CHAPTER 1

INTRODUCTION

1.1 GENERAL

Investment in irrigation has been and is, huge, worldwide. Estimates of the World Bank indicate that the total investments in irrigation and drainage to date amount to a staggering US$ 800 billion (World Bank 1990). Over the last 40 years, the area of irrigated land in the world expanded rapidly at an overall rate of 2.7 per cent a year and has reached about 250 million ha now. The expansion of irrigation has been a major usher of the rapid growth of food production between 1960 and 1990. Irrigation has been a source of livelihood for hundreds of millions of the rural poor in the third world. Many countries in the world, especially the Asian countries, had moved from being net importers of food grains to conditions of "self-sufficiency in food".

Despite this success in food production, in recent years, there has been a growing concern that the performance of the irrigated agriculture is less than the anticipated. Seckler (1981) estimated that while India created a potential of 30 million ha, it actually utilised only about 11 million ha. The shortfalls in performance can be cited at almost every level of the irrigation sector. The donor agencies, notably the banks and certain bilateral funding agencies, have begun to feel that the return on investment is not fully justified. Evaluation had reiterated that there has not been commensurate benefits as many of the irrigation systems have not performed to their maximum.
There has always been a greater emphasis on improving the hardware components (construction orientation) than improving the software or management components in the 1960s and 1970s. This resulted in poor performance and underutilisation of the resources (Lenton 1986). The underutilisation was not considered as a technical problem, but as a managerial problem. Consequently, the attention has recently been turned towards improving the managerial components of the irrigation systems.

1.2 THE PROBLEM DEFINITION

In recent years, attempts have been made to improve the performance through several management strategies such as institutional development, human resources management, improved organisational activities, training, financial control and information management. Limited efforts have however been made to improve the system performance from an information management perspective.

Good information is a pre-requisite for effective and efficient operation of the system. Information is crucial for providing a reliable, predictable and equitable delivery of water and for responding to the feedback from the field on a real time basis. The emphasis is that the use of better information by managers leads to better understanding of their systems and, ultimately, to better quality of decision making. Hence, the present study aims at improving the performance of the system through management information system. The general objective is to set up a more streamlined system of data collection, communication, processing and more rational decision making, with necessary feedback and monitoring. This will gradually lead to efficient utilisation of water and other resources.
1.3. FOCUS OF THE STUDY

Management Information System can be developed at different levels, that is, operational (lower or shopfloor management dealing with day-to-day operations and control), tactical (middle level management dealing with short term planning, control and decision making over six months to one year) and strategic levels (top level management dealing with long term policy planning, resource allocation and decision making over five to ten years) involving different resources like men, material, finance and water. In irrigation systems, water delivery system is the key component, playing a major role in the performance of the system. Hence, this research study focuses on the performance of the irrigation system in general and the operational performance of the water delivery system in particular, with emphasis on allocation, distribution and management of water, from the source (reservoir) to the outlets, where the farmers take responsibility. The main objective of the MIS is to refine and improve the system operational plans year after year.

Focus in this study is on the development of an operational level MIS, as management decisions are well structured at this level. It has great potential to produce quick and tangible results when compared with the tactical and strategic levels. Sathanur Irrigation System across the River Ponnaiyar in Tamil Nadu, India has been taken as the study area for this research.
1.4 OBJECTIVES OF THE STUDY

Within the context above, the present research study is taken up with the following main objectives:

i. To make a performance oriented diagnosis of the system and to quantify the existing level of performance of the system

ii. To develop a methodology for improving the operational performance of the system, and

iii. To demonstrate the potential of the methodology in achieving improved operational performance of the system.

1.5 LIMITATIONS OF THE STUDY

Performance of the irrigation system is a complex subject. It is governed by many factors ranging from policy and policy decisions at the Government level to the farming decisions taken at the field level. Focus of this study is limited to the water delivery system (operational level management) concerning with the delivery services provided by the managing agency upto the outlet. It does not go into the specifics of the farming decisions taken by the individual below the outlet. The strategic and tactical decisions at the Government level are unstructured/semistructured. The farming decisions taken by the individuals at the field level are more complex. Therefore the focus is restricted to the operational MIS.

The MIS developed for improving the operational performance is demonstrated only by comparing it with the existing water delivery
performance and the data available on hand. There is also a paucity of data at the micro level (minor canals) to make a quantitative comparison of the potential of the tool in improving the performance. Also, the MIS suggests a few performance indicators such as productivity of water and land, income-expenditure associated with the water delivery and area benefitted by irrigation to assess the system performance at the system level (macro level). Data required for these are also not available either because the current formats used by the agency are not amenable for the application here or inadequacies do exist in data components themselves.

1.6 ORGANISATION OF THE THESIS

Chapter 1 introduces the problem and the objective of the study. Chapter 2 presents some of the essential concepts on the performance of the irrigation system and a review on the performance indicators and standards.

Theory and concepts of the Management Information System, the need for introducing it in the irrigation system management are described in Chapter 3. The review of the MIS applications in irrigation management, and to a limited extent, in public organisations are also presented in Chapter 3. Chapter 4 describes the profile of the study area and the issues in the system operation and management. The research methodology is presented in Chapters 5 and 6. Chapter 5 makes a diagnostic analysis of the existing performance level of the study area and identifies the deficiencies in the existing operational and management procedures. This diagnostic study also identifies the critical activities influencing the performance of the system for which efforts have to be focussed.

The design and development of the Management Information System for the study area is described in Chapter 6. The MIS has been developed with three functional modules, integrating the concepts of the MIS and irrigation system performance. Chapter 7 discusses the results of
the present MIS applied to the study area. Comparison is made with the existing water delivery performance to show the potential of this tool in achieving improved operational performance. Chapter 8 presents the summary and conclusions of the present study and the scope for further applications of MIS.