RECLAMATION RESEARCH IN NORTH DAKOTA

PART A

RESEARCH PROJECTS AND NEEDS

I. INTRODUCTION

Research on surface coal mining and reclamation in North Dakota received much emphasis during the 1970's and 80's, after the enactment of the state's first reclamation law in 1969. Federal and state grants enabled the creation of a few reclamation research laboratories/centers in the state, where many scientists and technicians dedicated their time and talent in developing the knowledge and techniques deemed necessary to minimize the environmental effects of and economic constraints to surface coal mining. Numerous research projects covering a wide range of mining and reclamation disciplines were conducted at these centers, which focused on both active and abandoned mine land problems. The results of these studies have been, and continue to be, published in various forms including reports, papers in refereed journals and symposia proceedings, popular scientific articles, etc. Most of this material is available for review and has been summarized in this report.

In 1983 the North Dakota state legislature mandated (NDCC 38-14.1-04.1) the creation of a three-member Reclamation Research Advisory Committee, which was required (NDCC 38-14.1-04.2), among other responsibilities, to: 1) develop an inventory with brief descriptions and analysis of conclusions of all past and ongoing reclamation research projects conducted in the state; 2) identify all existing or future research needs; 3) establish priorities and prevent duplication in research; and 4) prepare future reclamation research budgets to be administered by the Commission. It was in compliance with these requirements that the 1984 edition of this report was prepared. That report contained information on reclamation projects, publications, research needs, and a projected cost estimate of conducting research deemed necessary at that time. In the 1996 revised edition much of this information has been updated to provide a more recent assessment of the status of reclamation research and technology in North Dakota. The section on estimated funding requirements has been deleted, however, because reclamation research was largely funded by the Lignite Research Council (created by Executive Order 1987-4) and funneled through the Industrial Commission. Nevertheless, before approving funding for any reclamation research proposal, the Lignite Research Council sought and received comments and recommendations from the Reclamation Research Advisory Committee.

Since the initial publication of this report a dozen years back, the reclamation research climate in North Dakota has changed significantly. The USDA-ARS Northern Great Plains Research Laboratory, where the agricultural aspects of reclamation were first seriously considered and incorporated in its research program, officially ended its active field involvement in reclamation research in 1985. Around the same time the University of North Dakota's 'Project Reclamation', which had been initiated in 1975 with federal funds and later on supported by some contract funding from the Public Service Commission, came to an end in 1984 after years of concentrated work on ecological aspects of mining and reclamation. North Dakota State University's Land Reclamation Research Center, which developed a very good program in the soils and agronomic aspects of reclamation research, was closed in September 1996, for want of continued financial support from the state. Support and enthusiasm for reclamation research is also fading at other university departments/laboratories and in many government agencies which were earlier engaged in one or another aspect of reclamation research. Recently, a recommendation to repeal the law that created the Reclamation Research Advisory Committee has also been made. Apparently, for good reasons, the emphasis has now shifted more in support of those research and development activities that can make mining and reclamation practices less costly and help enhance the quality, value, and marketability of North Dakota coal.

Nevertheless, the fact remains that a substantial amount of money has been spent thus far in conducting mining and reclamation research in North Dakota, and additional funds may yet be needed for addressing some of the outstanding research needs. It is therefore essential to review and assess the overall impact that all this research has had in actually advancing the state-of-the-art of reclamation, and how it has affected the development and refining of reclamation laws and rules in the state. Research and regulation are interconnected in that the research provides a sound basis for making good rules, and rules and regulations challenge research to develop appropriate technology. A good example of this interaction is provided by the alternative rule for soil respreading thicknesses based on the properties of the underlying spoil, that was adopted in North Dakota in 1985. This rule was based squarely on the research conducted by the NDSU-Land Reclamation Research Center.

The interdependance of research, regulation, and technology relevant to mining and reclamation can not be overemphasized (see Figure 1). Reclamation research draws upon a number of basic and applied disciplines of science. For the reclamation research to be meaningful, expedient, and cost-effective, a clear understanding of the research needs and priorities is a must. Also, to avoid repetition of effort and redundancy in research spending, it is crucial to know what research has been already conducted and which problems have found their partial or complete solution. This report is meant to serve such a purpose, as it provides a concise and consolidated picture of the numerous research projects and publications on various aspects of coal mining and reclamation in North Dakota. Also, in preparing this report an attempt to present the material in a non-technical, easy-to-understand format has been made. The Reclamation Research Advisory Committee is aware that this report does not include information on all the projects, publications, or reports pertaining to reclamation research conducted in North Dakota, but hopes that the information presented in this report is useful to the coal industry, regulators, the scientific community, and the interested public.
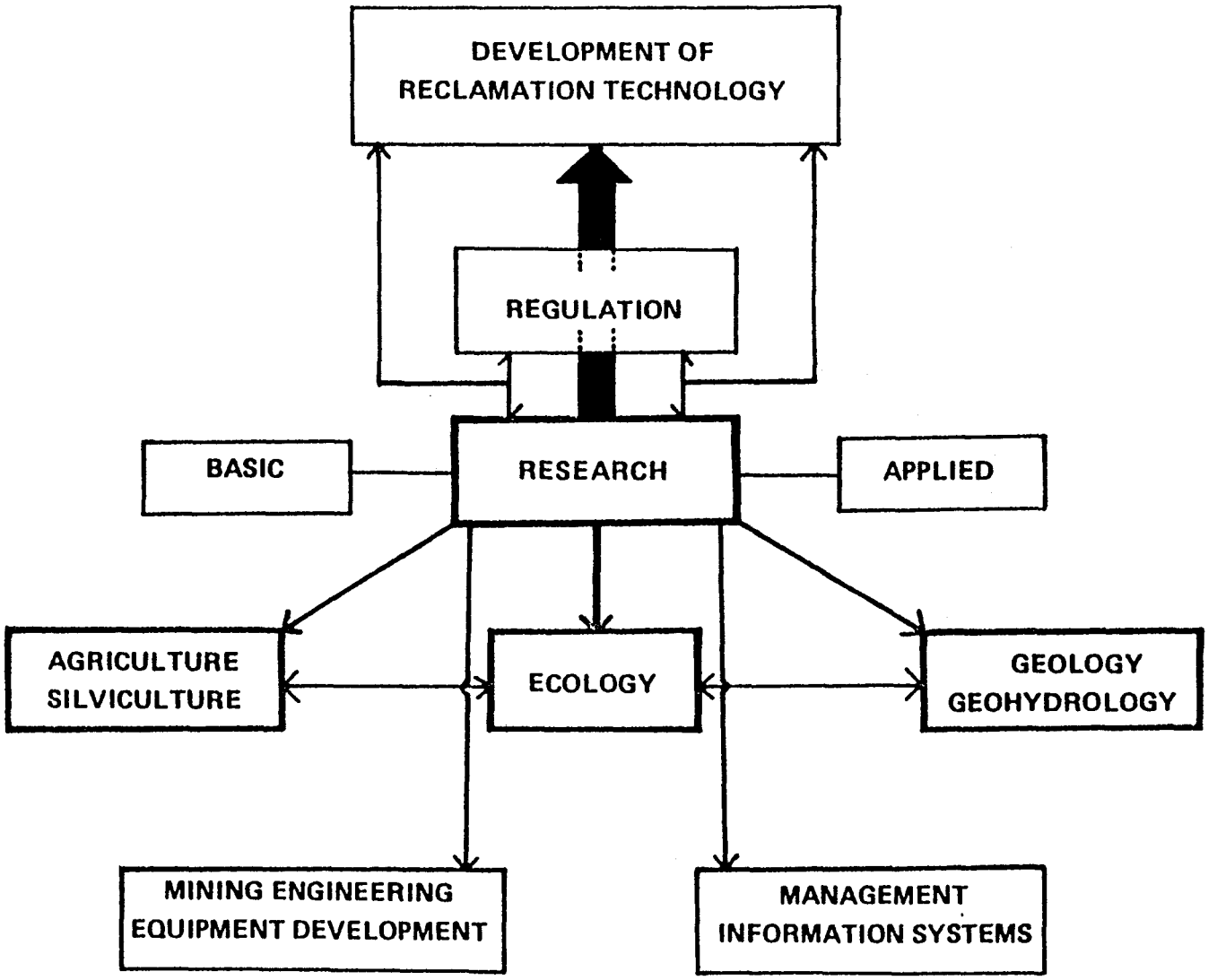
Figure 1. Interrelationship between reclamation research, regulation, and technology.