

Institution of Engineers, Andhra Pradesh State Centre, Hyderabad has selected Er. P. Madanaiah, Consultant working with the Centre for Good Governance, to deliver Er. Matur Gopala Rao Twelfth Endowment Lecture on 10th September, 2009 at 1800 hrs. The extracts of lecture paper of P. Madanaiah, is furnished below

**Er. Matur Gopal Rao Twelfth Endowment Lecture
On
Monitoring and Evaluation of Irrigation Projects**

All of us know that the development of Irrigation infrastructures has made a major contribution to food production and food security in India and throughout the world. Without irrigation projects, the massive growth in agricultural productivity over the last six decades in India could not have been achieved. The development of planning, monitoring and evaluation of irrigation projects is very critical activity and to be essentially formulated for effective implementation. It has to focus primarily on the two main functional areas of the irrigation wings of the Department; one being the development of new irrigation infrastructures including ERM (Extension Renovation Modernization) works and the other; operation & maintenance of the completed facilities.

Creation of new irrigation infrastructures need a comprehensive project management and it shall start from the early stage of project formulation, development and to evaluation. The ability of management of projects greatly influences the cost, quality, schedule, time frame and goals /deliverables in any or all phases. Thus Project management is a combination of planning, organizing and managing resources for successful completion of the project for achieving the designed goals and deliverables and to avoid cost and time overruns. The construction management is the crucial sub-component of the project management and is a combination of technology, construction techniques and organizational management.

On successful completion of the project or a phase/stage, it shall be followed by the Operation and Maintenance (O&M) management of the system which shall aim to provide continuously the optimum designed benefits, ensure efficiency of the system, water budgeting and improved productivity. The operation and maintenance plans and system improvements as needed over the period of time has to be ensured through proper adoption of maintenance plans, monitoring and evaluation by taking timely decisions at all related levels of management.

It is generally noticed that there is an increasing dissatisfaction and disappointment among the beneficiaries and community on the results of irrigation projects, primarily due to postponement of benefits, cost and time overruns, poor systems management, non achieving of all the designed benefits and other related aspects like, R&R, LA etc. Therefore, monitoring and evaluation of the plans are essential to improve the effectiveness of implementation of any project at any stage. Careful project monitoring and evaluation allows administrators and engineers-in-charge, to make appropriate timely decisions on a day-to-day basis and to ensure that projects are carried out as designed and modified when necessary during the process itself.

Project management and monitoring plans including development of Irrigation projects, existed since centuries, but were to be generally managed by the formulators or the main architect of the project. During 1910AD, Henry Gantt, an American Mechanical engineer and Management consultant who is called as the 'Father of Planning and Control (Monitoring &Evaluation) Techniques', developed the famous management tool, known as 'Gantt Charts. Henry Fayol, a French Mining Engineer developed the general theory of Management and created the 5 prime functions of management, which forms the basis of the project and program management. Till 1950, many projects were managed successfully using mostly 'Gantt Charts' and other traditional methods. A further development in project management started

with the formulation of CPM by 'DuPont Corporation' and 'Remington Rand Corporation' for managing plant maintenance projects and "Program Evaluation and Review Technique" (PERT) developed by Booz-Allen & Hamilton.

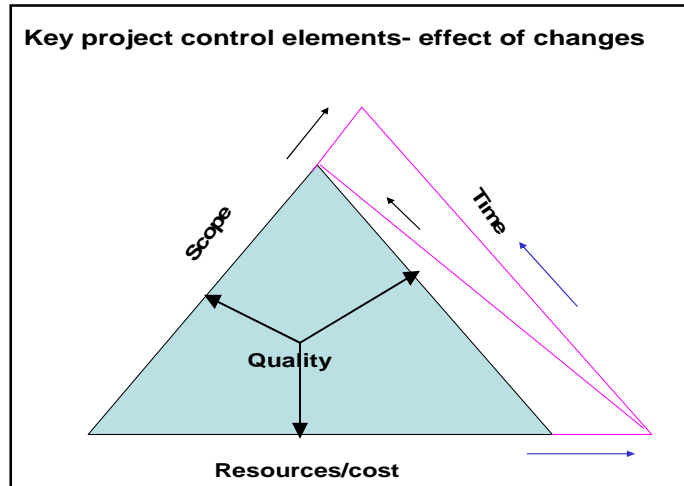
On development of software tools, the new era of planning and monitoring techniques has begun. The software is an easy-to-use tool that handles all types of projects including irrigation projects for planning the programs and continuous monitoring and evaluation. The software programs enable to create Gantt /PERT Charts eases drawing and modifications to the plans and supports in decision making at the management levels. Many Project Management Institutes and organizations have also been established in many countries to serve the interests of the project management industry.

The important and typical development stages or phases of a project are categorized as,

- Formulation
- Design
- Construction
- Monitoring and control (M&E) systems
- Completion

Along with the project planning and implementation, Program monitoring and evaluation techniques have to be designed in order to support policy-makers and implementation agencies to get clear answers to questions such as; what aspects of a program are performing, what are the constraints and whether the designated beneficiaries are benefiting from the program

Project Management is represented by a triangle of the critical constraints, namely; scope, time, and cost and represented by each side. A further refinement is made by adding 'Quality or performance' as the fourth constraint. It is clear from the diagram that one side of the triangle cannot be changed without affecting project management triangle.



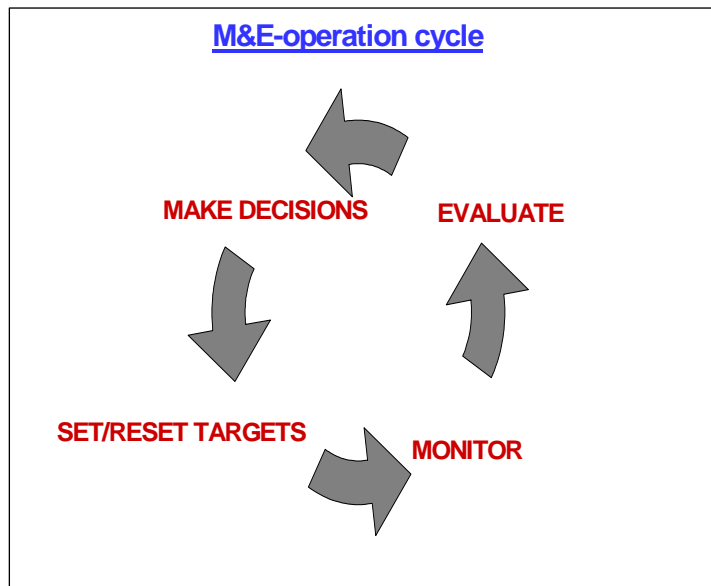
Monitoring is the process of continuous tracking or surveillance of the implementation of the construction of project with quality. It primarily involves gathering information that can be used to determine whether the program is being implemented as planned and therefore achieving its objectives in practice and in the scheduled time. The monitoring focuses on collecting information that indicates whether project inputs have been mobilized, activities undertaken. Thus the fundamental prerequisite for monitoring of an irrigation project is optimum usage of budget and time with optimum output with quality.

Evaluation is the process of systematically and objectively assessing the Relevance, Performance, Quality, Success or Achievement of end goals/ objectives and the desired sustainability of project results or impact of the on-going or completed irrigation projects. Evaluation enables project managers to understand and demonstrate the results of their work, determine the best strategies for achieving their goals and document lessons learned to improve the future programs. Thus the fundamental pre-requisites for evaluation of the project (construction & functional) are the stated objectives and criteria or indicators that measure the achievement of each.

Evaluation process for the irrigation projects is broadly divided into two functional areas; ongoing and periodic. The concurrent or ongoing project evaluation is a continuous activity and provides to incorporate changes that are needed for timely execution and to ensure performance achievement of project deliverables, in the time frame. Periodic evaluation is needed on development of infrastructure in regular intervals and long durations to ensure system functioning and effective deliverances.

Thus the Monitoring and Evaluation are essential for improving the effectiveness of any project.

Careful project monitoring allows managers to make appropriate decisions on a day-to-day basis and ensures that projects are carried out as designed and modified when necessary. The general cycle of M&E is represented by a simple diagram. For proper and effective monitoring and evaluation, there shall be a scientific Reporting



System from all the stake holders, in regular and defined intervals. Reporting is the preparation of written accounts of the progress and/or results of implementation and is one of the primary responsibilities of all the agencies involved in the projects. Reports are the important inputs and tools in monitoring & evaluation at all stages and an essential tool for the management and administration of a project in decision making. Accurate and relevant information enables effective decision-making at all levels in construction/ERM of irrigation projects. All such reports and decisions have to be communicated to all stake holders and involved agencies of the project. Besides sharing information on the performance of a project, reporting is a means by which all the agencies of the project discharge their

accountabilities. In addition, the experiences and best practices could be shared and implemented, based on reports and data. Therefore the development of M&E systems shall be done along with the construction phasing, organizational level planning / re-planning stages and form as an integral part of part of the process, from the very beginning of the activity, decision making during any stage of implementation and to the final stage of completion of all tasks of the project cycle. This ensures that M&E procedures stay relevant to programme of implementation and avoids the common pitfalls of developing M&E as an afterthought. A participatory approach to M&E is essentially formulated and adopted duly involving

- Stakeholders of the project
- Subject Experts
- Staff responsible for implementing the project and collecting & analyzing
- Monitoring data
- The beneficiaries or project participants
- Agencies of financial support, technical support and other support departments such as R&R, LA, Forest, Revenue etc.

The main issues to consider in designing the M&E plans are:

- To establish common understanding amongst programme staff and all other stakeholders about the priorities in M&E
- To match the priorities with organizational capacity, human and financial resources and other required inputs
- To select suitable Framework for Monitoring and Evaluation

The important MIS Techniques generally adopted for Project Monitoring & Evaluation are:

GANTT Charts: for analyzing and planning more complex projects and help to plan out the tasks that need to be completed.

PERT: Program evaluation and review technique (PERT) charts which will depict the tasks, duration, and dependency information etc.

PERT/ CPM: The Critical Path Method (CPM), was developed for the project management and it facilitates to arranges the critical activities dependent on each other. It has become synonymous with PERT, CPM, or PERT/CPM

CPA: An effective Critical Path Analysis can make the difference between success and failure on complex projects. It can be very useful for assessing the importance of problems faced during the implementation of the plan.

MICROSOFT PROJECT and other programs like 'primavera' are very effective for project monitoring and evaluation. They also ease in drawing of Gantt Charts / CPM/PERT/CPA and to make modification of plans and provide facilities for monitoring progress against plans.

Real-Time Monitoring Systems: It provides continuous and high precision monitoring and evaluation of projects using GPS and other modern technologies.

E-tools developed by CGG for monitoring irrigation projects of AP

A Typical client oriented, Project Monitoring System (PMS) embedded with Quality Monitoring for Major and Medium irrigation is developed by the Centre for Good Governance for the Irrigation &CAD Department of Andhra Pradesh and has been adopted.

Further a separate Software programme for monitoring of Minor Irrigation Schemes and allied works is also developed for CADA unit (Works Track System).

In addition an "online tool for Monitoring of Resettlement and Rehabilitation plans", as per State Policies is also developed and launched on web.

suggestions may please be sent to Mr. P.Madanaiah, Consultant, CGG.

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