)

Use of outside aid

good, provided slack resources, additional expertise, continuity and fresh perspectives

poor, in the case of the use of students in contact with the Wildlife Division, which objected to the use of students

Use of a team

good, provided a structure which could expand and contract as needed and increase or decrease in diversity and formality as needed

appeared to be very low. Strong resistance to the SFRP could also be expected since it was an intrusion by another DNR division.

While the team's strategies for SFRP activities with other divisions was ostensibly reeducative, some of the communication was, doubtless, persuasive in nature. It was obvious at times that efforts at persuading other divisions to cooperate were not totally successful as their members perceived little relative advantage to their divisions from adoption of the SFRP. It is worth noting that in the late stages of the development of the Recommended Program Wildlife Division participation in the SFRP became much more active. The Governor had just previously publicly given his support to economic development through forest management and the role that the SFRP had in setting this direction. Wildlife Division members expressed their strong desire to have the current and potential economic benefits of Wildlife included in the Program. It appears that the Governor's statements changed the Wildlife Division's perception of the relative advantage of the SFRP to them.

Strategies to gain adoption of the SFRP by various publics were primarily reeducative. These strategies were appropriate given most of the public's lack of knowledge about statewide forest resource planning. It is also likely that few of the public were committed to or perceived a need for the process. Mass media as a channel for information about the SFRP was not used. The use of mass media to create initial awareness of the SFRP would have been more effective than was the use of mailings to selected individuals and groups. The primary approach used by the SFRP for involvement of the publics was communication with organized public interest groups, private

organizations and opinion leaders in forest management in the state. This was appropriate for the later part of the process where mass media is not influential but interpersonal communications are very effective. Plans for future mass media communications regarding the 1977-1981 SFRP are not likely to gain additional public support or involvement.

During the program phase of the SFRP, Forest Management Division team members increased their activity in promoting the SFRP. Their work in gaining the Governor's public support of the SFRP and in gaining support of legislators and forest industry was a more persuasive approach than had been used previously. This support was gained by promoting the SFRP as being able to contribute to the solution of Michigan's economic problems. This was probably an effective persuasive strategy, and appropriate to the more controversial program phase.

Organizational Strategies Used

All the principals of the SFRP indicated that the factors of top level support and outside aid for the SFRP were crucial in its successful development. Although the use of a team per se was not cited, the establishment of an SFRP team which expanded and contracted as needs arose enabled the use of this outside aid. Innovation diffusion research supports the conclusions that: (1) top level support, (2) outside aid and (3) the use of a team are effective strategies in the diffusion of an innovation in an organization.

Top level support. The strong support of the SFRP by the Forest Management Division Chief and the M. S. U. Professor of Forest Economics was very influential in the diffusion of the SFRP. This level of support indicated to the Forest Management Division, the DNR and the forest management community that there was a strong commitment to statewide forest resources planning. This was combined with the support of the DNR Director and the support of other forest management agencies and other public and private organizations which the Division Chief and the Project Directors were able to gain. The Division Chief and the M. S. U. Project Director were also able to use their authority to channel resources from the Division and from Michigan State University, respectively, to the SFRP project.

Outside aid. Aid to the SFRP from M. S. U. and private consultants took a variety of forms. The M. S. U. Professor of Forest Economics co-directed much of the SFRP process throughout. His graduate assistant was actively involved as a co-ordinator of the SFRP activities and analyst for three years. Periodic assistance was rendered by resource analysts; and recreation, wildlife and public involvement specialists. This provision of additional expertise and workforce was cited by all SFRP principals as being critical.

The additional workforce was a slack resource that could be concentrated on the SFRP, unlike Division Staff which had other responsibilities. The Division was also restricted in the number and types of resource analysts available. The addition of analysts and specialists from outside the organization increased the amount and diversity of expertise that was applied to the SFRP.

As mentioned previously in Chapter 4, the use of outside aid is appropriate if the organization develops the resources to sustain the innovation after the outside aid is withdrawn. Only a later evaluation of the Statewide Forest Resources Plan would allow the determination of the extent and success of its adoption.

Use of a team. The use of an SFRP team to structure the activities of the process also was effective. Because the team composition was flexible, analysts and specialists could be added only when needed. The costs of this expertise were, thus, less than if personnel were added to the Division itself. In the early stages of the assessment phase and of the program phase the team expanded, building in the important factors of diversity and informality. As each of these phases neared completion the SFRP team was reduced to the smaller management team of the Project Directors and Project Co-ordinators. This management team had a less diverse and more formal structure, which was more appropriate to the final stages of each phase. Achieving this differentiation of the structure of the unit developing the innovation would have been much more difficult if all the members were permanent Division staff.

Extent of Adoption of the SFRP

The extent of the adoption of the SFRP within the DNR, the Forest Management Division and the various phblics can not as yet be judged. The author's involvement in the project ended in early 1981 as the Recommended Program was beginning to be prepared. This case study and its conclusion are, thus, relevant only up to that point in the

process. An examination of the extent and level of support for the SFRP would be a useful subject for future research.

APPENDICES

APPENDIX A

OUTLINE OF THE HISTORY OF MICHIGAN'S STATEWIDE FOREST RESOURCES PLAN

APPENDIX A

OUTLINE OF THE HISTORY OF MICHIGAN'S STATEWIDE FOREST RESOURCES PLAN

Pre-Planning

1977

Dec. 19 Forest Goals and Issues Statement compiled by Forest Management Division for U.S. Forest Service.

1978

Jan. Plans for Statewide Forest Resource Plan developed and described by Forest Management Division.

March 8 DNR Director Tanner announces beginning of SFRP process, names M.L. Petoskey responsible for coordinating inter-division cooperation, announces R.S. Manthy's agreement to assist in SFRP process.

March 9 Cooperative Agreement between the DNR and Michigan State University arranges for R.S. Manthy's assistance, the participation of R. Alston's resource economics proseminar class at M.S.U. in the Assessment, and K. Olson as resource specialist and co-coordinator of Assessment activities.

April 21/22 "Michigan's Forests and the Future" sponsored by West Michigan Environmental Action Coalition. Participants informed of plans for the SFRP.

April 24/28 "Comprehensive State Forest Planning and the RPA" program sponsored by U.S. Forest Service held at M.S.U.

May 2 Information meeting on the SFRP held with Bureau and Division Chiefs or their representatives.

May 26 Informational meeting on the SFRP held with the Hiawatha National Forest Planner.

1978 (continued)

May 27	Informational Meeting on the SFRP held with the USFS Region Nine Planner and Huron Manistee National Forest Supervisor.
	<u>Assessment</u>
July 20	Draft Assessment outline reviewed by DNR Technical Advisors, Bureau Chief, Division Chief, and Public Advisory Group.
August 4	Informational Meeting held with Ottawa National Forest Planner.
August 10	Information Meeting held with Region III staff.
August 14	Information Meeting held with Region I and II staff.
August 22	Informational Meeting held with U.S.F.S., S&PF Southeastern Area Planning Staff.
August 23	Information Meeting held with U.S.F.S., S&PF Northeastern Area Planning Staff.
September 25	Summary of responses to the draft outline sent to reviewers.
September 28/29	Review of working draft of Assessment by SFRP management team.
October 10	Progress report made to Governor's Office.
October 12	Progress report made to Director Tanner and M.L. Petosky.
October 20-21	"Michigan's Forests and the Future" sponsored by West Michigan Environmental Action Coalition. Participants informed of progress of the SFRP.
1978 Oct. 1 - 1979 March 1	Draft Assessment prepared.
March 14	Draft Assessment reviewed by DNR, U.S.F.S., S&PF personnel, and Public Advisory Group.
March 20	Draft Assessment reviewed by public at Natural Resources Days at Michigan State University.
March 30	Intensive review of draft Assessment by DNR technical advisors begun.

September 13 Michigan's Forest Resources 1979--An Assessment
printed and distributed.

1979

April Management team begins plans for the Program phase.

April 20 Meeting held with Technical Advisors in DNR to discuss plans for the Program.

May 8 Team members participated in Forest Resources Planning seminar at Michigan Technological University.

May 29 Advisory Panel of leaders in forest resource management establish.

June 15/Sept. 1 Team proceeds with analysis:

- Five alternative directions drafted
- Relationship of issues to directions developed
- Programs, activities, output levels and costs analyzed for each alternative direction.

June 26 Advisory Panel reviews forest resource issues.

August 17 Advisory Panel reviews alternative directions and tentative alternative resource output targets.

September 1/
October 30 Analysis compiled.

November 20 Draft of analysis reviewed by SFRP principals.

December 19 Working Document "Analysis of Alternative Forest Resource Programs for Michigan" presented to Forest Management Division by consultants.

1980

January 1 Preparation of "Michigan's Forest Resources: Alternative Programs" for public review begins.

February 1 Review of analysis by Technical Advisors complete.

March 19 Review draft presented to public at Natural Resources Days at Michigan State University.

March 15/
September 1 Team of Forest Management Division members develop discussions of issues and policy options.

1980 (continued)

- September 12 Working draft "Michigan's Forest Resources Plan: Overview of Issues and Policy Options" presented to the Michigan Forestry Planning and Development Committee for their review.
- October 20 Review draft "Michigan's Forest Resources Plan: Issues, Policy Options, and Recommended Overall Program Direction" sent to Public Advisory Group for Review.
- December 11 SFRP meets with U.S. Forest Service personnel in Michigan to review resource output targets and public forests role.

1981

- January 9 Plans begun for public workshop for review of and comment on a draft recommended program.
- January 9/
February 1 Recommended Program drafted.
- February 20 Michigan's Statewide Forest Resources Plan workshop held, Draft Recommended Program discussed.
- February 20/
September Revision of Recommended Program, preparation brief Assessment, final draft of Michigan Statewide Forest Resource Plan.

APPENDIX B

**SURVEY OF THE CHARACTERISTICS OF MICHIGAN'S STATEWIDE
FOREST RESOURCES PLAN**

APPENDIX B

SURVEY OF THE CHARACTERISTICS OF MICHIGAN'S STATEWIDE FOREST RESOURCES PLAN

Objectives

The characteristics of complexity, relative advantage, trialability, observability, and compatibility are thought to be related to the rate of adoption of an innovation. A questionnaire survey was designed to determine how these characteristics were perceived by those in the Michigan Department of Natural Resources and the U.S. Forest Service who had been involved in the development and implementation of Michigan's Statewide Forest Resources Plan. These same people were also asked their opinion of how the public perceives these characteristics.

Methods

The survey was designed to be relatively simple, straight forward, and short. This was because much of the interviewing was to be done by telephone and all was to be done during working hours^{1/}. Ten questions were asked of each person interviewed--one question on each of the characteristics from their perspective and one question on

^{1/} Eight surveys were administered by telephone, thirteen were administered by interoffice mail.

their opinion of the public's perception of each of the five characteristics.

The questions and the possible responses were worded similarly to facilitate the responses and their interpretation. The response categories did not allow for a "no opinion" answer but forced the respondent to make a judgment.

There is a possibility of bias in the wording of the questions, although they were written so as to avoid this. Each question and the responses contain normative words--better, worse, easy, difficult, compatible and incompatible. It was thought that if the questions were phrased such as "How difficult do you think..." that this might yield a different response than "How easy do you think..." The questions were, therefore, worded "How easy or difficult do you think..."

The Survey Questions

The questions concerning the characteristics were developed relatively directly. The Statewide Forest Resources Plan is a new method of planning and directing forest management in the state. It was thought, therefore, that respondents would be able to make a judgment as to how difficult the SFRP is to understand and to participate in, complexity; to implement on a trial basis, trialability; or to observe the results of, observability.

It was difficult to phrase questions concerning the other two characteristics. Relative advantage can have several components in this case. These are advantage in dealing with the public, advantage in performing internal agency function, or both. Since a major objective of the SFRP is to make the performance of forest management

"better" in the state, respondents were asked how much better or worse they thought the SFRP would make their job of forest management and how much better or worse they thought the public thinks forest management will be with a statewide plan. This was judged preferable to guessing as to how respondents might perceive what composes relative advantage.

Because compatibility of an innovation with organizational and personal norms, values and experiences would have been difficult to explain in a short time period, the question dealing with compatibility was also difficult to phrase. The professions which practice forest resources management and members of the public have norms concerning what is proper forestry, wildlife, outdoor recreation, and/or fisheries management. Respondents were, therefore, asked how compatible they thought the SFRP was with the values of forest management. This was opposed to asking respondents how compatible they thought the SFRP was with the values of the DNR or of their community.

Results

A total of twenty-one questionnaires were administered. Survey participants were: the Division Chief; the Assistant Division Chief for Natural Resource Development; Unit leaders of the Cooperative Forest Management, Planning, and Forest Recreation units; the Planning Analyst; three staff members of the Forest Recreation unit; two staff members of the Cooperative Forest Management unit, and four Forest Planners (two Forest Planner positions are currently vacant); of the Forest Management Division; one technical advisor from the Wildlife Division and one technical advisor from the Recreation Services Division

of the DNR; the three National Forest Planners in Michigan; and the public involvement consultant to the Forest Management Division for the SFRP. The author did not respond to the questionnaire.

As indicated in the tally sheet following, the responses did fall into clusters for most questions.^{1/} There was more agreement in responses for those questions which asked for the respondents' perceptions than there was for the responses which asked for their opinions of the public's perceptions.

Complexity

Most respondents thought the SFRP process is somewhat difficult to understand and to participate in, although just as many thought it was somewhat or very easy. No pattern in these responses was found between Lansing office personnel, the Forest Planners (field personnel) or the Forest Service Personnel. One respondent did answer that he thought the SFRP is very easy to understand but somewhat difficult to participate in due to his distance from others involved in the process. A large majority of respondents thought that the public finds the SFRP somewhat or very difficult to understand and to participate in. One response was split between very easy, for organized groups, versus very difficult, for individuals.

Relative Advantage

The large majority of respondents thought that the SFRP would make their jobs somewhat or much better. Only one response of somewhat

^{1/}Since this was a 100 per cent survey of those who were directly involved with the SFRP at that time, so statistical analysis was required.

worse was given. A large majority of responses as to the public's perceptions of the relative advantage of the SFRP were in the somewhat better category.

Trialability

Most respondents thought that the SFRP would be somewhat difficult to implement on a trial basis. Responses for the public's opinion of trialability, however, were split fairly evenly between the somewhat easy, somewhat difficult and very difficult categories.

Observability

The responses to the two questions as to observability of results of the SFRP were more scattered than for any other of the questions. The responses for both questions four and nine did tend to fall in the very difficult or somewhat difficult categories. Many respondents noted that they perceived the results, or thought the public would perceive the results, as being difficult to observe because of their long-term nature. Since short-term results are more visible, the results of the SFRP are regarded as being difficult to observe overall.

Compatibility

Most respondents thought that the SFRP is very compatible with the values of forest resource management. Two responses fell into the incompatible categories. Opinions of the public's perception were varied from the response that the SFRP is somewhat incompatible to that it is very compatible. Reasons for the somewhat incompatible response were that the SFRP might be viewed as intrusive in private

interests.

Comments

There were two unintended results of the survey, both of which yielded additional information about the SFRP process. First, there was a recognition by many of the respondents that the "public" is actually many publics, with perspectives on the SFRP which may vary. This is a good indication that the complexity of the SFRP process is also recognized. Secondly, there was some misperception that the Recommended Program or the Plan document were to be the Statewide Forest Resources Plan. Many respondents did perceive that the SFRP was, rather, the process which incorporates the Assessment, and Recommended Program and all the activities associated with the planning. The questionnaires were administered, however, such that the misconceptions that did exist were clarified before the responses were recorded.

A sample of the questionnaire with a tally of the twenty-one responses follows.

CHARACTERISTICS OF THE STATEWIDE FOREST RESOURCES PLAN

SURVEY QUESTIONNAIRE

Tally

1. How easy or difficult do you think the Statewide Forest Resources Plan is to understand and to participate in?

very easy	somewhat easy	somewhat difficult	very difficult
3	9	8	0
1, to understand		1, to partici- pate in	

2. How much better or worse do you think your forest resource management job would be with a Statewide Forest Resource Plan?

much better	somewhat better	somewhat worse	much worse
9	11	1	0

3. How easy or difficult do you think the Statewide Forest Resources Plan would be to implement on a trial basis?

very easy	somewhat easy	somewhat difficult	very difficult
1	3	14	3

4. How easy or difficult do you think it would be to see the results of the Statewide Forest Resources Plan?

very easy	somewhat easy	somewhat difficult	very difficult
3, in long run	4	9	5

5. How compatible or incompatible do you think the Statewide Forest Resources Plan is with the values of forest resource management?

very compatible	somewhat compatible	somewhat incompatible	very incompatible
13	6	1	1

6. How easy or difficult do you think the public finds the State-wide Forest Resources Plan to understand and participate in?

very easy	somewhat easy	somewhat difficult	very difficult
1 for groups	1	14	14 1 for in- dividuals

7. How much better or worse do you think the public thinks forest management will be with a Statewide forest resources plan?

much better	somewhat better	somewhat worse	much worse
2	16	1	1

8. How easy or difficult do you think the public thinks the Statewide Forest Resources Plan would be to implement on a trial basis?

very easy	somewhat easy	somewhat difficult	very difficult
0	8	7	6

9. How easy or difficult do you think the public thinks the results of the Statewide Forest Resources Plan will be to see?

very easy	somewhat easy	somewhat difficult	very difficult
3	4	7	7

10. How compatible or incompatible do you think the public thinks the Statewide Forest Resources Plan is with the values of forest management?

very compatible	somewhat compatible	somewhat incompatible	very incompatible
4	12	5	0

APPENDIX C

**INTERVIEWS OF THE PRINCIPALS OF MICHIGAN'S STATEWIDE
FOREST RESOURCES PLAN**

APPENDIX C

INTERVIEWS OF THE PRINCIPALS OF MICHIGAN'S STATEWIDE FOREST RESOURCES PLAN

Objectives

The perceived need for an innovation, the type of organizational support it receives and the methods used to diffuse it in an organization have been related to the success of an innovation in an organization by various researchers. A set of questions were developed and used to interview the five principals of the Statewide Forest Resources plan, excluding the author, in order to analyze their perceptions and opinions of these factors with regard to the SFRP.

Methods

Five questions were used to structure interviews with Forest Management Division Chief Henry Webster, Assistant Division Chief Gerald Rose, Planning Analyst Jim Olmstead, Planning Section Leader Gerald Theide and M.S.U. Professor Robert Manthy. Two of the interviews were conducted in person. Three of the interviews were conducted by mail due to limitations on the principal's time. No restrictions were placed on the length of each interview, each response was as long or short as the principal desired. In addition, no prompting from the interviewer was given during the interview itself.

The Interview Questions

The interview questions were developed based upon a review of innovation diffusion literature and upon discussions with several of the SFRP principals as to questions they desired to have researched. All the questions were worded in a general fashion so as not to suggest that certain responses were expected. A list of the five interview questions follows on Figure C.1.

Results

The interviews were analyzed for common and constrasting elements. As responses to the questions were specific in almost all cases, the analysis was not difficult. A list of all responses to each question was made. Like responses were then grouped. Table C.1 which tallies the number of interviews citing a particular response is a summary of this analysis. It should be noted that the responses in the cases of questions one, two and four need not be mutually exclusive and thus the total number of citations under these questions can be more than five. In the interest of space and confidentiality of the principals involved the transcripts of the interviews are not presented here.

Discussion

Question 1. Perceived need for a statewide forest resources plan.

Perceived needs for a statewide forest resources plan varied. The most common response was that indicative of a need to set goals and direction for the programs and the activities of the Forest Management Division. It was mentioned that a statewide plan was needed

1. Perceived need:

What need or needs did you perceive for a statewide forest resources plan?

2. Institutional support:

What support within the agency or from other institutions do you feel was especially important in developing the Statewide Forest Resources Plan?

3. Plan of work:

Do you feel that the cooperative working arrangements for outside aid in developing the Statewide Forest Resources Plan were critical, helpful, or not important in developing the plan?

4. Assessment and Recommended Program development:

Are there any key events external to the Forest Management Division which you feel were especially important in developing the Assessment or Recommended Program?

5. Public involvement:

How important do you feel public involvement was in developing the Assessment and Recommended Program?

How important do you feel public involvement was and will be in achieving acceptance and support for the Recommended Program?

Figure C.1. Michigan's Statewide Forest Resources Plan Interview Questions

Table C.1. Interview Results

(number of people citing a particular response)

1. Perceived Need

Set of Goals or Overall Direction for Forest Management Division	Budget Acquisition/ Support	Direction for All Forest Management in the State
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4

3

3

2. Important Institutional Support

Division Chief	Academic Community	USFS S&PF	DNR Director or DNR Bureau Level	Other Public Agencies or Private Organi- zations
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5

4

3

2

3

3. Plan of Work

Outside Aid Critical	Outside Aid Helpful	Outside Aid Not important
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5

0

0

4. Assessment and Program Development: Important External Events

Michigan's Economic Problems	RPA/NFMA
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3

2

5. Public Involvement

In Developing Assessment

Crucial	Helpful	Not Important
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0

1

4

In Developing Program

Crucial	Helpful	Not Important
---------	---------	---------------

0

4

0

In Achieving Support of Recommended Program

Crucial	Helpful	Not Important	Depends Upon Balance of Impact
---------	---------	---------------	--------------------------------

4

0

0

1

such that the Division could assess its role in the context of forest management statewide. A perceived need for creating a common sense of direction for forest management in Michigan was mentioned in three of the interviews. In two of these the need for forest management to contribute to economic development in the state was specifically related to this common sense of direction. Three of the interviews cited the need to do statewide forest resources planning to ensure federal funding for forest management programs in the state, or to secure other budget support.

Question 2. Importance of institutional support.

The interviews cited a variety of sources of institutional support felt to be important. All interviews mentioned the self-generated support of the Division Chief. The four principals, other than the Division Chief cited his support as being very important.

Four of the interviews cited the support of the academic community in Michigan as being important. Two of these interviews mentioned the support of Professor Manthy as important in bringing additional expertise to the SFRP process and in facilitating gaining support from other sources.

The partial funding of the SFRP and some technical assistance from the Northeastern State and private forestry branch of the U.S. Forest Service was cited in three of the interviews as being important. One additional principal also assessed this factor as being very important after being asked about the role of the U.S. Forest Service after the structured interview was completed.

Two interviews mentioned DNR Director Tanner or higher levels

of the DNR as important sources of support.

A variety of other sources, public agencies, or public or private organizations were cited in the interviews. These were: grass roots support of the Division field staff, Michigan Forestry Planning and Development Committee members, the Washington Office of the U.S. Forest Service, forest industry, a major environmental organization in Michigan, the Council of State Governments and the Michigan Department of Agriculture. These sources were cited in no more than one interview each.

Question 3. Plan of work.

The cooperative working arrangements with the SFRP principals from Michigan State University were cited as being critical in the development of the SFRP in all five interviews. The additional analytic talent, leadership and perspectives this arrangement provided as well as the usefulness of personnel not constrained by other Divisional activities and responsibilities were mentioned in these responses.

Question 4. Assessment and program development.

Three of the interviews indicated that the economic problems of Michigan were the most influential external factor in the development of the SFRP. As well as shaping the direction the program took, the state's economic problems created a climate which was receptive to new planning methods and in which there was increased interest in the role of forest resources in Michigan's economy.

The importance of the federal RPA Assessment and Program and

the Provisions for state forest resource programs in the National Forest Management Act were cited in two of the interviews.

Question 5. Public involvement.

There was agreement among the principals that public involvement was not very important in the development of the Assessment, although it did serve to keep people informed of the process.

Most of the interviews indicated that public involvement was useful and had some substantial influences on the Program. Two of the principals interviewed discussed the changes in the program that resulted from the presentation of draft alternatives at Natural Resources Days in March 1980.

Four of the principals felt that public involvement in the SFRP was crucial to developing the needed common sense of direction for the program and to gaining support for the Recommended Program. Involvement of the public from the earliest stages of the SFRP process created familiarity with aspects of the SFRP among some of the public and was also useful in discussing the Recommended Program with the members of the Natural Resources Commission. One principal reported that some Commission members needed to feel confident that various publics had been involved in the development of the program. Also cited in this interview was the importance of the involvement of the state legislature, which passed a joint resolution recognizing forest management in the state, and of the Governor's office, which recognized the importance of the SFRP at a state conference on forestry and in the State of the State Address in the fall of 1980.

APPENDIX D

**RECOMMENDED DIFFUSION STRATEGIES FOR MICHIGAN'S
STATEWIDE FOREST RESOURCES PLAN**

Table D.1. Recommended Diffusion Strategies for Michigan's Statewide Forest Resources Plan Agency Change Target Groups.

Knowledge	Innovation Decision Stages		
	Persuasion	Decision	Confirmation
Sources: Chief Forester Division Director	Opinion Leaders - technical advisors possibly unit leaders	Opinion leaders	Personal, opinion lead- ers, Chief Forester, Division Director
Channels: Inter- and Intra- office	Interpersonal	Interpersonal	Interpersonal Intrapersonal
Media: Memoranda	SFRP Characteristic Sur- vey, small interdivision- al implementation meet- ings and informal com- munications; i.e., coffee breaks, etc.	Professional meet- ings, participation in workshops for pub- lic target. Partici- pation in SFRP Assessment	Progress Reports, Implementation work- shops, participation in presentations to public
Messages: Announcement of institution of SFRP, explanation of SFRP process	Sharing experiences with, perceptions and knowledge of the SFRP especially about posi- tive attributes of SFRP and decrease complexity	Facilitative of try- ing SFRP on for size, stressing other plan- ning successes	Assurances that SFRP will meet expectations by reporting accomplish- ments

Table D.1 (cont'd.)

Feedback: Identify FRM contact person as source for future information and clarification	Identify contact person in each agency as source for information, Meeting summaries, Results of attribute survey	Formal and informal communication with contact person	Progress reports, Workshops to work through difficulties
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Table D.2. Recommended Diffusion Strategies for Michigan's Statewide Forest Resources Plan Public Change Target Groups.

Knowledge		Innovation Decision Stages		
		Persuasion	Decision	Confirmation
Sources:	Chief Forester Division Director	Opinion leaders - public interest and user group leaders	Opinion leaders	Personal, opinion lead- ers, Chief Forester, Division Director
Channels:	Mass	Interpersonal	Mass and inter- personal	Mass and interpersonal
Media:	Radio and TV News natural resource magazines - state distribution sufficient	Person to person, through small workshops sponsored by public groups, also on an agenda of general meet- ings of groups	"Choices" film to group meetings fol- lowed by discussion lead by opinion leader	Radio and TV news releases - progress reports, presentation of results to groups, implementation work- shops
Messages:	Information on institution of SFRP, its benefits to forest manage- ment	Stress relative advan- tage, compatability, of SFRP, explain SFRP as to reduce complexity	Try SFRP on for size, observe successes of other planning efforts	Progress, results, successes of SFRP to date

Table D.2 (cont'd.)

Feedback:	Identify contact persons in FMD, establish list of interested participants	Mailings to participant list, request perceptions of issues in forest management in Michigan from groups and individuals	Mail back results of issues survey, encourage public interest-user groups discussions of issues and how SFRP will deal with them	Implementation workshop format to include sharing of perceptions, questions
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LIST OF REFERENCES

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