

Code No. 8242
PGD



Allama Iqbal Open University Islamabad

PROJECT IMPLEMENTATION, MONITORING AND EVALUATION-I

**Code No. 8242
PGD**



Allama Iqbal Open University Islamabad

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PREFACE

The idea of the course on Education Project Implementation, Monitoring, and Evaluation is based on the experiences of several project managers, evaluations of a number of education projects, and the fate of several education projects in the country. It was, however, during the workshops on Project Planning and Costing organized jointly by the Planning Commission and Economic Development Institute of the World Bank (August — Sept. 1979) and the workshop on — Planning and Appraisal of Educational Projects organized by the Pakistan Institute of Development Economics and the Project Planning Centre for Developing Countries, University of Bradford, U.K. (4800) that the problems of project planning and implementation became subjects of concern to both the participants as well as the leaders of the workshops. It was felt that there was a need for an extensive and advanced level training course for education project planners and managers. The Institute of Education (now the Faculty of Pedagogy Literacy, Adult and Continuing Education) of the Allama Iqbal Open University, undertook to prepare the course as part of its Master's degree programme in Educational Planning and Management. A proposal in this connection was prepared by the University and under an ODA (Overseas Development Administration of the British Government) assistance programme an arrangement was worked out for cooperation between the Project Planning Centre for Developing Countries (PPC), University of Bradford, U.K. and the Allama Iqbal Open University for development of the course on "project implementation, monitoring and evaluation". Mike Veitch of the PPC who had been associated with the Planning Commission in connection with the review and improvement of the sectoral PC—1 forms, visited the University in December, 1981 and April, 1982

under the ODA assistance programme and drafted a plan for the course in the first phase of the course development.

In the second phase, the work on the development of the course began at PPC in March—April, 1985 with the development of a detailed synopsis of the course and collection of material for the course. Stephen Doherty of the PPC was appointed to assist in the development of the detailed plan of the course, and writing of the course units. Development of the plan of the course and selection of material for the course was preceded by review of project implementation and evaluation, in both developing and developed countries of the world in general and in Pakistan in particular. Problems of inservice education and training, and scope and limitations of the distance learning system were also discussed in detail. This exercise aimed at making the course practical and relevant to the jobs of project planners and managers.

In view of the fact that most project planning and management terms, concepts, and techniques used in education owe their origin to economic thoughts and industrial concerns, they need to be adapted to education projects. The terms, concepts and techniques of project implementation, monitoring and evaluation were, therefore, carefully selected and translated into education terms, and then illustrated by examples of real projects.

Since the conception of the idea of this course in 1979, so many people have contributed to its development that it is not possible to name them all. However, it was Dr. Ahaukat Ali Siddiqui, the then Director, Institute of Education, Allama Iqbal Open University, and present Dean of the Faculty of Pedagogy Literacy, Adult and Continuing Education, who approved and took personal interest in the development of the course. Of course, if

was the financial assistance of the ODA and the efforts of Mr. Alee. Fleming, British Project Team Consultant at this University who contributed to turning the idea into a reality; But it is Mr. Stephen Doherty presently associated with Industrial Training Service Limited (ITS) Area Office Leeds, U.K., whose name will always be with this course as expert. designer, consultant, writer and reviewer of the course.

M. ATHAR KHAN

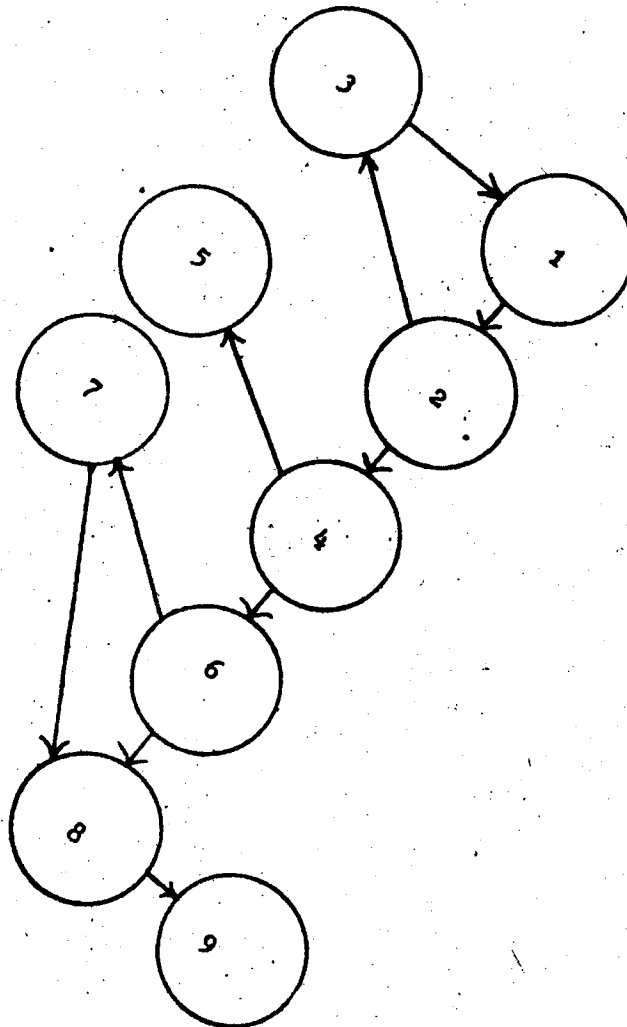
INTRODUCTION

It has been realized both by the trainees and trainers that most of what is learnt and taught during a training or an instruction course in educational planning and management, like many other similar programmes, is not applicable in practical situations with the result that a larger part of the knowledge gained and taught remains unutilized. Besides other things one factor mainly responsible for this situation appears to be interest in the methods of learning and teaching. In these courses a lecturer or writer of course-material takes it for granted that the reader or the student fully understands the concepts and the terms which are used in his lecture or writing. It is a matter of common experience that in 80 to 90 per cent cases, students and trainees do not have standard concepts of the terms frequently used in writings, lectures or discussions. It makes communication defective and the learning becomes intrans-ferable to practical situations. Also most of the terminologies, concepts, tools, and techniques used in educational planning and management are the ones taken from economic and industry etc. and do not in many cases directly relate to education. The course is therefore, designed to give readers a clear concept of a term or concept, translate them into educational context and illustrate them with the examples of their uses in various types of education projects.

For illustrations the authors have depicted the actual projects of the country's education sector. However to conceal the identity of certain projects sometimes the names of the projects have not been re-vealed. Instead, false names have been used for reference.

As shown in the Figure 1, the units of the course are linked together to form a unified whole. They are presented in a developmental sequence. The purpose of the course is not to provide a package of teaching and learning material alone in project implementation, monitoring and evaluation. But the aim is

also to provide the students with a guide or a hand-book which they can use for effective project planning and management.



The first unit contains the background of the situation as it exists in relation to project formulation and implementation, not only in education sector in Pakistan, but it also covers the situation

in general. The unit identifies the problems which are frequently faced by project planners and managers.

The unit aims to acquaint the student with the situation the prospective project managers would be faced with. But the main objective of the unit would be to help the student to have an overview of the course and understand its relevance and applicability for implementation, monitoring and evaluation of education projects.

The unit 2 explains basic terms and concepts used in project planning and management in greater details to provide the readers with a sound base for understanding other units of the course. Study of this unit would enable the student understand the meaning and interrelationships of plan, programme and projects and their purposes. The unit also contains detailed discussions on various stages of the project cycle. Included in the unit are also chapters on project plan, feasibility analysis, project design and project appraisal which provide useful information on project planning which is of value to both the project planner as well as the project implementer.

Since the course is meant specially for project planners and administrators of Pakistan, the unit—3 gives information about the process of project planning in Pakistan with the purpose in view to making it possible for the readers to analyse and understand it better in the background of the information contained in the unit—2.

The unit—4 is in fact the first step in the formulation of projects and key stage in project management and leads the readers to the understanding and application of the content and context of project implementation.

This unit specifically deals with the description and use of the technique of the "Logical Framework". It enables the planners to prepare and review, in a systematic way, logical projects, and

provides a means of communicating the central idea to these concerned with its planning, preparation, implementation, monitoring and evaluation.

The unit—5 comprises examples of the use of logical framework in various types of education projects. The purpose of this unit is to provide the readers with the models which they can use for practical purpose and upon which they may develop their own critical, constructive and evaluation skills.

The unit—6 deals with the concepts of the project environment, and discusses with reference to education projects, various internal and external factors which interfere with their implementation. The purpose of this unit is also to warn the project managers against the factors which might interfere the implementation of the project and which if the project manager is already prepared to face can be controlled.

The Unit—7 deals with application of tools and techniques of project implementation and provides usable information about preparation of a project work-plan. In this connection, the unit traces the logical development and linkage between various network techniques and brings out their uses and implications for management of the education projects.

The unit—8 also deals with the application of network analysis models specifically in the area of scheduling of resources for project implementation.

As a project management organisation has unique functions and characteristics, and combines a mix of central organisation, vertical organisations and parallel organisations, the concept of the matrix management which is most appropriate for such situation, is presented in the unit—9. The emphasis, however, is on the project management organisation and selection of project personnels.

The Units 10—11 are a reproduction of ILO publication "Strategic Management of Development Programmes". The contents of the unit are based on an analysis of some of the most successful development programmes in the world. The author has combined his studies of these programmes with his vast experience in management development to create thought-provoking guidelines for action. Managers and leaders who are keen to operate development programmes more effectively will find this book of great value and ministers and other policy makers who initiate and oversee such programmes will find the lessons of success presented in this unit.

Contents of the Units 12—13 have been reproduced and adapted from "A Handbook on Monitoring and Evaluation of Agriculture and Rural Development Projects" published by the World Bank. The Handbook is directed primarily to those working within a specific project, whose task is to operate the monitoring and/or evaluation systems, and secondly to those responsible for management of the project so that they may better assess what they can expect their monitoring and evaluation operations to provide.

UNIT-1

THE PROJECT MANAGER'S WORLD

**Written by:
Dr. M. Athar Khan**

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OBJECTIVES

On completion of this unit, you will be expected to:

- i) have visualized the situation for which a project manager should prepare himself;
- ii) realize the challenges of the implementation of education projects;
- iii) describe the relevance and interlinkages of the units of the course;
- iv) explain the basic terms and concepts used in education project implementation, monitoring and evaluation.

1. PROJECT MANAGER'S WORLD

While the plans are essential for development, the projects are known to be the "cutting-edge" of the plans. But, how little attention is paid to formulation and implementation of projects, especially in the sectors of national development is evident from the end-results of many of the development projects. In recent years both individuals and national and international organizations have been expressing concern over the fates of the development projects ——— especially in the developing countries.

2. PROJECTS AND THEIR PROBLEMS

In their book *How to Learn from Project Disasters*, Kharbanda & Stalworthy (1983) have presented case studies of several projects from both developed as well as developing countries. They have analysed several projects and concluded that many projects end-up ever-running in cost and time. There are projects which have proved to be "white elephants" because of faulty planning and inefficient management.

Although Kharbanda and Stalworthy (1983) have pointed to the problems of project implementation and management in general and have concerned themselves mostly with the roles of project planners and implementers in general, their views are also applicable to education sector projects. The source of problems of projects according to them lie in the following:—

- 1) Optimistic Project Costing.
- 2) Excessive Delays in Approval and Implementation of Projects.
- 3) Unforeseen Situations.
- 4) Mis-handling of Projects.
- 5) Inflation.
- 6) Unstable Currency Exchange Disparities.

A brief description of each of the above problems with particular references to education, is given below. The author has purposefully avoided to quote the examples of actual projects, but the reader should certainly know of projects which have fallen victims to these problems.

2.1 Optimistic Project Costing

There is a tendency among the planners of development projects to be optimistic about the costs of project. The problem might have its roots in the policy-making and authority structure in the Ministry and Provincial Departments of Education, the system and process of formulation, appraisal and approval of projects, and people might find themselves obliged to give an optimistic cost of a project and this could be done deliberately. Sometimes, the unrealistic costing of project is also caused by inaccurate and limited knowledge of project planners in technical areas of projects which include costs of construction, material, production, personnel organization, costs of consultancies, transportation etc. Whatever the reason, many projects are known to have been delayed, revised or left incomplete for want of the funds required for their implementation.

2.2 Excessive Delay in Appraisal, Approval and Implementation of Project

In the public sector, projects are delayed commonly in appraisal and approval.

In most cases, the gap between the time when a project should have started and the time when it actually starts to be implemented is so big that it completely changes the situation and the manager of the project is left with the project which has to be implemented under entirely new conditions without changing the original plan of the project to adopt it to the changed conditions. The factors responsible for the delays in appraisal, approval and implementation of project are numerous and often inevitable. Since many of these delays occur before a project is handed over to the project manager for implementation, there is nothing that the manager necessitates that the manager must review the project plan with a view to adapting it to the changed conditions, if the situation demands it. This review would help the manager evolve strategies to steer the project through the changed and changing tides.

2.3 Unforeseen Situations

The project plans usually do not provide for meeting unforeseen situations which occur as results of changes in the national and international scenes and policies of the governments and higher levels of administration. Sometimes, projects are upset by incidental events taking place locally. While it is not possible to predict the future, it may be

possible to identify the critical assumptions upon which the project depends for its success.

2.4 Mis-handling of Projects

A very important factor which leads to many education projects to disaster stems from within the administrative or organizational set-up of the project management. Frequent shift of projects from one person or organization, to another, transfers and changes of personnel in the project management organization, and unaccountability of the project management personnel, are most frequent cases of mishandling of projects. This is the experience of many developing countries especially of the Asian Region, and it is commonly agreed that one solution to the problem could be found in establishing a permanent project-specific organization to avoid the situations causing mishandling of projects.

2.5 Inflation

The rate of spiralling inflation, particularly in the developing countries of the world is such that it is bound to disturb the implementation of even a very carefully costed project. The problem is closely related with the unrealistic costing of the projects. Sometimes on purpose and sometime out of ignorance the project planners do not take into account the factor of inflation, which even though it may not be accurately determined, can often be calculated on the basis of the past trends and the present rate of inflation.

2.6 Unstable Currency Exchange Disparities

This factor relates to prices of imported goods and material in the foreign currency. The rate at which various currencies are devalued or revalued has a direct effect on the estimated and actual cost of imported goods and material. Youker and Burnet (1980) have identified seven specially troublesome — and inter-related — problems of project implementation. As these problems have been presented in the context of rural development projects, some of them are peculiar to the rural development projects, some of them are peculiar to the rural development sector. But, in general they do affect implementation of development projects in other sectors also. However, what seems to be a common factor among the problems is that all of them "start with general factors in the environment outside the project and end up with problems within the project boundaries" (P-1).

The problems identified by Youker and Burnett (1980) are:—

- a. The policy environment
- b. The government administrative process
- c. Inaccurate demand for costs
- d. Organizing farmers
- e. Technology and project design
- f. Personnel Administration
- g. Procurement

A brief description of each of these problem areas is given below, with particular reference to education projects:—

- a) *The Policy Environment:* An agricultural project may fail to achieve its objectives if the prices of agricultural products are set at a low level and the farmer is not provided with adequate incentive to grow new crops. In education, this situation may be similar to the problem of the priority which education sector receives among the other development sectors, as well as the incentives given to the teachers, students, parents and other participants of an education project. For example, the project 'P' aimed to educate the illiterate men and women of the country. An experimental pilot project was launched to develop and test the teaching material and methods in actual adult class situations. Thirty to forty adult education centres were set-up by the project team and approximately 1000 adults were registered. The project evaluation reports were indicative of the great success of these centres but, in fact very few adults actually attended them. The expenditure on the project management was approximately seven to eight lakh, of which not more than 10% was paid to the teachers. This amounted to not more than Rs. 150 a month (less than \$10 a month) per teacher. How could it provide any incentive to the teacher for the success of the project? No wonder this and similar other projects end in fiasco.
- b) *The Governmental Administrative Process:* Most common sources of the problems of project implementation are the governmental and administrative procedures and processes. Most common among them are the following:—
 - i. slow and cumbersome decision making,
 - ii. system of financial authorization and disbursement of project accounts,

- iii. ill-defined organizational arrangements at the higher level of administration,
 - iv. lack of coordination among different persons and agencies involved in the planning and implementation of a project,
 - v. the power structure within the organisation, -
 - vi. delegation of powers to the project manager.
- c) *Inaccurate Demand Forecasts:* While preparing the forecast of demand for the services of a project, the project planner is often forced to rely on inaccurate statistical and other data, which result in problems which were never anticipated. In the education sector, the need for reliable data is paramount.
- d) *Organizing Farmer:* As said earlier, the problem of project implementation identified by Youker and Burnett (1980) relate to the rural development and the farmers were participants of the projects referred to by the authors. In projects relating to education, the population which is directly affected by the project, and on whose participation and cooperation depend the success of many education projects are teachers, students, community members and persons associated with the management and organization of education. The education projects usually ignore these people and concentrate more on project management and project organisation. This often results in the failure of a project to achieve its objectives specially where a project aims at bringing certain reforms to the education system.
- e) *Technology and Project Design:* Unlike agriculture and other sectors, technology in education has a special connotation. Choice of technology in education projects is not an easy one. The experience of use of modern technology in education projects, such as computers, films, VCR/VTR, etc. shows that the use of these gadgets in education seldom justifies their cost.
- f) *Personnel Administration:* Staffing a project management organisation often creates problems to the department as the service conditions of various project staff are laid down within the framework of the government regulations. Projects, therefore, fail to attract the right type of skilled personnel. The skill-gap among project personnel remains unfilled and affects its implementation adversely.
- g) *Procurement:* Delays in procurement have been found to result in shortage of supplies. This is partly due to the unfamiliarities of the

project planners and project managers with the procurement procedures and practices. But more often it is caused by the red-tapism and other routines and management habits of the personnel involved in it.

Systems and programmes of project evaluation by the international organisations like Overseas Development Administration (ODA) of the United Kingdom and U.S. Agency for International Development (US AID) and the emphasis which these organisations lay on the evaluation of the projects which they sponsor for developing countries of the world, are manifestations of their concerns for planning and implementation of the development projects.

3. ODA STUDY OF PROBLEMS OF DEVELOPMENT PROJECT

Findings of the project evaluation studies by the ODA (1983) for example point to the following major problems relating to development projects in general:—

1. Taking too narrow a focus.
2. Need to weigh-up alternatives.
3. Ignoring the wishes of the people.
4. Need for manpower and training.
5. Need for flexibility in project design and management.
6. Transfer of benefits to the target population.
7. Need for better monitoring.

As in the case of the problems identified by Kharbanda and Stalowrthy (1983) and Youker and Burnett (1980) the problems of projects listed by ODA (1983) relate to development projects in general. But they equally relate to development projects in education sector also. In the following paragraphs, each of the problems identified by ODA (1983) have been discussed with reference to education project:—

3.1 Taking too Narrow a Focus

Project Planners, in education projects particularly are known to have a tunnel-vision-view of the situation and they fail to see a project in the wider relationship of its mental conditions. Such projects could be successful on paper, but since they are planned "On too narrow a front", they are not successful in achieving the objectives. Most education projects, on their very take-off, fall victim to innumerable environmental

factors. Many of these factors could be controlled if they are taken into consideration while preparing a project plan. Some-times it is only part (B) of a larger area that a development project covers. In such cases although the cost may be high and the objectives of the project could have been fully achieved, in fact, it may contribute little to improve the total situation.

3.2 Need to Weigh-up Alternatives

Findings of the several evaluation studies of the projects carried-out by ODA show that projects are sometimes formulated in a hurry. The project planners do not have time to consider alternatives. In such cases they simply present very optimistic views of the out-comes of the projects and justify it. It narrows down the choice of decision making. In Pakistan, it has been a practice that the money which was made available to the education sector has been invested in projects which have little value, whereas many important areas of education where investment was needed were totally ignored.

In Pakistan, the system of project identification and formulation in education is such that they do not have room for alternative decision making relating to the approval of projects. In cases where a project forms the basis for an Annual Development Programme (ADP) and or a Plan (the Five-Year Plan or an Annual or Mid-Term Plan) in education, the project is already identified leaving no room for any change in it. In cases where a project is derived from a plan or a programme, the major concern appears to be the implementation of the plan within the limited time and limited budget allocation. Perhaps the principle dominating the policy decisions is that "It is better to have a project than to do nothing".

3.3 Ignoring the Wishes of the People

A study of several projects has shown that in formulating their objectives and targets, sufficient attention is not paid to the social factors or the actual needs of the community where a project is located. There may be reasons locating projects in areas where they are not even needed by the people, but usually such projects fail to produce anything which is of real value to the people. They result in-wastage of money and resources. The problem relates to a situation where a project is based on decision taken on political or other conditions. And the needs of the larger number of people for whom the project should have been undertaken, are ignored.

3.4 Need for Man-Power and Training

The ODA evaluation study has revealed that sometimes capital is provided for the projects where the skills required to implement them are not sufficient. In Pakistan, there are projects which have resulted in failure for reasons that the manpower required for implementation of a particular project was not available and the training facilities promised in the projects could not be provided. In one project, a large sum of money was spent in producing certain instructional material which remained un-utilized because the training of personnel in the use of that material could not be organized effectively. In another case, the scheme of starting guidance and counseling service in high schools of the country proved to be a failure because the personnel capable of organizing guidance services in schools were not available.

3.5 Need for Flexibility in Project Design and Management

It often happens that there are changes in the circumstances surrounding a project and there is a need to make certain changes in the objectives and plan of the project. A rigid adherence to the original plan of a project may sometimes be like "stretching or cutting the man to fit the size of the bed". It may cause a project disaster. It is, therefore, essential that the projects' plans and its objectives should be implemented in a flexible enough way to incorporate the situational changes and allow adaptations as required during the implementation of the project.

The main document upon which the implementation of a project is based is known as PC-I form and it has long been criticised for its inadequacy for project planning. The form does not provide any flexibility of designing to adapt a project to the unforeseen situations. Similarly, there is lack of provision for flexibility in the project management structure for adapting it to the changing staff and manpower requirements as the project progresses.

3.6 Transfer of Benefits to the Target Population

This problem is very much related to the problem 3.3 above. It has been observed again and again that a large portion of the budget of a project is spent on the project organisation and very little monetary or other benefits of a project reach the persons who are actually responsible for its implementation. Also in certain cases projects have been found located where they are not needed and the beneficiaries of a project are those who do not need or are not able to benefit from them as others do.

3.7 Need for Better Monitoring

The problem of lack of monitoring is also common in education projects. Either there is practically no monitoring of project implementation or it is in the form of a few charts and diagrams which serve more for decoration rather than project monitoring. One of the major findings of the project evaluation report of the ODA points to the fact that an effective system of monitoring is badly needed to ensure that the projects are successful and that the things do not go very wrong with a project before corrective action taken.

In 1978, a section of the Planning and Development Division of Government of Pakistan reviewed a number of development projects in various sectors with a view to evaluating the efficiency of their implementation. The review report revealed that "Certain Common Bottlenecks exist for most of the projects reviewed." These bottlenecks were found to exist in financial, administrative, political and general areas. But, in fact they relate to the planning and implementation of projects in general and could be overcome by their careful planning and implementation.

Following are some of the bottlenecks identified by the Commission.:-

- a) Unrealistic financial phasing of projects and programmes.
- b) Uncertainty and inadequacy of events
- c) Fluctuation in foreign exchange rates.
- d) Inflation and price escalation
- e) Wrong assumptions about price of inputs
- f) Inappropriate planning and forecast of procedure for loan negotiation
- g) Lack of expertise in conceiving and preparation of developmental scheme on realistic basis
- h) Lack of cooperation between various departments and agencies.
- i) Proliferation of corporations having relatively lowly experienced officers to manage them
- j) Lack of delegation of financial power to appropriate level in the field
- k) To lack or even an absence of appropriate progress in monitoring fields
- l) Approval of economically and financially non-viable projects
- m) Over staffing in certain projects

- n) Wrong location of projects
- o) Award of contract to non-deserving parts
- p) Shortage of appropriate manpower.
- q) Shortage of certain key inputs imported or local
- r) Unexpected events and incidents
- s) Long term planning.

So far the problems common to project as seen by individuals and national and international organisation have been presented with particular reference to education projects. A synthesis of all the problems listed in the foregoing pages would help avoid many of the problems which relate to most education projects. Some of these problems, the reader would have noticed, are beyond the control of project planners and managers. But most of these problems, if taken into consideration by the planners and managers at the time of preparation and during the implementation of projects they could be overcome without letting them cause much damage to a project.

The individuals and organisations who have been quoted above with reference to identification of the problems of development projects have also suggested a number of steps for improvement of the situation. The suggestions mostly relate to the jobs of educational planners and managers and imply the use of scientific methods of formulation, implementation, monitoring and evaluation of projects. This course of project implementation, monitoring and evaluation is based on the training needs of the personnel currently engaged in formulation and implementation of projects and the prospective planners and administrators who would be signed to perform these jobs in future.

Sometime ago, the problem was also realised by the Planning and Development Division (1978) and it was once considered essential to introduce "more scientific and modern methods of monitoring progress of projects and controlling their cost through network analysis" (p.8), but for the project executing agencies, specially in education sector, the job would not be an easy one. The use of the modern methods and techniques of project monitoring — of which the network analysis is only one, — requires both education and training. In education, the use of the project monitoring methods suggested by the Planning and Development Division becomes even more difficult as the methods have mainly been devised to cater to the needs of Industrial, Agricultural, Rural Development and other sectors, and are based on the theories and concepts of general economics. There has been limited experience of their application, where the focus is not on the conversion of material inputs into

outputs but teachers; students, curriculum, educational facilities and qualitative considerations. The returns to investment in education are not always measureable in quantitative terms, and they are not always immediately visible. So the techniques of modern management could not be applied to education because of the different economic basis upon which many educational decisions are made. However, sound planning is necessary in all sectors where best use has to be made of limited resources.

The use of the modern methods and techniques of monitoring in education projects, therefore, requires adoption, modification and adaptation of economic and industrial terms and concepts to what is "educational". Eventually, for an educational project planner and implementer, it is essential that he.

- a) must have a thorough knowledge and understanding of the terms and concepts of economics and industries.
- b) has command over the use of the methods and techniques of project preparation, management, and evaluation, and for this purpose it is also necessary that he receives systematic and comprehensive education and training in the preparation of tools of project monitoring and evaluation.

5. SELF ASSESSMENT QUESTIONS

Before you proceed to the next unit, make sure that you can answer the following questions:—

- 1) Why do many education projects over-run in cost and time?
- 2) What are common causes of most education projects' failures to achieve their objectives?
- 3) What problems do you anticipate to face in implementing an education project if you are appointed as manager of the project?
- 4) What are your suggestions for improving the implementability of education projects?

REFERENCES

Kharbanda, O.P. and Stalworthy, E.A., *How to learn from project*

disasters, Gower Publishing Company Limited, Aldershot, Hants, England, 1983.

Youker, R. and Burnett, N. *Problems in implementing development projects*, EDI training material, CN854, International Bank for Reconstruction and Development, 1981.

Lessons of Experience: Evaluation Work in ODA. Her Majesty's Stationery Office, London, 1983.

Monitoring of development projects during the period from August, 1978 to October, 1978, Government of Pakistan, Planning and Development Division, 1978.

GLOSSARY

The Glossary consists of the terms commonly used in project planning, implementation, monitoring and evaluation. The glossary has been included in the unit 1 to familiarise the students with the meaning of the terms which they would come across during the study of this course in particular, and literature on projects in general. The terms in the glossary are not necessarily the ones used in this course. Also some of them have been taken from various sources such as the papers of various agencies of the United Nations and the British Overseas Development Administration (ODA) etc. The purpose is to present the terms in a broader perspective and lessen student's dependence on dictionary for comprehending the contents of this course.

Appraisal:

Appraisal is being increasingly used to refer to the process of assessment of requests for technical assistance prior to their endorsement or approval by the donors.

The processes the result of which provides a basis for decisions on requests for assistance in the light of established criteria, such as: relevance to the development objectives to be attained, propriety in terms of legislative and other requirements of the international system of development assistance, operational feasibility, and cost-benefit studies.

The process of examining the attractiveness of a project, from economic, technical, social and other viewpoints, before the investment is made.

The scrutiny to which a project is subjected prior to making a decision whether to approve it.

Appraisal is the critical examination of the design and potential effectiveness of a project for which UNDP assistance is requested, based on the prescribed documentation and other available information and undertaken by UNDP at the designated levels . . . The purpose of appraisal is to determine whether a project for which UNDP assistance is requested, provides — as designed — a reasonable assurance of its effectiveness.

Assumption:

A situation or a condition which must be assumed to exist if and when the project is to succeed, but over which the project management team may have little or no control.

Example: Increased crop yield (project purpose) will contribute to expanded export of agricultural crops (sector goal) only if price and market conditions are favourable (assumption).

Assumptions reflect those conditions (or linkages) which must be satisfied if the hypotheses of the project are to be met. Many of these conditions (policy inputs, coordination between government or outside agencies, natural factors, assured supply of material or financial inputs for follow-up, etc.) have a very close bearing on the effectiveness of the technical assistance project but are not within its direct purview.

Prerequisite (assumptions): An event or action which must take place, or a condition which must exist, if a project is to succeed, but over which the project team has little or no control.

Assumptions are statements describing certain anticipated external considerations, events, or factors which influence the success of an activity, but the effects of which must be assumed to exist or to occur because they are largely outside the control of those responsible for the activity.

Examples:

- * For an agricultural project, price, market and weather conditions will remain relatively stable.
- * A family planning programme will be socially and culturally acceptable in the area in which it is to be implemented.

- * Where more than one currency is to be utilized for an activity, or where multi-country procurements are involved, there will be no sharp or drastic changes in foreign exchange rates which would affect the overall resources required.
- * Key project or programme personnel will be available with no major disruptions in work schedules, such as might be caused by major illness, accidents, or other incapacity.

Audit, Internal:

An audit made by persons on the staff of the organization whose accounts are being audited, primarily for the purpose of internal control (hence "Internal Auditor").

"Audit, External: An examination and review aimed at verification and certification of an organization's accounts by an independent auditor appointed and given terms of reference by the appropriate authority of the organization (hence "External Auditor").

Autonomy:

The degree of freedom a programme agency enjoys from its parent ministry/department in important areas of decision making and action, such as internal fund allocation, operational plans for service delivery, recruitment, remuneration and promotion of personnel.

Benefit-Cost Ratio:

The ratio of total discounted benefits over a project's life to total discounted costs.

Border Price:

The value of a good if it were to enter international trade. An exportable good would be measured f.o.b (free on board, but would deduct domestic transport to the point of departure). An importable good would be measured c.i.f. (cost, insurance, freight, including domestic transport from the point of entry to the point of use).

Comparative Advantage:

An economic principle whereby countries specialise in the pro-

duction of goods and services for which they are relatively better endowed.

Consumers' Surplus:

The benefits a consumer gets when he/she is provided with a good or service at a lower price than he/she would be willing to pay.

Cost-Benefit Analysis:

A method of appraising projects that consists of quantifying costs and benefits, expressing them in annual streams over the life of the project, and discounting the resulting net annual flows to obtain a present value.

"Normally, *cost-benefit analysis* implies measuring both the cost and the benefits of an action in comparable terms, usually monetary, so as to determine whether the benefits exceed the costs or to assess which of several alternatives is likely to yield the best ratio of benefit to cost.

Cost-Effectiveness Analysis.

An appraisal method that consists of defining the objectives of the project and choosing that solution which minimises total discounted capital and recurrent costs.

Cost-effectiveness analysis assumes that the benefit is worthwhile and attempts to identify the least costly of two or more ways of attaining it.

Cost Recovery:

The attempt to earn revenue from a project or programme whether from fees, tariffs or other prices, sufficient to defray all or part of the cost of that project.

Cross-Subsidisation:

The application of the proceeds from a public service, deriving from its profitable parts, to keep providing that service to users where it would otherwise be unprofitable (e.g. because of their remoteness from the rest or their inability to afford the full economic charge).

Demand Mobilisation:

The use of media, incentives, participation and leadership to make beneficiaries and the general public aware of and utilise a programme. This implies the use of financial, physical and human resources to provide services to meet mobilised demand.

Development Project:

An aggregate of activities that have a definite time limitation and a pre-determined amount of resources and that are directed towards the attainment of precisely defined quantified objectives.

Discounting:

The procedure whereby future values of costs and benefits are reduced to reflect the lower value that society, firms, and individuals place on future costs and benefits compared to those arising now. The discount rate is the rate, analogous to a negative rate of interest, at which future streams of costs and benefits are written down. Discounted cash flow is a common method of financial appraisal in which net annual cash flows from a project are discounted using the appropriate annual discount factor and summed to produce a net present value.

Dominant Goal:

A clear, well focused, major objective of a programme expressed in qualitative and quantitative terms.

Economic Incentives:

Include the economic and non-economic benefits and bonuses available to staff members and the prices paid to suppliers.

Economic Rate of Return.

A measure of the return on funds invested in the project, but — unlike the financial rate of return — the ERR looks at it from the point of view of the economy as a whole. This necessitates adjustments to the costs and benefits to correct for any distortions caused by, for example, monopoly or price controls, and the elimination from prices of taxes and subsidies since these are transfer payments rather than resource costs.

Effectiveness:

(a) Are the objectives being achieved? and (b) what are the reasons for success or failure?

. . . a project is considered effective when (a) it has achieved its immediate objective and (b) the results of that achievement are utilized appropriately as part of a wider programme of coordinated and inter-dependent efforts aimed at attaining the broader development objective.

Effective Autonomy:

The degree of autonomy an organisation actually enjoys, which may differ from that defined in its legal character.

Effectiveness:

Is an expression of the desired effect of a programme, service or institution in reducing a health problem or improving an unsatisfactory health situation. Thus, effectiveness measures the degree of attainment of the predetermined objectives and targets of the programme, service or institution. The assessment of effectiveness is aimed at improving programme formulation or the functions and structure of health services and institutions through analysis of the extent of attainment of their objectives . . . The evaluation of effectiveness should also include an assessment of the satisfaction or otherwise expressed by the community concerned with the effects of the programme, service or institution.

Evaluation:

Of technical assistance consists essentially of two integral elements — effectiveness and efficiency — which must be studied together. Effectiveness of a technical assistance project is determined by the extent to which the project output is (or is likely to be) used for development follow-up. Effectiveness is thus concerned with an evaluation of the relevance, adequacy and timing of project objectives or output for a specified development follow-up irrespective of the means employed to achieve this output.

While effectiveness is a value judgement on the usefulness of the *outputs* of technical assistance, efficiency is concerned with the utilization of *inputs* made available to achieve these outputs. A technical assistance project can thus be efficient without being effective or vice versa.

Effectiveness is a measure of the extent to which an activity achieves its objectives.

Examples:

- * If the objective of both projects is to increase industrial employment, a training project that placed 90 per cent of its graduates in jobs may be considered more *effective* than a comparable one that places only 40 per cent of its graduates.
- * If the objective of both programmes is to increase fertile land and thereby agricultural production, an irrigation programme providing a stable water supply *may* be considered more *effective* than a comparable one providing an erratic water supply.
- * If the objective of both administrative processes is to resolve medical claims, a group which correctly processes claims 95 per cent of the time *may* be more *effective* than one that has an 80 per cent correct processing rate, even though the second group processes a greater number of claims overall.

Efficiency is an expression of the relationships between the results obtained from a health programme or activity and the efforts expended in terms of human, financial and other resources, health processes and technologies and time. The assessment of efficiency is aimed at improving implementation, and adds to the review of progress by taking account of the results. . .

Efficiency: (a) At what cost are the effects being achieved? Do the benefits justify the cost? Are there less expensive means of achieving the same objectives? (b) In the event benefits no longer justify the cost, what changes have transpired since the preparation of the original design to bring this about?

Efficiency, on the other hand, refers to the cost and speed of project operations and the quality of the work done. There is no evaluative element in efficiency analysis with regard to the nature or relevance of the stated project objectives or output (in relation to development follow-up) Efficiency in this sense is synonymous with cost-effectiveness in as much as it implies consideration of alternative approaches to the achievement of outputs or objectives already determined or assumed to be worth achieving.

Efficiency is the productivity of an activity's implementation process — how well inputs were converted into outputs. Efficiency analysis usually compares alternative ways of conducting an activity to find that alternative which requires minimum inputs to achieve some fixed goal or produces maximum outputs from a fixed quantity of inputs.

Elasticity.

(of demand or supply): Responsiveness of demand or supply to changes in the price of a good (price elasticity) or to changes in the incomes of consumers and producers (income elasticity).

Environment:

Those forces outside a programme which create opportunities for, as well as constraints on, its growth. Forces inside an organization's boundaries are generally subject to management control. Important forces outside its boundaries in its environment, can only be influenced, or if not *influenced*, must be understood and appreciated.

Evaluation:

Investigation of how a project turned out in comparison with what was expected of it (see Appraisal).

Evaluation is not to be confused with routine monitoring, audit or inspection activities which are concerned largely with administrative or financial matters or operational problems that might arise periodically in the lifetime of a project.

It is in this examination of the development assumptions that evaluation goes beyond monitoring, inspection or audit.

Evaluation is different from monitoring — and this cannot be emphasized too strongly. It is undertaken separately and is distinct in nature and scope from monitoring. While monitoring is the review of the progress of a project in the light of parameters established in the Project Document, evaluation requires that a project be examined *de novo* by persons not closely associated with its formulation and implementation (including monitoring). It calls for a fresh and independent assessment of the project's design, implementation, results and effectiveness, aimed not only at determining the progress made and identifying the causative factors, but also verifying whether the project was properly conceived

and designed in the first place and whether it is so at the time of the evaluation.

Evaluation is also different from appraisal essentially in its timing. While the appraisal of a project is undertaken prior to approval by UNDP of the assistance requested for it, evaluation is undertaken *after* the approval, at any time during the project's implementation or after its completion.

Evaluation is the critical examination of an ongoing or completed projects' design, experience, results and actual or potential effectiveness.

Evaluation may be broadly defined as a systematic examination of the objectives, design, implementation and results of a programme, project or process in order to provide a basis for improving the planning and implementation of policy and of current and future activities.

Evaluation: The analysis of project/programme results against objectives in order to assess the extent to which the latter have been, or are being realized as well as to explain any discrepancy between results and objectives.

Evaluation is a systematic way of learning from experience and using the lessons learned to improve current activities and promote better planning by careful selection of alternatives for future action. This involves an analysis of different phases of a programme, its relevance, its formulation, its efficiency and effectiveness and its acceptance by all parties involved.

In the abstract, programme evaluation consists of passing an informed judgement on:

- (a) The quality and timeliness of the outputs delivered;
- (b) The impact of these outputs, especially the extent to which the stated objectives have been attained.

Evaluation in the context of this note refers to a simultaneous assessment of *all aspects* (social, economic, technical, institutional and managerial) of an on-going or completed technical assistance project or programme. It is the process by which at any point of time the direct and indirect results of a project or programme are determined and critically reviewed to assess the rate of progress towards attaining the immediate project objectives and the development action which the project is expected to assist.

Evaluation aims at measuring, whenever possible in quantitative terms, and according to well-defined criteria, the major direct and indirect effects of a certain activity, taking into account its objectives as established before its inception.

The evaluation function consists in the continuous measuring, monitoring and reporting of programmes and activities on a selective basis to determine the degree of effectiveness, efficiency and economy achieved in relation to established goals and objectives. This evaluation process, serving as "feed-back provides a basis for the next cycle of planning and programming."

Evaluation is the analysis of project results against project objectives in order to assess the extent to which the latter are being, or have been, realised by the project as well as to explain any discrepancy between project results and the objectives. Both the development and re-assessment of objectives may also be part of evaluation.

Sometimes it is also considered that the concept of evaluation would be more clearly understood if it were related to four distinct phases in development assistance activities, in each of which elements of evaluation entered to a greater or lesser extent. These phases were: identification of needs, appraisal of requests, operational control, and evaluation of context, was only one phase in the process.

Evaluation. . . should not be used to justify past actions or merely identify their inadequacies. It is essential to perceive evaluation as a decision-oriented tool, and to link the evaluation process closely with decision-making whether at the operational or the policy level. The very process of carrying out evaluation can be just as important as the conclusions drawn, since involvement in the process itself often induces a better understanding of the activities being evaluated, and a more constructive approach to their implementation and future action required.

Nature of Evaluation. It is necessary to avoid too ambitious or elaborate objectives and methodology of evaluation. The approach in FAO should therefore be pragmatic and flexible. In the process of formulation, implementation and built-in evaluation, there should be emphasis as far as feasible and reasonable on quantification and the use of at least objectively verifiable intermediate indicators or, failing that, on the measurement of actual inputs compared to estimated requirements. The programme management system should, as envisaged, intensify efforts to: define objectives more clearly and concretely, produce

more specific workplans, monitor resources planned and consumed and activities planned and accomplished, and correct deviations at the earliest possible stage.

Expected Impact: The expected impact must be some change in Member States or in relationships between them, not the mere completion of the planned activities.

Extension:

Attempts to induce producers to adopt new or improved techniques or practices by providing direct advice and demonstration. Usually applied to agricultural services, but also applicable to the promotion of small-scale industry.

Externalities:

Those costs and benefits of a project which do not accrue directly to the agency undertaking it and which cannot be directly attributed to the project.

Feasibility Study:

Examination of all the important aspects of designing, constructing and operating a project. Sometimes used interchangeably with appraisal, but an FS is usually longer, more detailed and more technical. An appraisal is often done by the client or financier for their own decision purposes, using material contained in the FS.

Impact:

Impact is an expression of the positive effect of a programme, service or institution on overall health development and on related social and economic development. While a programme may be effective in that it has attained its objectives, the attainment of these objectives may, in fact, make little or no contribution to overall health and related socio-economic development. The assessment of impact is thus aimed at identifying any necessary change in the direction of health programmes so as to increase their contribution to overall health and socio-economic development.

Impact is an expression of the changes produced in a situation as the result of an activity which has been undertaken. (this impact should be identifiable at the level of the specific or immediate objectives to

which the activity is directed (labelled as Level I below), as well as at the high level of broader, long-range objectives to which the activity is expected to contribute (level II below).

Example.

- * Level I: Interest shown in a use made of an action-oriented report on air pollution following a research study or conference.

- * Level II: Passage and successful implementation of a new law to eliminate certain air pollutants as part of a broad-scale environmental protection programme.

- * Level I: Institution of new tax collection procedures and utilization of new training course knowledge by tax collectors.

Level II: A substantial increase in governmental tax revenue from these and other activities designed to increase revenue flows.

- * Level II: Successful utilization of wind-powered energy techniques from a rural water-supply project.

Level II: Adoption of similar applications of alternative technology in a rural development programme.

- * Level I: Successful and productive utilization of new office word-processing equipment.

Level II: Ability to respond much more rapidly and efficiently to requests for information and a reduction in staff increases.

- * Level I: Diversification of exports of primary and manufactured products.

Level II: Stabilization of export income as a result of the diversification programme in combination with other fiscal, currency, and trade agreement efforts.

- * Negative impacts can also occur, as in

Level I: A successful timber harvesting programme which raises employment and incomes, but also creates.

Level II: Serious land erosion and river sedimentation problems.

* And impacts may also be unexpected, as in

Level I: A flood control project which sharply reduces flooding and thereby contributes to

Level II: Improved agricultural production in a rural area (but also provides the unanticipated positive impacts of creating a new recreation area, which in turn vitalizes small-scale handicrafts activities and provides new sources of income for a previously-isolated rural population).

Impact Indicator:

Variable for estimating the change in health or socio-economic situation brought about by the programme or project activities. For example, the maternal and prenatal mortality rates as indicators of the effectiveness of a scheme for improving obstetric care or the diminution of absenteeism rate as the consequence of a programme of occupational health.

Import Substitution

A process of industrialisation consisting of the domestic production of items formerly imported. It is normally done with various forms of protection against foreign competition, such as tariffs, exchange controls, discriminating public procurement etc.

Indicator:

An explicit and objectively verifiable measure—either direct or indirect (proxy)—of results expected.

Indicators and criteria are used as aids throughout the evaluation process. . . *Indicators* are variables which help to measure changes. *Criteria* are standards against which actions can be compared.

Indicators are objective and specific measures of changes or results expected from an activity. (They are designed to provide a scale

against which to measure and show the activity's progress toward producing its outputs and achieving its objectives. A given activity might well use several carefully chosen indicators, or indirect "proxy" indicators where direct measurement is not feasible. The indicators can also be stated as specific targets to be achieved at specific points in time during the implementation of the activity, or categorized by type—such as output indicators or impact indicators.

Examples.

- * Percentage of children in a target group receiving supplied food.
- * Number of hectares surveyed.
- * The number of loan applications received (or processed, or approved).
- * Number of persons employed after completing a specialized skills training course.
- * Unemployment rates.
- * Sales of a publication series.
- * Utilization rate of a computer centre.

Information System:

The procedures for reporting, monitoring, and for reviewing and controlling the achievement of objectives.

Infrastructure:

(Economic or Social). Basic public services economic infrastructure is normally of a physical nature, covering such items as roads, railways, ports, airports and power systems. The main items of social infrastructure are education and health services, though housing, water and sewerage can also come into this category.

Inputs:

Inputs are the resources required for carrying out the project's activities, producing its outputs and achieving its immediate objective.

While they may be provided either by the Government or the UNDP, they should, in the first instance, be conceived in terms of the totality of resources needed for the project, before the sources of supply of particular inputs are decided on.

"Inputs: Actions taken or goods and services (personnel, commodities, training, etc.) provided by donors or beneficiary with the expectation of producing certain definable outputs."

Inputs are the goods, services, personnel and other resources provided for an activity with the expectation of producing outputs and achieving the activity's objectives.

Examples:

- * Building materials.
- * Technical advisor services
- * New varieties of seeds
- * Textbooks
- * Credit
- * Feasibility studies
- * Machinery
- * Research or training fellowships.
- * Raw statistical and economic data
- * Budgeted funds
- * Expert consultant services
- * The subject matter and preliminary agenda for a conference

Inspection:

Is the examination of the execution of field activities with a view to improving and strengthening the action undertaken by the Secretariat at the request of, and in co-operation with, Member States, in particular

through checking the extent to which projects are fulfilling their stated objectives, providing advice and orientation for staff away from headquarters and detecting shortcomings in the management of an activity by headquarters or field staff.

Internal rate of return: see Economic rate of return

Inspection: An extraordinary outside intervention taking place in the course of the life of a project in order to check on particular aspects or problems that ordinary procedures may be unable to discern or correct. Inspection is likely to involve making recommendations for the resolution of any problems which may have been detected.

Linkage Effect:

The effect of a project on investment, prices and output in related industries and trades. Backward linkages (sometimes known as upstream effects) occur in sectors that supply goods and services to the project, while forward linkages (downstream effects) arise in industries that use the output of the project.

Matrix Structure:

A form of organisation designed to focus on both diverse outputs or services and the functions relevant to them. Under this arrangement, many members of staff simultaneously report to two bosses. Thus there is a dual authority (control) structure.

Methodology:

Is the particular set of selected analytical methods and techniques used to perform the evaluation of an activity.

Examples of various analytical methods, which might be chosen and combined to form a methodology for a particular evaluation or type of evaluation include the following, in a rough progression from less to more complex and elaborate.

- * Content analysis of documents and reports.
- * Comparative analysis of:
 - planned results (objectives) with actual results
 - standards or criteria with actual results

- “baseline” data (the original situation) with actual results
- the activity with similar activities
- legislative guidance with actual operations
- * Physical inspections.
- * Inventory taking
- * Questionnaires
- * Interviews
- * Synthesis of other relevant evaluations and reports
- * Cost analysis.
- * Productivity analysis
- * Selection and/or application of progress indicators
- * Statistical sampling and inference.
- * Operations research techniques.
- * Economic or econometric analysis
- * Cost-effectiveness or cost-benefit analysis.
- * Modelling and simulation.
- * Control group/treatment group comparisons.

Methodology may be defined as the application of a concept through the use of appropriate methods and techniques. As regards evaluation, the basic concept remains essentially the same, but the methods and techniques vary according to the characteristics and requirements of each case. It is clear, therefore, that no one standard methodology will apply to all evaluations.

Monitoring:

Overseeing the physical implementation process to ensure that actions and decisions are as actually agreed upon, inputs are made avail-

able on time and are properly utilized and actions are occurring within the planned time-frame.

Monitoring is overseeing the progress of a project to ensure that the project is being implemented as set forth in the project document. The purpose of monitoring is to identify and bring about those actions necessary to utilize opportunities for improving, or to correct problems relating to, the implementation of a project and the effective utilization of its results.

Monitoring is the continuous gathering of information on project inputs and objectives, and on conditions and complementary activities that are critical to the success of the project.

Financial Rate of Return:

A measure of the financial profitability of a project from the viewpoint of the enterprise undertaking it. It is the discount rate at which the present value of the costs would equal that of the benefits. Put differently, it is the maximum interest rate that the enterprise could pay on the capital invested in the project and still break even.

First Year Rate of Return:

A decision rule for determining the best time to undertake a project. The benefits in the first year of the project's life are expressed as a percentage of the project's cost. If the result is below the discount rate being used this would suggest that the project is premature, and would benefit from a later start.

Functional Structure:

Where an organisation's tasks are divided according to its functions and these tasks are integrated hierarchically and performed according to rules and authority.

Fungibility:

A principle whereby another project is substituted for the one that is ostensibly being appraised and financed. More generally, the substitutability of resources and projects for each other.

Goal, Sector/Program Goal:

The programming level beyond the project purposes, i.e. the next higher objective to which the project is intended to contribute.

Example: Increased per hectare yield (project purpose) is intended to result in expanded exports of agricultural crops (sector goal).

Multiplier Effect:

The effect of a project on other parts of the economy produced when income generated by the project works its way through the economy, reactivating idle capacity, and creating new income and employment to multiple of the original stimulus.

Net Present Value.

A common decision rule in project appraisal, resulting from summing the discounted difference between costs and benefits for each year of the project's life.

Network Structure. Where several public or private agencies must formally collaborate to achieve common goals, but where the leading agency cannot exercise direct hierarchical control over participating agencies. Sources of influence used to achieve collaboration include joint planning and review of activities, control over budget (resource allocation) and common membership of committees.

Nominal Autonomy:

The legally defined extent to which an organisation can depart from the norms and practices of its parent organisation.

Objectives:

Are the purposes and aims of an activity, representing the desired state which the activity is expected to achieve. (Objectives are usually conceived of in terms of hierarchical levels: achievement of the specific or immediate objectives of an activity (labelled as Level I below) should contribute to the fulfilment of broader, long-range objectives at a higher level which are beyond the range which the activity could achieve by itself (Level II below). Clearly-stated objectives can greatly facilitate evaluation, while vague or non-operational objectives make evaluation difficult.)

Examples:

- * Level I: Train farmers in new agricultural techniques.
Level II: Expand agricultural exports and foreign exchange earnings.
- * Level I: Reduce levels of chemical pollutants in a river.
Level II: (several objectives at the same level). Expand and improve health, fishery, and recreational and tourism conditions and opportunities in a river basin.
- * Level I: Reduce deaths, additional complications and disability of people with acute injuries by providing emergency medical care.
Level II: Improve the quality of urban life.
- * Level I: Prepare occupational employment surveys.
Level II: Increase employment opportunities in a country.
- * Level I: Design and implement a programme budgeting structure throughout an organization.
Level II: Design and apply an integrated planning, programming, budgeting and evaluation system to achieve more coherent and orderly programme decision-making.

Objectives: A desired state to be reached or maintained through one or more activities.

Immediate Objective: The developmental change which is to be created or accomplished with a view toward influencing the solution of a country or sector problem.

Development Objectives: The term characterising a programming level beyond the immediate objective: it provides the reason for the project or programme and articulates a desired end towards which the project efforts of the specialized agency, the financing agency and the beneficiary country or countries are directed.

The objectives of the United Nations in each economic and social sector are to do such things as:

(a) Assist Member States

- in the formulation of policies. . .
- in the creation or strengthening of institutions. . .
- in the training of cadres. . .

(b) Promote regional or international co-operation in. . .

(c) Create an awareness of. . .

Objectives: A desired aim or end, for example "the improvement of child health.

Detailed Objectives: The breakdown of an objective into subsidiary objectives: for example, for the objective "Improvement of child health" some detailed objectives might be the reduction of prenatal mortality, the reduction of infant mortality, the improvement of child growth and development, the prevention of childhood infections and the prevention of accidents among children.

Immediate Objective: The immediate objective of a project is defined as what the project itself is expected to achieve. A project could have more than one immediate objective.

Development Objective: In the context of a UNDP-assisted project, the development objective is the broader sectoral or multi-sectoral development objective which the project is expected to *help* attain through the achievement of its immediate objective. It is usually beyond the *range* of the project to achieve by itself. A project could have more than one development objective.

Project Objectives: The stated purposes and aims of a particular project; to be distinguished from broadly defined development objectives.

Objectively Verifiable Indicators: Pre-established criteria or measures of an explicit and specific nature designed to provide objective assessment of project progress. Progress indicators should be objectively stated so that both a proponent of a project and an informed skeptic would agree that progress has or has not been as planned. Pre-establishing objectively verifiable indicators and targets helps focus discussion on evidence rather than opinions.

On-Going Versus Ex-Post Evaluation:

On-Going Evaluation is the continuing analysis during project implementation of project outputs, effects and developmental impact.

Ex-Post Evaluation is an analysis after completion of a project (or of a distinct phase of it) of its effects and impact"

... it should be possible to conduct:

(i) *On-Going Evaluations*, the analysis during implementation of project outputs, likely effects and impact in order to provide management and decision-makers on a regular basis with any analytical support that might be necessary to enable them to assess, and if necessary adjust, policies, objectives, institutional arrangements and resources affecting the activity during implementation. •On-going evaluation studies may also feed into the preparation of projects in other areas:

(ii) *Ex-Post Evaluations*, an analysis after completion of the activity's effect and likely impact on the immediate and higher level objectives, in order to provide decision-makers and planners with information for future planning.

The work of *ex-post facto* evaluation should concern itself basically with results planned and achieved. It should be directed not only to the value of the programme *per se*, but also to providing a useful feedback to programme managers to assist them in defining future objectives, analyzing alternative ways of achieving them, making the preferred selection among the alternatives, choosing quantifying factors and intermediate indicators, and assessing results. This feedback is indeed a most important benefit of *ex post facto* evaluation since lessons can be learned only for future, not past activities.

Opportunity Cost

The value of a resource in its best alternative use. In the case of capital, the OC is the rate of return that funds committed to an investment could have earned in the most attractive alternative use.

Organisational Processes:

The instruments for influencing the behaviour of staff and beneficiaries of a programme. These include the goal setting and resource allocation (budgeting) methods, the monitoring, evaluation and control

processes, the human resource development (selection and training) systems of a programme, and the motivational processes (use of incentives, creation of commitment).

Organisation Structure:

The durable arrangements within a programme agency by which it performs its tasks. These include the distribution of authority and responsibility, the reporting relationships and the co-ordinating machinery.

Output:

The output of an activity is its final product — a report in the case of research activities, a meeting in the case of its preparatory activities, and so on.

Outputs are what the project itself should produce in order to achieve its immediate objective. They are the products of the activities of the project. Taken together, and combined as appropriate, they reflect the degree and quality of achievement of the project's immediate objective.

Outputs are the expressly intended and objectively verifiable results directly expected from providing the inputs.

Outputs are the specific products which an activity is expected to produce from its inputs in order to achieve its objectives

(Since activities may appear in sequence or in stages or at different levels, it is important to note that one activity's output may serve as another activity's input, i.e., a training manual produced as an output of project A may be an input to project B. An activity might also have intermediate outputs and inputs.)

Examples.

- * Trained manpower
- * A laboratory
- * A classification of accounts
- * Training manuals

- * A research work programme
- * Producer marketing co-operatives
- * An irrigation network
- * Library services
- * A report.
- * A meeting
- * An information system

Output Indicator: Variable for estimating the outcomes of programme or project activities. For example, the percentage of births attended by physicians, nurses, midwives or axuiliary nurse midwives as an indicator to the outcome of a programme for improving obstetric care. Ideally, relevant base line information should exist or be created at the beginning of the determined period in order to measure differences at the end of the period. However, the measurement of indicators requires an effort in itself and is often costly; therefore the cost/benefit of the measurement has to be considered. Wherever possible at a reasonable cost, ways of arriving at the indicators should form an integral part of the programme.

Personal Selection & Development:

The process of attracting the best available people, hiring them and training them to do their jobs as well as possible.

Pilot Project:

A small project undertaken to test and adapt a development approach to a particular social and geographic situation.

Programme:

- (i) A set of activities directed towards the attainment of one or more defined objectives.
- (ii) In the programme structure, the next lower sub-division of a major programme contributing to the - objective or objectives of that major program.

- (a) Level 1: *a major programme* consists of all activities in a sector in both headquarters and the regional commissions. For example, all work on natural resources in the United Nations.
- (b) Level 2: *a programme* consists of the activities in a sector under the responsibility of an office head or division director. For example, work on natural resources in the Economic and Social Commission for Asia and the Pacific.
- (c) Level 3: *a subprogramme* consists of all activities that are aimed at accomplishing one medium-term objective. For example, work directed towards the appraisal of the availability and use of water resources in the ESCAP region.
- (d) Level 4: *a programme element* is the smallest programme unit, a project or its equivalent. In most instances, the output of work at the level of the programme element is a meeting, a publication or a field action. For example, a meeting on the development of deltaic areas in the ESCAP region.

Programme: An organized aggregate of services, activities and development projects directed towards the attainment of defined objectives. A programme should ideally include the precise objectives, targets, methods, manpower, physical facilities, financial resources, time and their inter-relationships required for the implementation of each service, activity and development project and for the aggregate of these services, activities and projects of which the programme is constituted, as well as output indicators for the evaluation of efficiency and effectiveness. For example, programmes for maternal and child health, the promotion of mental health and cancer control.

Programme: A cluster of projects which are similar in nature or cover a well-defined arrangement and have related objectives, such as projects in the same field of activity (but in different countries), projects having the same basic function such as institution-building, projects in a particular area or country, etc.

Project:

An undertaking intended to achieve certain specific objectives with specified resources, usually within an over-all programme and within a specified period of time.

A project assisted by UNDP is a set of inter-related activities amenable to unified management which are aimed at achieving specific objectives within a given budget and a given period.

A planned undertaking, a unit of management that clearly specifies what is to be accomplished, over what estimated period of time, and at what estimated cost.

Process:

Process Evaluation: Process evaluation is the evaluation of one or more aspects of a process. In the case of UNIDO, it could be the process of technical co-operation, or that concerned with its supporting activities or with its organization and management. The specific purpose of process evaluation is to provide guidance for improving, or for helping to overcome problems with respect to, process aspects that have been identified as needing improvement on the basis of preliminary data.

Project Impact: This is the change in the standard of living and the increased capacity for self-sustained development of a group of beneficiaries or communities, resulting from project effects. These changes can be measured by increased income and consumption, improved diets, reduced incidence of diseases, increased literacy, increased local participation in planning and decision-making, and so on.

Project Linkages:

a) There is a causative linkage between project *outputs* (irrigation network) and the ultimate project *purpose* (improved crop yields). The outputs must exist before the purpose can be achieved. The existence of the outputs does not, however, guarantee that the purpose will be achieved. Factors outside the project design (farmer attitudes and access to credit) may prevent achievement of project purpose. Thus the causative relationship between project outputs and purpose must be explicitly stated as a hypothesis, the external factors (assumption) identified; and evaluation must then verify whether or not the hypotheses was realized.

b) Similarly, there is a causative linkage between project *purpose* (improved crop yields), and progress toward a higher sectoral or program goal (expanded export of agricultural crops). The achievement of project purpose does not guarantee that the goal will be reached. Factors outside the project design (price and market conditions, spoilage and other losses) may prevent planned progress toward the higher goal. Thus the

causative relationship between project purpose and higher goal must be stated as a hypothesis, the external factors (assumptions) identified, and the hypothesis validated.

c) These linkages should also be proportional as well as causative. Thus, the improved crop yields will mean little for export earnings if they occur in a relatively small area. Analyzing a project in terms of means-ends linkages may highlight a lack of realism in the original plans, i.e. a disbalance between modest means and grandiose targets. It is important to determine if the means are sufficient in quality and quantity to produce the desired end product.

Project Outputs:

These are the outcome of project activities. Examples of outputs of a rural development project are: acreages irrigated, farmers trained, co-operatives established, credit provided, kilometers of road constructed, health facilities constructed, schools constructed, and so on.

The specifically intended kind of results (as opposed to their magnitude) that can be expected from good management of the inputs provided.

Example. Manpower, training, machinery and building materials (inputs) can be managed to produce an irrigation network, trained operational staff, a water utilization schedule and a user rate scale (outputs).

Project Purpose:

The primary reason for the project, i.e., the development which is expected to be achieved or the problem which is to be solved if the project is completed successfully and on time.

Example: An irrigation network and associated facilities and services (outputs) are intended to produce increased per hectare yield (project purpose).

Real Value:

Normally refers to costs and prices which are not adjusted for expected inflation (constant prices as compared to expected cash prices). But may sometimes refer to economic values rather than financial costs and prices.

Relevance:

Relates to the rationale for having programmes, or activities, or services and institutions, in terms of their response to essential human needs and social and health policies and priorities. . .

Relevance concerns the degree to which the rationale, objectives, and expected impact of an activity are, or remain, pertinent, valid, and significant with regard to long-range objectives or other identified priority needs and concerns.

An activity might be both effective and efficient, in that it was both successful in achieving its objectives and well-managed (see definitions below), but still not be relevant because it makes little or no contribution to meeting long-range objectives and priority needs. An activity might even have substantial impact but not be particularly relevant, if the changes produced do not relate to priority concerns.

Examples:

- * A project to convert waste materials into an energy source may have lost its relevance if a newer conversion technology has been discovered elsewhere and found to be highly effective.
- * A major industrial management training programme may have lost its relevance if the host Government has revised its developmental priorities to concentrate on rural development as the essential priority.
- * A project may lose relevance even though it was successfully executed, if its results prove to be so unique that it cannot be applied or used anywhere else.
- * A project to improve information and reporting systems through the purchase of sophisticated communications equipment may have lost its relevance if the organization is confronted with a new era of budgetary austerity.
- * An activity may be determined to have been irrelevant in its basic conception, if its results and impact have no noticeable effect on the priority problems it sought to address.

Resource Cost:

The true economic cost of a good or service. It differs from a cost, such as a tax or customs duty, which is not cost to the economy as a whole, merely a transfer payment from one group to another. The RC is equivalent to the opportunity cost of an item (q.v.)

Sensitivity Analysis:

An integral part of cost-benefit analysis (q.v.) which tests the effect on the rate of return or net present value (q.v.) of possible changes in outcomes, on both optimistic and pessimistic assumptions.

Sequential Diversification:

A strategy under which the programme starts with a single service and subsequently moves into other services. This reduces managerial complexity and is a good strategy, especially when services are diverse, unrelated and difficult to measure.

Significance:

Will the achievement of the targets contribute to the economic development or other higher level objectives beyond the immediate objective? Has there been a change of circumstances which causes the activity to have greater or lesser significance (relevance)?

Source of Influence:

The groups of people or organisations that programme managers can count on in getting laws changed or funds allocated.

Strategic Management:

The inter-related top management interventions which provide the framework for operational decisions and actions to accomplish programme goals.

Strategy:

The set of long-term choices the programme leaders make in terms of goals, services, policies and action plans.

Structural Differentiation:

Dividing organisational tasks/functions into manageable components.

Structural Integration.

Putting together the differentiated organisational tasks or components to achieve the over-all objectives of the programme or agency.

Target Group:

A group of people who are intended to benefit from a particular public action. The group may be defined according to their social, sexual, economic or geographical status.

Targets:

An explicit and objectively verifiable statement of the kind and magnitude of final result to be realized at a specified date. The term target is used at the output, purpose and goal levels.

Technological Change:

The process of improving the way activities are performed and the way tools, methods and equipment are employed.

Tradables:

Goods and services that can be bought and sold internationally.

Turnkey Project:

One for which a single firm (contractor) takes complete responsibility, to the point where it is handed over to the client in a fully operational state.

Urban Bias:

The tendency of governments to favour the interests of their urban constituents, e.g. by keeping farm prices low, by directing public investment disproportionately to urban or industrial targets, etc.

Value-Added:

The value of production that can be attributed to the activities of a firm or individual. Normally calculated by deducting the value of bought-in materials from gross output or sales. What is left is equivalent to wages, salaries, profits and rents.

Without Case:

The imaginary scenario in which the project in question is not undertaken. This exercise is undertaken in order to identify the net effects of implementing a project.

UNIT – 2

FUNDAMENTALS OF AN EDUCATION PROJECT

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OBJECTIVE

After studying this unit, you are expected to be able to;

- i) Write about Project in detail**
- ii) Explain the relationship between a project, a programme and a plan**
- iii) Trace the steps of Project identification and Project preparation**
- iv) Write about Project planners and managers and basic terms and concepts which are essential for a good education project**
- v) State, what a good education project should be like**
- vi) To evaluate a project plan for its quality and implementability from the points of view of a project planner and a project manager.**

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PLAN, PROGRAMME AND PROJECT

A plan, a programme and a project appear in a continuum of a developmental scheme or schemes in any of the areas of interest to an organisation. From the preparation of a plan to the formulation and implementation of projects constitute a process of developmental activities. At the highest level, a plan assesses resources and needs, determines priorities and establishes objectives while at the lowest level of the continuum a project presents an implementable opportunity to achieve the purposes of the plan. In the process of developmental activity plan, programme and projects are inter-dependent. A plan gives rise to programmes of action which are effected through projects. In order that the student understands them fully and becomes cognizant of the relationship between them, brief descriptions of plan, programme and project are given below:—

1.1 The Plan

In operational terms, a plan represents a document which aims at achieving certain developmental goals or objectives. A typical plan includes an analysis of the present situation and forecasts for future, assumptions for the future, strategy to be used for achievement of the goals, and identification and determination of the sources for the achievement of the development goals and objectives.

The document called “plan” (in this text a ‘plan’ will be used to denote a national development plan) is an outcome of developmental planning in a sector or a multiplicity of sectors of national development. The process of developmental planning, in this context portrays, what is commonly known as “Macro Planning”. It is usually considered to be a plan of economic development, because, basically a plan provides a basis for allocating scarce resources among the priorities for development identified in National Development in National Plans. The education sector is only one small part of the National Development Plan, which also covers agriculture, industry, health and most of the sectors of the economy.

1.2 Types of Plans:

While the basic components of a plan remain more or less the same, depending upon their goals and the needs of the society or an

organization, the plan can be grouped under different types. Cleland and King (1975, p. 43) have identified three types of plans.

- a) Strategic plan
- b) Development plan
- c) Operational plan

a) **Strategic Plan:** A strategic plan is prepared for a period of five year or more and contains the following:—

- a) Objectives and goals
- b) Broad rules and means
- c) Strategy statement required to move the organisational posture to desired future position.
- d) Standard organisational planning.
- e) Qualitative and quantitative data basis.
- f) Environmental assumptions and predictions.

b) **Development Plan:** A development plan represents a plan prepared for a period of one to five years and includes the following:—

- a) Strategy for new programmes and services
- b) Organisational conditions necessary for new environment and services
- c) Divestiture of obsolete programmes and services
- d) Future resources identification
- e) Functional plan guidance
- f) Individual, sectoral plans (in case of education, it may refer to individual institutional or organisational plans such as a school)

c) **Operational Plan:** An operational plan represents a plan for one year and is specifically concerned with certain areas of development within a larger system.

In the context of education an operational plan may be concerned for example with any of the following:—

Long Term Plan:

The long term plan is a development of recent decades and appears to have evolved out of the peoples' growing interest in Futurology and

their concern for what the future would be like. In the world of education, people are certainly concerned with the future world. Because, if the education has to be of practical value to the society of tomorrow and to the child of today, it must orient itself to their future needs. This has led educational planners and administrators to look further into the future and plan for the education of today in such a way that it caters to the needs of the youths of the days to come.

The long-term plan, (of which a 'twenty-year plan' of education of Philippines is an example) aims at planning for education in the broader perspective of the times to come. A long-term plan as such, provides for systematic development which has its linkages with both the past and the present and takes into account the changing times, environment and the educational needs of youth and the society.

The long term Plan, which presents a development perspective for the future, also determines directions for the annual and other short-term development plans. They provide an opportunity to set out and examine the assumptions and contexts which underlie short term plans. As events happen and the world changes, the plan is put to the test and can be compared with the actual outcomes. A judgement may be made about its accuracy and utility and its content may be amended, to discuss what is the larger appropriate and to include what was not envisaged. Thus the direction of short term planning is changed in line with the needs of an evolving society.

A long-term plan is not without its limitations. The events which shape the future are certainly not in the Man's power to control. The future of a society which we foresee today may be entirely different just in next few years, and the long-term plan may become obsolete long before its targets have been achieved. In order to make a long-term plan a useful instrument of development it is, therefore, essential that its strategies and targets remain flexible enough to adopt to the changing times, places and environment and be able to meet the uncertainties of the future. The plan must never be allowed to become a rigid set of values which must be adhered to.

1.3 Types of Plan Used in Pakistan

In Pakistan, the importance of planned development was emphasised from early days of its inception. The following types of plans are, or have been, in use in the country at different times:—

a. Five-Year-Plan

The five year plans in Pakistan are also known as the Medium-Term-Plan. The history of planned development in Pakistan dates back to 1955, when the First-Five-Year-Plan was prepared by the Planning Board. The objective of the Plan was "to develop the resources of the country as rapidly as possible so as to promote the welfare of the people, provide adequate living standards, and social services, secure social justice and equality of opportunity and aim at the widest and most equitable distribution of income and property" (The first-five year plan, 1955-60, p. 1) The planning activity in the social context was defined as:

The formulation of programmes and policies designed to lead it by a consciously directed and accelerated movement from a largely technologically backward and feudalistic stage into the modern world of advanced technology now on the threshold of atomic age. Movement and change constitute the law of life. The problem is to regulate and adapt the change according to our own values of life. Resistance to change generates tensions which can lead to disastrous consequences. It should, therefore, be absorbed in an orderly and peaceful manner so that it contributes to our individual growth as well as the growth of the community in keeping with our own basic values. Economic development is a part of this general process of social change, and planning signifies our intention to influence, regulate and adopt it along the lines desired by us (ibid, 1-2).

The same definition of the planning has ever since been followed in the country in the preparation of all national development plans.

b. Mid-Term Plan

A mid-term plan is usually prepared for a period of three years, or sometimes/during a five-year plan period. It presents an adjustment of the five-year plan, which is necessitated by pressures on the economy generated by unforeseen environmental factors. It also presents adjustment of priorities and extents of sectoral plan-within the framework of Five-Year Plan.

The mid-term plan is prepared for the remaining period of five year plan, and is not fixed for three or any given number of years: as the needs be it could be re-adjusted every year until the end of the plan period. The annual readjustment is based on the impacts of the steps

taken to overcome the difficulties encountered in the implementation of the five year plans.

c. Rolling Plan

Like the mid term plan, the rolling plan was introduced in the country out of the necessity of adjusting the failures of the five year plans to achieve their targets of their annual phasing. As it is implied in the name of the plan, the targets not achieved within the stipulated period are "rolled on" to the next year. A rolling plan is usually used when annual targets are not achieved due to shortage of funds and resources during a certain period of time.

d. Annual Plan

The annual developments plans were used in Pakistan during the seventies (1972-78) when due to the emergencies of the aftermaths of a civil war in the East Pakistan and war with India, the five year plans could not be prepared. In the absence of five year plan, the annual plans represented developments planning activities in the country. As it is evident from its name an annual plan is prepared for a limited period of one year plan. Like a five year plan it is a broad ranging document.

Besides the above emergency use of the annual development plans in Pakistan, an annual development plan is also known to have the following uses:—

1. It is sometimes considered to be the implementational instrument of a five year plan.
2. It evaluates the annual performance of a five year plan.
3. It provides bases for modifying targets of five year plan.

e. Sectoral Plan

Sectoral plans are prepared by various Ministries and include "detailed requirements of the country's need" based on certain economic assumptions, over quite a long planning horizon. In other cases, the sectoral chapters of a five year plan form sectoral plans and they are largely concerned with general guidelines, targets and policies" (Veitch, 1979). Although sectoral planning has been in vogue in Pakistan for a very long time there seems to have been much less attempt to produce detailed sectoral plans because the facilities and resources required for preparation of detailed sectoral plans have not been available.

1.4 Purpose of the Plan

Regardless of their types, all "plans" usually aim to bring about development. It is, therefore, customary to call them development plans. As already said else where in this text, the two terms plans and development plans or national development plans will be used as synonymous and may be used inter-changeably. The plan is also known as a "macro plan". The purpose of development planning as described by Paul (1983) is, "to give a sense of directions to national economies and provide the basis for allocating scarce resources among the priorities for development identified in national plans" (p-1).

1.5 Scope of Plans

The scope of Plans, as reader will see later in these pages, is broader than those of the programmes and projects. A plan contains many development programmes whereas programmes are broken down into a number of projects for implementation. According to Paul (1983) "development plans consist not only of pattern of resources allocation and long term national budget, but, (they) also contain strategy for development of different economic sectors" (ibid). Plans are, therefore, concerned with the issues of a direction and resource allocation rather than the mechanisms of action.

2. THE PROGRAMME

In the process of a planned development, the "programme" represents a phasing of time and resource allocations for implementing a plan. A programme is composed of and provides the basis for many development projects, which in sum would aid in achieving a specific out put — oriented objective of the organisation, Ministry or nations. Programmes are sometimes open ended in nature while projects have specific objectives and specific end points. (Cleland and King, 1978, p. 184).

2.1 Types of Programme

As Paul (1983) lists the following as the major types of programme:—

a) Sectoral Programme

A sectoral programme generally aims to develop a single commodity or a service nationally (p. 12) Education is a sector within the nat-

ional plan, vocational teaching might be regarded as a sector within the education plan.

b) Regional Programme

Regional programmes are sub-sectoral programmes concerned with the development of sectoral service but at sub-national or regional level (ibid).

c) Inter-sectoral (Integrated) Programme

This type of programme focusses on several sectors and calls for a careful integration of diverse sectoral inputs. This type of programmes, though ideally suited to national development programming, have gained little popularity in Pakistan.

One reason for their want of popularity could be the complexity of coordination of the sectoral development planning. Generally, they are most appropriate where level of provision of resources and basic infrastructure are individual and the administrative capacity at national or local level is incapable of meeting needs. In Pakistan, the existence of administrative structures with specific areas of responsibility helps to account for the low level of acceptance of integrated development projects.

2.2 Purpose of the Programme

A programme represents the operational side of plan. Plans contain sectoral or national targets, whereas the purpose of programming is to identify projects which are essential for the achievement of the goals of the plan. The programme also aims at phasing the implementation of a developmental plan and provides basis for the distribution of resources and schedules for the achievement of the targets of the plan. In Pakistan, usually a programme is prepared in the form of an Annual Developmental Programme (ADP) and is regarded as the implementation side of a Five Year Plan. In the absence of the Five Year Plans, the Annual Development Programmes have been used to represent the implementation side of an annual or a mid-term plan.

2.3 Relationship between Plan and Programme

As stated earlier, the programme represents the implementation side of a plan. In Pakistan, it usually follows the preparation of a Five Year Plan. At times when the annual development plans took the place

of the Five Year Plan, the annual development programmes were prepared almost simultaneously with annual developmental plans. It is interesting to note that plans are primarily concerned with the physical targets, whereas a programme "introduces for the first time financial resources to be committed to specific projects. Whilst there is naturally full consideration of financial matters in the plan, these are in general restricted to inter-sectoral rather than intra-sectoral allocation" (Veitch, 1979, p. 20-21).

3. PROJECT

A project usually denotes a planned undertaking for achievement of a certain developmental objective usually driven from a plan.

Harrison (1981) defines a project as "a non-routine, non-repetitive one-off undertaking, normally with discrete time, financial and technical performance goals" (p. 1).

According to Taylor and Watling (1973) "a project may be defined as a group of connected activities with a definite starting point, a definite/finish and the need for central intelligence to direct it" (p. 3).

Gray (1981) conceives of a project as "a complex of non routine activities that must be completed with a set amount of resources and within a set time interval" (p. 1).

The definition of a project as formulated by Cleland and King (1975) denotes "a combination of human and non-human resources pulled together in a 'temporary' organisation to achieve a specific purpose" (p. 184).

3.1 Types of Project

Depending upon their nature and scope the projects could be categorised into the following major types:—

- a) Simple Projects
- b) Complex Projects
- c) Short-term Projects
- d) Long-term Projects
- e) Pilot Projects
- f) Research Project

- g) Investment Projects
- h) Technical Cooperation Projects
- i) Institution-Building Projects

Following is brief description of each of the types of the projects. —

- a) *Simple Projects:* A simple project may be defined as a project which aims to achieve a particular objective by accomplishing a single task as an independent unit of work or as part of a longer and a complex project. Construction of an additional room in a school, printing of a teacher's guide, or organizing of a training programme are examples of simple projects. Simple projects could be both long-term and their life may vary from few weeks to several years.
- b) *Complex Projects:* The projects, which are multi-variate multi-phase and often long-ranging, represent the projects which are complex and necessitate a larger or specific management organization for their implementation. Establishment of a new university, educational reforms, changing high school curriculum etc. are some of the examples the complex projects.
- c) *Short-term Projects.* The short-term projects could be both simple as well as complex. What characterises a project as a short term one, is the life of the project. A short-term project, thus ends with the completion of the task for which it is under-taken. It is neither repeated nor does it perpetuate itself beyond a certain period of time. Most of construction projects fall under this category.
- d) *Long-term Projects:* As opposed to the short-term projects, a long-term project is meant to continue for a longer period of time. It could be due to the length of time needed for completion of the project or it could be due to the scope of the project which necessitates its continuation for a longer period. Establishment of Allama Iqbal Open University as a distance teaching institution; Examination reforms, Agrotech-Scheme of Education; setting up of Comprehensive high schools and Pilot Secondary Schools, introduction of guidance services in secondary schools could be quoted as examples of the long-term projects.
- e) *Pilot Projects:* A pilot project is a small project under-taken to test and adopt a development project to a particular social and

geographical situation. It is, therefore, a harbinger of a larger or a long-term project. It actually serves as a laboratory or a test-ground for introducing new inputs or innovation to the education. The Pilot Secondary Schools established in the later half of the Fifties, Management Unit for Study and Training (Must), Peshawar, and Pakistan Primary Education Project-IV (PPEP-IV) are some of the example of pilot projects.

- f) *Research Project:* As it is evident from its title, a research project concerns with the application and use of methods of scientific research, for investigating into situations relating to educational development, determining feasibilities of education development projects, for assessing and evaluating the impacts of inputs, and for evaluating systems etc. Frequently, a research project seeks to find information to help resolve a problem. Examples of research oriented project include the analysis of vocational training needs.
- g) *Investment Projects.* The investment projects are characterized by a high proportion of physical inputs such as equipments, — Audio-visual, computers, laboratories, — buildings, sports facilities, hostels etc. Most typically, an investment project might establish a production facility such as textbook production plant. Generally an investment project is based on tried and tested methods and practices, otherwise it would be an experimental or a pilot project. An investment project might involve the replication of a successful pilot or an experimental project or a system in use elsewhere in the world. Comprehensive High Schools which sought to replicate systems in use in the United States and polytechnic institutions could be cited as examples of investment projects.
- h) *Technical Cooperation Projects:* The technical cooperation projects, when implemented, take many forms and cover a wide range of activities. The major purpose of a technical cooperation project is usually to obviate the shortage of specific expertise, either by the direct provision of technically qualified people e.g. the TV staff of Allama Iqbal Open University or by providing training opportunities to the local personnel of fellowships to staff of Allama Iqbal Open University. Technical Cooperation Projects are funded jointly by the local and foreign governments or international agencies. Generally, the foreign exchange component is provided by the foreign government or an international organization. To take a full advantage of a technical assistance programme, it is essential that the training needs of the project are accurately

determined and the personnel for such trainings are carefully identified, otherwise benefits may be missed. There is often a tendency for the provider country to provide what is readily available rather than what is needed, particularly where training courses are involved.

- i) *Institution-Building Projects.* The institution-building projects aim at establishing self-sustaining entities such as literacy, campaigns, universities, audio-visual units, libraries, boards of education, etc. These projects are concerned with not only the physical resources such as buildings and equipments and provision of expertise, but they also need to develop organizational structures, administrative procedures and inter-organizational linkages, as well as ensuring a sound base either through self-financing or through budgetary allocation e.g. Allama Iqbal Open University.

The reader should, however, take note of the fact that these classes are neither rigid nor exhaustive and that there are more such classifications of the projects. It is also to be noted that one single project may have the characteristics of several types of classification. The purpose of this part of the unit is to make a project manager aware of the varying natures of the projects so that he can visualize his role and identify his priorities according to the demands of the individual projects with which he is concerned.

As the reader may very well infer from the definitions and the types of project, all projects aim at marshelling of resources and devising and utilizing systematic methods and specific techniques for attainment of the developmental goals ought to be achieved through particular projects. In any development activity, thus, the projects serve the following purposes:—

- a) Identification of objectives which are contributory to the achievement of the broader organizational or national goals,
- b) Breaking down and ordering of the activities into manageable tasks to accomplish the greater tasks,
- c) Creating an organization to harmonize human and non-human resources for achievement of specific development objectives,
- d) Systematization and simplification of the process of implementation of development plans.

3.2 Relationship Between Project, Programme and Plan

As stated earlier, the plans, programmes and projects constitute a continuum of a scheme of development. The relationship between a project and a plan is more direct because a plan cannot be implemented or even completed without project. Projects may thus be viewed as the "building blocks of development," the implementable activities which bring plans to fruition. If a plan is to be regarded as a house, projects may be seen as the bricks of which it is built and the programme as the cement which holds them together.

3.3 Project Cycle

So far a project has been considered as a unique activity or a set of activities which aims at achieving specific objectives. The synthesis of the definitions of the project given above would help identify the distinguishing characteristics (Spinner, 1981, p. 2) of a project. They are the following:—

1. There is a specific start, a specific end point.
2. There is well defined objective or objectives.
3. The endeavour is unique and not repetitious for the project. It usually contains costs and time schedules to produce a specific product or result. However, similar projects may replicate successfully.
4. A project cuts across many organisational and functional lines.

Although a project is characterized by a specific start and a specific end point, in fact the planning process which underlies the planning of project is somewhat cyclical in nature. A good project plan passes through several stages of planning and implementation (Rondinelli, 1977, p. 5).

As Rondinelli (1977) suggests, an analysis of the project cycle is helpful for two reasons; first since different organisations and individual commonly assume responsibility for different aspects of projects planning and execution, a cycle provides an overview of task performed by a diversity of organisation, each considered an essential to a project success.... a second reason for using the

things as an ordering framework is the potential value of seeing the complexity of the entire process from the point of view of a developing nation when all of the international assistance agencies prescriptions are combined (pp. 5—6).

In view of the United Nations Public Administration Division it would be more useful to visualize the phases of the life cycle of a project in terms of links in a chain and to think of project administration as an instrument for making these things of equal strength. Unless this is done, the weakest link will affect the performance of the whole project (ibid. p. 6).

A project cycle usually begins with the identification of the project and passing through the stages of feasibility testing, project formulation, project appraisal, project approval, and project implementation, operation goes to the final evaluation of the project. The results of the evaluation are then again incorporated in the identification of a project. Future projects a phase of the same project.

Since each of the stage of the project cycle is equally important, a project planner or manager cannot afford to miss any one of them or lay less emphasis on any of them.

a) **Project Identification**

A good project is one which is based on a practical need and specific objectives. Project identification, however, is a complex process. Even when a project proposal is contained in a national plan, it is not easy to define it. In cases where a project forms a basis for development, the identification of a project involves a macro and micro analysis of the situation, formulation of objectives, and establishment of the need of the project. Other projects may be identified from an expressed need or the solution to a specific problem, e.g. a skilled labour shortage ideas may come from practices and achievements of other countries or regions or organisations or just a good idea from a suggestion. International comparisons of educational standards can highlight experiences in the national system which might necessitate action in the form of projects. It is more true for the local, national and international projects. It has been observed that sometimes education projects are prepared in haste.

b) Feasibility

Preparation of a project involves a decision to make an investigation. The feasibility of project refers to the process of investigation to determine the worthwileness of he project. The larger a project, the more formal the investigation required to determine its feasibility. Feasibility of a project is generally determined by the answers to the following questions:—

1. Shall the outcome of the project be useful for the people for whom it is intended?
2. Are the objectives of the project realistic?
3. Are the resources available for implementation of the project?
4. Are the benefits of the project worth its cost?

c) Project Formulation

Once the feasibility of the project has been determined, the formulation or initial preparation of the project is undertaken.

A good project proposal should give the following information.—

1. Definition of the project and its aims and objectives
2. Identification of executing organisation
3. Identification of resources
4. Determining project locations and size
5. Justification for the project
6. Detailed cost estimates of the project both, capital costs and its running costs
7. Estimates of the quantitative and qualitative benefits of the project including, if possible, their value
8. A financial plan schedule to indicate the funds needed, their timing and likely sources execution and project management matrix
9. Measures to meet unforeseen circumstances and environmental hazards in the form of an environmental analysis
10. A preliminary study of the feasibility of the project
11. A logical framework of the project
12. A projected work plan

13. Details of inputs and their sources including any imported materials or expertise
14. An output schedule
15. Proposals as to how the project might be evaluated
16. A draft implementation plan

d) **Project Appraisal**

Project appraisal involves a pre-investment analysis of a project with a view to determining its economic and technical feasibility, financial and managerial soundness and evaluation of the outcomes of the investment. This description of project appraisal covers five basic areas each of which needs a more detailed explanation (details are given in the later part of this unit).

- i) *Economic Feasibility*: Economic feasibility of a project refers to the economic value of a project either directly in terms of economic returns of the project or in terms of projects effects on the economic development. It is not always possible to give an explicit value for the outputs of an education project, and desire a cost benefit ratio; but it is usually possible to compare the costs of different ways of achieving the same ends and so give a cost-effectiveness analysis.
- ii) *Technical Feasibility*: The technical feasibility of a project is determined by considering the use of assumption of the outcomes of the project by the community, the size of the project in relation to the need of the community or place, and the type of technology etc. Consideration of alternative projects and the locations of the project to the maximum advantage of the community might also form part of an assessment of technical feasibility, as might an examination of the scale of outputs and objectives in relation to proposed inputs.
- iii) *Financial Soundness*: The financial soundness of the project is appraised in relation to the availability of financial resources from local or non-local resources and its continuation during the project life. It is especially important for projects which aim to be self financing, and these for which the quantity of finance is fixed or available only for a limited time.

- iv) *Managerial Soundness:* The assessment of managerial soundness of a project is placed with reference to the personnel available for managing the project and the soundness of the organisational structure of the project management matrix. This also refers to the inter-departmental and inter-organisational coordination of the project. An assessment might be made of the motives or obstacles for the inclusion of a project within the responsibility of an organisation.
- v) *Out-Comes:* The value of the outcome of the project is determined by what it promises to the sponsor and what benefits could be available to community or the organisation. Education projects generally quote their benefits in terms of numbers of students, graduates quantity and quality of technology, though increasingly attempts are made to place a monetary value on the benefit of education to ensure value for money in expenditure on education.
- vi) *Field Assessment:* As the project appraisal denotes a systematic review of all the aspects of a project. Domingues-Urosa and Germanicos (1978, CN 206, p/9) suggest that project appraisal should also include an assessment in the field, including onsite inspection. Appraisal accordingly should confirm that:—
1. The project is development-oriented and of high priority;
 2. It takes into consideration other education projects which the government is preparing or carrying out with its own or other external resources;
 3. It is educationally sound, economically conceived and logistically costed; and
 4. It is technically feasible, appropriately funded and has the mechanisms designed for its management which will ensure its efficient implementation. It, therefore, implies that the appraisal should be concerned not only with the implementation of the project but also with efficient and dynamic operation of the educational facilities or institutions created.

The jobs of the persons responsible for preparing and appraising a

project are not easy ones. Because, inspite of all instructions, and guide lines available to them so much of the jobs depend on their own resourcefulness, ingenuity and involvement in the project. However, in preparing or appraising a project one must ask himself the following questions and make sure that one finds answers to the questions in the project plan (PC-I):—

a. Justification for the Project:

1. What is the need for the project?
2. Who needs the project?
3. What benefits shall be accrued after the completion of the project?
4. Why should the project receive priority among other things needed for development of education?

b. Support data:

1. What are the sources of data used in the project plan?
2. What steps have been taken to ensure recency and reliability of the data?

c. Cost Estimates:

1. What are the basis of cost estimates?
2. What measures have been adopted to make cost estimates realistic?

d. Project Management:

1. What is the capability of the management organization for implementing the project?

e. Resources:

1. What are the sources of funds, men and materials for implementation and operation of the project?

f. Evaluation:

1. How would you evaluate the achievement of the objectives of the project?

3.4 Project Approval

Approval of a project involves a final decision of the acceptance of the project for implementation. It usually implies financial approval of the resources to be denoted to the project by appropriate authorities. Individual organizations follow their own method and process of project approval.

In case of education sector projects in Pakistan, the project approval system is based upon the authority structure of the education management organization. The process of project approval, therefore, is determined by the level of the authority which is competent to approve a project. In practice, it is the cost of a project which suggests the authority to which it would be referred. Following are the authorities and their powers to approve the projects:—

<u>Authority</u>	<u>Value of Project</u>
1. Provincial Development Working Party (PDWP) for all projects initiated in the province.	a. Upto a maximum of Rs. 30 m. b. Projects costing over Rs. 30 m. are referred to ECNEC through the CDWP.
2. Secretary, Education Federal Ministry of Education (in case of Federal Education Projects)	Upto Rs. 10 m.
3. Central Development Working Party (CDWP) all projects of Federal Government	Upto Rs. 30 m.
4. Executive Committee of the National Economic Council ECNEC)	All projects costing over Rs. 30 m.

3.5 Project Implementation

The implementation of a project means "taking a project design and managing the human behaviour required to carry it out". (Handle G. and Clauss 1979, p. 6). The implementation of project is usually the responsibility of a project team which includes the project manager, his staff and several parallel or superior organizations. Implementation of a

project involves preparation of a project, management plan and management of human and material resources for achievement of the objectives of a project. It also involves the use of techniques and methods of project management. The implementation of a project usually involves the following:—

1. Activating the project plan as already appraised and approved.
2. Procurement and use of inputs i.e. human and material resources.
3. Establishment of a project management organization.
4. Establishing contacts with parallel and superior organizations.
5. Handing over of a functioning entity of those who will manage the operation of the established project.

3.6 Project Operation

The operation of a project refers to the stage where a project is complete and defusal of its outcomes. The operation phase is the purpose for which the project is established — to supply a service or output over a period of time.

3.7 Project Evaluation

Evaluation of a project is carried out at three levels. Monitoring covers the implementation of the project. During the operation phase, its impact may be evaluated and the results fed back to the project. This is known as formative evaluation. Finally, the evaluation of the impact of the project may be undertaken for the sponsors of the project to help them to justify the project to tax payers, or to evaluate them to allocate resources in the future. This type of evaluation is known as summative evaluation.

4. PROJECT PLAN

4.1 What is Project Plan

As defined by Clelland and King (1975, p. 125) "Project plans are a combination of objectives, policies, procedures, budgets and other elements necessary to carry out a pre-determined specific objective. Project plans are the basic building element of the organizations system of plans. Depending upon the nature and size of a project there are different time scales for project plans:—

1. Short project plans
2. Intermediate project plans
3. Long range project plans.

However, there are certain characteristics which are common to all the project plans. They include:

1. There are specific objectives which are intended to be achieved, the quantity/type of benefits to be conveyed to a specific target group within a certain time.
2. The project plans provide a detailed statement of identifiable cost, time and purpose parameters.
3. All project plans identify location of the project and functional involvements.

In Pakistan, the standard project plan is available in the form of PC-I proforma (see appendix 'A'). There are several PC-I proformas for different sectors including education Sector. However, there is little difference between these forms. Usually a typical PC-I form contains a project digest which includes name, location, cost, justification for the project, estimates of recurring expenditure, dates of commencement and completion of projects, agencies responsible for execution and feasibility reports, if any. Part "B" of the project contains a detailed description of the project including the estimates and sources of financial and other inputs. Part "C" of the PC-I form gives details of manpower requirements, physical facilities and material supplies. The PC-I form presently in use in Pakistan has long been criticised as being inadequate.

In his *Report to the Planning Commission* referring to the inadequacy of the PC-I Veitch (1979) made the following observation:—

It has been suggested that the PC-I is too inflexible a document, and does not give project designers sufficient scope to use their imagination and make changes to the project as and when the need arises. This point is not taken. It may be true that certain proposals, with good and imaginative staff, would benefit from being rather less fettered by bureaucratic procedures and restrictive proformas. On the other side of the coin is the fact that very many projects are prepared by persons with less expertise and little understanding of the planning process; consequently, it is necessary for central planning units to keep some kind of control over what is going on. This cannot happen if the project sponsors are

allowed to make any but the next minor adjustments to design whilst the project is underway, and even these should not be allowed without permission. More seriously, allowing greater flexibility may tend to encourage the practice of changing the scope of the project — a practice which makes nonsense of any planning procedures and any cost estimates and is frequently illegal (p. 81).

It was during the later half of the 1970s when need for preparing a revised PC-I form was felt. However, there appears to have been little progress in this direction.

In view of the fact that the project plan is the only document available with the executing organization for implementation of a project it is essential that it provides not only the justification, objectives, cost estimates and input requirements of the project manager with a scheme of implementation of the project. A good project plan, therefore, should include full information about the following:—

1. Title of the project
2. Objectives and targets
3. Justification
4. Linkages with development plans
5. Description of the project
6. Organization and Management
7. Budgeting
8. Resource Identification

4.2 Title of the Project

Definition, name or title of a project have the same meaning in the project plan and they all refer to the same thing i.e. "what the project is". In Pakistan; it is customary to prepare project plan (PC-I) at one section of the Department or Organization and pass it down to another person or section of the department or organization for its implementation. It is essential, therefore, that the project is understood and interpreted in the same form at the implementing end as it is originally conceived by the planner. It is essential, therefore, that the document is comprehensive and unambiguous if those involved at different stages of the project life are to have the same preception of the project. A misunderstanding or misinterpretation of the title of the project by the project manager can lead to total misinterpretation of the project plan and it has been observed in many situations that the project which is

implemented becomes different from what it was conceived to be so much that even the objective and targets of the project are changed.

In defining a project or formulating a project title, the following should be taken into consideration:—

- a. The project title is short, simple and accurate.
- b. Only standard terms are used in the title.
- c. In case where some new or unfamiliar concepts and ideas are given in the plan they should be clarified. The title should be specific and attempts should be made to avoid vagueness.

4.3 Objectives and Targets

A project has a range of objectives, depending on its scope and the level of abstractions under consideration. A rural development project may seek to increase income of a group of rural poor by expanding their crop production through the introduction of new seed and cultivation methods. Depending on the level of abstraction, the objective may be distribution of seeds, the higher crop yield or increased income of the farmers.

Each of the above objectives is related to the others and they are really a part of the mean-ends chain (Youker and Burnett, 1980, CN853). In education projects, this chain and inter-linkage of objectives can be illustrated by the agro-technical scheme of education. The project aims at introducing a scheme of education which comprises teaching of agriculture, commerce, technical courses and home-economics to broaden the base of the present general education in high schools. To accomplish this purpose, the project aims to introduce agro-technical subjects specified in the new curriculum in 1000 schools at Middle stage (classes VI-VII) and in 200 high schools (classes IX and X).

The project thus has three distinct objectives:—

1. Introduction of the new curriculum (which depends first on development of)
2. 1000 school for teaching agro-technical subjects in classes VI — VIII (which would provide a base for teaching agro-technical subject in)
3. 200 high schools.

4.4 Objectives of a Project

As a project is part of a plan or a programme, it is essential that the objectives of the project should be realistically and objectively related with the goals and targets of the plan and should be stated in such a way that their achievements can be measured and evaluated on completion of the goals and targets of the plan and should be stated in such a way that their achievements can be measured and evaluated on completion of the project. In Education projects, there is a tendency to defining objectives of project in such a way that sometimes they are very remotely related with the goals of the plan and their outcomes or impacts are not immediately observable and measurable.

The specification of objectives, output, activities and inputs and the mean end hierarchy are the subject of unit 4 of this course.

4.5 Justification

Since all projects involve resources which could be invested anywhere else, selection of a project, therefore, should have full justification for its size, scope, its location and should be based on immediate needs of the people or area for which it is prepared. It should be justified in terms of providing the greatest benefits in relation to resources given the existing scale of priorities within the country.

4.6 Linkages with Development Plans

Education, although considered as a separate and independent sector in the national development plans, is very closely linked with and dependent upon development in other sectors. The linkage of an educational project with other development projects and plans should be very clearly identified and laid down in project. Examples of these linkages include the demand for skilled and educated workers from the industrial sector, the availability of building materials and other resources for schools and the interrelationship between curriculum and society needs.

4.7 Organization and Management

In business and Industry, project management is defined as "managing and directing time, material, personnel and costs to complete a particular project in an orderly, economical manner, and to meet established objectives in time, dollars (money) and technical results" (Spinner, 1981, pp. 1-2). The project management necessitates an organi-

zation peculiar to the nature of the project. As it was noted earlier in references to a matrix style project management, a project organization implies coordination among the several organizations or agencies involved. It is essential that the organizational structure of the project clearly identifies its linkages with other organizations specifying the jobs to be undertaken by each organization and the method and procedures should be clearly laid down to avoid any confusion in the process of implementation of the project. Needless to say the agreement of related organisations to their involvement is essential if the project is to succeed. This is especially issued when organization will face an increase in the workload and responsibility as a result of the project.

4.8 Budgeting

Literally the term budget simply means an estimate of the future financial income and expenditure. In projects, the 'budget' is used as a management tool. It serves the purpose of allocation of funds in the projects which are based on the pre-determined amount of money, and refers to estimation of financial requirements in cases where projects are initiated, and referred to authorities for approval of funds.

Although the total amount allocated for a budget is pre-determined, as the implementation of the project progresses, there are situations which might necessitate adjustment and readjustment of budget. The project plan, therefore, should provide for a flexibility in the reappropriation of the budget on the one hand and should also have provision for additional financing on the other hand in case it becomes necessary at any point. However, the project plan should not assume that extra resources will be made available and it might ever be used to plan on the resources for a project being reduced in the event of financial crises in the country.

Since the implementation of any project is dependent upon the availability of funds and the manager's controls over these funds, it is essential that the budgetary provisions, financial powers, and financial procedures are clearly defined before a project begins to be implemented.

4.9 Resource Identification

In general, four types of resource are usually required for implementing a project:—

a. Financial Resources

- b. Manpower Resources
- c. Materials
- d. Supplies, Services, Tools and Machinery

a. *Financial Resources:* Since the implementation of projects depends largely on availability of funds to the project manager as and when they are needed, all the items involving finances should be based on very careful calculations. The responsibility for finances should rest with the sponsoring authority and all matters concerned not sure about this should be clearly streamlined so that at the time of implementation of a project the project manager will not face with the financial problems.

b. *Manpower Resources:* The manpower requirements of a project may vary with the progress of the project. Some of the manpower, therefore, may be required for the project life and some could be hired on adhoc basis. In either case, it is essential that the right type of manpower, is available for project implementation. Selection of personnel for projects is a complex matter. Often the skills and expertise needed are in short supply and organising their employment at the appropriate time, in conjunction with other scale expertise can be difficult. A project also has a fixed life and the terms and conditions of contracted project personnel will vary from those of permanent organizations. In compensation for the greater insecurity and lack of career prospects, project staff might expect higher pay, knowledge of which can create university with the established staff of ministry. The manpower requirements of the project, therefore, should be made keeping in view the changing manpower needs of the project as it progresses. Miscalculations in this regard can lead to delays and to excessive expenditure or in distributed work on the part of the project personnel. A clear indication of the skills needed, the duration of the need, and the timing of the need is essential, if implementation is to proceed smoothly.

c. *Materials:* For projects where any kind of raw or finished material is required to be used, it is essential that the sources of supply of such material is verified from the output. Also fluctuation in their demand and supply and their cost should also be taken into consideration at the time of planning a project. Imported materials may need to be ordered in larger packets and well in time.

d. *Supplies, Services and Machinery*: The success of a project depends upon the availability of whatever is needed for the project at the time it is needed. During implementation, one cannot afford to have all the things readily available what one needs at a certain time. The project planner should take into consideration the requirements of the project and should ensure beforehand, through a detailed plan, network and resources schedules and by means of checking, constructing and securities for non-delivery, that they will be available and that delays in their supply and availability will not create problems to the project.

It is in the specification of type and quantity of inputs for a project that the greatest degree of technical expertise is called for. A knowledge of the most appropriate types of inputs, the quantities needed to achieve given objectives, and the timing of their delivery (so as to ensure their final arrival) is required. In the determination of inputs, a collective or team effort is more likely to produce accurate plans, than the effort of an individual.

4.10 Feasibility Analysis

Feasibility of a project refers to its being practicable and implies studies to determine it. The feasibility studies are also carried out to determine it and there is a need for experimental demonstration or pilot components before the full scale operation of a project. International aid-giving agencies like World Bank, UNDP, US AID etc. are insisting on detailed sophisticated feasibility studies before they agree to sponsor a development project. There are so many projects in education which would never have been undertaken only if a feasibility study has been carried out before its launching. Certainly, the large sums of money which had been almost wasted in such projects would have been saved and utilized for various other developmental activities of the sector.

Depending upon the nature of a project, a feasibility study could be simple or complex. Usually, feasibility studies are carried out to determine the following areas:—

1. Need for a project by the community and locality
2. Utilization of the outcome of the project
3. Cost benefit analysis, (or where this is not possible)
4. Financial requirements, the timing of local and foreign funding
5. Choices between alternatives

6. Cost effectiveness analysis
7. Organisational aspects of the proposed project
8. Impacts and possible spillover facts of the projects
9. Suitability of environment for the project

In Pakistan, a PC—II Form (see appendix “C”) has been introduced by the Planning Commission for feasibility studies to be carried out before a project is planned or undertaken. A PC—II Form is designed to provide preliminary information regarding the name of the project, administrative authorities responsible for its sponsorship and execution, details of surveys, feasibility studies and details of schemes likely to be submitted after surveys. The PC—II form is in fact a proforma giving justification for expenses and preparing cost of such expenses on conducting feasibility studies. It does not provide any guidelines for feasibility surveys.

A feasibility survey, as it is evident from its very title, implies carrying out a survey study which is a method of scientific research. A reliable feasibility study depends necessarily on a carefully designed studies strictly following the methods and procedures of scientific research.

4.11 Detailed Project Design Stage

Once the decision has been made to invest a given sum of resources in a specific set of activities in order to achieve given results, there follows the stage of the detailed planning how those resources will be marshalled and deployed. The responsibility for this lies with the project manager who should be appointed at the commencement of this stage and once the decision to go ahead with the project has been made. The detailed project design is a process which will determine how the project is to be implemented. It is a translation of the project idea into an action plan. It is the stage of the planning cycle at which such specialists as architects or curriculum planners will be engaged. If they had been employed prior to the feasibility study stage, and the project had been rejected, then their fee would have been wasted. The exact detailed requirements of the project will be determined at this stage: education issues may remain to be resolved.

4.12 Project Design

The project plan is a document prepared by the project planner whereas the project design is translating a project plan into a workplan by the project manager. Preparation of a project design, therefore, involves two activities — first, it involves the revaluation of the project

plan with a view to implementing it within the time and resources available and achieving the objectives or targets of the project, and secondly breaking it down into a number of activities or managerial tasks and preparing the scheme for undertaking each of these activities at an appropriate time.

In the process of preparing a project design, the project manager may on occasions have to fill the gaps in the project plan, left out by the planner and again and again to familiarize him with the project plan. In this process, the project manager may have to refer to the project planner. Once a detailed design exists for the project, its feasibility can be re-assessed.

SELF ASSESSMENT QUESTIONS

Having read this unit, you are expected to be able to answer the following questions. If you have difficulty with any of them, go through the relevant portions of the unit again and make sure that you do not skip any unanswered question.

1. What are the meanings, purposes and inter-relationships of plan, programme and project?
2. What are the various types of plans, programmes and projects known and in use in Pakistan?
3. What are the steps in a project cycle?
4. What should be the criteria for appraisal of an education project?
5. What are the essentials of a project which the project planner and project manager must never ignore?
6. What is the difference between a project plan and a project design?

REFERENCES

Cleland, D.I. and King, W.R., *Systems Analysis and Project Management*, McGraw-Hill Series in Management, McGraw-Hill Book Company, New York, 1968.

The First Five Year Plan, (1955—60), Govt of Pakistan.

Veitch, M.D., *Project Planning Process in Pakistan*, a report to the Planning Commission, 1979 (unpublished).

Paul, S. *Strategic Management of Development Programme: guideline for action*, Management Development Series No. 19, International Labour Office, Geneva, 1983.

Harrison, F.L. *Advanced Project Management*, Gower Publishing Company Limited, Hants, England, 1981.

Taylor, W.J. and Watling, T.F. *Practical Project Management*, Business Books, London, 1973.

Gray, C.F. *Essentials of Project Management*, Petrocelli Books, Inc., 1981.

Spinner, M., *Elements of Project Management*, Prentice-Hall, Englewood Cliffs, New Jersey, 1981.

Rondinelli, D.A., *Planning Development Projects*, Dowden, Hutchinson and Ross, Inc., Stroudsburg, Pennsylvania, 1977.

Dominguez-Urosa, J. and Germanicos, C., *The Project Cycle in Education Projects*, Economic Development Institute, World Bank, 1978.

Honadle, G. and Clauss, R. (Eds.) *International Development Administration Implementation Analysis for Development Project*, Praeger Publisher, New York, 1979.

APPENDIX—A
GOVERNMENT OF PAKISTAN

PC—I FORM

PLANNING COMMISSION

PROFORMA FOR DEVELOPMENT PROJECTS

(EDUCATION, TRAINING & MANPOWER)

Code Number for Project

*(To be filled in by
Planning Commission)

PART 'A'

PROJECT DIGEST

1. Name of Project
2. Authorities Responsible for
 - i. Sponsoring
 - ii. Execution
 - iii. Operation and maintenance
3. Time required for completion of project: (in months).
4. a. Plan provision
 - i. If the project is included in the Current Five-Year Plan, specify actual allocation.
 - ii. If not included in the current Plan, how is it now proposed to be accommodated (Inter/Intra-Sectoral adjustments in allocation or other resources may be indicated).
 - iii. If the project is proposed to be financed out of block provision for a programme indicate:

Total Block Provision	Amount already committed	Amount proposed for this project	Balance available
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- b. If the project is not in the Plan, what warrants its inclusion in the Plan.
5. Relationship of the project with the objectives of the sector: Indicate the contribution of the project, quantified if possible, to the targets in the Five-Year Plan, and the names of other projects (whether sanctioned or under preparation) which would form part of an integrated programme within the sector.

6. Capital Cost of Project: (In thousand Rupees)
 Local Costs. _____
 Foreign Exchange Costs. Total. _____

7. Annual recurring expenditure after completion (In thousand Rupees)
 Local _____
 F.E. _____
 Total _____

8. Objectives of the Project, preferably in quantitative terms.

PREPARED BY (NAME AND DESIGNATION)
 CHECKED BY (NAME AND DESIGNATION)
 APPROVED BY (NAME AND DESIGNATION)
 Date.

PART 'B'

PROJECT DESCRIPTION AND FINANCING

9. Location of Project (Attach map):

- a. Give name of place and administrative district in which the service centre will be located.
- b. Indicate total area which will be served.

10. Existing facilities:

Give information about public and private sector institutions in the area, their staff and equipment, actual enrolment in various classes and capacity enrolment of the institution. The information about public and private sectors institutions should be given both for the level of the educational programme proposed by the Project as well as for the lower level institutions which will serve as feeder institutions for the Project.

11. Description of the project

- a. Give brief history, proposed facilities and justification of Project.

- b. Give population of the area to be served, age groups and income levels.
 - c. Relationship with other programmes in the same sector and in other sectors. — Indicate whether coordination with other sectors has been ensured.
 - d. Give student-teacher ratio for the project and the national average for the proposed level of education. — Give also the extent of library and laboratories facilities per student and how it compares with the national average.
 - e. The employment prospects of the persons to be trained in terms of the present and future demand.
 - f. Give details of the type of training or education to be imparted. — The syllabus and the subjects in which emphasis will be placed. Indicate availability of teaching staff.
 - g. Give details of administrative structure for implementing the project.
12. Give date when capital expenditure estimates were prepared: If prepared more than one year ago, confirm if they are still valid.
 13. Capital Cost: Give breakdown of capital cost year-wise covering the whole of the investment period, as indicated below:—

Item			Total at official rate of exchange			I Year at official rate of exchange			II Year at official rate of exchange		
Local	FEC	Import Duties	Total	Local	FEC	Total	Local	FEC	Total		

14. Basis of cost estimates. (give full details).
15. Estimates of annual recurring expenditure after completion of each phase of the project: Also indicate source of financing recurring expenditure.

Local Cost F.E. Cost Total

Salaries of Staff:

- a. Service Staff
 - b. Ancillary staff (e.g. para-medical)
 - c. Supervisory and Administrative Staff
 - d. Consumable Stores and Supplies (Please specify)
 - e. Books and Journals
 - f. Contingent Staff
 - g. Other Contingencies e.g., electricity, water, postage etc.
 - h. Rent and Rates
 - i. Other Expenditure e.g., sports and workshop supplies
16. Unit cost for each category of service or output e.g., for educational institutions, the cost per student and how it compares with cost in other institutions.
17. In case of projects for production of goods and services e.g., production of textbooks, give expected income statement (Profit and Loss accounts) for ten years or until normal capacity is reached: Rate of depreciation and salvage value of property should be given.
18. Annual phasing of physical work and financial requirements for the project: Attach PERT or Bar Diagrams, if prepared..

Physical work		Financial requirements	
Item	Local	F.E.C.	Total
Already completed:			
1st year	(19		
2nd year	(19		
3rd year	(19		
4th year	(19		
5th year	(19		

19. Foreign Exchange Expenditure:

Year	Material Consultants	Others	Total
1.			
2.			
3.			
4.			
5.			

20. a. Likely sources and amount of foreign exchange cost of the project.
- b. Present position regarding availability, commitment or negotiations.

21. Indicate sources and amount of rupee component of Project:

Sources	Amount for Capital Expenditure	Amount for Re-curring Expenditure
---------	--------------------------------	-----------------------------------

a. Government sources:

- i. Grant
- ii. Loan
- iii. Investment
- iv. Direct Govt. Expenditure

b. Sponsoring Agency's own fund

c. Private Investment.

d. Local body resources, if any

e. Non-Government borrowing.

f. Other sources (e.g. Recoveries)

22. Results of the Project:

- i. Direct benefits
- ii. Indirect and other benefits

Number of persons served

Contribution toward specific targets/social objectives

23. a. Approximate number and categories of job opportunities likely to be created indirectly as a result of —
- i. Implementation.
 - ii. Operation of project.
- b. Economic life of components of project (Buildings, equipment etc).

PART 'C'

PROJECT REQUIREMENTS

24. a. Manpower
- | <u>For Execution</u>
man month | <u>For Operation</u>
Number |
|---|--------------------------------|
| 1. Professional and Technical | |
| 2. Administrative, Executive and Managerial | |
| 3. Clerical | |
| 4. Service | |
| 5. Skilled | |
| 6. Unskilled | |
| 7. Others | |
- b. Likely shortage of manpower by occupation
- c. Steps to be taken to assure availability of manpower
- d. Approximate number of persons required to be trained per year (locally and abroad) and the kind of skills to be learnt
- e. Give total capital outlay, give the capital cost of mobilizing one worker for one shift.
25. Physical and other facilities required for project:

Item	Total	To be provided from the project itself	To be provided from the public utility
------	-------	--	--

- a. Housing by type
- b. Power supply.

- c. Water and other utilities
- d. Others

26. Materials, supplies and equipment requirement:

A.I. Minimum total requirements for execution:

To be completed only for major items costing more than 10% of the total cost.

Items	Unit	Local	Foreign	Already available with agency	
		Quantity Rate	Cost per Quantity	Rate Unit	Cost per Unit

1. Materials

- a.
- b.
- c.
- d.
- e.

2. Supplies and spares

- a.
- b.
- c.
- d.
- e.
- f.
- g.

3. Equipment and machinery

- a.
- b.
- c.
- d.
- e.

A.II. Materials, spares and supplies and equipment for operation of Project.

Unit	Local			Foreign		
	Quantity	Rate	Cost	Quantity	Rate	Cost
	per unit			per unit		

1. Material

- a.
- b.
- c.

2. Supplies and Sapres.

- a.
- b.

27. In the case of imported material and equipment for execution, indicate.

- a. Justification for imports
- b. Proposed source/sources of supply

Annexure to P.O.C.

(This part should be filled up only for revised scheme).

1. Comparative cost estimate of the last sanctioned and revised schemes:

Items	Last sanctioned Project			Revised Project		
	Local	Foreign Exchange	Total	Local	Foreign Exchange	Total
a.						
b.						
c.						
d.						
e.						
f.						
g.						
h.						
i.						

Give reasons for the revision in cost estimate

Items	Reasons for the revision
a.	
b.	
c.	
d.	
e.	
f.	
g.	
h.	
i.	

2. Total expenditure incurred so far:

	Expenditure		
	Local	Foreign	Total
a.			
b.			
c.			
d.			
e.			
f.			
g.			
h.			
i.			

3. Progress of work:

(a)	(b)	(c)
As per schedule sanctioned	Actual Achievement	Reason for delay

4. Project History:

Date	Cost	Planned period of completion in months.	Reason for revision
Local F.E. Total			

Original sanction
1st Revision
2nd Revision
3rd Revision

APPENDIX-B

**GOVERNMENT OF PAKISTAN
PLANNING COMMISSION**

**MANUAL
OF
INSTRUCTION FOR FILLING THE
P.C.I FORM**

1974

PART "A"

PROJECT DIGEST

Item I. (title.—The exact title of the project should be brief and should properly identify the purpose of the project. If owing to revision before sanction, the name is no more representative of the scope and purpose of the project, it should be changed but the previous name should continue to be added in parenthesis below the new name, until the project is sanctioned. No name should be changed after the project has been sanctioned. If the project is a phase of scheme, the phase number should be mentioned.

Item 2 (Agencies involved).— The names of the agencies should be separately indicated. If the same agency is responsible for more than one function, the name may be repeated. If the project has been sponsored by a Provincial Government, the names of the Central Agencies concerned should be separately indicated against 2(i), 2(ii) & 2(iii), as the case may be, by giving semi colon (;) after the name of the provincial agency.

Item 3 (Period for completion of Project).— The period for completion of the project should begin from the month in which the ground work on the project is started and end with the month in which the project is expected to be operational.

Item 4 (a) (i) Plan Status).— In case the project is not included in the current Five Year Plan write the words not included.

Item 4(a) (ii) & (iii)— Self explanatory.

Item 4(b).— In case the project is not included in current Plan, state briefly its relation, if any, with the programme of the Plan. Sufficient reasons should be given for its inclusion in the Plan.

Item 5 (Sectoral Programme).— The role of the project in the overall programme of the sector should be indicated. Information relating to this item may be obtained from the plan documents, administrative ministries or planning organisations. Other projects which are to be closely integrated with the proposed project should be named and their present status (sanctioned or under preparation) indicated.

Item 6.— Indicate briefly without giving detailed itemised break-up the capital cost of the project.

Item 7.— The information given in detail in Part B relating to financing of project should be given in abstract form.

Item 8.— Against this item indicate, in a brief manner, the objectives of the project which have been given in greater detail against item II. While item II should give a complete justification and consequences of the project, item 8 should give only the main objectives preferably in quantifiable terms.

PART "B"

9. Self-Explanatory.

10. The purpose of this paragraph is to know the total needs of the area or the community and to what extent those needs are at present being met by the existing facilities. The needs have to be spelled out in terms of the specific requirements for each category of population. Thus if the Project is for establishing child health clinics the population of children of the relevant age groups and the income characteristics of those families should be given. The details of the existing public and private sector institutions catering to children's health should be given to the extent possible. For the establishment of a general purpose hospital, data about morbidity etc. should be given for about five years and the number of beds and outdoor arrangements in public and private sector should be indicated. For preventive health services, data relating to water, sewerage and environmental hygiene should be spelled out.

For family planning, the demographic statistics should be given alongwith the staff at present working for family planning in public sector and on voluntary basis. The effectiveness of the existing staff should be highlighted by giving the results of knowledge attitude practice surveys. For social welfare projects, give similar details about the needs for a particular service, the population and income groups to be covered and the existing facilities available for coverage of such population.

11. Having established the need and indicated the existing facilities, the sponsor should give details of the proposed facilities to be created through the project. Thus details of building, equipment and staff requirements should be given and each component of the project justified in the context of the purpose set out for the project. The details should

indicate how a balance is being achieved in the provision for various components of a project e.g. the balance between outdoor and indoor facilities in case of a hospital. In case of family planning, it will mean giving the staff and supplies, the arrangements for motivation and distribution and the targets for each phase of work.

12. Self-explanatory.

13. If any item of capital expenditure has not been mentioned in the list, give details of such item.

14. Self-explanatory.

15. Indicate how the facilities created by the project will be maintained when the project period is over.

16. The most appropriate unit should be selected. In case of curative health, the cost per outdoor patient or per bed should be given. In case of family planning, the cost per acceptor and per couple contacted should be indicated. In all projects which have building components, the cost of construction per square ft. of built — in area should be given.

17. Self-explanatory.

18. The phasing should be given in detail. The physical work should be broken up into various parts.

19. Indicate details of items included in others.

20. Self-explanatory.

21. —do—

22. The results of the project should be given in terms of various hierarchies of objectives. The ultimate objective of a health project may be reduction in mortality and morbidity which consequently increase the productive span of a person's life. The contribution of the project to such objective should be given. The ultimate objective is obtained by achieving intermediate level targets e.g. increasing the number of beds or controlling specific diseases. These intermediate goals should also be stated so that the path through which the goals are to be achieved are known. In case of family planning, the ultimate goals would be reduction of birth rate but the intermediate target would be increasing supplies of

contraceptives, motivating couples in relevant age groups and increasing the number of acceptors.

23. a. Indicate, if possible, the number of jobs likely to be created indirectly as a result of implementation and operation of project.

b. Indicate the period for which the building or equipment will continue to be useful and productive.

PART "C"

PROJECT REQUIREMENTS

Manpower

a.— Information required to complete this item should be obtained from appropriate sources. If the work is to be completed on "turn-key basis", the information should be obtained from the agency directly concerned with it. If the work is to be executed through International tenders, the details of that tender should be indicated. The extent of foreign collaboration may be specified clearly. Where the work is to be jointly executed, the extent of responsibility of each agency should be indicated separately. Under this item, only the number of full time employees should be included. Clear distinction needs to be made between foreign and local (Pakistani) personnel and their number mentioned separately. If foreign personnel are to be replaced gradually by Pakistanis, both the initial and the eventual Pakistani-foreign breakdown should be given. The period for which each category of personnel is required should be indicated in months.

The sub-head, "Professional and technical" includes accountants, agronomists, engineers, teachers, lawyers and other professional and technical personnel. Administrative managerial sub-head includes managers, directors and government administrators; "Skilled Workers" includes Working foreman, and their assistants, Mechanics, Electrician, Carpenters, Masons, Factory or agricultural "Unskilled Workers" would include those who do not require any special training before they start the work. Other employees who do not fall in any of the above categories, may be put under "Others":

A list of the manpower required should be appended with PC-I to indicate specific occupation titles (designation) rather than general

groupings. Whenever possible, the scale of pay suggested for each type of employees should be given. For particular persons requiring special training, the period when they would actually need the training should be indicated. It should also be made clear whether the persons are already employed by the sponsoring authority/contractor or whether they are to be specially recruited for the Projects.

Details should be given for the manpower required on completion of each phase of work or for various levels of capacity utilisation. Thus for education projects, if a number of schools are to be opened, the manpower required for running the schools opened at the completion of each phase should be given.

(b&c).— When there is no shortage of manpower, the reply may be “no shortage anticipated”.

If there is any shortage expected in any particular unit of the overall scheme, the details of such shortage should be given by occupation (Managerial, professional, technical, skilled/unskilled etc.). Whenever possible, shortage of foreign and Pakistan personnel should be indicated separately. The period for which the shortage is anticipated should also be mentioned. Whenever possible, exact title of the occupation including the scale of pay may be supplied. Once the shortage has been quantified, the possible ways of meeting the shortage should also be suggested. Indication as to whether the required manpower is locally available or not and also whether the shortage is temporary should be highlighted. The possible ways of arranging manpower may include recruitment, transfer or deputation from other agencies/Depts and through training either within the project or in some organised institute.

(d) The details such as extent of training, subjects to be covered, the duration of training etc. should be clearly indicated. Possible places (whether within the country or abroad) where such training facilities should be available may also be stated.

(Physical Requirements):— Physical and other facilities may include housing, power plant, filtration plant, sewerage treatment plant etc. Details of the sources of obtaining these physical facilities should be indicated. If a particular facility is to be provided on a joint venture basis, the extent of responsibility for each authority/agency should be clearly indicated. The importance of giving careful attention to the completion of this item is stressed as delays have occurred in the completion of many projects owing to non-availability of certain services. It is

necessary for the authorities responsible for preparing PC-I form to ensure that the precise requirements in terms of quality, quantity, of supplies and services is made and a confirmation obtained from the service or utility organisations that those services would be made available.

(Equipment Requirements).— The information should be given only about major items (i.e. those costing 10% or more of the total cost) or about items which may pose problems of procurement. Materials and equipments available locally and to be imported should be put separately under appropriate columns. Indication should be made about the possible sources of getting this equipment.

(Imported Material) -- Justification of Imports may include reasons such as:—

- a. the item in question is not available locally;
- b. local production can not meet the overall requirements;
- c. it is cheaper to import the item even after shadow pricing to foreign exchange;
- d. sponsoring authority may be bounded by certain agreements with the aid giving agency to import the item;
- e. the quality of local production is not acceptable to the foreign contractors etc.

Details should be given regarding the sources of supply. Reasons for selecting the proposed source may include the following:—

- a. bounded by certain agreements with the aid giving agency;
- b. for the sake of standardisation;
- c. rate quoted is reasonable;
- d. item in question is available there only;
- e. quality is thought to be the best;
- f. Free service would be available for a comparatively longer period;

- g. available on suitable credit terms;
- h. transportation cost would be largely reduced;
- i. source is more reliable etc.

Item—1.— All work should be broken down into major items. Reasons for the revision in cost estimate should be given in detail against each item. Main reasons of revision may include.

ANNEXURE TO PC—I

- a. Change in the unit rate of the items
- b. Change in the quantity of the item due to change of plan and design or due to more accurate design and estimate
- c. Addition of items left out in previous estimate
- d. Change due to increased cost of Insurance and Freight
- e. Change due to Government policy towards customs and excise duties including import and export policy
- f. Change due to any other factor which could not be anticipated at the time of previous estimate, such as:
 - i. Change due to comparatively higher cost of materials and equipments bound to be imported from aid giving agency
 - ii. Change due to higher transportation cost of materials and equipment to and from the site which is located in a place where transportation system is not fully developed.
- g. Change in the agreement with foreign/local contracting firm etc

While explaining for revision, details of each and every change should be indicated by quoting old and new rates/figures for each sub-item.

Item 2.— Only major items as in item 1 above should be included.

The heading "expenditure incurred so far" calls for the indication of a specific date (preferably in month of the year) to which the expenditure related.

Item 3.— The physical progress made upto the month in which revised PC—I is proposed should be indicated. Wherever possible, item-wise progress should be given. Progress should be indicated in percentages.

Item 4.— Give a history of the Project as indicated.

APPENDIX — C

P. C.-II FORM

GOVERNMENT OF PAKISTAN

PLANNING COMMISSION

PROFORMA FOR DEVELOPMENT PROJECTS

(SURVEYS AND FEASIBILITY STUDIES)

1974

Serial No. :

To be filled in by Planning Commission.

1. Name by which survey will be identified.
2. Administrative authorities responsible for.
 - (i) Sponsoring.
 - (ii) Execution.
3. Central Ministry concerned with:
 - (i) Sponsoring.
 - (ii) Execution.
4. Details of Survey/Feasibility study:
 - a. General description.
 - b. Justification.
 - c. Month of commencement and completion (give details of phasing).
 - d.

Estimated Cost	Local Cost	Foreign Cost	Total Cost
Year			
1			
2			
 - e. (i)

Personnel required.	Pakistani	Foreign
Category Number	personnel	personnel

 - (ii) Give period of contract for local and foreign consultants and term of their appointment.

f. *Mode of financing:* (Give budget provision).

If foreign exchange expenditure is involved indicate whether a firm commitment is available.

5. **Details of scheme likely to be submitted after survey:** (Give information wherever possible)

a. *General description*

b. *Location*

c. *Estimated cost* Local cost Foreign cost Total cost
Year

1

2

3

d. *Benefits of Project* (Economic, financial and non-quantifiable)

e. *Probable mode of financing*

f. *Number of persons likely to be employed during implementation of scheme and after completion.*

Category Number Local personnel Foreign personnel

g. *Materials and parts required yearly after completion of project.*
(Local costs and Foreign costs).

*Signature and designation of Officer
sponsoring the Project.*

Instructions for filling up Form PC-II

1, 2 and 3 No. comments necessary.

4. (a) Provide a general description of the aims, objectives and cover-

age of the Survey/Feasibility Study. Details of the Terms of Reference of the Survey/Feasibility Study must also be submitted. Indicate the present position regarding the lining up of finances and manpower for the survey indicate and likely problems in this regard.

- (b) Provide a detailed justification for undertaking the Survey/Feasibility Study. Indicate whether previous studies in the field have been undertaken. A copy of such a study should be enclosed.
- (c) Indicate approximate duration of study and proposed months of commencement and completion of the study. The phasing for major items should be given in the form of a table or a bar chart.
- (d) Indicate cost estimates of the study broken down between local and foreign exchange expenditure. Indicate also date on which cost estimates were prepared and the basis of these estimates. Costs should be detailed according to requirements of manpower, both local and foreign, equipment, transport etc. Only the cost of Survey and Feasibility Study should be included and no cost pertaining to the main project which would later be prepared on PC-I form should be included in the item.
- (e) (i) Indicate personnel, requirements separately for local and foreign personnel according to the following categories.

Professional and Technical; administrative, executive and managerials, clerical, sales; service; skilled; unskilled; others.
- (ii) Indicate the period of contract of both the local and foreign consultants and the terms of their appointment.
- (f) Indicate the budget provision that exists or has been requested for undertaking the proposed Survey/Feasibility Study. If foreign exchange expenditure is involved, indicate whether a firm commitment has been made, or probable source of financing alongwith terms of financing.
- (a) Provide, in as much detail as possible, the technical, economic and financial aspects of alternative project that are proposed

to be undertaken after the Survey/Feasibility Study has been completed.

- (b) Indicate the location or choice of locations that are being considered for the proposed project (s).
- (c) Indicate approximate cost of the project (s) with a breakdown of costs between local and foreign currency expenditures and the years in which the expenditure will be incurred.
- (d) Indicate probable benefits of the proposed project (s) including the anticipated rate of return, and social benefits. Item-wise non-quantifiable benefits as well.
- (e) Indicate probable mode of financing for both the local and foreign currency requirements.
- (f) Classify personnel needs as in 4(e) above.
- (g) Indicate annual operating requirements of the project in terms of materials, spare parts etc.

UNIT-3

THE PROJECT PLANNING IN PAKISTAN

Written by:

M. Athar Khan

INTRODUCTION

This unit deals with project planning in Pakistan. The contents of this unit are based on the official reports and documents of the Planning Commission, Ministry and Departments of Education and personal experiences of personnel associated with them. An attempt has been made in this unit to present the actual situation as it relates to project planning in the country. But on occasions, some general comments or suggestions have also been given to help the student understand and better appreciate the project planning.

OBJECTIVES

After studying this unit you will be able to.—

1. Discuss the stages of project cycle in relation to project planning, practices in Pakistan.
2. Elaborate the process of project planning and its implication for the jobs of project planners and project implementers.
3. Analyse the items of the present PC—I form and its short-comings.
4. Explain the project plan gaps under the present system.

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1. THE PROJECT CYCLE IN PAKISTAN

The process of project planning is usually described in reference to the stages of the project cycle. Although, these stages are often dependent upon and determined by the nature of the individual projects, most good projects would, however, follow the following project cycle discussed earlier in the Unit—2:—

- a. Sources of Project
- b. Feasibility study
- c. Project formulation (project preparation or project planning)
- d. Project appraisal
- e. Project approval
- f. Project implementation
- g. Project operation
- h. Project evaluation

The stages of the project cycle are logically inter-linked and inter-dependent activities. However, each of these stages constitutes an independent activity in itself as well. A study of education projects specially, in Pakistan, however, shows that in most cases, the above project cycle has never been followed in its entirety. Sometimes, some of these stages are inter-mixed and they are not identifiable in actual practice, e.g. it is difficult to find a project, the formulation of which had been preceded by a feasibility study of any kind. Similarly, there have been few studies on project evaluation. Project appraisal and project approval tend to be somewhat inter-mixed in the project authorization procedure. For the purpose of the studies of process of project planning in Pakistan, however, the above project cycle will be used as a model of project planning which planners should aim to follow.

1.1 Sources of Projects

The projects identified for implementation are reflected in the National Development Plans of various sectors. However, in practice following are the sources of projects:—

- a. National Development Plans
- b. Sectoral Plans
- c. Annual Development Plans (ADP's)

- d. Personal Initiatives
- e. International Assistance Programme
- f. Local and Community Needs

a. *National Development Plans*: In the past, it was a common practice to append related projects to the National Development Plans. The practice was discontinued in the 5th Five-Year Plan, but there is still a reference to major on-going projects in the Plans. However, plans still form a basis for project identification as it is evident from the PC-I form which requires information about the project having its provision in the plan. In case it is not included in the plan, the PC-I form contains an item on the justification of the project. A study of many PC-I forms prepared in the past shows that this justification is usually given with reference to certain plan provisions.

b. *Sectoral Plans*: As pointed out by Veitch (1979, p. 26) "Even if there is a marked showing towards planning projects from a basic needs stand-point (in Pakistan) sectoral plans still form a basis of project identification in very many instances."

c. *Annual Development Plans (ADP's)*: Although it is not always true, the ADP requires that the projects for each sector should be identified in advance and should form the basis for ADP. However, in practice a large part of an ADP is taken up by the on-going projects, and the projects over-running in time and cost estimates. There is practically little room for new projects. A certain amount of ADP funds goes for "Block Allocation" which does not require prior identification of the projects. However, the block allocation is limited and would provide for very few new projects to be undertaken.

d. *Personal Initiative*: Some of the major projects in education have been identified by officers of Ministry of Education or Departments of Education on their personal initiatives. The well-known Teaching Kit Project of the Ministry of Education and Functional Educational Project for Rural Areas of the Allama Iqbal Open University are examples of such projects.

e. *International Assistance Programmes*: The International Assistance Programmes have been sources of many major projects like 'Third Education Project', 'The Pakistan Primary Education Project-IV', Population Education Project etc. International

agencies are in a good position to identify projects for all countries based on their knowledge and experience of standards of educational provision and project ideas in other countries in the same region or elsewhere in the world. Sometimes, international agencies have "pet" project ideas which they try to promote in many countries, without paying detailed attention to local wants and needs.

Project definition requires, as a preliminary step, the assigning of a title or a name to a project. This constitutes item No. 1 of the PC-I form. The name of a project is intended to tell what the project is about. Much of what follows in terms of planning a project unfortunately depends upon how carefully a project is named. The title of a project therefore, must clearly reflect the nature of the project. Too often, the name conveys the purpose and content of a project proposal in the rush to implement it, too little attention is paid to the objectives and definition.

f. *Local and Community Needs:* Sometimes, a project is based on the needs of the people. These projects are usually identified by the people concerned and presented through the local departments or politicians. They usually constitute small projects such as building of a school in a community, up-grading a school; construction of Intermediate college etc.

The practices and policies regarding project identification, described in the preceding pages were intended to present an account of the existing situation of project on-goings in Pakistan. The following extract from course notes of the Economic Development Institute of the World Bank on Project Generation and Design are reproduced here to help the reader to analyse and better understand the project identification system in vogue in the country.

1.2 Project Generation and Design

The project generation process is perhaps best viewed as having two components, the coverage over time towards the achievement of a development objective and the solution of a development problem:

- a. Elimination of alternatives — a narrowing down from an initially wide range of alternative solutions, each marked with uncertainty, to one well enough defined in its physical and institutional components, costs, benefits and risks to be ready for project appraisal and implementation; and

- b. **Elaboration of details** — a sharpening of the detail and precision with which the design of each aspect of the project is worked out.

The initial broad definition of objectives encourages consideration of wide range of possible solutions and lessens the risk of pre-mature rejection of promising alternatives, while the gradual narrowing down to a specific definition of the project avoid unnecessary detailed preparatory work on alternatives that eventually are discarded.

Project generation — whether intended or not — is generally divided into a number of stages or sub-stages (often combined in practice), each ending with a decision necessary for proceeding to the next stage. It is preceded (or accompanied) by sector work — i.e. the process by which greater sector and cross-sectoral knowledge is acquired by the project funding organization and the project executing agency; development problems, policies and institutions are analyzed; and the knowledge is organized into actionable policy and investment strategies.

Project identification is the first stage, comprising:—

- a. **Identification of project ideas** (and possible alternatives) to resolve priority problems or to meet key development needs as defined in sector strategies. This is followed by the recognition of one, several, or a series of alternatives as potentially viable and consistent with country's objectives. Usually, after completion of pre-feasibility studies on the most promising project ideas, (it leads to)
- b. **Preliminary selection of a project concept** and of alternative design approach as suitable for further feasibility work.

Project preparation consists of bringing a project defined in a preliminary way to the point at which it can be appraised — i.e. a determination can be made whether and, if so, how it can be carried out effectively and at a cost comparing favourably with its expected contribution to economic and social development and how it can be made suitable for domestic and/or international financing.

- a. **Feasibility study:** Project preparation usually requires the development by means of a feasibility study of the selected project concept to the point at which a choice can be made from among various design alternatives, and the project can then be considered as defined in terms of both "software".

- b. *Detailed design*: At this point — which in many but not all sectors usually coincides with the start of the bank's project appraisal stage — it is prudent and efficient for a country to commit the level of resources needed for detailed engineering and detailed institutional design.

1.3 Origin of Project Ideas

Project ideas originate from a multiplicity of sources; from within a country and from the international sectors, from national sectoral or regional plans or strategies, from the beneficiary agencies, and from various informal channels including — as occurs with increasing frequency — those who are most in need.

At the national level, project ideas can emerge from the national planning processes, usually supplemented by sectoral or regional studies. In some cases, these studies are commissioned by a project identification agency or by a national pre-investment fund set up to provide an institutional solution to the difficulties that often occur in translating national development plans into specific projects. In certain sectors, such as education there have been increasing efforts to involve and consult all relevant elements of a country in the review of national policies and plans.

In practice, project ideas often result from the identification of:

- a. Unsatisfied demands or needs and the most effective means to meet them;
- b. Problems or constraints in the development process due to shortage of essential skills and facilities etc.
- c. Unused or under-utilized material or human resources and opportunities for their conversion toward more productive purposes; or, conversely, over-utilized resources which need to be preserved or restored; and
- d. The need to complement over investments.

Ideally, the identified needs, problems or opportunities would be ranked according to priority and organized into actionable strategies, from which would flow the desired project ideas to be implemented in sequence or in parallel.

Project ideas also emanate from:

- a. The initiative, or the response to government incentives;
- b. A government's desire to respond to local political or social pressures originating, for example, from growing economic, social or regional inequalities;
- c. The perception of the possible external factors which may lead to investments in education;
- d. The occurrence of natural events (drought, flood, earthquakes, etc.) or hostilities, which can be of such magnitude as to require and enlist the aid of the international community; or
- e. The desire to create a local permanent development capability (investments in institution building, the development of local capabilities in project generation and implementation, etc.

Project ideas originate not only from within a country but also from abroad:

- a. The investment decisions of international agencies,
- b. The programming process of bilateral or multilateral aid agencies,
- c. The influence of strategies of investment patterns adopted by other developing countries; the opportunities created by international agreements,
- d. The prevailing professional opinion and moral concerns within, or policy pressures emanating from, the international community,
- e. International comparisons of standards of education with countries at similar stages of development.

Before project ideas can be identified, there is need to organize and analyze the available information on the country and the desirable geographic project areas; the economy and the natural resources; existing technologies, institutions, human resources and their development potential; and the experience gained from past development projects. This information can then be interpreted operationally through economic sector or special studies, with or without the involvement of the international community.

1.4 Recognition of Project Ideas

The first step in identifying a project consists of the recognition and selection of one, several or a series of a project ideas, originating from one or more of the various sources (described in the foregoing pages) as potentially viable to resolve one or several problems, needs or constraints in a country's development. This requires a quick, preliminary screening by experienced professionals, who would be expected at the same time to suggest modifications and additional and potentially better project ideas. This is a delicate process as both the agencies and specialists concerned tend to identify and retain ideas for priority investments in their particular area of competency, to the exclusion of other ideas; hence, the need for the country to adopt broad criteria (technical, socio-economic environmental) within an agreed policy framework in carrying out the screening process.

1.5 Pre-Feasibility and Preliminary Selection

Promising project ideas then need to be refined in an orderly manner — up to the point where only the most suitable are retained — leaving open the option of eliminating alternative ideas from further consideration at any stage, with a minimum of wasted time and effort. This requires the preparation of reports (pre-feasibility or pre-investment studies), with details just sufficient to indicate the general promise of the project ideas in terms of the possible alternatives and the reasons for the choices made or proposed, financial, institutional and social analyses at the design stage, while underlining such aspects deserve special attention. To permit a decision on the merit of the project ideas, these reports briefly examine:

- a. The size and nature of the demand or market for the product or services, and the intended or expected beneficiary groups or target areas;
- b. The basic available alternative technical solutions or packages, with corresponding estimates of outputs, including identification of technologies already in local use and their potential for improvement;
- c. Availability of the main production factors; e.g. skilled T.V. technicians.
- d. An order of magnitude of the costs (investment and operation);

- e. A rough estimate of the financial or economic return, if the project is a production project. Otherwise a quantitative statement of the expected benefits;
- f. Any apparent major constraints or other general factors likely to have an important impact on the proposed project, such as institutional channels for project preparation and implementation and essential government policies and regulations related to the project;
- g. If a project idea shows merit, the essential additional information that should be obtained through the project preparation process; e.g. detailed demand studies; investigation of potential local students (in case of an educational institution) building project environmental surveys; economic, social or attitudinal characteristics of the project area population; availability of (land means to generate) technical and managerial skills and, more generally, existing or potential sources of local capacity for project planning, implementation and evaluation; evaluation studies of the outcome of earlier similar projects in the country, other gaps in sector or cross-sectoral knowledge; and
- h. Any other major potential issues or choices remaining to be examined, such as religion, legal constraints, legal obligations etc.

1.6 Selection Criteria

The criteria for screening or modifying project ideas — and, later on, design alternatives — will be very broad initially and become more specific as the preparation work progresses. For instance, project ideas exhibiting the following characteristics should be quickly eliminated when there are no identifiable alternatives or no reasonable remedies to their weaknesses: technically unsound or inappropriate technology; too much risk; weak financing; inadequate raw materials, skills or other inputs; excessive social or environmental costs; lack of commitment of the beneficiary. Many of these criteria are inevitable rather vague, and it is important that authorities in decision-making try to arrive at a common understanding of the criteria to be used and their implications (including consistency in their use), apply them in a constructive manner, and recognize that there is an inherent risk in any project selected.

The preliminary selection tests should be such that when a project has passed them it should have reached the following stages in its preparation:

- a. It is clear that detailed project preparation work is justified;
- b. Major issues, options and alternatives have been identified and some initial choices made;
- c. An order of magnitude of the project cost has been estimated; and
- d. A specific preparation programme has been or can be established (ibid, pp 2-4).

1.7 Project Formulation

Once a project has been identified and defined the next step in the project cycle is to determine its feasibility for implementation. As discussed earlier, feasibility surveys or studies involve a formal study or survey to determine the worthwhileness of the project. A review of the education sector projects in Pakistan, however, reveals that even the major national education projects have been undertaken without first determining their feasibility. Absence of feasibility survey has resulted in investments in projects which seldom achieved their objectives. Some of the projects also proved to be nothing but white elephants. It appears that decision regarding the feasibility of an education project is more a matter of persuasiveness and satisfaction of the project initiator, satisfaction of the person appraising the project and disposition of the project authorising person or agency. While most of the projects in education sector are identified at a higher level of administration, the formulation or preparation of a project is usually carried out at the lower level of administration. In Pakistan, therefore, the step which follows the identification of a project or a project generation idea, is necessarily the formulation of the project or in other words the filling up of the PC-I form (Appendix 'A'). As a matter of routine, the PC-I form is filled up by a person other than the one who identifies the project and a person usually lower in rank. It has also been observed that the person preparing the project plan (i.e. PC-I) does not have access to the data required for project for the following reasons:—

- i. The project preparation does not allow sufficient time for collection of basic data.
- ii. Educational statistics, if at all available, have very low reliability.
- iii. Cost estimates of local and foreign materials, equipments etc. are not always readily available.

It is also a very common practice that the person who prepares a project and the person who implements it are to different persons and very often they have no linkage whatsoever with one another. The system may offer advantages, namely that "the more brought to bear on a problem, the better", but this practice often results in gaps in the PC-I which are subject to mis-interpretation by the implementer. In certain major projects, it has been found that the project manager finds no help from the PC-I form in implementing the project. Consequently, the project manager has to work out his own implementation strategy which sometimes even changes the basic spirit of the project and ends up with something which was, perhaps, never thought of.

It is realized by all the individuals and agencies involved in the preparation or sponsorship of projects that a project must be on sound and reliable data. This data is needed not only to establish a reliable estimate of the need/demand for the service, and an accurate indication of costs but also it facilitates the appraisal of the project and leads to better decision making in this connection.

It also is commonly agreed that there should be a linkage between the project planner and the project manager all the way through the preparation of the project documents to the implementation of the project, its operation and evaluation. Preferably, the same organization or agency which prepares the project should also implement it. In this connection, it is necessary to make a distinction between the Department or a Ministry and the project formulating and implementing organization. In the former case, there may be several independent sections within the Ministry and the Department and there may not exist a direct linkage between the section which plans a project and the section which implements it. It implies that for every project, from its beginning a section of the Ministry or Department or an autonomous organization undertaking a project should be assigned the job of its planning and implementation and as far as possible there should be no changes within that organisation.

1.8 Appraisal of the Project Plan

As discussed earlier, the purpose of appraisal of the project plans (PC-I) is to facilitate decision regarding the approval of a project for implementation. A good project planner prepares the project document (PC-I) keeping in view the criteria of project appraisal followed by the local organizations in case of locally funded projects and the criteria suggested by the international organizations for projects to be funded by foreign agencies.

At the first sight, the appraisal of a project appear to be a simple job. But in practice, specially in cases of large and complex projects, it becomes a difficult job and demands even "Away from table work" and a critical analysis of each item of the project plan.

Based on his experience in project appraisal in the Planning and Development Division, S.M. Aijaz has laid down the following criteria for project appraisal which is usually followed in the country:—

a. Purpose of Project Appraisal

The basic purpose of project appraisal is to provide such information to decision-makers, political leaders and aid-giving agencies etc. as would assist them in making investment decisions. Project appraisal provides data or information which implies decision makers to compare different projects and to choose those that are likely to contribute most to development objectives. Other purposes, of project appraisal include:—

- i. Wherever necessary, modifying projects to make them likely to succeed
- ii. Timely rejection of a project which is poorly formulated and does not justify investment of resources. (The proposed interventions imply analysis and identification of deficiencies and the limitations of action in the project proposals to create the situation)
- iii. Adequacy and feasibility of the proposed intervention
- iv. Administrative and managerial capability
- v. Project costs:
 - i. Building
 - ii. Equipment and furniture
 - iii. Library books, periodicals etc
 - iv. Development of Instructional Material
 - v. Staff development
 - vi. Staff salary
 - vii. Project outcomes
 - viii. Schedule of work
 - ix. Financial phasing

The aspects of a project appraisal suggested by S.M. Aijaz may not always be applicable for appraising education projects, but they still cover a broad area of project appraisal. As a matter of procedure, projects depending upon their cost and size have to be approved at different levels of authorization such as Provincial Departments of Education, Ministry of Education, and Executive Committee of National Economic Council. The levels of appraisal thus also vary. Study of several approved projects of different sizes, however, shows that in practice an objective criteria for project appraisal is not always followed. Such projects are known to be ended in complete waste of the resource investment in them or they usually over run in time and cost so much so that their very utility becomes obsolete at some stage and they do not serve any developmental purpose.

b. Problems of Project Appraisal

Following are major reasons for poor inadequate appraisal of many education projects:—

i. *Time and Resources Available for Appraisal of a Project:* As pointed out earlier in this unit, project appraisal is a complex job. It requires technical analysis of a project plan; verification cost estimates; and evaluation and assessment of the anticipated out-comes. The job, therefore, demands enough time and working of more than one person, which is seldom available. The appraisal of a project is done usually hurriedly and usually by one-man team.

ii. *Political and Administrative Pressure:* Origin of project ideas and project planning have sometimes, political background, sometimes they are based on certain administrative decisions. In such cases, the appraisal of a project becomes a more formality. Project plans approved under the circumstances are known to be hasty and full of gaps.

iii. *Local and Foreign Commitments to National Development Sectors:* The projects which are based on local and foreign commitments, or sometimes promises of central and provincial governments to fund a project have certain elements of uncertainties as has been the experience with several education development projects. Such uncertainties restrict appraisal of a project.

iv. *Uncertainties about Approval of Project and Project Financing (projects cuts):* The projects which are proposed with any prior commitment are fraught with the uncertainty of their non-acceptance. The labour, therefore, in preparation and appraisal of such projects could even be lost if the project is not approved. In some cases, the costs of projects are cut down arbitrarily and the whole process of project costing, cost verification, appraisal etc. appears to have been an exercise in futility. Such uncertainties make appraisal of projects both interesting as well as difficult.

v. *Lack of Experties in Project Formulation:* Source of one major problem, faced by the appraisers lies in the lack of proper training and experience of project planners.

vi. *The format of the Present PC—I Form:* The PC—I form which is presently used as the standard format of project formulation has long been criticised for its inadequacy and inappropriateness for education projects. But, both education project planner and project appraiser have to work within the limitations of the PC—I proforma, which considerably limits the scope of appraisal.

vii. *Non-Availability of Project Data:* A good plan of a project must be based on reliable data about the project location, need for the facility to be created, absorption capacity of the outcomes of the project in the community or institution, their present and future demands etc. Their project data are seldom available and the project planner and appraiser both have to depend either on crude guesses or on the sources which they themselves find inadequate and unreliable.

viii. *Unrealistic Cost Estimates:* As of the data for a project, the cost estimates of materials, equipments and services are made unrealistically for various resources, most common of which are:—

- project planners' tendency to under estimate cost and over estimate benefits,
- fluctuations in rate of foreign exchange and market prices of materials and equipments,
- limited access of project planners to markets,

- complex system of specification and cost estimation of buildings etc. by the government departments,

ix. *Adhocism in Project Planning:* In education sector, project planning is done on adhoc basis. There is a need of a permanent body to be set up and manned with specialists in project preparation, who are provided both time and resources for project formulation. Presently, the project appraiser spends more of his time improving the project plan prepared by a non-professional, often a novice.

2. PROJECT REVIEW

As pointed out earlier in the unit, one of the purposes of project appraisal is to assist the review of the project to make it more viable to achieve objectives. A project plan, once it has been prepared, is always subject to review for the following reasons:—

a. *Appraisal:* As a result of the appraisal of the project, a review of the project may be necessary to improve it and make it more viable to achieve the objectives for which it has been prepared and make it more convincing for approval by the appropriate authority. Review at this stage may be more technical and relate to the technical aspects of the project formulation.

b. *Financial Adjustments:* Sometimes, it so happens that the cost estimates given in a project plan are not acceptable by the Departments or financing agencies and they are reduced in their size. A project in this case, therefore, has to be reviewed to be adjusted to the finances available to the project.

c. *Delays:* On occasions, the time that lapses between the initial preparation of the project and its approval and release of fund, is so long that the cost estimates become obsolete. In order to adjust the project needs to the funds available it must needs be reviewed thoroughly. The project manager in this case has the responsibility for managing the project under the changed conditions.

As in case of financial approval, the delays in the approval of a project may also cause constraints in the time schedule of the project. If a

project has to be completed by certain date, it is to have some provisions for crash programmes. This requires additional inputs to complete various activities of the project which could be managed by reappropriation of funds or by generating new sources of funds for the project. It also necessitates a redesigning of the project and rescheduling of its activities.

In case where project managements are not sensitive enough to review project and readjust it to the emergency the projects usually end up in disaster.

3. LIMITATION OF THE PC-I FORM

The PC-I form, currently in use for preparing development projects, has long been criticised for its inadequacy for development projects. A serious effort appears to have been made in the later half of the 70s to review the PC-I form and develop a form which is suited to the need of project planners of all sectors in the country. Mike Veitch of the Project Planning Centre for Developing Countries, University of Bradford, (UK), has preped, on the request of the Planning Commission, a comprehensive draft PC-I to replace the present PC-I. The proposed PC-I contained the following sections:—

- | | | |
|----|------------------------------|-------------|
| 1. | Project Description | (items 1-7) |
| 2. | Capital Cost Estimates | (" 8-14) |
| 3. | Recurrent Cost Estimates | (" 15-20) |
| 4. | Project Review and Financing | (" 21-26) |
| 5. | Summaries of Project Worth | (" 27-34) |
| 6. | Implementation | (" 35-37) |
| 7. | Economic and Social Effects | (" 38-41) |
| 8. | Project Administration | (" 42-45) |

This 45 item PC-I form was proposed to replace the existing form which has only 27 items or questions.

It was, however, further realized that due to variations in the development projects of different sectors, it was not feasible to use a single PC-I form. Accordingly, in the second phase of the work, Mike Veitch developed a set of PC-I forms keeping in view the specific needs of each sector.

In the general structure of the PC-I form suggested by Veitch in his next phase of the development of a PC-I form for Pakistan, the fol-

lowing information was proposed to be included:

1. Project Digest
2. Project Objectives and Description
3. Market Study, Project Demand and Output
4. Technical and Engineering Aspects of the Project
5. Project Investment Cost
6. Operating Costs
7. Project Finances
8. Economic and Social Effects
9. Project Management and Administration
10. Appraisal of the Project
11. Implementation of the Project

The PC-I form suggested by Veitch cannot be said to be the ideal one. However, when compared with the present PC-I form, it necessarily points to the deficiencies of the present form and suggests the information which needs to be included in it.

As mentioned earlier, the Planning and Development Division had also once felt that there was a need for the development of more scientific and modern methods of monitoring progress of projects and controlling their costs, through network analysis, which would be prepared by the executing agencies and attached with the PC-I form at the time of its submission for approval. The Planning Commission's observations point only to the monitoring aspects of the PC-I form. A critical analysis of PC-I form shows many such deficiencies in it. It is also very important in this connection to note that the Manual of Instruction for filling the PC-I form prepared in 1974 is almost extinct and very few people have even heard of it. The person filling in PC-I form, therefore, is left with no guide but his own personal initiative, knowledge and imagination. Even if attached with each PC-I form, the manual provides little to help the project planner develop a good project plan. The Manual of instructions for filling the PC-I form is reproduced in Appendix 'A' for the reference of the reader.

The present PC-I form contains three sections which include:

1. Project digest
2. Project description and financing
3. Project requirements

The form, as would be seen from a comparison of the proposed sections of Veitch's draft for a PC-I form for Pakistan, has no provision for project demand, studies and outputs, technical aspects of the project management and administration and implementation of the project. Besides, items of the PC-I form also suggest a vagueness and leave much to be interpreted by the project planner. This vagueness as could be seen from the example—1 of the project "Setting up of staff training wing in technical training Centre", do not provide the project manager with enough and accurate information for implementation of a project.

3.1 Example of a Project

Code Number of Project

(to be filled in by Planning Commission)

PART "A"

1. Name of Project: Setting up of Staff Training Wing in Technical Training Centre,
2. Authorities responsible for:
 - i. Sponsoring: Directorate of Labour Welfare (Manpower & Employment Wing), Government of the Punjab.
 - ii. Execution: Buildings Department and Directorate of Industries (Supply Wing).
 - iii. Operation & Maintenance: a. Directorate of Labour Welfare.
b. Buildings Department.
3. Time required for completion of project (in months) 36 months
4. a. Plan Provision:
 - i. If the project is included in the current Five Year

Plan, specify actual allocation:

Yes.

- ii. If not included in the current plan, how is it now proposed to be accommodated (Inter-Sectoral adjustments in allocation or other resources may be indicated):

- iii. If the Project is proposed to be financed out of block provision for a programme, indicate:

b.	Total Block provision	Amount already committed	Amount proposed for this project	Balance available
----	-----------------------	--------------------------	----------------------------------	-------------------

- c. If project is not in the plan, what warrants its inclusion in the plan:

With a view to meet the requirement of Skilled-Labour of Industries both in public and private sectors the Department of Labour is operating

5. Relationship of the project with the objective of the sector. Indicate the contribution of the project quantified, if possible, to the targets in the Five Year Plan, and the names of the other projects (Whether sanctioned or under preparation) which would form part of an integrated programme within the sector.

4 Technical Training Centres and 2 Apprentice Training Centres. The annual out put of Technical Training Centres is 1220. Instructional Staff numbering 200 approximately are employed in the Technical Training Centres to impart both practical and theoretical trade training to trainees. The scheme envisages the setting up of Staff Training Programme in a wing of Technical Training Centre Gulberg, to provide facilities for staff training & refresher courses to in-service instructors. The duration of staff Training is one year and the capacity would be 20 Instructors per year.

- | | | |
|----|--|---|
| 6. | Capital cost of Project: | |
| | Local Cost: | 1900 |
| | Foreign Exchange costs: | _____ |
| | | |
| 7. | Annual recurring expenditure after completion: | 125 |
| | | |
| 8. | Objective of the project preferably in quantitative terms. | The objective of the project is to provide for both practical and theoretical training to 20 in-service instructors per year to undergo-staff training of one year duration. Instructors from other institutions imparting trade training and from industry operating Apprentices training scheme would also be eligible to avail facilities of the project on payment, provided seats are available. |

P A R T "B"

PROJECT DESCRIPTION AND FINANCING

- | | | |
|-----|--|--|
| 9. | Location of project (attach Map): | |
| | a. Give name of place and administrative district in which the service centre will be located: | Technical Training Centre |
| | b. Indicate total area which will be served: | Punjab. |
| | | |
| 10. | Existing facilities: | No institution in the province of Punjab exists where facilities for Trade Instructor's Training is provided. Prior to the dismemberment of one Unit a Staff Training Wing in Technical Training Centre, North Nazimabad, Karachi and an |

Instructor Training Centre at Kotri in Hyderabad were available. These two institutions are now in Sind. The necessity of operating the staff Training Programme for Instructors is being actually felt.

11. Description of the project:

- a. Give brief history, proposed facilities and justifications of project.**

The project provides for the addition of a staff Training Wing in the existing T.T.C. Gulberg, where besides trade Trg. facilities and App. Trg. Wing with Tech. Assistance from the Govt. West Germany has been set up and is operating. A continuing supply of properly trained instructors is considered essential to any expansion of programme of trade training schemes. The project provides for training 20 instructors at one time. The duration of training is one year. The training would cover both practical and theoretical training. The programme will be directly supervised by 4 staff trainees who are of the status of Chief Instructors, Grade 16.

The benefit of the project would be that it would provide for competent instructors for the existing T.T.Cs. and Apprentices Training Centres.

- b. Give population of the area to be served, age group and income levels.**

The project would serve whole of the Punjab. Age group would be 25 to 40 years and income level is middle level.

- c. Relationship with other programme in the same sectors.**

Coordination with apprentices training programme in ATCs has

Indicate whether coordination with other sectors has been ensured:

been ensured.

d. Give student teacher ratio for the project and the national average for the proposed level of education. Give also the extent of library and laboratories facilities per student and how it compares with the national average:

No similar institution exists in the Province of Punjab. Library and laboratories facilities of the T.T.C. will be utilized.

e. The employment prospects of the persons to be trained in terms of the present and future demand:

The project is basically meant for the staff training of in-service instructors.

f. Give details of the type of training or education to be imparted. The syllabus and the subjects in which emphasis will be placed. Indicate availability of teaching staff:

It is a staff training programme with emphasis on methodical & Pedagogical teaching in the workshop & class room. The teaching staff are available and will be recruited.

g. Give details of administrative structure for implementing the project:

The execution of the construction component of the project will be done by Executive Engineer, 4th Prov. Buildings Divis. Lahore. The execution of the supplies of equipment and furniture will be done by the Directorate of Industries (Supply Wing). The Development Cell for Skilled Labour Training in M&E Wing of the Directorate of Labour Welfare and the Principal T.T.C. Gulberg are responsible to ensure the implementation of the project.

12. Give date when capital expenditure estimates were prepared. If prepared more than one year

Due to very short notice for the submission of this P.C.I. the rough cost estimates of construction

ago, confirm if they are still valid.

has been worked out by this Directorate on the basis of 2nd revised rough cost estimates for similar workshop block prepared in December, 1974 by the X-En. 4th Provincial Building Division, Lahore.

13. Capital costs Give breakdown of capital cost year wise covering the whole of the investment period as indicated below:

Items	Total at official rate of exchange	I year at official rate of exchange	II year at official rate of exchange
Local FEC Impart Duties		Total Local FEC Nil	Total Local FEC

14. Bases of cost estimates
(Give full details):

According to our estimate, the Building would cost Rs. 5.00 lakh inclusive of electrification, Public Health and Power wiring. The requirement is being supplied to the S.E. III Provincial Circle, Lahore with the request to arrange forming of the rough cost estimates. The estimated cost of equipment and furniture is Rs. 8.50 lacs which is based on the prevalent market rates. Detailed lists are under preparation.

15. Estimates of annual

recurring expenditure after completion of each phase of the project. Also indicate the source of financial recurring expenditure

Local Cost	FE Cost	Total
—	—	—

Salaries of Staff

a. Service Staff	28	—	28
b. Ancillary Staff (e.g. paramedical).			
c. Supervisory and Admin- istrative Staff	98	—	12
d. Consumable Stores and Supplies Training Material (Please specify)	12	—	12
e. Books and Journals.	—	—	—
f. Contingent Staff	—	—	—
g. Other Contingent e.g. electricity, water, postage etc.	—	—	—
h. Rent and Rates	—	—	—
i. Other Expenditure e.g. sports and workshop supplies.	—	—	—

16. Unit Cost for Each Category of Service or Output e.g. for educational institute, the cost per student and how it compares with costs in other institutions: Rs. 6,250.00 per instructor trainee

17. In Case of Project for Production of Goods and Services e.g. Production of Text-books) give expected income statement (profit and loss accounts) for ten years or until normal capacity is reached. Rate of depreciation and salvage value of property should be given: Not applicable.

18. Annual Phasing of Physical Work and Financial Requirement for the Project. Attach PERT or Bar Diagram, if prepared.

Physical work	<u>Financial requirements</u>		
	Local	FEC	Total
Building 40% 1st year 1975-76	400	—	400
Equipment 15.8% etc.			
Salary 10%			
Buildings 60% 2nd year 1976-77	825	—	825
Equipment 47%	"	"	"
Salary 22.5%	"	"	"
Equipment 37.2% 3rd year 1977-78	425	"	425
Salary 22.5%	"	"	"
Salary 22.5% 4th year 1978-79	125	"	125
Salary 22.5% 5th year 1979-80	125	"	125

19. Foreign Exchange expenditure:

Year	Material	Consultants	Other.	Total
1.				
2.				
3.			Nil	
4.				
5.				

20. a. Likely sources and amount of foreign exchange cost of the project:

Nil

b. Present position regarding
availability, commitment of
negotiations:

— Nil —

Sources	Amount for capital expenditures	Amount of recurring expenditure
---------	---------------------------------------	---------------------------------------

21. a. Government sources

- | | | |
|------------------------------|------|-----|
| i. Grant | | |
| ii. Loan | | |
| iii. Investment | | |
| iv. Direct Govt. Expenditure | 1350 | 350 |

b. Sponsoring Agency's own fund

c. Private Investment

d. Local Body resources, if any

e. Non-Government borrowing

f. Other sources (e.g. Recoveries)

22. Results of the project:

- | | |
|---------------------------------|--|
| i. Direct benefits | 20 per year |
| ii. Indirect and other benefits | Having undergone staff training, the Instructor would improve the standard of training in TTCs/ATCs. |

23. a. Approximate number of
categories of job opportuni-
ties likely to be created in-
directly as a result of:

- | | |
|---------------------------|----|
| i. Implementation: | |
| ii. Operation of project: | 18 |

b. Economic life of components
of Project (Buildings,
equipment) etc.

Buildings
Equipment

30 years approximate life.
20 years approximate life.

PART "C"

PROJECT REQUIREMENTS

24. a. Manpower	For execution	For operation
	Man months	Number
1. Professional and Technical		9
2. Administrative Executive and Managerial		—
3. Clerical		5
4. Services		4
5. Skilled		—
6. Unskilled		—
7. Others		—
	Total:	18
b. Likely shortage of Manpower by occupation		—
c. Steps to be taken to assure availability of manpower		—
d. Approximate number of persons required to be trained per year (Locally and abroad) and the kind of skills to be learnt.		—
e. Give total capital outlay, give the worker for one shift.		—

25. Physical and Other Facilities Required for Project:

Item	Total	To be provide from the project itself	To be provided from the public utility
------	-------	---	--

a. Housing by type

Workshop and Class

room will be provided
from the project.

b. Power supply.

Power supply and Water

c. Water and other utility

supply will be available
from Technical Training
Centre, Gulberg.

d. Others.

26. Material, Supplies and equipment requirements:

A.I. Minimum total requirement for execution:

To be completed only for major items costing more than 10%
of the total cost.

Item	Unit	Local	Foreign	Already available with agency		
		Quantity	Rate cost	Quantity	Rate cost	per unit

1. Materials

- a. Cement
 - b. Sand
 - c. Shingle
 - d. Balast
 - e. Bricks
 - f. Tiles
 - g. Steel & Pipe
 - h. Timber
 - i. Glass Strips
- Any other material turbine with motor.

2. Supplies and spares:

- a.
- b.
- c.
- d.
- e.

A.II. Materials, spares, supplies and equipment for operation of project

1. Material

- a. Steel As per annual requirement of the ships.
b. Timber
c. Electric wire etc.

2. Supplies and spares:

Tools and training material will be required for imparting staff training.

27. In the case of imported material and equipment for execution indicate:

- a. Justification of Imports;**
b. Proposed source/sources of supply.

The Project plan cited above for illustrating the weaknesses of the PC-I form is an example of many project plans, which are usually passed down to the project manager for implementation. There is so much in it which the project manager has to redefine and interpret for himself. There are ambiguities which he would have to clear. there are gaps which he has to fill.

In the light of what you have read in the Unit 2 and in the preceding pages of this unit, consider yourself for a moment in the position of the person who has to implement the project. Consider each item.

As stated above, the format of present PC-I forms does not provide for a detailed implementation plan. It rather creates several gaps in the PC-I form which under the present practice is the only document available to the project manager for implementation of the project.

4. PROBLEMS OF PROJECT PLANNING IN PAKISTAN

The education project given in the example—1, if re-examined from the point of view of the project implementer or the project mana-

ger, would reveal that there are the items which need to be clarified; specially stated; and need to have carefully calculated answers. Also there are items which have been left incomplete, and details are missing in several places. It is also to be noted that the PC-I does not provide for a guideline to be followed by the project manager. The project cited in the example-1 is a typical project so far as it represents the implementation aspect of an education project.

A typical education project, when it comes to be implemented, therefore, needs to be reviewed with a view to improving its implementability. This is seldom done in Pakistan. However, the Pakistan Primary Education Project-IV (a national project jointly funded by the World Bank and the Government of Pakistan) was assigned to a group of experts for a pre-implementation review. In its review report, the group pointed out, (among other things)

- a. It is an experimental pilot project for primary schools of Pakistan which have the problems, which are best known to and understood by the local educationists. Heavy dependence and reliance on foreign consultancies and institutions will serve no useful purpose.
- b. The project needs to be adapted to the general conditions of primary schools and national resources.
- c. A strong monitoring unit needs to be set-up at the Centre, and that the commitments of the provincial governments should be obtained for sponsorship and execution of the project.
- d. The project managers should be encouraged to adapt and, if necessary, re-structure the experiment to suit to the local conditions.
- e. In view of the shortage of personnel for technical aspects of the project, such as construction and administration of objective tests for primary school children etc., the scope of the project should be redefined.
- f. The cost of the project is too high and there appears to be an element of exaggeration in the expected benefits of the project.

It was, however, soon found out that the system of project preparation and implementation in vogue in the country did not allow for

any major changes in the PC—I once it has been approved for implementation. It was also due to the location of the project for sponsoring, execution and operation with the general organizations such as Ministry and Provincial Departments of Education, that the project was shifted from person to person even in the early days of its implementation. The fate of the project, therefore, could not be expected to be any better than what happened to many education projects in the past.

4.1 Planning Gaps

If we take planning as a task, no matter what our purpose be, the task is concerned with the identification of goals, and ways and means of attaining them. In the context of a project, the planning includes defining the objectives, setting up of the targets, estimating the time required for completion of the project, and the cost of the project, assessing the personnel and material requirements, selecting the methods and techniques of monitoring the project and evaluating its outcomes. The gaps occur in the planning within a particular activity or sometimes, in the task itself. These gaps, for example, appear as follows.—

a. Identification of Goals

- Project objectives are not clearly defined,
- Project objectives are not related with the national education plans and policies,
- Project objectives are not linked together.

b. Targets

- Targets to be achieved are not marked in terms of completion of project activities by certain period of time.

c. Time Estimation

- Time for completion of a project and time for completing project activities are not correctly estimated. The total project activities required longer than the time estimated for the total project completion.

d. Project Cost

- There is a tendency to over—estimate and under—estimate cost of a project. In either case there exists a need for cost adjustment.

e. Assessment of Personnel Requirements

- The man-power needed for implementation of a project is under-estimated and usually it is presumed that the man power required for the project implementation would be available. The gaps in this activity happened in terms of the appropriate number and type of man power required for implementing various projects activities and for project managements as a whole.

f. Material Requirements

- The gaps in material requirements are seen often as the project planner presume that they will be determined by the agencies or the organizations responsible for that particular activity. Such gaps upset the costing and budgeting of a project.

g. Method and Technique of Monitoring

- The project plans usually do not suggest the method and technique of monitoring, implementation of a project. This gap in the project plan is to be filled-up by the project manager.

h. Project Evaluation

- Evaluation is essential for monitoring a project during its implementation and assisting the achievements of the objectives of the project on its completion. The project plans usually do not include it.

4.2 Why do Planning Gaps Occur

The planning gaps in the development projects may be caused by several factors. The following are the major causes of planning gaps:—

1. Lack of collaboration, coordination between project planning and project implementation organizations.
2. Preparation of project plans by non-professionals
3. Non-availability of time and human resources required for

preparation of a good project plan.

4. The format of the PC-I form
5. Uncertainties about the approval of the projects and their financing.

4.3 The Project Manager's Job

The project manager's job therefore, consists in reviewing the project before undertaking its implementation and identifying and filling the planning gaps in the project plan. Without removing these gaps in the beginning the job of the project managers becomes like that of a man driving a truck through a road, which is full of bumps, ditches, and cuts. It is essential, therefore, that before the project begins to be implemented the project plan should be checked and rechecked to make sure that no gaps creep into the project design.

5. SELF ASSESSMENT QUESTIONS

Just in a way to recapitulate what you have read in this unit, see if you can answer the following questions —

1. What are the steps in a project cycle, and how are they being followed in planning education project in Pakistan?
2. In view of the purposes of project appraisal what criteria should be used for appraisal of education development projects?
3. What are the gaps and ambiguities in the PC-I of the staff training wing in Technical Training Centre?

Unit -4

**THE LOGICAL FRAMEWORK: AN AID TO THE
DESIGN AND REVIEW OF PROJECTS**

**Compiled and
Adapted by:
M. Athar Khan**

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OBJECTIVES

After studying this unit you will be able to:—

- 1) write about logical framework;
- 2) discuss the elements of the logical framework;
- 3) elaborate the use of logical framework in educational project planning and evaluation;
- 4) develop a logical framework suited to the particular education projects.

Units 3—6

ACKNOWLEDGEMENTS

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The contents of this units are based on the following U.S. AID publications:

- Design and Evaluation of AID-Assisted Project (Nov. 1980).
- The Logical Framework — modifications based on experience.

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INTRODUCTION

As a project planning device, the logical framework or a Logframe Matrix, as it is sometimes called, evolved out of the experiences of the United States' Agency for International Development in Projects sponsored by the Agency particularly in the developing countries. In many developing countries, it is a common experience that several foreign assisted or locally sponsored public sector projects fail to achieve their objectives or they turn out to be uneconomical in their implementation and operation. Projects are seldom evaluated to determine their successes, failures, and problems. The reasons for such a situation could be many. But most basic of them is understood to be the faulty planning of a project. Because, usually project plans are prepared by non professionals. They are prepared in a hurry. The data pre-requisite for project planning is usually speculative: assumptions about project outcomes and inputs are often illogical. project planning and implementation are both fraught with uncertainties.

The logical framework has been developed by a team of professionals and experts in project planning. It is intended to provide project planners guidelines for preparing a good project plan which ensures high degree of implementability within the speculated time and cost estimates. The logical framework forces the project planner to proceed systematically with a sound logic for each step, as the project planner has to articulate assumptions; objectives, goals, inputs, outputs etc. of a project plan.

Basically, the logical framework appears to have been designed to serve the purpose of project planning. But this course is adding to the logical framework a new dimension of project management and implementability. Accordingly, in the Unit-5, which illustrates its use, the logical framework has been presented with particular reference to the job of a project manager. The logical framework, besides serving as a planning device, has potential to serve as a device to facilitate implementation and management of a project as well.

The Unit-4 contains theoretical information about the logical framework and the student is expected to study it not only in the context in which it has been developed by its authors but also keep translating it into the requirements of the work of a project manager with particular reference to education projects in their specific area of professional concern and interest.

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THE LOGICAL FRAMEWORK

The Logical Framework which is also called a Log Frame Matrix is a summary worksheet for presenting the project development hypothesis and analysing a project design. The Logical Framework is primarily a project planning device. It is also used for re-examination of the original design of ongoing projects as a necessary prelude to evaluation, i.e. it sets the standards against which the project will be evaluated. Evaluation then consists of determining and validating whether or not the project outputs are being produced; whether these outputs in fact are serving to achieve the project purpose; and finally whether this achievement is making a significant contribution, as planned, to the higher order goal.

The Logical Framework has both a vertical and a horizontal logic. Its vertical logic defines the series of causative linkages which is intended to transform project inputs into development changes at the sector or programme level and permits the planner/evaluator to judge whether these linkages are viable. Its horizontal logic encourages the evaluator to measure progress and verify planning assumptions at each level (output, purpose and goal) separately and independently from other levels.

A key element in project planning and evaluation is the working out of a logical framework which

- a. defines project inputs, outputs, purpose and higher sector/programme goal in measurable or objectively verifiable terms;
- b. hypothesizes the causative (means-end) linkage between inputs, outputs, purpose, and goal;
- c. articulates the assumptions (external influences and factors) which will affect the causative linkages;
- d. establishes the indicators which will permit subsequent measurement or verification of achievement of the defined outputs, purpose, and goal.

Characteristics and Limitations of the Logical Framework

- All aspects of project planning (i.e., the formulation of targets, causative linkages, indicators, and assumptions) are defined by the

project planner and the sector manager and are project-specific. Similarly, the degree of rigor and the level of effort in collecting and analyzing data for both planning and evaluation are determined by management and are project-specific.

- The logical framework is ethically neutral. It gives no guidance on questions of socio-economic equity or benefit incidence such as equitable income distribution, employment opportunities, access to resources, popular participation in decision-making and in the fruits of development projects, unless such aspects have been explicitly included in the statements of goal or purpose.
- The logical framework is programmatically and technically neutral. It gives no guidance on proven strategies and techniques, cost and feasibility of replication, effects on ecology, concentration on key problem areas, reliance on the private sector, etc. It does not assure that the project is optimal, i.e. that the project directly addresses the most critical constraint to goal achievement or that it is the most effective means for overcoming that critical constraint evaluators choose to explore alternative approaches.
- The methodology permits, but does not require, cost/benefit and cost/effectiveness analysis.
- A clear distinction should be made between the logical framework concept and the logical framework matrix format. The concept is a unified structuring of a set of project design elements. It introduces order and discipline into the intellectual processes of the planner.
- The matrix format is merely a convenient planner's tool which simulates and visually displays the project design elements so that they can be manipulated, assayed and communicated.
- The logical framework concept, as applied to any given project, is analogous to a game of chess, the matrix format is the chessboard.
- A distinction should be made between the logical framework matrix format and the Project Paper (PROP). The former contains succinct summary statements of targets, assumptions, etc. The latter should spell out these statements in a more specific and comprehensive way.

- The logical framework is objective-oriented; it does not describe the actions, activities or processes which transform means into ends. Other instruments fill this need, i.e., Project Paper (PROP), Joint Project Implementation Plan (PIP), network analysis such as PERT, CPM etc.

The logical framework shown on the following page is the standard format used by A.I.D. for planning and evaluating all noncapital projects.

ELEMENTS OF A LOGICAL FRAMEWORK

A typical logical framework is divided into rows and columns. The rows describe goal, purpose, outputs and inputs etc. whereas the columns define narrative summary, objectively verifiable indicators, means of communication and assumptions etc. In the following pages a description is given of each of the elements of the logical framework.

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Programme or Sector Goal: The broader objective to which this project contributes	Measures of Goal Achievement		Assumptions for achieving goal targets
Project purpose	Conditions that will indicate purpose has been achieved: End of project status		Assumptions for achieving purpose
Outputs	Magnitude of outputs		Assumptions for achieving outputs
Inputs	Implementation target (Type and quantity)		Assumptions for providing inputs

LOGICAL FRAMEWORK ELEMENTS

LEVELS — OBJECTIVE (Goal and Purpose)

GOAL — Narrative Summary

“Goal” is a general term characterizing the programming level beyond the project purpose; — i.e. the next higher objective to which the project is intended to contribute. The Goal is the reason for dealing with the problem, which the project is intended to solve. The Goal identifies a desired result to which an entire programme may be directed. Goals are established at top programme management levels. Project managers need to understand these overall programming goals, even though their contribution in formulating them may be limited.

Generally, a goal is not achieved by one project alone; but is rather established with the expectation that success in a variety of projects (as well as non-project activities) will be necessary for its achievement. In this respect, the relationship between the project Goal (the end) and the project Purpose (the means) is causal and partial. Causal relationships become more direct and complete when descending to the *Output* and *Input* levels. The establishment of a goal is thus only one final stage in a logically progressing series of hypotheses:

- *If this goal is desirable, then what project purpose will be necessary to achieve it?*
- *If this project purpose will contribute to goal attainment, then what outputs will be necessary to achieve the project purpose?*
- *If these outputs are to be accomplished, then what inputs will be required?*

PURPOSE — Narrative Summary

The project purpose is the specific result desired of the project. A well conceived project should have an explicitly defined purpose that contributes to the goal. In turn, the combined project outputs should contribute directly to achievement of the project purpose.

In establishing project objectives, the **PURPOSE** is the most important level upon which to focus attention.

The Objective, whether at the goal or purpose level should be as explicit as possible. For example:

POOR OBJECTIVE:— ESTABLISH CREDIT SYSTEM

GOOD OBJECTIVE:— ESTABLISH A NATIONAL SYSTEM OF SELF-SUSTAINING CREDIT UNIONS CAPABLE, BY 1985, OF PROVIDING 30% OF RUTHINIA'S SMALL FARMERS WITH THEIR PRODUCTION CREDIT NEEDS

"PROBLEM SOLVING" METHODOLOGY TO DEVELOP PURPOSE STATEMENT

1. Describe the Problem
2. "Invert" the Problem Statement

Example:

Problem Statement:

POPULATION GROWTH WILL OUTRUN DOMESTICALLY PRODUCE CEREAL GRAIN SUPPLY IN A FEW YEARS.

Inversion: INCREASE DOMESTIC PRODUCTION OF CEREAL GRAINS TO MEET NEEDS OF GROWING LOCAL POPULATION

(Inversion helps clarify, but Project Objective needs to be Targetted)

TARGETTING: Be specific in terms of:

- Magnitude
- Time
- Target Area, or Audience and express in *precise, finite and verifiable* terms

PROJECT PURPOSE STATEMENT:

**INCREASE DOMESTIC PRODUCTION OF PADDY RICE
IN THE SEVEN NORTHEASTERN PROVINCES,
FROM xxx Metric tons in Crop Year 1980
To yyy Metric Tons in Crop Year 1985**

CLARIFICATION OF MEANS — ENDS LINKAGE

COEXISTENT OBJECTIVES

In some situations, multiple objectives may be embodied in the statement of project purpose.

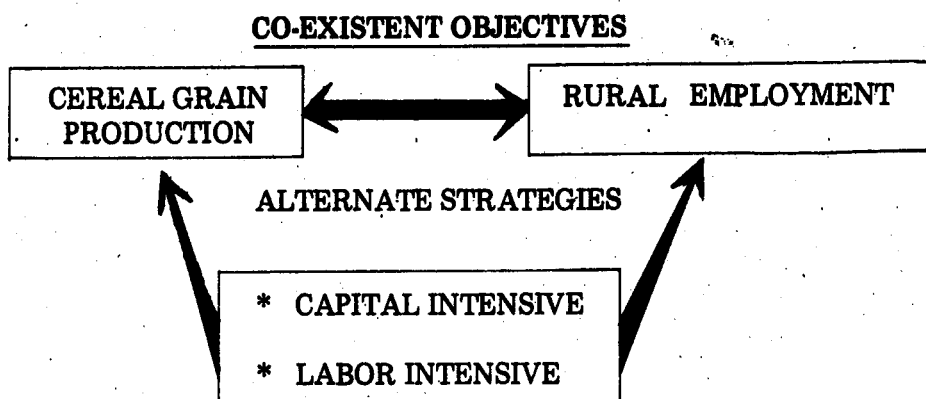
Multiple Objectives are acceptable where two competing objectives can coexist.

For example: "Increasing Agricultural Production" and "Expanding Rural Employment"

With a capital intensive strategy, increased production might be achieved at the expense of rural employment opportunities.

Conversely, a labor-intensive strategy would probably expand employment, but increases in production might be delayed or kept to an unacceptably low level.

The relationship between the two objectives, therefore, is a trade-off which should be anticipated and stated clearly in the project design. There is a need to identify the trade-off relationship and establish the trade-off point, devise separate progress indicators for both production and employment, establish targets, and monitor progress towards each.



UNACCEPTABLE MULTIPLE OBJECTIVES

The Means-Ends linkage is often disguised as a single objective. For example:

PROJECT PURPOSE: TO INCREASE WHEAT PRODUCTION *IN ORDER TO* INCREASE FARMER INCOME

is not acceptable because it compresses a hierarchical Means-Ends relationship, and accomplishment of one is not synonymous with attainment of the other.

Without stable farm prices, for instance, farmer income could be unaffected, or even reduced, since by increasing wheat production the price of wheat per ton could fall.

Thus, attempts to measure the above project purpose could produce confusing results.

Therefore, the two objectives should be separately stated, the intended causative relationship defined, and each given its own level, with independent progress indicators. This may necessitate adding another horizontal row in the logical framework for a "Sub-Purpose" (or sub-goal) level.

<u>LEVEL</u>	<u>OBJECTIVE</u>
PURPOSE	INCREASE FARMER INCOME
SUB-PURPOSE	(Which contributes to the above Purpose) INCREASE WHEAT PRODUCTION

When separated in this manner, the intended cause-effect relationship of the project becomes clearer, the probability of attaining the objective at any level evaluated, and alternate strategies considered in the event the objective is not achieved.

In reviewing project "Objective" statements, be alert for conjunctive phrases, such as

... IN ORDER TO....
 ... BY MEANS OF ...
 SO AS TO
 THROUGH.....

OBJECTIVES FOR "NON-PROJECTS"

The project designer is often confronted with a *general* activity which does not take the classical forms of a development project; such as general Participant Training, or Food Distribution. When this situation arises, the project designer should attempt to make the expected results as explicit (and verifiable) as possible. For example, a project

**"TO UPGRADE THE DEVELOPMENT LEADERSHIP OF
RURITANIA"**

could be considerably improved for both planning and evaluation purposes if it were restated as follows:

PROVIDE PARTICIPANT TRAINING (MASTERS DEGREE LEVEL) BY SEPTEMBER 1986, FOR 35 RURITANIAN DEVELOPMENT PLANNERS, WHO WILL HEAD AND STAFF THE PLANNING OFFICES IN THE MINISTRIES OF AGRICULTURE, TRADE, FINANCE AND INDUSTRY

OUTPUTS — Narrative Summary

Project outputs are the specific results expected to be produced by managing project inputs. The outputs may be physically quantitative, such as "kilometers of rural road built"; qualitative, such as "Farmer cooperative functioning effectively"; or behavioral, such as "Increased awareness of, and receptivity", or behavioral, such as "Increased awareness of, and receptivity to employment of paramedical personnel".

INPUTS — Narrative Summary

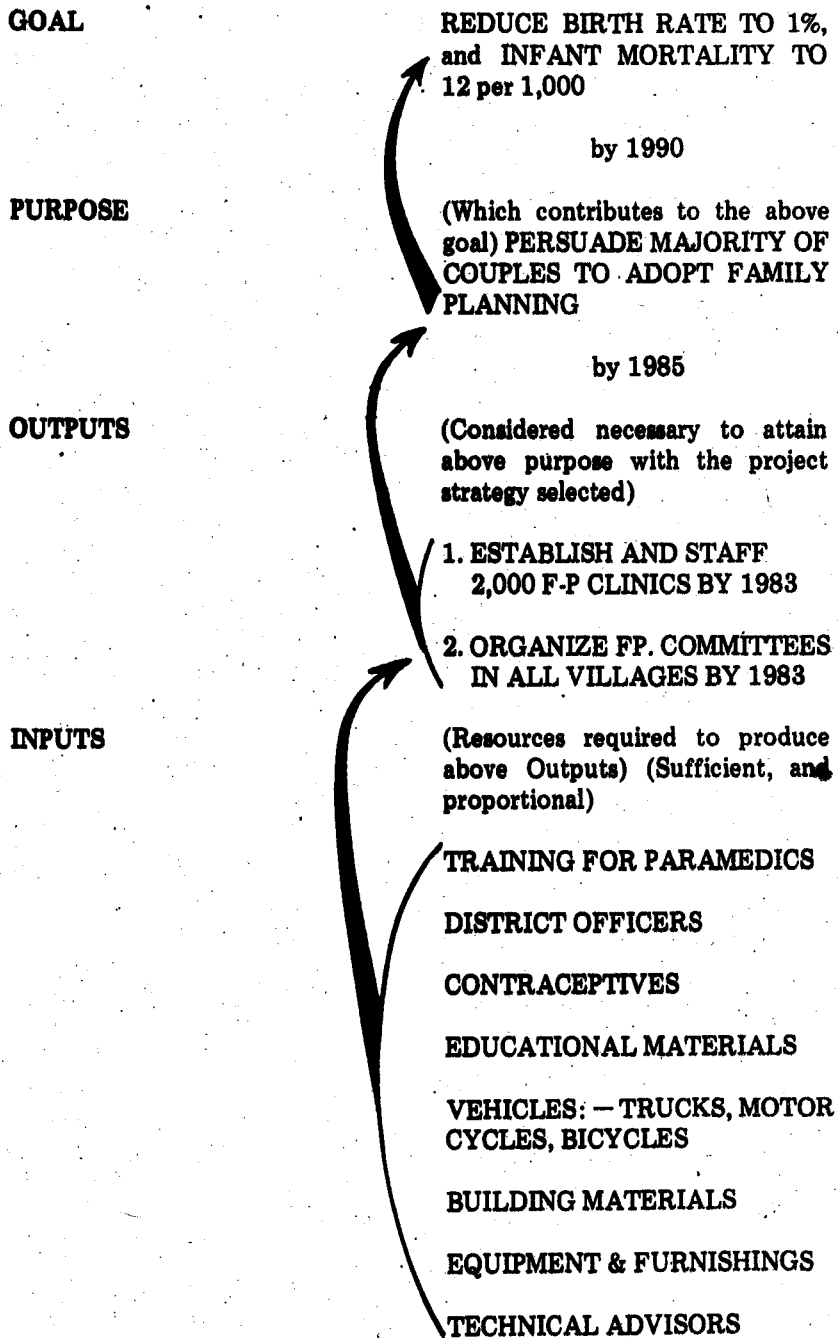
Inputs are those things provided by USAID, the cooperating country, and/or other donors, with the expectation of producing specific, definable outputs. The inputs are usually various combinations of personnel, supplies and equipment, training, funds, contract services, etc. These inputs may be provided directly by AID, through intermediaries such as contractors, participating agencies, or voluntary agencies; the cooperating country, and/or other donors, on either loan or grant funding. The general categories are:

USAID INPUTS

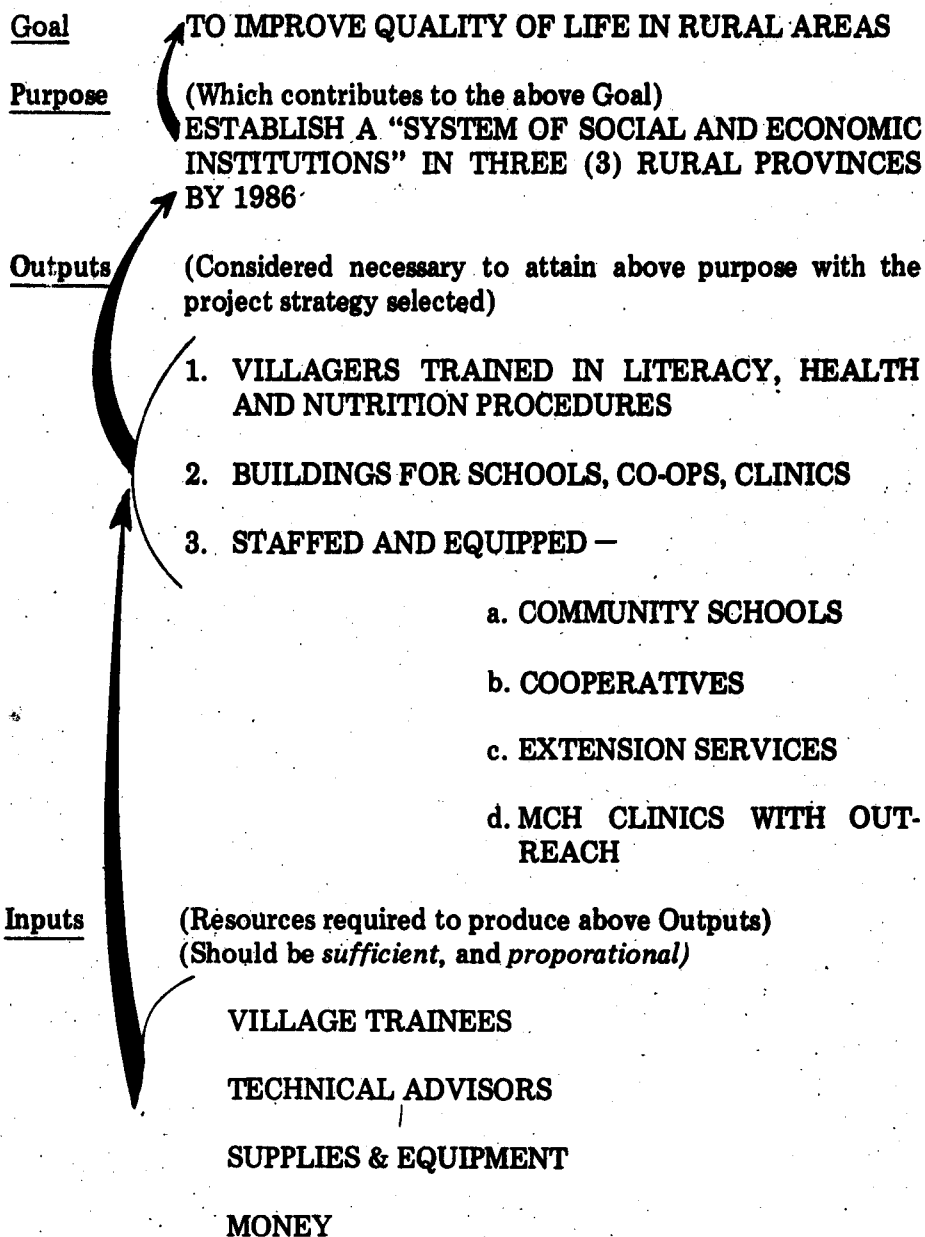
- 1. Technical Assistance**
 - a. Direct Hire
 - b. Consultants
- 2. Participants**
 - a. Long Term US
 - b. Short Term US
 - c. Short Term, 3rd Countries
- 3. Commodities**
 - a. Vehicles
 - b. Technical Equipment
 - c. Office Equipment
 - d. Supplies
- 4. Local Currency Support**

HOST COUNTRY INPUTS
OTHER DONOR INPUTS

EXAMPLE OF FAMILY PLANNING: Means-Ends Hierarchy



EXAMPLE OF RURAL DEVELOPMENT MEANS-ENDS HIERACHY



INDICATORS & TARGETS

An Indicator is a unit of measurement which facilitates concise, comprehensive and balanced judgements about a situation. It is subject to the interpretation that if its level changes in the "right" direction, things have gotten better (or people are "better off"), and if the level changes in the "wrong" direction, things are getting worse, or people are "worse off".

A *target* is an explicit statement of *results desired* for an indicator over any specified time period, at any level (Output, Purpose or Goal). It is the planned performance standard by which actual performance may be subsequently compared and measured. Targets should contain three dimensions:

- Magnitude
- Target Area (or audience)
- Time

Good project design must include pre-establishing what will be measured or observed to demonstrate progress. Pre-establishing project indicators and targets helps focus discussion on evidence rather than on opinions.

OBJECTIVE	INDICATOR & TARGETS
(LOGFRAME COLUMN 1)	(LOGFRAME COLUMN 2)
OBJECTIVE TO BE REACHED AT: GOAL, PURPOSE OR OUTPUT LEVEL	TO MEASURE WHETHER OB- JECTIVE WAS REACHED
RAISES QUESTION: WHY?	RAISES THREE QUESTIONS:
(WHEN GOING UP G P O I)	* W H A T ? — RESULTS EXPECTED
	* H O W M U C H ? — MAGNI- TUDE OF RESULTS

RAISES QUESTIONS: HOW?
(WHEN GOING DOWN G P O I)

* W H E N ? — TIME THOSE RE-
SULTS WILL BE
REALIZED

Indicators may be quantitative or qualitative. A quantitative indicator may be expressed as a:

Single measure— e.g., graduates during the academic year

Cumulative figure — e.g., graduates since the beginning of the project; or as a degree of change (usually percentage) increase in the number of graduates per year between——and——academic year;

or

Ratio — Professional medical personnel coverage per population, increased from——to——during the life of the project.

In some cases, where quantitative measures are not possible, objective measurement of a qualitative change is possible by defining the indicator in behavioral terms; — e.g. “working relations among cooperating-country personnel in the extension service have ‘significantly improved’ during the year”, or

“Students are ‘participating more’ in unstructured classroom discussion and ‘focusing less’ on rote memorization and regurgitation.”

In these situations, the behaviour expected must be described in such a way that it can be objectively counted or observed by different people.

Where this is not possible, identification and selection of an “Objective observer”, and having him/her participate in both the “pre-” and “post” — measurement for comparative purposes, is critical for the evaluation’s credibility.

An alternate procedure may be for an “accredited” objective observer to compare the status of indicators within the project with conditions in areas not reached by the project.

Sometimes, it is not possible to measure change directly. In such cases, indirect (or “proxy”) indicators must be used: — e.g., “6th grade

graduates" as an indicator of literacy, or "purchase of 'luxury' items" as an indicator of farmer income.

A caution: — when indirect measures are used, the causal relationships that underlie them should be verified; for instance, the hypothesis that a 6th grade certificate is actually a reliable indicator of literacy in a particular country; or that farmers in a particular society actually do purchase certain luxury items as their income rises.

- Indicators may — be identical to the specific objective (direct indicators),
- Supplement the objective by describing quality or aspects
 - Substitute for the objective (indirect or proxy)

Using a single indicator cannot give a comprehensive picture of change. Multiple indicators are often needed. For example, to measure change in the development of a *vocational training institution*, it might be appropriate to measure several things such as:

- Number of graduates
- Staff turnover
- Salary level of graduates
- Equipment replacement budget

INDIRECT (PROXY) MEASUREMENTS

**IN ORDER TO DETERMINE
WHETHER THERE WERE**

**GATHER INDIRECT DATA
AND TAKE PROXY
MEASURES OF**

**IMPROVEMENTS IN WATER
QUALITY IN COMMUNITY WELLS**

**INDEX OF WATER-BORNE
INTENSTINAL DISEASES**

INCREASE IN FAMILY INCOME

**CHANGES IN LOCAL RETAIL
SALES, TAX, SAVINGS
COLLECTIONS**

**INCREASES IN AGRICULTURAL
PRODUCTION**

**CHANGES IN FREE MARKET
PRICES VOLUME SHIPMENTS**

**EVIDENCE OF-INCREASED
STORAGE, INCREASED CON-
SUMPTION OF LOCALLY
GROWN PRODUCTS**

EXAMPLES OF DIRECT AND INDIRECT (PROXY) INDICATORS

PURPOSE	DIRECT INDICATORS	INDIRECT INDICATORS PROXY (OR SUBSTITUTES)
<i>To Increase Per Capita Income of Small Farmers</i>	—Crop Sales & Food Consumption	—Purchase of Typical Consumer items —Tin Roofs on Huts
<i>To Increase Agricultural Production</i>	—Total Metric Tons	—Free Market Price Fluctuations —Shipment of Agriculture Products
<i>To Improve Nutrition of School Children</i>	—Amounts & Types of Food Consumed	—Height & Weight of Children —Cases of Kwashiorkor

TARGETING is the art of defining how much of

WHAT is desired by
WHEN,
WHERE
and
BY WHOM?

SOME EXAMPLES OF TARGETS

- Small Farmer Rice Productivity in Ilandia of 5 tons/hectare/season by 1985.
- Enabling Land Reform Legislation passed by Midonian Parliament by 1983.

Where multiple targets are stated at various levels they should be reasonably proportional.

Example of Proportionality

- 1 Extension Agent for 300 farmers
 - 1 Classroom for 40 children
 - 1 Clinic within 3 km walking distance of market place.
- (Note: The above ratios are not definitive; merely illustrative)

Lack of Proportionality

A lack of proportionality exists when

- Input magnitudes are *too small* to produce Outputs
- Output magnitudes are not related to the size of the problem needing solution (i.e., Purpose to be achieved).

However, note that the *PURPOSE IS SELDOM DIRECTLY PROPORTIONAL TO THE GOAL*. It is usually merely contributory to the goal.

OBJECTIVELY VERIFIABLE INDICATORS

Progress should be "Objectively Verifiable" so that both a proponent of a project, and an informed skeptic could agree that progress has, or has not been a planned.

To be objectively verifiable means that one must be able to obtain the data from a reliable source. This is a very real problem in many economic development projects. It is quite easy to state a macro-economic goal "to raise the per capita income of a selected population group (for instance, the Rural Poor) by 5%".

It is entirely another matter to obtain raw data to actually measure per capita income of that group, and even more difficult to do on a frequent basis.

GOAL — Objectively Verifiable Indicators

The indicators of goal achievement may be quantitative, qualitative, or behavioral; or a mixture. Measures of achievement should indicate a causative relationship between project purpose and goal. A single project will not usually be the total cause of goal achievement. Other projects and non-project factors usually also have a significant influence.

PURPOSE — Objectively Verifiable Indicators

The statement of the End-of-Project-Status (EOPS) is a description of the conditions that are expected to exist when the project is successfully concluded. The objectively verifiable indicators may be either quantitative, qualitative or behavioral.

In projects which have an institutional purpose, the end-of-project status conditions should reflect the *performance* of the institution (such as effectiveness in producing goods and/or services, efficiency and self-sufficiency) rather than merely its physical completion and/or *readiness* to perform.

At least one of the indicators should be the number and type of *beneficiaries* the project is expected to reach.

INDICATORS AND EOPS

The Project Planner Must:

- STATE THE PROJECT PURPOSE IN FINITE, VERIFIABLE TERMS
- DEFINE THE CONDITIONS WHICH WILL EXIST WHEN THE PROJECT PURPOSE HAS BEEN ACHIEVED
- FORMULATE OBJECTIVELY VERIFIABLE INDICATORS

NOTE: We cannot measure *outputs* to verify whether or not *purpose* has been achieved. This must be independent of, and different from measuring outputs.

The overall goal can often be sub-divided into smaller, intermediate targets. For example, Prevention of Births might be expressed and subsequently measured in monthly as well as annual terms.

Difficulty may arise because project descriptions frequently lack the necessary degree of specificity. Beware of such imprecise terms as "viable", "expanded", "improved", or even a combination thereof:

Definite Terms:

Install x
Establish y
Build Z
Complete A
Reduce from x to y
Eradicate x
Cover cost of x
Raise \$——foreign exchange

Fuzzy Terms:

improve
Enhance
Reinforce
Upgarde
Service
Strengthen
Raise quality
Promote
Augment
Assist
Expand
Develop
Coordinate
Make viable
Stimulate

Ideally, both project *purpose* and *indicators* should be in definite terms. Indicators, however, must be definite, and they may compensate for an impracise project purpose statement by providing explicit targeting.

Some Examples of EOPS

PURPOSE

(To Establish) a system of social and economic institutions in three (3) rural provinces by 1986.

EOPS INDICATORS

- Adults attend school
- Number of co-op loans increasing
- New crops being grown
- Infant mortality declining
- Women active in village councils

Purpose (End of Project Status) (Often Combined) Indicators and Targets

(To establish) a functioning agricultural credit system

1. Two branch offices in all districts by 1984.
2. 75% of small farmers apply for loans by 1986
3. System is self-supporting by 1988
 - a. Annual 20% reductions in government subsidies starting 1983.
 - b. 95% loan repayment rate by 1988
 - c. Interest covers loan losses and administrative cost

It is also useful to include in this EOPS block, a summary of the baseline situation data for the various indicators, so that planned progress is highlighted, thus:

INDICATOR	BOPS	EOPS	%CHANGE
A xxxxx	X	Y	Z

Although improvements may always be made in development situations, and development programmes such as an education system, health system, extension system may never "End", the aim of EOPS indicators is to set up definite targets which can be achieved in a reasonable period. The idea is to improve management, not to impose arbitrary termination dates on projects.

A development project is thus a phased attack on some identifiable aspect of an overall development problem.

OUTPUTS — Objectively Verifiable Indicators

Objectively Verifiable Indicators of each output are the quantities, or conditions identified in the narrative summary, with the level of attainment planned. Where ever possible, these should be identified as cumulative annual (or other appropriate time interval) numbers, percentages, ratios, qualitative assessments, or other appropriate increments. More than one indicator for each output may often be desirable. For example:

Indicator	Base Line	YR 1	YR 2	YR 3	YAR 4	YR5
A.	0	5	8	10	14	19
B.	15%*	16%	18%	25%	40%	65%
C.	6/1000	6/	5.5/	5/	4/	3/1000
D.	UNSATIS	UNSAT	POOR	FAIR	GOOD	EXCELLENT
E.	F	F	D	D	C	B
F.	No Data/Situation Studied/Analysed/Report Submitted					

NOTE: Whenever a % target is used, a base reference number should be included somewhere so that subsequent percentages can be interpreted.

Caution: The important factor in personnel assignment is the *services to be performed*. The fact that an advisor is at post is not a sufficient statement of the output expected from that advisor.

OUTPUTS AND PURPOSE ARE DIFFERENT IN KIND

MEASURE THEM INDEPENDENTLY

<u>PURPOSE</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>TARGETS</u>
TO INCREASE SMALL FARMER PRODUCTIVITY	CROP YIELD PER HECTARE	<u>BOPS</u> 45 ca/ha <u>EOPS</u> 80 ca/ha
<u>OUTPUTS</u>		
	— IRRIGATION NETWORK EXISTS	— 3 Pumps
ESTABLISH AN OPERATIONAL IRRIGATION SYSTEM	—	— 4 km pipes — All ditches free flowing
	— TRAINED STAFF	— Watermaster — 2 Assistants
	— UTILIZATION SCHEDULE	— Approved by User Association
	— USER RATE SCALE	— Economically viable @ 5 ¢ per 100 customers

INPUTS — Objectively Verifiable Indicators

List the major input categories by programmed budget, in thousands (or millions) of dollars and/or level of effort, by year, for the life of the project. Separate USAID Host Country and other Donor inputs, thus:—

INPUT

(From Narrative Summary)	YR 1	YR 2	YR 3	YR 4	YR 5
<u>USAID INPUTS</u>	<u># \$000</u>	<u># \$000</u>	<u># \$000</u>	<u># \$000</u>	<u># \$000</u>
Technical Assistance					
(Direct Hire)	12	person-months etc.			
(Consultants)	4	\$100			
Participants	1	\$20			
Commodities	—	\$4,000			
Local Currency Support	—	\$1,000			

"PIVTAC" — THE SIX-STEP TEST FOR INDICATORS

Indicators should be:

- ** PLAUSIBLE** A believable or genuine measure of the project level should vary with progress achievement, but not vary significantly with changes in unrelated factors.
- ** INDEPENDENT** Separate, discrete, and distinct from measures at other levels? No indicator may be used for more than one level.
- ** VERIFIABLE** Objectively verifiable (as opposed to subjective). Impartial, tangible, or material? Could both a skeptic and an advocate of the project be expected to agree on the facts shown by the indicators?
- ** TARGETTED** Explicit or specific including the *quantity*, *type*, the *time*, and if appropriate, the target *audience*, or *place*?
- ** ACCESSIBLE** Are the information sources which are listed — reasonably available or accessible? Are additional special studies, or surveys required? (If so, are funds and skilled personnel available to conduct them?)
- ** COMPREHENSIVE** Are all major aspects measured, so that no additional indicators are needed?

CONSIDERATIONS IN ESTABLISHING TARGETS

Is the degree of change significant? Another way of asking this is,

“How much of a difference makes a difference”

The range of progress expected should be defined in advance. Change observed can then be labeled *unsatisfactory*, *adequate*, or *satisfactory*. The meaning of *unsatisfactory* must be given in terms of a standard. (For example, an infant mortality rate of 75 per 1000 live births might be considered unsatisfactory until it reaches a more tolerable or adequate rate of less than 30 per 1000). Such a standard can be obtained by collecting the historical experience in various countries and (1) determining the current status of development by using indicators, and (2) making intra-country and inter-country comparisons of these indicators to see where on the scale of comparison a particular country lies. These measures often go beyond the evaluation of A.I.D. activities and assess a country's total development programme. The rates of growth for a number of countries can also be used as standards of progress against which to describe a particular less-developed country's growth.

Advantages

If properly formulated and applied, progress indicators and performance standards can:

- Establish that change has occurred and indicate the character, direction, and rate of change;
- Permit comparison of the actual change against that which was planned;
- Permit assessment of the impact of this change on higher goals;
- Compare a project's performance with that of similar projects;
- Allow the examination of the relation of input to output and of cost to benefit.

Disadvantages

Indicators and standards have a tendency to cause apprehension and can indeed be harmful if wrongly applied because they may:

- Force the establishment of unrealistic targets, or the setting of targets more precisely than perhaps they should be set, given the uncertainties of the cooperating country situation;
- Require quantitative measurements when much of the project's concern should be with qualitative improvements in human knowledge and skill, institutional capacity, etc.;
- Subject the project to comparison with other projects and programmes which are not comparable due to significant differences in cultural, economic, political, or other characteristics.

Quantitative vs. Qualitative Measures

When it is practical, quantitative measures are preferable to qualitative measure. However, the central issue in evaluation is not so much one of quantitative vs. qualitative measures, but rather that indicators of change be objectively verifiable.

MEANS OF VERIFICATION

GOAL — Means of Verification

State the *kinds* and *sources* of data needed to support the indicators cited as measures of goal achievement.

PURPOSE — Means of Verification

State the *specific types of evidence* which will be used to verify conditions marking the End-of-Project Status, and the *source* (documents, and organizations) from which they will be obtained. If no documentation exists during the design stage of the project, the necessity for obtaining base-line data and for developing a project monitoring/reporting system, or conducting special surveys should be noted. Activity to develop a reporting system or conduct surveys should be included as an *additional project output* to be funded under the project.

OUTPUTS — Means of Verification

State the *source*, and *kind of data* required to verify each indicator. (This may be existing agency or ministry reports, or new reports which will be generated as a direct byproduct of the project's existence. If no documentation exists, or is expected to be created as a normal aspect of the project's implementation, this fact should be noted and included as an *additional project output* to be funded under the project indicator data. Frequently, such data can be more effectively and efficiently obtained from periodic studies, and/or random sample surveys. If such is the case, establishing the capability of the host country to conduct such surveys and studies might be an appropriate collateral project output. However, if during the design stage of the project specific provisions are *not made* for obtaining necessary data it is highly unlikely that the data will be available subsequently, for project evaluation.

INPUTS — Means of Verification

AID reports usually provide sufficient accounting and recording for AID-provided inputs. However, other inputs (such as those provided by the cooperating country, other donors, voluntary agencies, and third countries) should have confirming data sources shown.

**THE RELATIONSHIP BETWEEN TARGETS, INDICATORS &
MEANS OF VERIFICATION**

TARGETS ← INDICATORS ← MEANS OF VERIFICATION

PLANNED RE- SULTS AT THE	Ways of Measuring Progress Toward Targets	Sources of Data, Method of Collection and Analysis
-------------------------------------	--	---

GOAL

PURPOSE

&

OUTPUT

LEVEL

DATA GATHERING & REPORTING IMPORTANT DESIGN CONSIDERATIONS

The following is a check-list of some major factors to bear in mind when designing a data gathering and reporting system. The list is not structured in any particular order, nor is it comprehensive. However, it should serve as a good start for a design group.

- Purpose
- Scope
- Environment
- Communications
- People/Machine interface
- Cost
- Personnel
- Data processing
- Processing time
- Reporting frequency
- Detail desired
- Authority & Chain of command
- Data summarization
- Verification
- Project popularity
- Sources
- Vested interests

Each of these factors is discussed in general terms on the following pages.

Purpose: Why is information required? For the Host country, Project Manager, USAID Project Manager and/or AID/Washington? What type of system is needed, who will operate, maintain and use it?

Scope: How is the project organized; what are the units from which data will be gathered? Are they technical, functional, and/or geographical? Are each of the data elements unique to a particular "organization", or are there a number of work units which can be structured to produce similar data elements? Are any of the data elements summarized through intermediate organizational levels, or are they directly analyzed only at the central level?

Environment: Is the project being implemented in a modern, sophisticated urban situation; an underdeveloped traditional rural situation; or some stage in between? What geographical distances exist between data collectors and processors?

Communications:

- a. What methods of communication are available to transmit data from the collectors to the processors? Telephone, Radio, Telegram, Bush Telegraph, Mail, Messenger, personal hand-carrying, and/or verbal reporting?
- b. What is the time lag between transmission by the collectors and receipt by the processors? Instantaneous, delays of seconds, minutes, hours, days, weeks, months? How consistent is this? Is the time lag the same all year round, or does it vary by the season or political climate?
- c. How reliable and secure is the system? Does it transmit accurately, or is there likely to be distortion (deliberate intervention or natural/technical causes) in the process? Is a written copy of the data transmitted from the collector to the processor?

People/Machine Interface: To what extent is the system people-oriented or machine-oriented? Are the indicators "instrument" readings (such as weights, measures, or temperatures), or are they judgemental factors? Are they produced automatically, or are they interpreted by people?

Cost: How much is management willing to spend to obtain the information it desires? Is the information needed whatever the cost, or are there budgetary limitations, i.e. some percentage of the project cost; or is it preferred that the cost not be explicit, but buried in the operating costs? Can the project bear the cost? If not, what are the alternatives?

Personnel:

- a. Are there sufficient personnel to collect the data for the area of coverage?

- b. Is the project staffed with experienced, skilled data collectors, or will the burden be on inexperienced, unskilled technicians who must learn on-the-job?

Data Processing: Will the system be manual, computerized, or some combination of both? Can any of the collection aspects be "Source Data Automated" or will the data be manually captured and later transcribed for machine processing?

Processing Time: How long will it take after an occurrence before the project management staff can receive an analysis of the phenomenon?

Reporting Frequency: How frequently does the Project Manager (and the next higher level of management) desire to be informed of the operational situation — continually, daily, weekly, monthly, quarterly, periodically; or infrequently "By Exception"?

Detail Desired: How much does the next higher level of management want to know — "everything," "selected indicators", regularly "selected indicators by exception", "ad hoc", "special studies"?

Authority & Chain of Command:

- a. Is the project manager "all powerful" to those from whom reports are required? Does he/she have direct authority over the reporters, or do they work for someone else? Do they provide data as a primary or as an additional task, or only as a courtesy?
- b. How long is the Chain of Command? Can the project manager communicate directly with the data collectors, or does he/she have to go through several intermediate managerial levels?

Data Summarization: Is the data only to be summarized on the project as a whole, or will it be summarized at, and for intermediate levels?

Verification: Can the Project Manager's staff get easy access to the source of the data and the collectors to spot-check, sample and verify the validity and accuracy of the data reported?

Project Popularity: Does the project have a favorable Public Image with which people are willing to identify, or is it generally unpopular, and data collectors likely to encounter resistance, withholding or deliberate distortion of facts?

Sources:

- a. Is base line data available?
- b. Is any of the data already being gathered for some other purpose?

Vested Interests: Are the data collectors or the intermediate supervisors completely unbiased observers of the data they are required to collect and transmit, or do they have vested interests in understating or overstating the facts as they see them.

ASSUMPTIONS

An "Assumption" (in AID Project Design Logframe Terminology) is an attempt to identify significant external factors or conditions over which the project manager may have no control, but which are essential to successful project implementation.

Identifying critical elements which are not part of the project design plan, "Conditions Precedent" to project implementation can be established in the Project Agreement; the plan can be modified to incorporate these elements in the project design; or another collateral project may be initiated (with a new Project Identification Document). By explicitly identifying these aspects during the design stage, the project is clarified and the probability for success can be improved. The extent of external coordination is also brought to the fore and subsequent implementation of the project can be more realistically evaluated.

Horizontal Integrity: The "Assumptions" stated at each level in the AID logframe are the external conditions which are necessary in order for *that level's* objectives to be successfully attained.

GOAL	←	GOAL ASSUMPTIONS
PURPOSE	←	PURPOSE ASSUMPTIONS
OUTPUT	←	OUTPUT ASSUMPTIONS
INPUT	←	INPUT ASSUMPTIONS

There are normally different assumptions for each level (Goal, Purpose, Output, and Input) of the project;

TYPICAL CATEGORIES OF VARIOUS LEVEL ASSUMPTIONS

GOAL	— Political Stability
	— Inflation not too Severe
	— Equitable Land Tenure System
PURPOSE	— Incentives for Change Exist
	— Related Projects Successful
	— Host Government Policy Commitment
	— Replication Successful

- OUTPUT** — Permanent Personnel Positions Established
— Long Term Funding Requirements Budgetted for
- INPUT** — Sufficient Qualified Personnel Pool Exists
— Required Funding will be provided on a Timely Basis.

GOAL — Important Assumptions

Achievement of the Goal is usually beyond the capability of any one project, and indeed often beyond the time-frame of the project under design. The single project is merely one building block in the overall economic development strategy of the country. Nevertheless, this does not absolve the project designers of the responsibility for articulating a coherent development hypothesis between the project's immediate Purpose and its longer range Goal.

Similarly, the critical assumptions associated with achieving that Goal may be beyond the project manager's capability to influence. Nevertheless, such assumptions should still be identified and compared with existing "reality" so that the project environment and prospects for ultimate Goal attainment can be assessed in the design stage; and subsequently evaluated by others, long after the project itself has been completed.

PURPOSE — Important Assumptions

Achievement of the Purpose also usually occurs after the project's completion and is thus in a sense beyond the immediate control of the project manager. However, the relationship and time frame between Output and Purpose is usually much closer than between Purpose and Goal, and the project manager can often exert influence (directly or indirectly) to improve the prospects for success at this level.

Successful attainment of the Purpose is usually based on two major categories of expectations:—

- that certain external conditions, or actions outside the scope of the project, will occur; and

Coordination with other agencies, civic organizations, and private sector suppliers; availability of qualified personnel, and resources — particularly funding and commodities; enabling regulations or decrees; cooperation by local government officials and community residents are all important elements which must be considered.

INPUTS — Important Assumptions

At the Input level, the major critical assumption is that the Inputs will be available in a timely manner, in the quantities programmed. Project designers also use this Block to record "Conditions Precedent".

- that the host country will continue to encourage, maintain, replicate and/or extend the Outputs provided by the project, at an acceptable level and quality, after AID's input to the project has terminated.

For example, "Increased agricultural productivity" may be a realistic (though vaguely stated) Purpose. However, achieving increases in agricultural productivity may depend upon motivating the farmers and farm labor force; establishing market regulations, distribution centers, and national price structures for agricultural commodities; all of which may be outside the design scope of any particular project.

For specific project related activities, a critical assumption with regard to essential project personnel (usually hired on a temporary basis) may be that the government will establish appropriate permanent positions and will budget funds to payroll them. For personnel who have received specialized training under the project, the assumption might be that the government will utilize them appropriately in the skill for which they were trained. For *physical* outputs, such as buildings, roads, equipment, etc., a critical assumption might be that the government will budget maintenance funds, or make other appropriate arrangements (such as hiring additional staff, or contracting out) to ensure that they continue to operate as intended.

OUTPUTS — Important Assumptions

Outputs are usually categories of

- New Items (roads, buildings, equipment, newly trained personnel, organizations, etc.)
- Upgraded Items (All-weather roads, modernized clinics, advanced training, etc); and/or
- Demonstrations of Improved Methods for doing things (Use of fertilizer with high-yielding variety seeds, providing health care through use of paramedical personnel, nutritional MCH programmes, etc).

Assumptions should identify the external factors related to these items which are essential if the Outputs are to be accomplished in a timely manner.

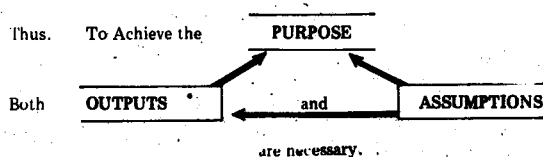
ASSUMPTIONS — GENERAL CONSIDERATIONS

As indicated above, an assumption describes a situation (or condition) which must exist if, and when the project is to succeed, but over which the project management team may have little or no control. The degree of confidence placed on assumptions depends upon the project design team's familiarity with the cooperating country; knowledge of the sector in which the project is being developed; prior experience, and performance by the host country and other donors on similar projects.

If many critical factors are unearthed at various levels in designing the project which are beyond the project manager's control, the feasibility of successfully implementing the project may be questionable. Assumptions identified in this manner may provide the impetus for formulating other, complementary projects, or establishing "Conditions Precedent" to funding approval, or continuation of the project beyond certain stages.

A project's design is only as sound as its rationale and assumptions. As the project is implemented and these linkages are tested, confidence in the project Development Hypothesis should increase. If it does not, project management attention should be drawn to the assumptions. If the assumptions are not being met, some extraordinary measures may have to be taken before the project is permitted to continue. If the assumptions are being met, but confidence is not increasing, there may be other critical assumptions which were previously overlooked but which must now be addressed. In either event, external factors should be stated as important assumptions regarding achievement, and evaluated periodically to assure their continuing validity.

Logframe Project Design rests on the basic premise that each level in the hierarchy is not only *necessary*, but also sufficient (in quantity and quality) to enable the next higher level to be achieved. Since each linkage is subject to external factors beyond the control of the project's management, each link must be examined to assure that the activities at a given level (e.g., Outputs) are necessary and sufficient to achieve the next level (Purpose). If not, the additional necessary assumptions must be identified.



EXAMPLE OF DIFFERENT LEVEL ASSUMPTIONS

NARRATIVE (Column 1)	(ASSUMPTIONS (Column 4))
GOAL. National Self-Sufficiency in Rice	— Economic Incentives for Farmers are favorable — Per Capita Consumption will remain stable or decline
SUBGOAL. To increase Farmers Incomes	— Price Stability, or Price Support System for Producers — Storage, and Transportation available — Costs of production favorable
PURPOSE: To Increase Yield per Hectare	— Water Supply Adequate — Fertilizer Applied Correctly
OUTPUTS: 1. Farmers Motivated to Use Fertilizer	— Cost of fertilizer is more than offset by sales of additional crop which results from fertilizer use
2. Farmers trained in using fertilizer.	— Knowledgeable extension workers are able to reach and train the farmers
3. Farmers obtain adequate fertilizer in timely manner.	— Fertilizer procurement and distribution system (Govt, Private or Coop) adequate for meeting project needs
INPUTS: USAID Advisor (Project Officer) Contractors (Extension Specialist)	— Available, or will be contracted for life of project.
Equipment (Vehicles for extension workers)	— Will be available for project use within 12 months of signing Project Agreement

Host Country Project — Available and/or can be recruited
Manager Extension and trained
Technicians

HYV Seed & Fertilizer — Available or can be procured

SOURCES OF UNCERTAINTY IN PROJECT DESIGN

- * **FAULTY LOGIC**
- * **LACK OF PROPORTIONALITY**
- * **INEFFECTIVE MANAGEMENT**
- * **CONTRARY EXTERNAL FACTORS**

Faulty Logic: Some times, those most closely associated with the particular technical aspects of a project assume that this input or speciality is the critical factor which will result in the achievement of the project's goals. While there may be some substantiation for this position, usually there is more than just *one* missing ingredient holding back development.

Unless the intervening and/or supporting variables are also identified, such tremendous leaps in faith and logic may result in the project being inadequately designed, and/or headed in the wrong direction; tackling the symptoms of under-development rather than causes.

Some Examples of Doubtful Causation

***IF* High Yielding Variety Seeds, *THEN* Higher Agricultural Production**

***IF* Contraceptives, *THEN* Lower Birth-rates**

***IF* Clinics, *THEN* Better Health**

***IF* Education, *THEN* Higher Incomes**

***IF* Electricity, *THEN* Industry**

***IF* Roads, *THEN* Development**

Lack of Proportionality: Getting the project outputs in sufficient quantity and quality, is extremely important. Many "Pilot" or "Demonstration" projects have limited success because they fail to address proportionality.

They have *too much* of everything at the outset when the "Model" is being developed, but insufficient (or an imbalance of) resources to *replicate* the model over the intended target area to achieve the Project Purpose.

Ineffective Management: AID-assisted projects are amongst the most difficult to manage. Not only are the technical dimensions complex, but so are the organizational arrangements under which they must be implemented. Multiple bureaucracies, with different nationalities, cultural sensitivities, and varying levels of training and experience, must all be taken into consideration when planning a development project. AID usually undertakes projects in geographically scattered locations, in environments which are lacking in support facilities, while attempting to change people's ways of living. Due care and consideration must be given to the extra managerial dimensions—Murphy's Laws! Otherwise, unrealistic expectations will be built into the plan, which will be reflected as "Project Management Failures" during subsequent evaluations.

Contrary External Factors: A project addresses only a limited number of the many factors effecting development. What may seem a positive effect in the project area by its proponents, may simultaneously be regarded as a threat by others. Exploration of the ramifications of the project impact may reveal some other factor (social, political, institutional or technical) which may require conversion or at least neutralization if the project is to succeed.

QUESTIONS IMPLICIT IN THE LOGFRAME

<u>NARRATIVE SUMMARY</u>	<u>INDICATORS</u>	<u>MEANS OF VERIFYING</u>	<u>ASSUMPTIONS</u>
W H Y? ↑ NOTE: This represents one selected route of a Means-Ends Analysis ↓ H O W?	W H A T? H O W M U C H? W H E N? (W H E R E)?	W H E R E A R E D A T A?	W H A T A R E O U T S I D E F A C T O R S? (U N C E R T A I N T I E S)?

DESIGN CHECKLIST

GOAL LEVEL

1. The Goal statement is a single, coherent goal; it does not contain multiple objectives which are causally related.
2. The Goal is so stated that progress toward it can be verified.
3. The Goal indicators are reasonably comprehensive measures of Goal achievement.
4. Goal indicators are objectively verifiable and are targetted in terms of audience/area, quantity/quality, and time.
5. Achievement of purpose (or subgoal) together with the appropriate assumptions creates the necessary and sufficient conditions to achieve the Goal.
6. Each Assumption has a strong probability of occurring.
7. Where feasible, Assumptions are stated in operational terms so that appropriate action can be taken to increase the probability of their occurring.
8. Assumptions take cognizance of other projects which immediately and directly affect the success of this project.

PURPOSE LEVEL

1. The project has a single Purpose, not a collection of sequentially linked targets clustered at the Purpose level:

or

The project has a limited number of complementary parallel Purposes whose relationships (trade-off, etc) are clearly identified.

2. The Purpose is so stated that terminal conditions for success (End of Project Status—EOPS) can be defined.
3. Purpose Indicators (EOPS) measure Purpose Level achievement.

4. The EOPS Indicators are objectively verifiable, and are targetted in terms of audience/area, quantity/quality, and time.
5. The EOPS Indicators are not merely a restatement of the Outputs.
6. Given Output target dates, it is plausible that the proposed EOPS can be achieved in the targetted time span.
7. Achievement of Outputs, together with the appropriate Assumptions creates the necessary and sufficient conditions to achieve the Purpose.
8. Each Assumption has a strong probability of occurring.
9. Where feasible, Assumptions are stated in operational terms so that appropriate action can be taken to increase the probability of an Assumption occurring.

OUTPUT LEVEL

1. Outputs are stated functionally as results, rather than activities.
2. All Outputs necessary for achieving the project Purpose are listed.
3. No unnecessary Outputs are listed.
4. The kind and magnitude of Outputs are so stated that progress toward them can be verified in terms of quantity and time.
5. Provision of Inputs together with the appropriate Assumptions creates the necessary and sufficient conditions to achieve the Outputs.
6. Each Assumption has a strong probability of occurring.
7. Where feasible, Assumptions are stated in operational terms so that appropriate action can be taken to increase the probability of an Assumption occurring.

INPUT LEVEL

1. Inputs are listed as activities which will produce Outputs, rather than as passive resources.

2. Input-level Indicators make clear what it will cost to achieve the Purpose (e.g. funding, staffing, equipment, other resources.)
3. The Inputs necessary for achieving project Outputs are listed.
4. It is reasonable to expect that host country managers and AID project officers transform Inputs into Outputs.
5. Input Assumptions have a strong probability of occurring.
6. Where feasible, Assumptions are stated in operational terms so that appropriate action can be taken to increase the probability of an Assumption occurring.

REQUIRED DATA

1. Baseline data has either been collected, or explicit provision has been made for its early collection in the implementation plan.
2. The Means of Verification (MOV) statements indicate *where* data will be found to support:
 - a. Goal level Indicators
 - b. Subgoal Indicators (if this level is used)
 - c. Purpose level Indicators
 - d. Output level Indicators
3. The MOV defines, at each level, *how* and from what sources hard-to-gather data or evidence will be collected.
4. The Inputs reflect the funding and for personnel requirements for any special data gathering efforts.
5. The time and cost of collecting data to support Indicators at all levels is proportionate to the nature of the project.
6. In projects which are experimental, provision has been made to collect data from a control area/group to permit comparative measurement of change in the project.

CAUSALITY AND CONSISTENCY

1. The vertical logic of the project is sound: the linkages (Input-Output, Output-Purpose, Purpose-Subgoal-Goal) are plausible both individually and cumulatively.
2. In projects concerned with institutional development, the project hierarchy differentiates between institutional *capability* (trained staff, budget, equipment, system, and procedures) and institutional *performance* (delivery of goods/services).
3. The logical framework matrix and project narrative are consistent.

REVIEWING THE LOGICAL FRAMEWORK OF A PROJECT

The key test of project design is the validity of the hypothesis

- Achievement of Planned Outputs
will lead to
Achievement of Project Purpose

THIS TEST IS CONDUCTED IN FOUR STEPS:

1. TEST PROJECT PURPOSE AGAINST CONDITIONS EXPECTED

Will conditions expected at the end of the project really represent achievement of the project purpose? If these conditions are not achieved, will this be an absolute signal of project failure?

If you get a "NO" on either of these question probes, more definitive design work is required.

2. TEST OUTPUT AND PURPOSE LEVEL ASSUMPTIONS

On the basis of past experience and familiarity with local developments, are the assumptions relevant and realistic? If not, what can or should be done?

Are assumptions inclusive: i.e., do they cover the range of possible external influences which could substantially affect achievement of project purpose?

Are new inputs, or outputs needed to assure success?

3. ACHIEVEMENT OF CONDITIONS EXPECTED WITH OUTPUTS PROVIDED

Is the production of the planned outputs likely to lead to the conditions at the end of the project?

Necessary: If any specific conditions are not going to be achieved, what (if any) changes need to be made in the project? Is there an alternate strategy that could be employed? Is the alternate strategy Feasible? Desirable?

Sufficient: Are any other actions required?

4. ATTAINMENT OF PROJECT PURPOSE

If the EOPS is attained, will the narrative statement be satisfactorily achieved? Are you convinced?

Is there an alternate strategy that could be employed

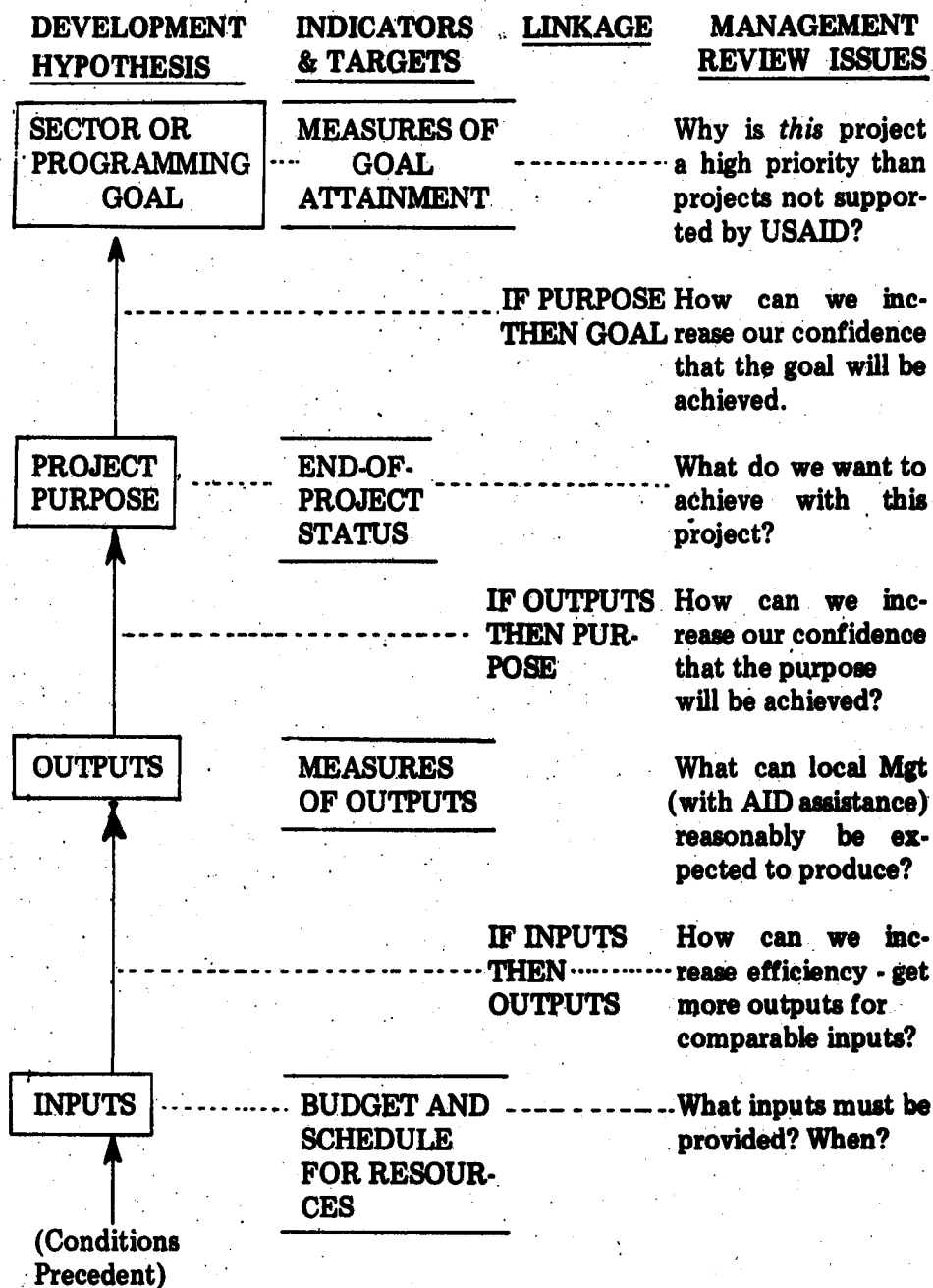
Is it feasible?

Is it desirable?

LOGICAL FRAMEWORK

GOAL	INDICATOR	MEANS OF VERIFICATION	ASSUMPTIONS
What is the overall reason for the project. To what national programme object will the project contribute.	What indicators will signal achievement of goal.	Specific source of data and method of obtaining it.	What external conditions are essential for the project to make its expected contribution to the programme or sector goals?
PURPOSE Briefly state what the project is expected to achieve, if completed successfully and on schedule.	EOFS Describe the conditions or situation which will exist when the project achieves the stated purpose. Designate an identifiable point (or state) which will be the logical end of the project.	What are the types and sources of evidence to be used in verifying the condition marking end of project status.	What conditions must exist if the project is to achieve its purpose. What are the factors over which the project personnel have little or no control, but which if not present, are likely to restrict progress from Output to Purpose achievement.
OUTPUTS What are the major kinds of results that can be expected from good management of the inputs?	What are the specific cumulative targeted indicators for each of the planned outputs. (i.e. How much of What, for Whom, by When)	What are the specific sources of data for each of the indicators, and how are the data going to be obtained? If it doesn't already exist, provision for funding it under Inputs, and require it as a condition, precedent, or as a separate output.	What external factors must be realized to obtain planned outputs on schedule.
INPUTS What are the key inputs by the U.S. - Other Donors - Cooperating Country	For each category of inputs identify the quantity and/or \$ value, by year	Specify source documents (records, reports, etc.)	Identify Conditions Precedent to Project Implementation for both AID and Host Government.

REVIEWING THE LOGICAL FRAMEWORK OF A DEVELOPMENT PROJECT



CHECKLIST FOR REVIEWING A LOGFRAME

1. PROJECT PURPOSE

- a. Does the project deal with a major problem in the country? If not, what changes would you make?
- b. Is the statement confined to a single objective without combining cause and effect?

2. PROGRAMME GOAL

- a. Will achievement of the Purpose contribute to an explicit aspect of the national development plan, or policy?
- b. Will an identified group of poor people benefit?

3. HYPOTHESES

- a. Does the series of "If-Then" hypotheses in the linkages (Input to Output, Output to Purpose, Purpose to Sub-Goal, and Sub-Goal to Goal) appear probable. If unlikely, make changes in the inputs, outputs, or assumptions to improve chances for success.

4. ASSUMPTIONS

- a. Are any more assumptions necessary to assure delivery of Inputs, production of Outputs, or attainment of Purpose and Goal?
- b. Do the assumptions adequately describe the external conditions which will affect success or failure?
- c. Does the project look doubtful? Should some assumptions become a part of the project, as new Outputs or Inputs; or even a new Project?

5. INDICATOR TEST

- a. Is each indicator plausible, independent, objective and targeted?
- b. When taken together do the several indicators for a target measure all important aspects of the target? *Look especially at EOPS.*

6. MEANS OF VERIFICATION

- a. Does each indicator have a source for data? Is the source reasonable?
- b. Is there a better way to get any of the data?

MODIFICATIONS TO THE LOGICAL FRAMEWORK

This section displays several modifications to the logical framework matrix format which have grown out of operational experience. These modifications do not alter the basic logical framework concepts.

They are displayed here for two reasons.

- they may have learning value for programme and project staff by clarifying one or another aspect of the logical framework concept.
- they may be useful to planners and/or evaluators as informal worksheets to be used in analyzing project design.

The modifications may be used singly or in combination; for instance, if the project planner/evaluator is concerned with the assumptions (external factors) affecting his/her project (s), he may want to combine modification #1. and modification #4. If the Mission finds that a modified logical framework is more effective than the standard matrix format for communicating with AID/W, this is acceptable.

MODIFICATION # 1 – VERIFICATION OF ASSUMPTIONS

Modification 1 of the logical framework, provides an added column for clarifying and elaborating the assumptions (external factors and circumstances) which affect the causative linkage. Entries in this column can be used to.

- a. verify the validity of the assumption,
- b. weigh the importance of the assumption critically,
- c. assess changes in the status of the assumption,
- d. suggest actions which could increase the probability that the assumption would be realised, and/or,
- e. specify the need for further study of the assumption.

Assumptions should be made as explicit as possible and should be stated in operational terms. This may permit the planner to take steps calculated to reduce uncertainty, increase control and, where possible, move the assumption within the scope of the project design.

Modification 1 may be usefully combined with Modification 4.

MODIFICATION #2 – INSERTION OF AN ADDITIONAL ROW (S) IN THE VERTICAL HIERARCHY OF OBJECTIVES

Modification 2 is intended to accommodate one or more intermediate levels in the vertical hierarchy of objectives. Such an intermediate or sub-level might be:

- intermediate output between input and final output levels,
- subsector goal between project purpose and sector goal (see example).

Modification No. 1

**PROJECT DESIGN SUMMARY
LOCAL FRAME
WORK**

Project Title & Number _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS	MEANS OF VERIFYING ASSUMPTIONS
Programme or Sector Goal: The broader objective to which this project contributes	Measures of Goal Achievement		Assumptions for achieving goal targets	
Project Purpose	Conditions that will indicate purpose has been achieved End of project status		Assumptions for achieving purpose	
Outputs	Magnitude of Outputs		Assumptions for achieving outputs	
Inputs	Implementation Target (Type and Quantity)		Assumptions for providing Inputs	

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Modification No. 2

Project Title & Numbers _____

Narrative Summary	Objectively Verifiable indicators	Means of Verification	Important Assumptions
Programme or Sector Goal The broader objective to which this project contributes	Measures of goal achievement		Assumptions for achieving goal targets
Subsector Goal	Measures of Goal achievement:		Assumptions for achieving goal targets
Project Purpose	Conditions that will indicate purpose has been achieved: End of project status		Assumptions for achieving purpose
Outputs	Magnitude of Outputs		Assumptions for achieving outputs
Inputs	Implementation target (Type and Qty)		Assumptions for providing inputs

Note that the setting of goals (subsector, sector, programme) is not normally the responsibility of project management, but rather of those to whom the project personnel report (this applies to both the host country and the donor agency).

MODIFICATION 3: INSERTION OF AN ADDITIONAL COLUMN FOR SPECIFIC TARGETS

Modification 3, spells out in explicit detail, (new column 3) the actual targets measured by each objectively verifiable indicator. It thus simultaneously elaborates the narrative statement of target contained in column 1 and states the final result as reflected by each indicator.

It is important to understand and preserve the distinction between a scheduling device and a listing of interim planned targets. Scheduling of project inputs, actions, events and outputs is accomplished in the Project Implementation Plans (PIP) and in network devices such as PERT. Modification 3 permits a statement of interim planned targets and their estimated dates of completion. Modification 3 should tie in with any scheduling device used by the project management team.

The grid shown in Modification 5 can be usefully applied in Modification 3, column 3. Following is an example of this usage.

Example. (Modification # 3)

1. Narrative Statement	2. Objectively Verifiable Indicators:	3. Specific Targets			
		FY 73	FY 74	FY 75	FY 76
Improve the food consumption habits and nutritional intake of low-income	a. Mothers enrolled in MCH programme conform to nutritional requirements.	a. All women receiving food are either pregnant or lactating mothers with demonstrable nutritional needs.			
	b. Percentage of children receiving food.	b. 25	50	75	100
	c. Percentage of MCH foods produced locally.	c. 0	0	15	25
			(to reach 60% by 1980)		
	d. Number of farmers using production packages (in 000s)	d.			
	(1) Cuy	(1) 0	1	5	10
	(2) Quinoa	(2) 0	0	2	7
	(3) Legumes	(3) 0	0	0	5

Modification 3:

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Project Title & Number _____

Narrative Summary	Objectively Verifiable Indicators	Specific Targets	Means of Verification	Important Assumptions
Programme or Sector Goal: The broader objective to which this project contributes	Measures of goal achievement	Goal Targets		Assumptions for achieving goal targets
Project purpose	Conditions that will indicate purpose has been achieved: End of project status	Performance Targets		Assumptions for achieving purpose
Outputs	Magnitude of outputs	Output Targets		Assumptions for achieving outputs
Inputs	Implementation Targets (Type & Qty)	Budget and Implementation Schedule		Assumptions for achieving inputs

MODIFICATION # 4 -- RELATION OF ASSUMPTIONS TO CAUSATIVE LINKAGES

Modification 4 recognizes that planning assumptions directly influence the viability of a causative linkage rather than the target itself. The split-level arrangement of columns 3 and 4 accommodates this relationship.

Modification 4 may usefully be combined with Modification # 1.

Modification No. 4

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Project Title & Number _____

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Programme or Sector Goal: The broader objective to which this project contributes:	Measures of Goal Achievement		Assumptions about Linkage Between Project Purpose and Programme Sector Goal
Project Purpose	Condition that will indicate purpose has been achieved: End of project status		Assumptions About Linkage Between Output and Project Purpose
Outputs	Magnitude of Outputs		Assumptions About Linkage Between Inputs and Outputs
Inputs	Implementation Target (Type & Qty.)		

Assumptions about Linkage Between Project Purpose and Programme Sector Goal

Assumptions About Linkage Between Output and Project Purpose

Assumptions About Linkage Between Inputs and Outputs

MODIFICATION #5 - INPUT-OUTPUT OR COST-BENEFIT COMPARISONS

EXAMPLE:

Modification #5 facilitates the comparison of inputs/costs during any period with corresponding indicators of outputs/benefits. It also permits comparison upwards to the purpose level if such a comparison is considered meaningful and desirable. This grid can also be used in Modification #3.

Project Purpose:	Conditions that will indicate purpose has been achieved: End of project status.				
Create a viable Agricultural College which can effectively contribute to agriculture development goals	Qualified Grades/Year	72	73	74	75
	Number of Farm Visits	2000	3000	3500	3500
	Research Reports	20	25	30	35
	Operating Budget Covered	20	50	70	100
Outputs:	Magnitude of outputs:				
Prof. Research fellows		22	25	30	30
Buildings		3	5	7	7
Laboratories		1	4	8	8
Library Services (000 Vols)		10	12	16	17
Extension Technicians		10	15	15	15
Inputs:	Implementation Target (Type & Qty)				
Participant Training	No/(\$000)	7/70	7/70	5/50	2/20
Technical Advisors	No/(\$000)	2/80	2/80	1/40	1/40
Other (Commodities etc)	(\$000)	50	30	20	10
Total Aid	(\$000)	200	180	110	70
Total IDS	(\$000)			500	
Total Host country	(\$000)	450	500	500	500
Grand Total	(\$000)	650	680	1110	570

Modification No. 5

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Project Title & Number _____

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions																																																												
Programme or Sector Goal: The broader objective to which this project contributes:	Measures of goal achievement.		Assumptions for achieving goal targets:																																																												
Project Purpose	Conditions that will indicate purpose has been achieved: End of project status: <table><tr><td>72</td><td>73</td><td>74</td><td>75</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>	72	73	74	75																		Assumptions for achieving purpose																																								
72	73	74	75																																																												
Outputs	Magnitude of outputs: <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																																														Assumptions for achieving outputs
Inputs	Implementation Target (Type & Qty) <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																																														Assumptions for providing inputs

MODIFICATION # 6 and # 7 — EVALUATION OF BENEFIT INCIDENCE

Modification # 6 and # 7 are designed to distinguish between the nature of the benefits created by the project (i.e., increased output of goods and services and the benefit incidence (i.e., those people who participate in the production and/or consumption of those benefits). The groups to whom the benefits are intended to accrue (target groups) should be identified by income, geographic, or other relevant socio-economic descriptors. Two classes of benefits and beneficiaries should be considered: (1) benefits generated by the construction/maintenance/operation of a facility or service, usually accruing to people employed for these purposes; and (2) benefits accruing to those who obtain access to the facility or services created (school children, clinic patients, owners of land brought under irrigation or connected to market by a feeder road).

Examples:

Indicators of Progress/Performance (Benefit)	Indicators of Benefit Incidence (Beneficiaries)
Increase in wheat production of _____ metric tones/year since 1970.	_____ % of lower income persons (under _____ pesos/year) able to purchase _____ kilo of wheat pro- ducts (bread, flour, etc.) per week as compared to _____ % in 1970.
Annual increase in hospital beds of _____ since 1970.	Annual increase of hospital admis- sions of target low income persons of _____ since 1970.
Increased revenues in agricultural production sector of _____ pesos/ year from 1970 to 1975.	_____ % of low income farm fami- lies in northwest province no less than _____ % annual increase in real income from cash crops from 1970 to 1975.

Modification No. 6

PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

	Objectively Verifiable Indicators		Project Title & Number	Means of Verification	Important Assumptions
	a. Indicators of Progress Towards Planned Targets-Benefits.	b. Indicators of Benefit Incidence Targets Groups Which Participate in the Production or Consumption of Benefits			
Narrative Summary					
Progress or Sector Goal: The broader objective to which this project contributes	Measures of goal achievement	Measures of Benefit incidence or Goal level			Assumptions for Achieving Goal Targets
Project purpose	Conditions Expected at End of Project	Indicators of Benefit Incidence Expected at End of Project			Assumptions for Achieving Purpose
Outputs	Magnitude of Outputs	Indicators of Benefit Incidence Expected at Output Level			Assumptions for Achieving Outputs
Inputs:	Implementation Targets (Type & Quantity)				Assumptions for Providing Inputs:

Modification No. 7

PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title & Number _____

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Programme or Sector Goal: The broader objective to which this project contributes	Measures of Goal Achievement: a. Progress/Benefit b. Benefit Incidence/Beneficiary		Assumptions for achieving goal targets.
Project Purpose	Conditions Expected at End of Project: a. Progress/Benefit b. Benefit Incidence/Beneficiary		Assumptions for achieving purpose
Outputs	Magnitude of Outputs a. Progress/Benefit b. Benefit Incidence/Beneficiary		Assumptions for achieving outputs
Inputs	Implementation Target (Type & Quantity)		Assumptions for providing inputs

**MODIFICATION # 8 — LOGICAL FRAMEWORK
SHOWING BOTH PROJECT DESIGN (ORIGINAL PLAN)
AND EVALUATION (CURRENT STATUS)**

Modification # 8 represents more than a minor modification of the basic format. It differs basically in that it permits the evaluator to display and measure change by recording the original objectives, indicators and planning assumptions and comparing these against the assumptions and actual status existing at the time of the evaluation.

This modification was developed for use in evaluating capital projects whether during their implementation stage or after completion. It can also be used on noncapital projects.

Note that this matrix also embodies modification # 4 and # 6.

Modification No. 8

EVALUATION SUMMARY — CAPITAL PROJECTS

ORIGINAL PLAN			CURRENT STATUS			
Narrative Summary of Original Planned Objectives	2. Objectively Verifiable Indicators		3. Planning Assumptions	4. Changes in Assumptions & Circumstances	5. Actual Progress in Terms of Objectively Verifiable Indicators	
	(a)	(b)			(a)	(b)
	Indicators of Progress Toward Planned Targets	Indicators of Benefit Incidence-Employment Income Distribution, Social Equity, etc.			Indicators of Progress Toward Planned Targets	Indicators of Benefit Incidence-Employment, Income Distribution Social Equity Etc.
Sectoral or Programme Goal	Measures of Goal Achievement	Measures of Benefit Incidence at Goal Level	Original Assumptions Affecting Linkage Between Project & Sector Programme Goal	Changes Affecting the Linkage Between Project Purpose and Sector Programme Goal	Contribution of Project to Sector Programme Goal	Benefit Incidence at Goal Level
Project Purpose	Conditions Expected at End of Project	Indicators of Benefit Incidence Expected at End of Project	Original Assumptions Affecting Linkage between Outputs & Project Purpose	Changes Affecting the Linkage Between Project Outputs & Project Purpose	Progress Toward Project Purpose	Benefit Incidence at Project Purpose Level
Project Outputs	Magnitude of Outputs	Indicators of Benefit Incidence Expected at Output Level			Progress Toward Output Targets	Benefit Incidence at Output Level

SELF-ASSESSMENT QUESTIONS

Now read the following questions and see if you can answer them. In case you find them difficult to answer, go through the relevant portions of the unit again. Before moving to the next unit make sure that you know answers to all the questions:

1. What is a logical framework?
2. In what way does the logical framework ensures a good project plan?
3. What are the characteristics and limitations of the logical framework?
- d. What are the elements of a typical logical framework?
5. What is meant by the narrative summary?
6. What should be the vertical and horizontal structure of a logical framework which you would suggest for a technical school project?
7. In what way will the use of logical framework ensure implementability of an education project?

UNIT – 5

**CASE STUDIES ILLUSTRATING THE USE OF
LOGICAL FRAMEWORK**

**Written by
Dr. M. Athar Khan**

OBJECTIVES

After studying this unit you will be able to:

- i. discuss the fundamentals of a logical framework;**
- ii. elaborate and understand about a project in the logical framework and prepare a good project plan;**
- iii. Prepare a logical framework from a regular PC—I for implementation.**

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Objectives

Introduction

1. Uses of Logical Framework:

- 1.1 Project Designing Stage
- 1.2 Project Appraisal Stage
- 1.3 Prior to Implementation Stage
- 1.4 Project Implementation Stage
- 1.5 Project Evaluation Stage

2. Case Studies:

- 2.1 Case Study I:
A Small Scale Rural Settlement and Training
Project for Unemployed Youths
- 2.2 Case Study II:
Project: Introduction of Agro-Technical Sub-
jects in the General School System

3. Plan or Sector Goals:

- 3.1 Programme or Sub-Sector Goals
- 3.2 Project Objectives
- 3.3 Outputs
- 3.4 Inputs
- 3.5 Project Activities

4. Conclusion

5. Self-Assessment Questions

- Annex—I Project Digest
- Annex—II Description of the Project
- Annex—III Aims of the Agro-Technical Educa-
tion at Middle Stage
- Annex—IV Scheme for Introduction of Agro-
Technical Courses in Middle and High
Schools in Sind

INTRODUCTION

This Unit presents two case studies to illustrate the use and preparation of a logical framework of a project. The Unit is intended to provide model guidelines which a project manager can follow to prepare it for implementing a project and which a project planner can use for preparing a better project plan (PC-I).

In this unit, it is hoped to illustrate the practical application of the logical framework to both the design of projects from new and to the review of existing proposals as they might come to the project manager in the PC-I form. It is also hoped to demonstrate how the log frame will assist in the completion of the PC-2 form for project appraisal and how an existing PC-2 might be reviewed as a result of compiling a Log. Frame for a project. Finally, some commonly made errors/faults in project design will be identified and suggestions made as to how they might be avoided in the design of future projects or mitigated in the case of projects whose implementation has to proceed with the constraints and limitations of inbuilt bad design.

1. USES OF LOGICAL FRAMEWORK

In the previous unit you have read that the "Logical Framework" provides guidelines and a structure for outlining a project development hypothesis, and for analysing a project design for implementation. The logical framework has multiple uses in development projects. It is particularly useful at the following stages:

1. Project designing stage
2. Project appraisal stage
3. Prior to implementation stage
4. Project implementation stage
5. Project evaluation stage

1.1 Project Designing Stage

At the stage of initial planning of a project the logical framework is used to guide the essential process of project formulation. It covers all stages of project planning starting from its relationship with the sectoral plan and programmes, identification of objectives of a project, its target outputs and planned inputs. It sets out the specific targets for measuring the pace of project implementation and thus provides a predetermined criteria for evaluating a project during and after its implementation.

1.2 Project Appraisal Stage

At the project appraisal stage, the logical framework provides an objective basis for a systematic assessment of the logical consistency of the project plan. The logical consistency in brief refers to:

- a. the reference of the project with the sectoral development plans and programmes;
- b. the relevance and consistence of the objectives of the project with those of the sector;
- c. analysis and assessment of the proposed inputs and outputs of the project or in other words a cost-benefit analysis of the project;
- d. objectivity, clarity and specificity of the targets aimed to be achieved through the project;

- e. basis for monitoring the implementation of the project;
- f. essential criteria for evaluation of the progress and outcomes of the project;
- g. beneficiaries and the benefits that would accrue to the completion of the project.

At this stage, the logical framework also provides a sound basis for review, improvements and adjustments by both—the project planner as well as the project appraiser.

1.3 Prior to Implementation Stage

In cases where a logical framework has not already been prepared, the logical framework could be prepared by the project management organization for translating the project plan into a logical framework. This exercise at the pre-project implementation stage would help clarify various aspects of the project and facilitate monitoring of the implementation of the project.

1.4 Project Implementation Stage

The project implementation stage refers to the situation and time, when the project management team begins marshalling resources to execute the project. The logical framework at this stage serves to monitor the flow of resources (inputs) in accordance with the targets set for various parts and levels of project implementation.

1.5 Project Evaluation Stage

Evaluation of a project is carried out at two stages. First, during the implementation of the project and second, on completion of operation of the project. Following are the main uses of the logical framework at the evaluation stage:

- a. It provides a criterion for evaluation of a project on the basis of the implementability of the project as it is assessed by the degree of the achievement of the objectives of the project,
- b. It provides a basis for evaluation of the project plan as it relates to the situation hypothesized and the realities of the

project implementation;

- c. It provides a test for assumptions;**
- d. It provides a basis to test how realistic the target setting was;
and**
- e. Finally it brings out the degree of the relevance of the project
with the plan and programmes of the sector's development.**

2. CASE STUDIES

In the following pages are given a number of case studies to illustrate how project plans are presented into a logical framework for facilitating its uses by a project manager and the project management team. The case study-1 has been selected from a different sector and country to demonstrate the generality of the logical framework and its scope for use in social sector projects of which education is an important sector.

CASE STUDY I

2.1 A Small-Scale Rural Settlement and Training Project for Unemployed Youths

Many of the problems faced by the Island of Jamaica have parallels with the social and economic problems of Pakistan. In Jamaica there:—

- exists high level of unemployment, (upto 40% nationally and even higher in certain regions and age groups)
- is a drain of skilled manpower, especially to the USA, Canada, Europe
- is a heavy dependence on agriculture in the economy
- is a drift of young people especially from the rural areas to the bright lights of the big city, where invariably no productive jobs exist for the newcomers.
- are areas of derelict, under-utilised land
- is a balance of payments deficit created by, among other things, the need to import

With a view to alleviating some of these problems, the Ministry of Youths, Sports and Community Development (MYSCD)'s special division; the Social Development Commission (SDC) proposed to utilise a 2100 acres of derelict plantation lands in the south of the Island, near to the Capital Kingston, to train and settle as many young farmers as possible, who would stay in the rural areas, adopt collective patterns of working, and produce crops for the domestic and export markets under a system of irrigation. The scheme should eventually be self-sufficient and

should provide a model for the adoption of collective/cooperative farming Island-wide.

Activity I

List all the questions that came into your mind about the feasibility of the above proposals?

Activity II

If you were given the responsibility for designing, appraising and implementing the above project, how would you proceed?

Among the problems, which such a proposal raises, are questions of the compatibility of the objectives. Farmers have a hard enough job without having to act as models/demonstrators for visitors. The question of whether a farmer's income and life in the rural areas are sufficiently attractive to prevent drift of young people is unanswerable in anticipation of the project. The question why the land has not been used, and whether it is feasible to cultivate under irrigation needs to be resolved. This type of farming patterns possibly needs to be determined so that the optimum farm size can be planned, cropping patterns examined, the demand for the crops investigated and the potential income for each farmer assessed so that his motivation to participate in the project can be gauged.

In compiling a logical framework for the project, (whose name incidently is project OASIS) all these questions can be examined in sequence. The Log. Frame shown in Fig. 1 sets out the broad goals of the programme or policy. It sets targets for the project, in terms of the feasible numbers of farmers who can make a living on the 2100 acre site and the crops they can grow. In fact the answers to these questions, the quantities of outputs possible and the activities and inputs needed are only given after careful consideration of the technical aspects of the project by farm planners, agronomists, rural sociologists, training experts, irrigation engineers and economists.

The planners/project designers' job is to set out the questions (information requirements), determine who will answer them, (recruite the necessary expertise) interpret the answers and integrate each of the components into the plan. Then either alone or in conjunction with the ex-

perts, the planner may identify, select and quantify targets and indicators of their achievements and finally to identify, articulate and appraise the assumptions which underly the project.

When the planner is satisfied with the design of the project as shown in the Log. Frame, it is possible to cost the inputs and prepare a reasonably accurate budget of both the capital and the recurrent cost of the project for the arrangement of financing. It may be that sufficient resources are not available and then the proposal will have to be financed in some way. Assuming that finances are available, that the calculations were reasonably accurate and the project was technically well designed, its implementation should be feasible, throughout its completion, within the budget allotted.

It may be your experience that in preparing budgets you are not given the freedom to design projects/programmes to meet given objectives whose financial requirements are acceded to by the ministry. In contrast you may be told how much is available for your department and then you concentrate on finding ways to spend it. The money is used up but little evidence remains of what it has been spent on. Invariably, the allocation is insufficient. Development of new projects invariably takes a lower priority than meeting regular commitments. You may, therefore, feel that this approach is not practicable.

However, the preparation of sound proposals which justify expenditure is a method by which.—

- a. developmental activities become part of the regular programme of work
- b. increased funds are made available, either from general revenues or from special aid funds.

Having gone through the previous pages about the logical framework you are requested to accomplish the Activities No. III and IV, on next page.

Activity — III

Critically evaluate the logical framework shown in Fig. 1 in terms of the criterion for sound compilation given in unit 4. Examine:

- 1. The statement of the items in the narrative summary**
- 2. The verifiability of the indicators**
- 3. The likelihood of the means of verification proposed in the third column being adopted.**
- 4. The assumptions, how justified they are in terms of whether the assumed information could be checked.**

Activity— IV

Refer to the PC—1 pro-forma given in the appendix to Unit 3. Which of the data required for the completion of the PC—1 could be provided simply by reference to the Logical Framework? Which data require further calculation or investigation?

FIGURE 1: A SUGGESTED LOGICAL FRAMEWORK FOR PROJECT

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Programme goals (Impact) 1. Greater useful employment for young people 2. Reduce rural to urban draft 3. Increase agricultural production, in terms of quantity and quality 4. Encourage planned cooperative ventures	New jobs exist Settlers remain in rural areas Increased output Lower rejection rates at grading Number of cooperatives set up and operating after given time intervals	Surveys of public reactions Census of employment Checking intentions of prospective settlers Project settlement records Farm manager's reports Production and grading records Count ventures/inquiries	The young wish to work in agriculture. Sufficient incentives are available to make rural life attractive to youth Resources are not simply diverted from extant farms. There will be a grading station. Settlers will use formal channels for marketing. Methods for disseminating information exist. The model is replicable for other regions/products
Project purposes (Effects) 1. Release under/unemployment, especially among the young of Clarendon 2. Reduce urban draft in Clarendon 3. Improve quantity and quality of agricultural production 4. Set up a self-sufficient cooperative mode of farming 5. Set up a model soap farm	240 farm jobs created 40 non-farm jobs created Age of settlers Drop in unemployment Settlers settle and all remain settled Use of sound techniques 1400 more acres under cultivation Productivity per head per acre is above average Quality is above average Cooperative activity in decision making and purchasing Project team and budgetary support can be withdrawn Level interest shown	Census/headcount Settlement records Local census Count at different times Visual observation after training Crops survey each year Crop records Settler incomes Prices obtained Visual observation Observation at intervals Teams withdraw and appoint management team of settlers Project accounts Number of visitors	Settlers would otherwise be unemployed Regional immigration can be measured Provision of jobs, houses, incomes and security is sufficient incentive to remain in rural areas Settlers accept new techniques. Land outside the project also remains in production. Valid and effective training is devised. Levels of output are sustainable. Prices reflect quality Settlers are prepared to cooperate Training is effective <i>Continued</i>

FIGURE 1: A SUGGESTED LOGICAL FRAMEWORK FOR PROJECT (Continued)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Project Outputs 1. 240 settlers trained in improved methods of farming 2. Cooperative structure including support services 3. Farm produce (in tons of vegetables) 4. Social infrastructure for Oasis community	Settlers completed training and using appropriate techniques Cooperative established with management team and members drawn from settlers Quantities sold at farm gate Revenue flowing into project 1 school, 2 day-care centres, sports/recreation complex, community centre	Farm manager's reports Project evaluation reports Registration of coop Inspection of the facilities continues to run Farm manager's records of physical output and inflow of funds Observation of use and management during operating phase	Technical skills and funds available for training Cooperative structure is desirable and effective in this context Techniques and inputs will result in saleable outputs Support from appropriate authorities for recurrent budget e.g. for schools
Project Activities 1. Project Management 2. Site procurement 3. Farming operations 4. Project facilities 5. Settler selection & introduction	Staff appointed Budgetary provision Action Plan Land acquisition Land surveyed and cleared Farming plan drawn up Marketing plan drawn up Plan and install irrigation Plan of buildings, houses and utilities Purchase of equipment Identification of settlers Introduction and training Settlement on plots	Contracts signed Funds allocated Passed by sponsor Deeds acquired Map drawn and site observation Agreed by experts Data on markets Plans and procurement Documents Observation Equipment list agreed Agreements/offers to settle Observation Individual plots farmed Houses occupied	Staff availability Availability and approval No contest of title Feasibility Appropriateness of items Agreements kept Continued

FIGURE 1: A SUGGESTED LOGICAL FRAMEWORK FOR PROJECT (Continued)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Project Inputs 1. Personnel Local staff e.g., from extension services Min. of agriculture Min. of Youth, Sports and Community Dev. External consultants (24 man months)	Presence of personnel Their suitability for the training task required Presence of agronomist/economist, coop consultant, irrigation engineer	Letters of appointment accepted qualifications and experience Technical agreement signed Staff contracted	Sufficient suitable staff are available The project may draw upon skills of other Government agencies Technical skills and funds are available
Administrative staff	Presence of project manager farm manager, irrigation engineer, systems analyst coordinator, physical planner, crop production manager, sociologist	Staff contracted Qualifications and experience reviewed	Staff are available and satisfied with the terms i.e. temporary contracts
2. Settlers	Establishment of 50 families farming for 4.5 year	Numbers applying and selected each year Approved by coop Families stay	Settlement prospect will appear attractive Selection process will be effective in identifying suitable settlers and will be followed in all cases
3. Equipment & supplies	Acquisition by GOJ Delivery to project Set up and in use	Signed loan agreement Possession of documents Arrival at project Operating	Budget allocations made available External funding/foreign exchange available for imports
4. Land	Acquisition of 2100 acres of land (Ebony Park)	Legal title acquired	Land irrevocably earmarked for Oasis project
5. Irrigation system	Irrigation system in suitable place and operating	Engineer's report	Ecological outcomes are safe Adequate suitable water available

Continued

FIGURE 1: A SUGGESTED LOGICAL FRAMEWORK FOR PROJECT (Continued)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
6. Social infrastructure for Oasis community operating	1 School, 2 day care centres, sports/recreation complex, community centre, roads, water, drainage, electricity operating	Dates of completion by contractor and handover Observation, occupation by users	

OOOOO

Explanation

The framework provides a starting point for more detailed estimation of costs and benefits and for the planning of the implementation of projects. Standards by which its achievements will be evaluated and its progress monitored are also articulated. On its own, its main use is to present at a glance the objectives and requirements of the project in terms of physical resources needed for its implementation. Any planning device which is capable of doing this has to provide information at a very general level, and thus lacks the detail necessary for physical planning.

Problem that will probably have been encountered is a lack of information. The technical coefficients of agricultural production on a given unit of land or with a given labour input will need to be assessed more accurately. The scale of construction can only be approximate at this stage and assumptions are made which, in reality, are unnecessary in a more definitive logical framework. The reason for this latter remark is that many of the assumptions that might have been made about, for instance, markets for produce, incentives for farmers, availability of inputs, climatic factors and similar measureable variables should really be checked in the detailed feasibility study for the project. One subsidiary purpose of a logical framework might now be gleaned — that is providing the project analyst with more of an overview of the information which is subsequently needed for appraisal.

Another comment relates primarily to the use of this tool in the establishment of rural development educational and training projects. Rural development covers such a wide range of situations that some would say it may not be desirable to narrow down a project to a few identifiable objectives. Some of the links between rural development objectives and verifiable means of checking on their achievement may be very tenuous. For example, would the project be more successful if it achieved high levels of income for settlers and high levels of output but with virtually no cooperative activity, than if the outcome of the project was a barely self-sufficiently low productivity farm which was run on strong communal lines? Very often it is the mundane details of project appraisal and management which are capable of being included in a logical framework rather than the larger issues. It is easier, for example, to verify that a settler will attend 24 lessons on crop production, regardless of what he may learn, than it is to ensure that he is a good farmer, yet the latter really constitutes one objective of the project.

With regard to monitoring and evaluation indicators, the project proposal generally attempts to use indicators which are fairly readily available. However, some of the indicators are too susceptible to distortion by external factors. These include the census to determine the contribution made by the project to the relief of unemployment in a class and (this is not possible) the survey of public reactions (this is too costly in reactions of prospective settlers. (This will be biased by the desire of settlers to settle and impress the project management team by their commitment). The indicators at the level of inputs, activities and outputs are easier to measure than those at the level of objectives and project purpose.

With reference to the completion of a PC-1, the Log. Frame provides information about project objectives, scale, location, numbers of beneficiaries, activities needed to bring the project about and much more. Furthermore, the following steps in the analysis of the project will seek to resolve some of the questions brought to light by the Log. Frame and to develop further details in the form of PC-I and PC-2 as well as permitting the development of a management information system to facilitate implementation of the project. Specifically, these steps will include:—

the analysis of feasibility, both physical and financial, at the farm level, because if the project doesn't provide sufficient incentives to the farmers it will almost certainly fail.

the analysis of feasibility at the project level, including a comparison of the capital and recurrent costs of the project with its long term benefits.

an estimation of cash requirements and identification of possible sources.

the implementation plan, in which the activities form the logical framework on the basis of a work breakdown structure and a scheduling exercise.

2.2 Case Study II

Project: Introduction of Agro-Technical Subjects in the General School System

The project was undertaken to implement one of the policy statements of the Education Policy (1972-80) which provided for a shift from general education to more purposeful agro-technical education.

The project was designed to achieve the following objectives:

"The system of elementary education was so designed that the knowledge and skills imparted, attitudes developed and the teaching methods employed would ensure that those not proceeding to secondary education could be usefully absorbed in the economy of the local community. For those leaving school after class VIII, special courses of training in the skills of their vocational interests would be provided in the school workshops so that the children who drop out at any stage should carry with them enough skills to return to their local or ancestor's vocation as better farmers or craftsmen."

It was also envisaged that the introduction of agro-technical subjects would develop in the children appreciation of dignity of labour and help in developing attitudes leading to motivation for productive service for the welfare of the community.

(For details of the project please see Annex 1).

The Fig. 2 presents a summary of a modified project design adapted for projects in Pakistan. In the following pages will be discussed each of the Columns and Rows with reference to the project of exercise 2, and with a view to providing students guidelines for converting a project plan (PC-I) into the logical framework.

PROJECT DESIGN SUMMARY (LOGICAL FRAMEWORK)

Project Title _____ Life of Project _____ Year _____
 Total Fundings Rs. _____ FEC _____
 Date Prepared/ _____

Narrative Summary	Objectively Verifiable Indicators	Specific Targets	Means of Verification	Important Assumptions
Plan or Sector Goals A	Measures of goal achievement A-I	Goal targets A-II	A-III	Assumptions for achieving targets A-IV
Programme or sub-sector goals A	Measures of goal achievement B-1	Goal targets B-2	B-3	Assumptions for goal targets B-4
Project objectives C	End of project Status C-1	Project targets C-2	C-3	Assumptions for objectives C-4
Outputs D	Magnitude of outputs D-1	Output targets D-2	D-3	Assumptions of or achieving outputs D-4
Inputs E	Implementation targets E-1	Budget and implementation schedule E-2	E-3	Assumptions for providing inputs E-4
Project activities F	F-1	F-2	F-3	F-4

3. PLAN OR SECTOR GOALS

A PC-I proforma provides for a reference to the project goals in the national development plans. In case of Pakistan, it is usually the Five Year Plan which provides a basis for a project.

For example, a reference to the project "Introduction of Agro-Technical Subjects in the General School System" could be found in the Fourth Five Year Plan (1970-75). P. 156. The Plan reads:

"While expansion of education in arts should be limited, teaching of Science and diversified courses including half time and full time vocational and professional training should be provided in Secondary Schools by a liberal allocation of resources. The objective of the Fourth Plan will be to convert, under a phased programme, a sufficiently large number of Secondary Schools to Institutions producing young men and women who are employable and can be easily absorbed in the economy. Curricula of Madrassas will be broadened and modified so as to allow teaching of Science, Mathematics and vocational subjects."

The Plan of Sector Goals to be derived from the plan could be constituted in the logical framework as follows:

- i. to provide diversified courses in High Schools in part time and full time vocational and professional training;
- ii. producing a large number of young men and women who are employable and can be easily absorbed in the economy.

A-I: Measures of Goal Achievement

Young men and women are able to find gainful employments in vocational and professional areas after passing Middle and High Schools examinations.

A-II: Goal Targets

The number of schools to offer agro-technical, vocational education to be in operation at the end of the plan period.

A-III: Means of Verification

1. Expert opinions
2. Periodic evaluation of plan implementation

A-IV: Assumptions for Achieving Targets

1. Enrolments in agro-technical and vocational courses will increase;
2. After passing High Schools, the students will find themselves ready to enter the labour force;
3. Local industries and organisations will find suitable High School Certificate holders for employment;
4. Students taking agro-technical vocational courses will be able to decide their future career by the time they pass High Schools.

3.1 Programme or Sub-Sector Goals

The programmes or sub sector goals, as they are reflected in the project, can be found in the annual development programmes which usually provide a phasing of the implementation of the plan. Sometimes, this phasing is given in the Five Year Plan also but for projects like this one, the financial allocation is usually included in the sub-sectoral programmes and they cannot be separated easily. In cases where such a programme of implementation is not available from the annual development programmes or the Five Year Plan, the logical framework may use the phasing of the project implementation. Unfortunately, the PC-I of the project (Annex 'A') doesn't provide this information. The only programme of implementation given in the PC-I, is in terms of the capital cost. The PC-I of the project prepared by the Govt. of Sind, Education Department is also lacking in this information.

B-I: Measures of Goal Achievements

: In this Column, the following information should have been given:

— Number of High Schools in which agro-technical vocational

courses have to be introduced during the project period or according to the phased programme of project implementation;

- Number of courses introduced, students enrolled: male and female and classwise.

B-II: Goal Targets

Agro-technical vocational units established in the country with provincial breakdown in Middle and High Schools as given in the PC-I form Annex 'A'.

i.	Industrial Group	=	6120	Units
ii.	Agricultural Group	=	8112	Units
iii.	Home Economics Group	=	2884	Units
iv.	Total Units	=	18116	Units

NOTE: The PC-I also provides for provincial programme of unit establishment.

B-III: Means of Verification

1. Reports of the provincial project implementation units;
2. Project accounts

B-IV: Assumptions for Goal Targets

1. There will be a diversification of curriculum of High Schools and Middle Schools;
2. Education will be work-oriented;
3. Effects will be visible in Post Secondary School adjustments and observations of students;
4. Students will be able to decide whether to go for general education or to the vocational education stream.

3.2 Project Objectives

The PC-I usually contains a description of the objectives of the project in quantitative terms but the present PC-I, for some reason, does not provide this information. The objectives of the project, however, were given in a support document which should have been used as basis for formulating project objectives.

(See Annexs. I & II)

C-I: End of Project Status

1. Number of schools in which agro-technical/vocational courses have been introduced.
2. Number of Units set up in:
 - i. Industrial Group
 - ii. Agricultural Group
 - iii. Home Economics Group
 - iv. Total units

C-II: Project Targets

Project targets could be derived from the objectives and project targets as given in the PC-I e.g.

- i. Degree of shift from general education to agro-technical/vocational subjects in curriculum.
- ii. Percentage of students taking agro-technical/vocational subjects.
- iii. Number of schools offering agro-technical/vocational courses.

C-III: Means of Verification

- i. Reports of the project completion
- ii. End of the project evaluation
- iii. Surveys
- iv. Project implementation record

C-IV: Assumptions for Objectives

- i. Without a scheme of agro-technical vocational education in Middle and High Schools students will continue to study general education,
- ii. Economic productivity can increase,
- iii. Rate of unemployment among the nation's youths can be reduced,
- iv. Students can learn many skills which they can use for earning bread or for use in their daily lives,
- v. It is assumed that a very large number of youths, both male and female, will find the agro-technical/vocational subjects meaningful and interesting,
- vi. The scheme is feasible and practicable,
The scheme will easily fit into the present education system of the country,
- vii. Manpower equipments, and facilities required for teaching agro-technical/vocational subjects are available.

3.3 Outputs

1. Number of students who passed Middle School examination with agro-technical subjects
2. Number of students who passed High Schools examination with agro-technical/vocational subjects.
3. Number of students who leave education and join labour force
4. Value of student projects/jobs completed during their education

D-I: Magnitude of Outputs

1. Number of male students who will benefit from the project during and after its completion
2. Number of female students who will benefit from the project during and after its completion

D-II: Output Targets

Output targets are of more elaborate statements of the outputs listed above and include the following:

1. Number of male students taking agriculture courses at:
 - i. Middle School
 - ii. High School
2. Number of students taking technical courses:
 - i. Electricity
 - ii. Woodwork
 - iii. Mettle work
3. Number of students taking commerce courses
4. Number of students taking Home Economics courses

D-III: Means of Verification

Same as for C-III above.

D-IV: Assumptions for Achieving Outputs

1. Facilities and funds for teaching agro-technical/vocational subjects are available;
2. System of education can accommodate these innovative changes in curriculum;
3. Students taking agro-technical/vocational courses will benefit from them,
4. Parents, educationists and community leaders will encourage the scheme;
5. Students will find the study of agro-technical and vocational subjects rewarding:
 - i. educationally
 - ii. economically
 - iii. socially

3.4 Inputs

Inputs of the project refer to the following:

1. Personnel

(Local staff e.g. teachers and instructors, staff of the agro-technical teachers training centres, education extension services staff, personnel in the implementation units at Federal, Provincial, Regional, Divisional and District levels)

2. Students

3. Equipments and supplies

4. Buildings

5. Institutional administration

The PC-I of the project provides the information about the schools which will be available for the project. It should have information about other inputs also. However, the Provincial PC-I of Sind provides more information about the suggested inputs of the project and works out details of educational buildings, furniture, equipments, teacher training programme for agro-technical course, teaching staff and teaching contingencies (consumable).

(For details see PC-I of Govt. of Sind, Education Department, Annex-IV).

E-I: Implementation Targets

- 1. availability of suitably qualified teaching personnel (give numbers),**
- 2. availability of administrative and service personnel (give numbers)**
- 3. availability of teacher trainers (give numbers)**

4. Students to be enrolled in each of the agro-technical (give target classwise number).
5. acquisition of:
 - i. buildings
 - ii. furniture
 - iii. equipments
6. delivery to the project implementation centres (schools selected for introduction of agro-technical/vocational subjects) of furniture and equipment
7. Number of schools in which agro-technical/vocational subjects will be taught

The implementation targets could be derived from the project inputs and the PC-I form. The PC-I form Annex. I does not specify most inputs in quantitative terms. But the PC-I of Govt. of Sind contains sufficient information in this connection. It is, therefore, suggested that for the purpose of an exercise students should refer to the PC-I of Govt. of Sind Annex II.

E-II: Budget & Implementation Schedule

The budget and implementation schedule could be adopted from the PC-I as it gives annual expenditures to be incurred on the project.

The implementation schedule in terms of the project tasks to be completed should be worked out clearly. The two PC-I proformas (Annexed to this unit), don't provide this information.

E-III: Means of Verification

1. By the allocations of the project
2. Assurances of the project sanctioning authorities
3. Project implementation, monitoring, charts and graphs record of the project implementation and sponsoring organisations.

E-IV: Assumptions for Providing Inputs

1. Sufficient suitable staff is available;
2. The project may draw upon skills of the existing administrative offices of Federal and Provincial Government;
3. Resources i.e. funds, buildings, furniture, equipments will be available;
4. The students will register for the agro-technical/vocational subjects as the subjects will be more attractive than the general education subjects;
5. Training institutions, organisations will produce required staff for the project;
6. Provincial Governments and their supporting offices fully understand the purpose, implications and benefits that will accrue to the execution and completion of the project;
7. The outcomes of the project will justify public financing of the project.

3.5 Project Activities

a. Project Management

- i. Appointment of the National Committee on agro-technical studies to formulate syllabi for teaching agro-technical subjects at Middle and High Schools
- ii. Agreement with the provincial Governments
- iii. Signing of agreement with UNDP/UNESCO for financial assistance
- iv. Preparation of an implementation plan of the project

Year	Classes	Subjects
1974	VI	Agrotechnical studies in selected schools
1975	VI	Agro-technical studies in all schools
	VII	Agro-technical subjects in selected schools
1976	V, VI, IX	All subjects
	VII	Agro-technical studies
	VIII	Selected schools
1977	VII, VIII & IX & X.	All subjects

b. Project Requirements

1. Procurement of

- i. equipments
- ii. tools, and
- iii. Sites (land and buildings)

2. Appointment of teaching staff

c. Monitoring project implementation

d. Project evaluation

F—I: Objectively Verifiable Indicators

1. National Committee appointed
2. Syllabi for agro-technical subjects finalised

3. Agreement signed with the Provincial Governments
4. Agreements signed with UNDP/UNESCO
5. Year-wise targets of implementation plan achieved
6. Equipments, tools and sites procured and delivered
7. Teaching staff appointed, trained, and placed

F—II: Specific Targets

1. Preparation of syllabi for teaching agro-technical subjects at Middle and High Schools
2. Provincial commitments to be obtained for implementation of projects
3. Assurance of financial assistance obtained from UNDP/UNESCO
4. Year-wise targets of establishing agro-technical vocational Units
5. Procurement of equipments, tools, land and buildings according to the annual schedule of implementation
6. Appointment of teaching staff according to the annual implementation plan, training and placement of teachers according to the annual implementation plan

In actual logical framework, the project manager should give specific quantities and numbers of equipments and tools etc. teachers and the agro-technical/vocational Units to be set up annually during the project period.

F—III: Means of Verification

1. Project monitoring charts and graphs
2. Formative evaluation of the project implementation plan

3. End of the project evaluation

F—IV: Important Assumptions

- 1. Syllabi of agro-technical/vocational subjects will be according to the training needs of the youths of a community and the manpower requirements of local and national industries and business organisations**
- 2. Provincial Governments will implement the project according to the plan**
- 3. Financial assistance of UNESCO will be available in time**
- 4. Agreements with suppliers will be kept.**
- 5. On the whole the project will be feasible**

4. CONCLUSION

The two case studies given in this Unit are intended to provide students guidelines for developing a logical framework for implementation from the PC-I or the available project document. In the exercise II although a reference has been made to a specific project which in effect includes curriculum planning, development and implementation, training and procurement and delivery of equipments, buildings etc., there is so much information that needs to be worked out by a project manager himself. The implications of the two exercises on preparing logical framework for project planners, however, are that while preparing a project with a view to converting them into a logical framework, they still certainly tend not to overlook the information which should be given in the project plan.

5. SELF-ASSESSMENT QUESTIONS

1. How does a logical framework improve the implementability of a project?
2. What are various uses of a logical framework in a project cycle?
3. What are the problems of developing a logical framework from a PC-1?
4. What changes will be required in a PC-1 form if it has to be prepared according to a logical framework?

PART 'A'

PROJECT DIGEST

1. Name of Project: Introduction of agrotechnical subjects in the General School System
2. Authorities responsible for: Education Division, Minister of Education
 - i. Sponsoring EDUCATION DIVISION, MINISTRY OF EDUCATION
 - ii. Execution —do—
 - iii. Operation and Maintenance: Provinces/AJK/FGEI/FATA
3. Time required for completion of project. (in months) 36 months
4. (a) Plan Provision:
 - i. If the project is included in the current Five Year Plan, specify actual allocation. The Project forms a part of the programme of implementation of New Education Policy introduction of Agrotechnical subjects in the General School System.
 - ii. If not included in the current Plan, how is it now proposed to be accommodated (Inter/Intra-Sectoral Adjustment in allocation or other resources may be indicated).
 - iii. If the Project is proposed to be financed out of block provision for a programme, indicate:

Total Block Provision	Amount already committed	Amount proposed for this project 30.67 crore	Balance available
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- (b) If project is not in the plan, what warrants its inclusion in the Plan.

5. Relationship of the Project with the objectives of the sector. Indicate the contribution of the project, qualified if possible, to the targets in the Five Year Plan; and the name of the other projects (whether sanctioned or under preparation) which would form part of an intergrated programme within the sector. The new Education Policy 1972-80 envisages a massive shift from general aimless education to more productive agrotechnical subjects in Educational Institutions, proper facilities are to be provided.

6. Capital Cost of Project. (In crore of Rupees)

Local Costs:	Rupees	<u>30.67 crore</u>
Foreign Exchange Costs:		<u> </u>
	Total: Rupees	<u>30.67 crore</u>

7. Annual Recurring expenditure after completion (in Crore of Rupees)

Local Rupees 19 crore

F.E.

Total To be provided by the Provincial Governments.

8. Objectives of the Project preferably in quantitative terms

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Officer

Checked by Dr. M.I. Hussain (Name and designation)
O.S.D. (Tech)

Approved by Dr. Rashid Ahmed Shah (Name and Designation)
Joint Educational
Adviser

Date:

PART 'B'

PROJECT DESCRIPTION AND FINANCING

9. Location of Project (Attach map): All over Pakistan including Azad Kashmir, Federal Area and the Tribal Area

a. Give name of place and administrative district in which the service centre will be located/Details attached at Annex—I

b. Indicate total area which will be served: Throughout Pakistan.

10. Existing facilities:

Give information about public and private sector institutions in the area, their staff and equipment, actual enrolment in various classes and capacity enrolment of the institution. The information about public and private sector institutions should be given both for the level of the education programme proposed by the project as well as for the lower level institutions which will serve as feeder institutions for the project.

11. Description of the Project: See attach Agrotechnical Curriculum Studies

a. Give brief history, proposed facilities and justification of project,

b. Give population of the area to served, age groups and income level;

c. Relationship with other programmes in the same sector and in other sectors. Indicate whether coordination with other sectors has been ensured;

d. Give student-teacher ratio for the project and the national average for the proposed level of education. Give also the extent of library and laboratories facilities per student and how it compares with national average;

e. The employment prospects of the persons to be trained in terms of the present and future demands;

- f. Give details of the type of training or education to be imparted: the syllabus and the subject in which the emphasis will be placed. Indicate availability of teaching staff;
 - g. Give details of administrative structure for implementing the project.
12. Give data when capital expenditure estimates were prepared. If prepared more than one year ago, confirm if they are still valid.
 13. Capital Cost:

Give breakdown of capital cost year-wise, covering the whole of investment period, as indicated below: (In crore)

Item	Total at official rate of exchange	I year (75-76) at official rate of exchange.	II year (76-77) at official rate of exchange	III year (76-77) at official rate of exchange
Local FEC Import duties	30.67	10.67	10.00	10.00

14. Basic of cost estimates (save full details) (See attached Agrotechnical Curriculum)
15. Estimates of annual recurring expenditure after completion of each phase of a Project. Also indicate source of financing recurring expenditure:

Recurring expenditure will be provided by the Provincial Governments.

Salaries of Staff:

- a. Service staff
- b. Ancillary staff (e.g. para-medical)
- c. Supervisory and administrative staff
- d. Consumable Stores and Supplies (Please specify)

- e. Books and Journals
- f. Contingent Staff
- g. Other Contingencies e.g., electricity, water, postage etc.
- h. Rent and Rates
- i. Other expenditure e.g., sports and workshop supplies

16. Unit cost for each category of service or output e.g. for educational institutions, the cost per student and how it compares with costs in other institutions.

17. In case of projects for production of goods and services (e.g. production of textbooks) give expected income statement (Profit and loss accounts) for ten years or until normal capacity is reached. Rate of depreciation and salvage value of property should be given.

18. Annual phasing of physical work and financial requirements for the project. (Attached PERT or Bar diagrams if prepared).

Physical Work Item	Financial requirements	
2nd year	1975-76	10.00 crores
3rd year	1976-77	10.00 crores
4th year	1977-78	10.00 crores
5th year		

19. (a) Likely sources and amount of foreign exchange cost of the project

(b) Present position regarding availability, commitment for negotiations

20. Indicate Sources and Amount of Rupee Component of Project:

SOURCES	Amount for Capital expenditure	Amount for recurring expenditure
a GOVERNMENT SOURCES:		
(i) Grant (ii) Loan (iii) Investment		
(iv) Direct Govt. expenditure		

- b. Sponsoring AGENCY's own fund
- c. Private Investment
- d. Local Body Resources
- e. Non-Government borrowing
- f. Other sources (e.g. Recoveries)

21. Results of the project:

- i. Direct benefits No. of persons served
- ii. Indirect and other benefits Contributions toward specific targets/social objectives

22. a. Approximate number and categories of job opportunities likely to be created indirectly as a result of

- i. Implementation
- ii. Operation of Project

- b. Economic life of components of project (Buildings, equipment etc).

P A R T 'C'

PROJECT REQUIREMENTS

		for execution	for operation
		Man month	Number
23.	1. Professional and technical		
	2. Administrative, executive and managerial		
	3. Clerical		
	4. Service		
	5. Skilled		
	6. Unskilled		
	7. Others		
	a. Likely shortage of manpower by occupations		
	b. Steps to be taken to assure availability of manpower		

- c. Approximate number of persons required to be trained per year (locally and abroad) and the kind of skills to be learnt
- d. Give total capital outlay, give the capital cost of mobilising one worker for one shift.

24. Physical and other facilities required for project.

Item	Total	To be provided from the project itself	To be provided from the public utility
a. Housing by type			
b. Power supply			
c. Water and other utilities			
d. Others			

25. Materials, supplies and equipment requirement:

A.I. Minimum total requirements for execution:
to be completed only for major items costing more than 10% of the total cost.

	Local	Foreign	Already available with agency	
	Quantity Rate	Cost per Unit	Quantity Rate	Cost per Unit

1. Materials:

26. Province-wise financial abstract of expenditure on equipment regarding the introduction of Agro-technical subjects in the general school system.

Province	Cost of Equipment (in lacs of rupees)
Sind	992.276
Punjab	1405.52
N.W.F.P.	386.59
Baluchistan	62.67
Azad Jammu Kashmir	64.94
F.G.E.I.	19.53
F.A.T.A.	27.78
F.G.E. Nationalised Cantt. Schools	93.32
Northern Areas	14.63
Total	3067.283

Say Rs. 30 crore 67 lacs

MIDDLE AND HIGH SCHOOLS					UNITS				
Sr. No.	Provinces	Industrial Group	Agricultural group	Home Economic Group	Total Schools	Industrial Group	Agricultural Group	Home Economics Group	Total Units
1.	Sind	564	514	314	1392	2256	1028	628	3912
2.	Punjab	631	2400	1300	4331	2524	4800	2600	9924
3.	A.J.K.	25	245	32	302	100	490	64	654
4.	N.W.F.P.	195	589	173	957	780	1178	346	2304
5.	Baluchistan	27	239	65	331	108	478	130	716
6.	F.G.E.I.	10	19	13	42	40	38	26	104
7.	F.A.T.A.	30	35	6	71	60	70	12	142
8.	Cantt. Nationalised Institution	55	—	35	90	220	—	70	290
9.	Northern Areas	8	15	4	27	32	30	30	70
		1530	4056	1942	7528	6120	8112	2884	18116

Note: The basis on which requirement have been worked out, is four Units per School for Industrial Arts group and two Units each for Agriculture and Home Economics on the average. (One unit = 20 students).

PROVINCE OF SIND

1. The existing number of middle and high schools in Sind both for boys and girls at present in which it is proposed to introduce the Agro-technical courses is as follows.

		Units
Industrial Schools	564	2256
Agricultural Schools	514	1028
Home Economics Schools	314	628
Total Agro-Technical Units	1492	3912

2. The cost of each unit is based of list fo equipment already prepared and taking into account escalation in the prices by about 33% the cost for each unit works out as follows:

Cost of each Industrial unit	Rs.	40,000/-
Cost of each Agricultural unit	Rs.	4,100/-
Cost of each Home Economics unit	Rs.	7,600/-

3. In the light of the above figures, the total financial implications for the province of Sind work out as follows:

A. Industrial Units:

2256 units at an estimated cost of
Rs. 40,000/- comes to Rs. $2256 \times 4100 = 90,240,000/-$

B. Agricultural Units:

1028 units at an estimated cost of Rs. 4100/- per unit
comes to Rs. $1028 \times 4100 = \text{Rs. } 42,148,000/-$

C. Home Economics Units

628 units at an estimated cost of

Rs. 7600/- comes to Rs. 628 x 7600 = Rs. 47,72,800/-

Total cost A+B+C =	90,240,000
Rs.	4,214,800
Rs.	4,772,800

Total Rs. 9,92,27,600

Say Rs. 9.92 Crore

PROVINCE OF THE PUNJAB

Detailed expenditure to be incurred for introducing the Agro-technical subjects in all schools of the province of the Punjab.

	Middle	High	Total	Units
1. Schools				
Agriculture	1900	500	2400	4800
Industrial Arts	132	499	631	2524
Home Economics	300	—	1320	2600
				9944

2. Cost estimates for providing Agro-technical equipment:

Agriculture	4800 x 4100 =	Rs. 1,96,80,000/-
Industrial Arts	2524 x 40,000 =	Rs. 10,09,60,000/-

Home Economics	2620 x 7600 =	Rs. 1,99,12,000/-
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Grand Total		Rs. 14,05,52,000/-
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Says Rs. 14.05, crore.

AZAD JAMMU KASHMIR

1. Groups:	Schools	Units	Cost
Agriculture	245	490	Rs. 20,08,500/-
Industrial Arts	25	100	Rs. 40,00,000/-
Home Economics	32	64	Rs. 4,66,400/-
Total:			Rs. 64,94,900/-

Say Rs. 64,949 Lacs.

N.W.F.P.

Detailed expenditure to be incurred on equipment for introducing Agro-technical subjects in all schools of the province of N.W.F.P.

	Schools	Units	
1. Agriculture	580	1178	
Industrial Arts	195	780	
Home Economics	173	346	
2. Cost estimates for providing Agro-technical equipment:			
Agriculture	1178 x 4100	=	Rs. 48,29,800/-
Industrial Arts	780 x 4000	=	Rs. 3,12,20,000/-
Home Economics	346 x 7600	=	Rs. 26,29,600/-
Total			Rs. 3,86,59,400/-

Say Rs. 3.86 Crores.

PROVINCE OF BALUCHISTAN

1. Groups	Schools	Units	Cost
Agriculture	239	478	Rs. 19,59,800/-
Industrial Arts	27	108	Rs. 43,20,000/-
Home Economics	65	130	Rs. 9,88,000/-
Total:			Rs. 62,67,800/-

Say Rs. 62.67 Lacs

FEDERAL EDUCATIONAL INSTITUTIONS ISLAMABAD

Detailed expenditure to be incurred on equipment for introducing Agro-technical subjects in all schools.

1. Groups	Schools	Units	Cost
Agricultural	19	38	Rs. 1,55,800/-
Industrial Arts	10	40	Rs. 16,00,000/-
Home Economics	13	26	Rs. 1,97,600/-
Total:			Rs. 19,53,400/-

Says 19.53 lacs

FEDERALLY ADMINISTERED TRIBAL AREA

1. Groups	Schools	Units	Cost
Agriculture	35	70	Rs. 2,87,000/-
Industrial Arts	30	60	Rs. 24,00,000/-
Home Economics	6	12	Rs. 9,1200/-
Total			Rs. 27,78,200/-

Say Rs. 27.782 lacs.

NATIONALISED CANTONMENTS INSTITUTIONS

Groups	Schools	Units	Cost
Industrial Arts	35	220	Rs. 88,00,000/-
Home Economics	35	70	Rs. 5,32,000/-
Total:			Rs. 93,32,000/-

Say Rs. 93.32 lacs.

NORTHERN AREAS

Group	Schools	Units	Cost
Industrial Arts	8	32	Rs. 12,80,000/-
Agriculture	15	30	Rs. 1,23,000/-
Home Economics	4	8	Rs. 60,800/-
Total:			Rs. 14,63,800/-

Say Rs. 14.638 lacs

DESCRIPTION OF THE PROJECT

1. One of the main objectives of the Education Policy (1972-80) of Government of Pakistan is to design curricula relevant to the nation's social and economic needs by providing a massive shift from general education to more purposeful Agro-technical education. It is envisaged that the system of elementary education be so designed that the knowledge and skills imparted, attitudes developed, and the teaching methods employed would ensure that those not proceeding to secondary education could be usefully absorbed in the economy of the local community. For those, leaving school after class VIII special courses of training in the skills of their vocational interests would be provided in the school workshops so that children who drop out at any stage should carry with them enough skills to return to their local or ancestral vocation as better farmers or craftsmen. It would lead to a better appreciation "dignity of labour" and help in developing attitudes leading to motivation for productive service for the welfare of the community.

2. The National Bureau of Curriculum, in collaboration with the Provincial Bureau of Curriculum, prepared the goals and aims of education in Pakistan and based on these drew up schemes of studies for the elementary and secondary stages of education. Draft curricula and syllabi of different subjects for the elementary classes were then prepared. Drafts prepared by the provinces were then considered by the National Committees on different subjects. A National Committee on Agro-technical Studies was also constituted. The Committee consisted of 26 experts from different provinces and the Federal Ministry of Education. Comments were received from the provincial governments, educationists, intellectuals and teachers throughout the country and the report finalised.

3. The recommendations of the National Committee on Agro-technical studies were accepted by the Government of Pakistan and steps were soon initiated for implementation of its recommendations.

4. The Committee worked out the broad objectives and the detailed syllabi for teaching the following Agro-technical subjects at middle stage:—

1. Agriculture
2. Metal work, wood work & Applied electricity
3. Home Economics (for girls)

5. The National Committee on Agro-technical Studies has been widely circulated amongst the provinces for implementation.

6. The National Committee prepared the standard list of equipment and material required for teaching these subjects and also worked out recurring costs.

7. The UNDP have also signed an agreement with the Government of Pakistan for providing assistance over a period of 2½ years in the form of experts, training facilities, and equipment. The UNESCO has agreed to provide assistance to the tune of \$ 3,06,450.

8. It is further envisaged to extend the Agro-technical scheme to grade IX and X. The National Committee has already developed curricula.

9. The Federal Government has envisaged the implementation according to the following schedule:

Year	Classes	Subjects
1974	VI	Agro-technical studies in selected schools
1975	VI	Agro-technical studies in all schools.
	VII	Agro-technical subjects in selected schools.
1976	V,VI, IX	All subjects
	VII	Agro-technical studies,
	VIII	Selected schools.
1977	VII, VIII & IX & X.	All subjects.

10. As the Agro-technical shift is a massive project, it involves huge amounts in terms of development as well as non-developmental expenditure. The Provincial Governments have shown their willingness to go

ahead with the programme, as per schedule. However, the Governments are handicapped for want of resource allocation. The project will provide capital equipment to schools, high and middle, both for boys and girls, for introducing the Agro-technical subjects in classes VI-VIII. The scheme will serve the whole of Pakistan. The teachers will be provided by the Provincial Governments. A separate scheme has been prepared for the training of the teachers in the Agro-technical subjects. The non-developmental expenditures will be borne by the respective Governments.

11. The Textbook and teacher guide in Industrial, Agricultural and Home Economics subjects have been prepared and published for class VI.

12. Crash programme of teacher training for 25000 teachers is needed to introduce the scheme in 7543 schools throughout the country, to allow the early implementation of the scheme. At the same time, refresher courses for the existing teachers are foreseen while the implementation of the project is in progress. Teacher training, concept and skill oriented workshops have been conducted by Federal Ministry of Education with the collaboration of the Provincial Governments, at Abbottabad, Quetta and Lahore. More workshops are being organised by the Federal Government as well as Provincial Governments.

12. The Provincial Governments have submitted their schemes regarding the "Introduction of Agrotechnical subjects in the General School System", to their planning Departments and on the basis of the approval of the schemes they have ensured, provision of adequate buildings/space in each school and the availability of trained teachers for this programme on a phased basis.

13. They have also given commitment for raw materials contingencies and other recurring expenditure, maintenance. Provision of work-book, teacher's guide and other instructional material required by the teachers and students for the implementation of Agro-technical programme is also ensured to be provided by Provincial Governments.

14. Each province will constitute a purchase committee to buy it in bulk according to the specification and distribute them to various schools through conveniently placed supply outlets at the Tehsil or District level.

15. The Divisional/District Education Officers with the help of their Technical Officers will inspect and supervise the introduction and utilisation during and after the completion of the project:—

MIDDLE SCHOOLS HIGH SCHOOLS

No.	Provinces	Boys	Girls	Boys	Girls	Boys	Girls
1.	Sind	630	144	448	170	1078	314
2.	Punjab	2032	870	999	430	3031	1300
3.	N.W.F.P.	465	101	319	72	784	173
4.	Baluchistan	184	41	80	24	266	65
5.	A.J.K.	161	91	109	13	270	32
6.	F.G.E.I.	16	3	13	10	29	13
7.	F.A.T.A.	45	2	25	2	40	4
8.	Cantt. Nationalised Institutions	13	11	42	24	55	35
9.	Northern Area	15	2	8	2	23	4

Practical:

Practice of construction, Trouble Shooting and repair of radio circuits.

**AIMS OF THE AGRO-TECHNICAL EDUCATION AT
MIDDLE STAGE**

(Class VI—VIII)

1. to prepare the student for making useful contribution to home, school and community life,
2. to develop in students a sense of dignity of labour,
3. to develop in students a sense of pride in achievement through manual work,
4. to encourage the students to explore, experiment and to express individual creativeness,
5. to develop in students systematic clean and safe work habits,
6. to create in students an awareness of their aptitudes, abilities and inclinations,
7. to develop in students the habit of engaging in gainful pursuits for making the best use of their time,
8. to develop in students an appreciation of the value of private and public property and of their preservation,
9. to impart to students a knowledge of basic materials, processes and techniques with a view to their introduction to the world of work,
10. to develop in students, proficiency in the use of elementary hand tools and equipment,
11. to inculcate in students an attitude of economy in the use of materials with a view to reduce unnecessary wastage,
12. to develop in students an appreciation of the role of agriculture and industry in the development of the country,
13. to impart to students the knowledge of conservation, utilization and development of natural resources of the country,
14. to provide to students an understanding of the ideology and cultural values of Pakistan as the basis of education to inculcate respect for them.

**AIMS OF AGRO-TECHNICAL (VOCATIONAL) SUBJECTS IN
CLASSES IX AND X**

At the end of Vocational Subjects in classes IX and X the students should:

1. have sufficient knowledge of the raw materials, processes, tools and equipment of the chosen vocational subjects to enable him or her to be employed or self-employed in a related trade if required,
2. have developed such attitude of mind as will enable him or her to appreciate the value to the individual, to the local community and Pakistan as a whole, of skilled occupations and skilled personnel,
3. have developed an appreciation of the value of personally possessing skill to produce or create articles of beauty and/or value and or use either for the home or for commercial purposes,
4. have developed sufficient skill in the practical aspects of the chosen vocational subjects to enable him or her to be employed or self-employed in a related trade if required,
5. have sufficient skill to carry out the activities specified in general objective No. 3 for the purposes of maintenance, repair, development and production,
6. have a feeling of self-reliance and self-confidence that will enable him to utilise full his knowledge and skills,
7. appreciate the necessity for the good habits of productivity craftsmanship, handwork, punctuality, team spirit,
8. realise the inter-dependence of all members of any family, community or organisation on each other,
9. appreciate the value of the knowledge and skills which have been acquired to his or her occupation, irrespective of what that occupation may be, either professional or non-professional,
10. have pride in achievement,
11. Have developed a realisation of the value of the inculcated skills, in making them better qualified professionally and better to carry out the practical aspect of their chosen profession.

**GOVERNMENT OF SIND
EDUCATION DEPARTMENT**

**SCHEME
FOR**

**INTRODUCTION OF AGRO-TECHNICAL COURSES IN
MIDDLE AND HIGH SCHOOLS IN SIND**

**PREPARED BY
GOVERNMENT OF SIND, EDUCATION DEPARTMENT, KARACHI
APRIL, 75**

**GOVERNMENT OF PAKISTAN
PLANNING COMMISSION**

**Proforma for Development Project
(Education Training & Manpower Sector)**

Code Number for Project

**(To be filled in by
Planning Commission)**

**PART 'A'
PROJECT DIGEST**

1. Name of Project. INTRODUCTION OF AGRO-TECHNICAL COURSES IN MIDDLE AND HIGH SCHOOLS IN SIND.
2. Authorities responsible for:
 - i. Sponsoring Govt. of Sind, Education Deptt., Karachi.
 - ii. Execution -do-
 - iii. Operation & Maintenance Govt. of Sind, Buildings Department, Hyderabad.
3. Time required for completion of project (in months) 36
4. Plan provision:
 - i. If the project is included in the current Five Year Plan, specify actual allocation, Proposed to be included in 5th Five Year Plan with an allocation of 94808 thousands.

- ii. If not included in the current Plan, how is it now proposed to be accommodated (Inter/Intra-Sectoral adjustments in allocation or other resources may be indicated) **NOT APPLICABLE**
- iii. a. If the project is proposed to be financed out of block provision for a programme indicate.

Total Block Provision	Amount Already Committed	Amount Proposed for this Project	Balance Available
-----------------------	--------------------------	----------------------------------	-------------------

NOT APPLICABLE

- b. If project is not in the Plan, what warrants its inclusion in the Plan.

NOT APPLICABLE

5. Relationship of the project with the objectives of the sector. Indicate the contribution of the Project, quantified if possible to the targets in the Five Year Plan, and the names of other projects (whether sanctioned or under preparation) which would form part of an integrated programme within the sector.

AS DISCUSSED IN PART 'B'

6. Capital Cost of Project (In thousand rupees)

Local Costs 89808

Foreign Exchange Costs 5000

Total: 94808

7. Annual recurring expenditure (In thousand rupees) after completion.

Local 33907

F.E. —

Total: 33907

8. Objectives of the project preferably in quantitative terms.

As discussed in Part 'B'

PREPARED BY. Syed Anweruddin (Name and Designation)
Section Officer (P-I)
—Education Department.

CHECKED BY. Mir Mohammad Ali (Name and Designation)
Addl: Education Secretary
Govt. of Sind.

APPROVED BY. Syed Panah Ali Shah (Name and Designation)
Education Secretary
Govt. of Sind.

Date.

PART 'B'

Project Description and Financing

9. Location of Project (Attach map)

- a. Give name of place and administrative district in which the service centre will be located. Scheme to cover all Middle and High Schools in all Districts of the Province.
- b. Indicate total area which will be served. Entire Province.

10. Existing Facilities

Give information about public and private sector institutions in the area, their staff and equipment, actual enrolment in various classes and capacity of enrolment of the institution. The information

about public and private sectors institutions should be given both for the level of the educational programme proposed by the Project as well as for the lower level institutions which will serve as feeder institutions for the Project.

Agro-Technical courses have not been introduced in the schools so far. However, partial facilities exist in the total number of 240 schools for the teaching of Agricultural, Industrial and Home Economics courses in Classes VI-VIII.

11. Description of the Project

- | | | |
|----|---|--------------------------|
| a. | Give brief history, proposed facilities and justification of project. | |
| b. | Give population of the area to be served, age groups and income level. | |
| c. | Relationship with other programmes in the same sector and in other sectors. Indicate whether coordination with other sectors has been ensured. | As discussed in Part 'B' |
| d. | Give student-teacher ratio for the project and the national average for the proposed level of education. Give also the extent of library and laboratories facilities per student and how it compares with the national average. | |
| e. | The employment prospects of the persons to be trained in terms of the present and future demand. | Not Applicable |
| f. | Give details of the type of training of education to be imparted, the syllabus and the subjects in which emphasis will be placed. Indicate availability of teaching staff. | As per Annex. I. |
| g. | Give details of administrative structure for implementing the project. | As per Annex. II. |

12. Give date when capital expenditure estimates were prepared. If prepared more than one year ago, confirm if they are still valid. March, 1975
13. Give breakdown of capital cost, year-wise covering the whole of the investment period, as indicated below:

Item			Total of official rate of exchange			I year at official rate of exchange			II year at official rate of exchange		
Local	FEC	Import duties	Total	Local	FEC	Total	Local	FEC	Total	Local	FEC
89808	50000	—	94808	30042	1500	31542	30042	1500	31542		
29724	2000	31724									

14. Basic of cost estimates (Give full details) As given in Annex III, III(a), III(b), IV, IV(a), V & V(a). III(c)
15. Estimates of annual recurring expenditure after completion of each phase of Project. Also indicate source of financing recurring expenditure.

Local Cost F.E. Cost Total.

Salaries of staff.

- a. Service staff
 - b. Ancillary staff (e.g. para-medical)
 - c. Supervisory and administrative staff.
 - d. Consumable stores and supplies (please specify)
 - e. Books and Journals.
 - f. Contingent staff.
 - g. Other contingencies e.g. electricity, water, postage etc
 - h. Rent and rates.
 - i. Other expenditure e.g. sports and workshop supplies
16. Units cost for each category of service or output e.g. educational

institutions, the cost per student and how it compares with costs in other institutions. Rs. 430

17. In case of projects for production of goods and services (e.g. production of text books) give expected income statement (profit and loss accounts) for ten years untill normal capacity is reached. Rate of depreciation and salvage value of property should be given.

NOT APPLICABLE

18. Annual phasing of physical work and financial requirement for the project (Attached PERT or Bar diagram if prepared).

	Physical Work Item.	Financial Requirements		
		Local	F.E.C.	Total
	Already completed			
33%	1st Year (1975-76)	30042	1500	31542
33%	2nd Year (1976-77)	30042	1500	31542
33%	3rd Year (1977-78)	29724	2000	31724
		89808	5000	94808

19. Foreign Exchange Expenditure.

Year	Material	Consultants	Others	Totals
1.	1500	—	—	1500
2.	1500	—	—	1500
3.	2000	—	—	2000
4.				
5.				

20. a. Likely sources and amount of foreign exchange cost of the project (Through F. Aid/own resources/Barter)
- b. Present position regarding availability, commitment of negotiation — Nil —

21. Indicate sources and amount of rupees component of Project.

	Sources	Amount for Capital Expenditure	Amount for Recurring Expenditure
a. i.	Grant —		
ii.	Loan —		
iii.	Investment —		
iv.	Direct Govt: Expenditure,	94808	33907
b.	Sponsoring Agency's own fund,		
c.	Private Investment.		
d.	Local body resources if any.		
e.	Non-Government borrowing		
f.	Other sources (e.g. Recoveries)		

22. Results of the Project.

- | | | |
|-----|-----------------------------|---|
| i. | Direct Benefit | Number of persons served 80 thousand |
| ii. | Indirect and other benefits | Contribution toward specific targets/ social objectives |

As discussed in Part 'B'.

23. a. Approximate number and categories of job opportunities likely to be created indirectly as result of.

- | | | |
|-----|----------------------|------|
| i. | Implementation | — |
| ii. | Operation of Project | 3488 |
- b. Economic life of components of project (Buildings, equipments etc.). 40 years.

PART 'C'

PROJECT REQUIREMENTS

24. a. MANPOWER.

	<u>For Execution</u> man month	<u>For Operation</u> Number
1. Professional and technical		2852
2. Administrative, executive and managerial.		
3. Clerical		
4. Service		
5. Skilled	The scheme is to be implemented through the Building Department which has regular staff for the purpose.	
6. Unskilled		
7. Others		
		636
b. Likely shortage of manpower by occupation		Requisite manpower will be available.
c. Steps to be taken to assure availability of manpower		(Not applicable)
d. Approximate number of persons required to be trained per year (locally and abroad) and the kind of skills to be learnt.		(Not applicable)
e. Give total capital outlay, give the capital cost of mobilizing one worker for one shift.		(Not applicable)

25. Physical and other facilities required for project

Item	Total	To be provided from the project itself	To be provided by public utility

- a. Housing by type
- b. Power supply
- c. Water and other utilities Not applicable
- d. Others.

26. Materials, supplies and equipments requirement.

A—I Minimum total requirements for execution

To be completed only for major items costing more than 10% of the total cost.

Item	Units	Local	Already available able with agency			Foreign		
			Quantity	Rate	Cost	Quan-	Rate	Cost per
			per unit			tity		Unit

NOT APPLICABLE.

3. Equipment and Machinery

- a.
- b.
- c.
- d.

— do —

A. II Material, spares and supplies and equipment for operation of project

Unit	Local			Already available Foreign		
	Quan-	Rate	Cost	Quan-	Rate per	Cost
	tity	per		tity	Unit	
		Unit				

1. Material

- a.
- b.
- c.
- d.

Not Applicable

2. Supplies and Spares

- a.
- b.

—do—

27. In the case of imported material and equipment for execution, indicate

- a. Justification for imports **Not Applicable**
- b. Proposed source/source of supply **ANNEXURE TO PC-I**

(This part should be filled up only for revised Schemes).

- 1. Comparative cost estimates of the last sanctioned and revised schemes.

Last sanctioned Project			Revised Project		
Local	Foreign exchange	Total	Local	Foreign exchange	Total

a to i. Not Applicable

Give reasons for the revision in cost estimates

Items	Reasons for the revision
-------	--------------------------

a to i. Not Applicable

2. Total expenditure incurred so far.

Expenditure		
Local	Foreign	Total

a to i. Not Applicable

3. Progress of work	a. As per schedule last sanctioned	b. Actual achievement	c. Reasons for delay
---------------------	------------------------------------	-----------------------	----------------------

4. Project History Date Cost

PART 'B'

INTRODUCTION OF AGRO-TECHNICAL COURSES IN MIDDLE AND HIGH SCHOOLS IN SIND PROVINCE

In pursuance of the recommendations of the New Education Policy, the Federal Ministry of Education has decided that Agro-technical courses will be introduced in selected Middle and High Schools during 1974-75 and in all schools in a phased manner with effect from 1975-76.

The scheme for Secondary Schools designed by the National Committee includes 6 schools periods for class VI and 8 periods for Agro-technical courses. These courses include industrial group viz. Wood work, Metal works and Applied electricity for schools in urban areas, Agriculture for rural areas and Home Economics subjects for all Girls' Schools.

The scheme under consideration has been prepared for the purpose of providing necessary facilities in terms of of Agro-technical courses in all the schools from the academic year 1975-76. There are in all 1013 Middle and High Schools for Boys and 371 schools for Girls in the Province. Partial facilities for teaching of Agro-technical subjects already exist in a total number of 240 schools and, therefore, 1144 schools will be provided necessary facilities as per details below:

1.	Industrial & Agriculture Units.	108
2.	Agriculture Units Only	368
3.	Industrial Units only	354
4.	Home Economics Units.	014
Total =		1144

The total number of units to be provided in these 1144 schools is as under:

1.	Industrial Units	'A' type.	360
2.	—do—	'B' type.	138
3.	Agriculture Units.		476
4.	Home Economics Units		314
Total =			1288

The details of district-wise distribution of Agriculture, Industrial and Home Economics units are given in Annexure I (a) and I(b).

The broad principles adopted for the distribution of units are as under:

1. Industrial units provided in schools in big cities & towns.
2. Industrial and Agricultural units in some of the schools at Taluka level
3. Home Economics units in all girls schools.

The two type of Industrial units viz: 'A' and 'B' include two different sizes of workshops, a combination of which has also been provided in some of the schools and it has been adopted for the purpose of maximum utilisation of space 'A' type workshops have been designed for one to two section-schools with enrolment ranging from 150 to 250 students in classes VI-VIII, while 'B' type workshops are meant for three to four section schools having about 450 students in classes VI-VIII. Combined A.B and B.B. shops have been provided for schools having more than 450 students.

The total capital cost of the Project works out to Rs. 94,808 thousands with an annual recurring counterpart of Rs. 33,907 thousands as per details below.

I. Capital cost

a. Construction of workshop for Industrial course.	51,840 thousands
b. Construction of Home Economics Labs.	23,550 thousands
DETAILS IN ANNEXURE III, III(a) III(b) and III(c)	75,390 thousands
c. Provision of equipment for Agriculture, Industrial and Home Economics courses	11,272 thousands.
DETAILS IN ANNEXURE IV & IV(a)	86,662 thousands

d. Teacher Training	8,146 thousands
DETAILS IN ANNEXURE	
V&V (a) Total:	94,808 thousands
	=====

II. RECURRING EXPENDITURE

a. Salary & Allowances	32276.84
b. Teaching Contingencies	1630.00
DETAILS IN ANNEXURE	
VI & VI(a)	33906.84
	=====

The scheme has been phased over a period of 36 months i.e. 1975-76 to 1977-78 as detailed in Annexure VII, VII(a), VII(b) and VII(c).

APPENDIX—I

INTRODUCTION OF AGRO-TECHNICAL COURSES (SYLLABI AND TYPE OF TRAINING)

The Agro-Technical Studies Curriculum has been prepared by the National Bureau of Curriculum and Text Books which will be followed for the introduction of the agro-technical courses in this province. A copy of the Agro-Technical Studies Curriculum is attached.

2. The teachers to be recruited for the Industrial, Agriculture and Home Economics with qualification as recommended by the National Committee will be given one year in - service training in a phased programme with four months training at a time in each of the trade viz. wood work, metal work and applied electricity. In case of Agriculture and Home Economics, the four months training will be phased according to the nature of work in each of the classes VI, VII and VIII.

3. The training of the teachers will be conducted by a team of Master Trainers who will be given two weeks short courses by resource persons. Details of the expenditure on the training of teachers are given in appendix V & V (a).

4. In order to introduce the programme of Agro-technical courses in schools from the year 1975-76, the training of the teachers will be undertaken simultaneously at selected centres and phased out on four months basis at a time.

APPENDIX I (b)

**AGRO-TECHNICAL COURSES IN SIND,
HOME ECONOMICS UNITS
FOR GIRLS.**

	High	No of Girls Schools		Facilities
		Middle	Total	
Hyderabad Region	63	130	193	35
Karachi Region.	130	45	178	22
Total	199	175	371	57

Balance to be
Provided 314 Units

APPENDIX-1(a)

DISTRICT-WISE DISTRIBUTION OF INDUSTRIAL AND AGRICULTURE
UNITS IN BOYS SCHOOL IN SIND

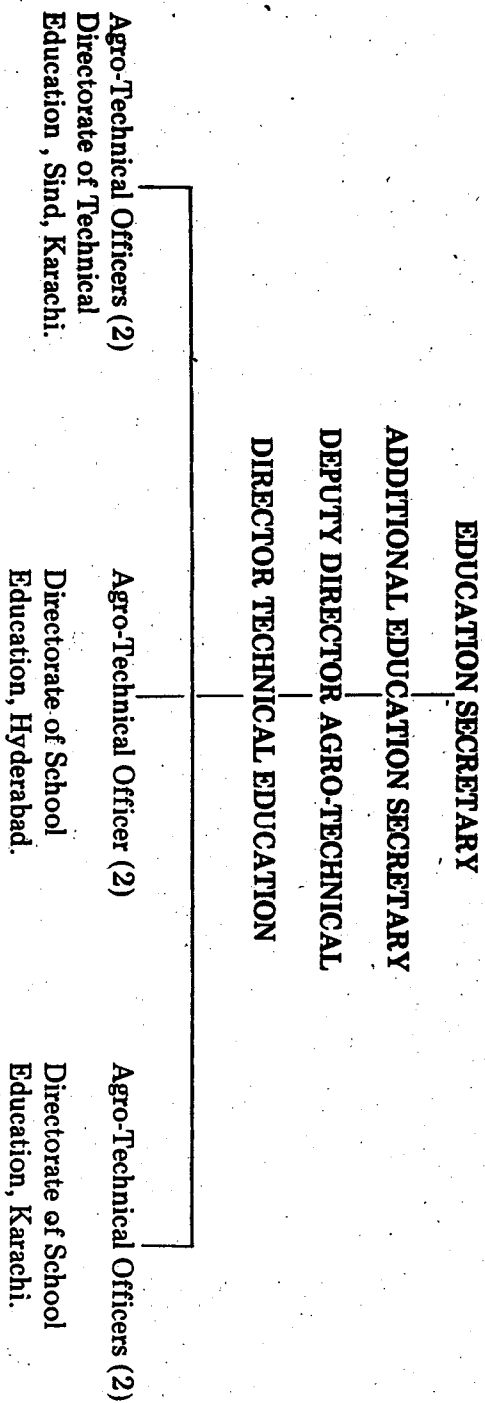
Sr. No.	DISTRICT	SCHOOLS			Industrial Units		Industrial Units		Agricul- ture Units Only	Remarks
		High	Middle	Total	Type of Unit		A	B AB BB		
1.	Hyderabad	55	87	142	20	1	3	1	85	A type - for one or two Section Schools B Type 3-4 Section Schools AB-5-6 Sec- tion Schools BB-more than 6 Sections Schools (Average 50 students - per section)
2.	Sukkur	31	43	74	8	4	3	1	40	
3.	Khatipur	16	38	54	4	2	1	1	35	
4.	Jacobabad	14	40	54	4	2	3	1	37	
5.	Navabshah	23	38	61	15	1	3	1	35	A type - for one or two Section Schools B Type 3-4 Section Schools AB-5-6 Sec- tion Schools BB-more than 6 Sections Schools (Average 50 students - per section)
6.	Larkana	18	38	56	11	1	2	1	35	
7.	Dadu	19	37	56	6	1	2	1	35	
8.	Sanghar	23	22	45	10	1	1	1	22	
9.	Tharparker	25	38	63	14	1	2	1	35	A type - for one or two Section Schools B Type 3-4 Section Schools AB-5-6 Sec- tion Schools BB-more than 6 Sections Schools (Average 50 students - per section)
10.	Thatta	14	22	36	5	1	1	1	9	
11.	Karachi (A)	37	30	67	1	1	43	11	9	
12.	Karachi (B)	39	43	82	1	1	55	59	5	
13.	Karachi (C)	74	68	142	1	1	80	27	6	A type - for one or two Section Schools B Type 3-4 Section Schools AB-5-6 Sec- tion Schools BB-more than 6 Sections Schools (Average 50 students - per section)
14.	Karachi (D)	32	39	71	1	1	42	17	3	
		430	583	1013	97	11	240	78	23	368

Total number of Industrial Units - A' Type = 240 + 97 + 23 = 360
B' Type = 11 + 78 + 13 + 13 = 188
No. of Agriculture Units = 368 + 97 + 11 = 476

ANNEXURE – II

**GOVERNMENT OF SIND
EDUCATION DEPARTMENT**

PROPOSED ADMINISTRATIVE SET UP FOR IMPLEMENTATION OF AGRO-TECHNICAL STUDIES



APPENDIX I.

INTRODUCTION OF AGRO-TECHNICAL COURSES IN SIND

1. CAPITAL EXPENDITURE COST ESTIMATES FOR WORKSHOPS

1. INDUSTRIAL GROUP

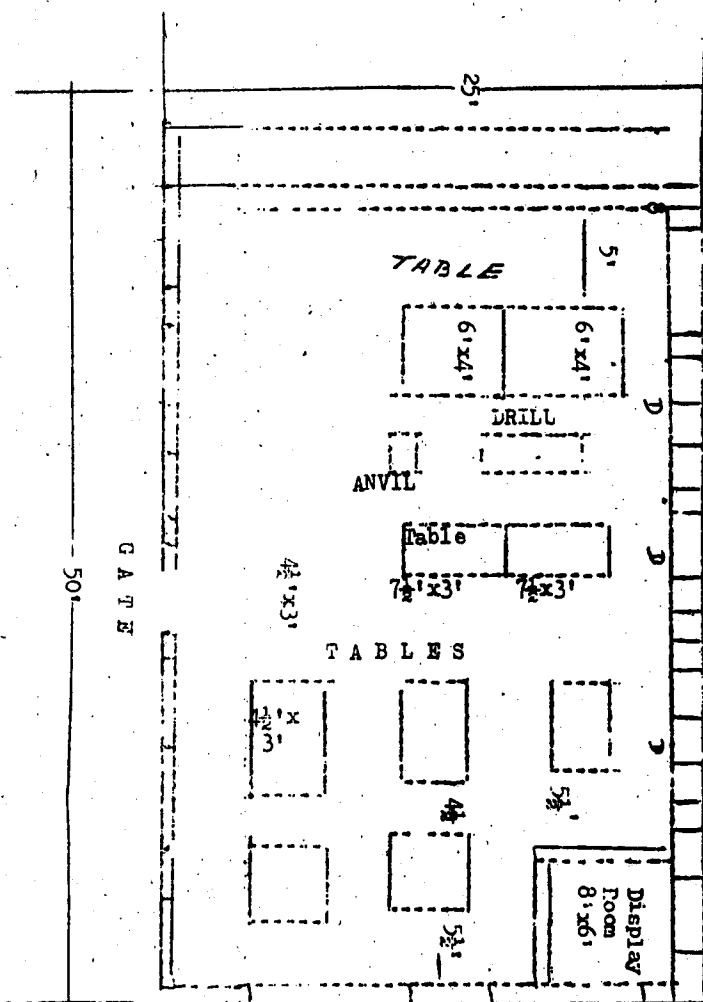
a. "A" type Workshops 50' x 25'	Area	Rate	No of Units	(Amount in Rs.)
	=	1250 sq. ft. Rs. 60/-	360	27,000 Thousand
b. "B" type Workshops 100' x 30'	=	3000 sq. ft. Rs. 60/-	138	24,840 "

2. HOME ECONOMICS GROUP

50' x 25'	=	1250 sq. ft. Rs. 60/-	314	23,550 "
Total Rs.				75,390 Thousand

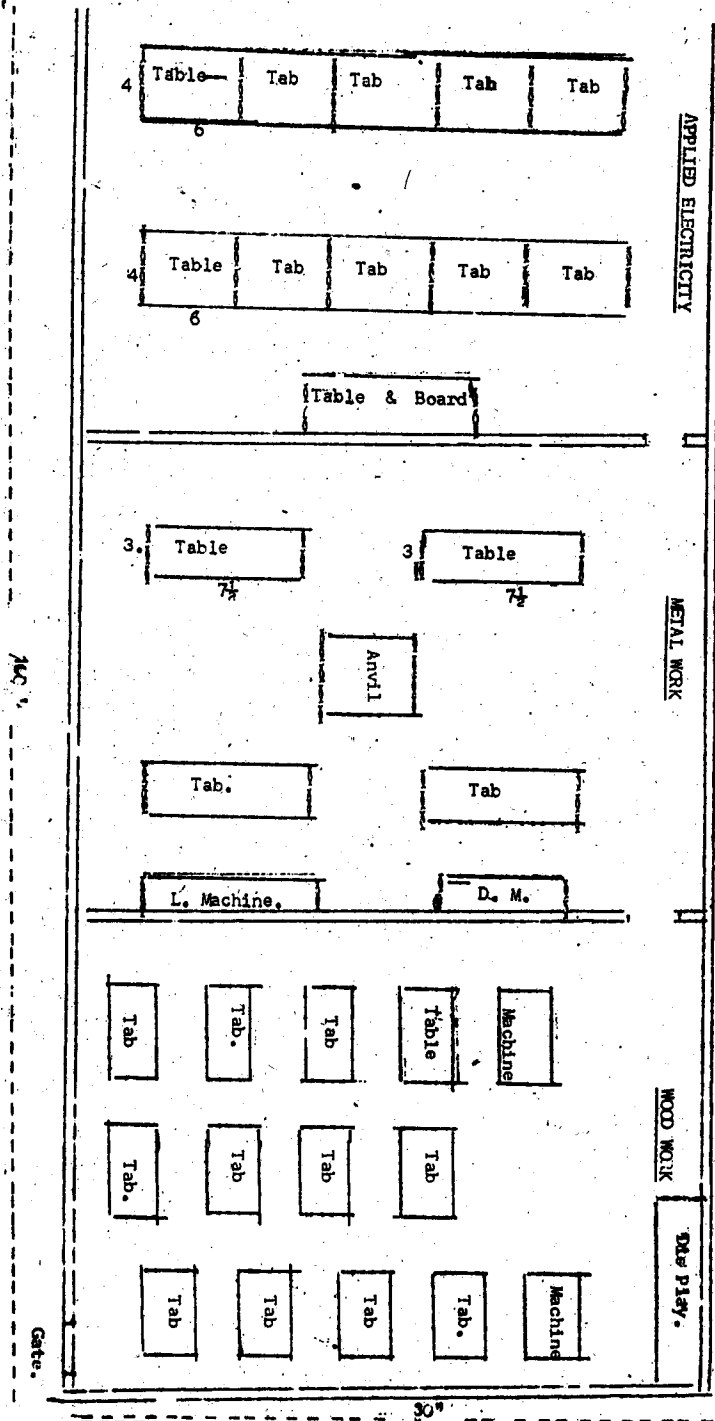
TYPE "A".

**WORK SHOPS FOR WOOD WORK METAL WORK
AND APPLIED ELECTRICITY
FOR 30 STUDENTS.**



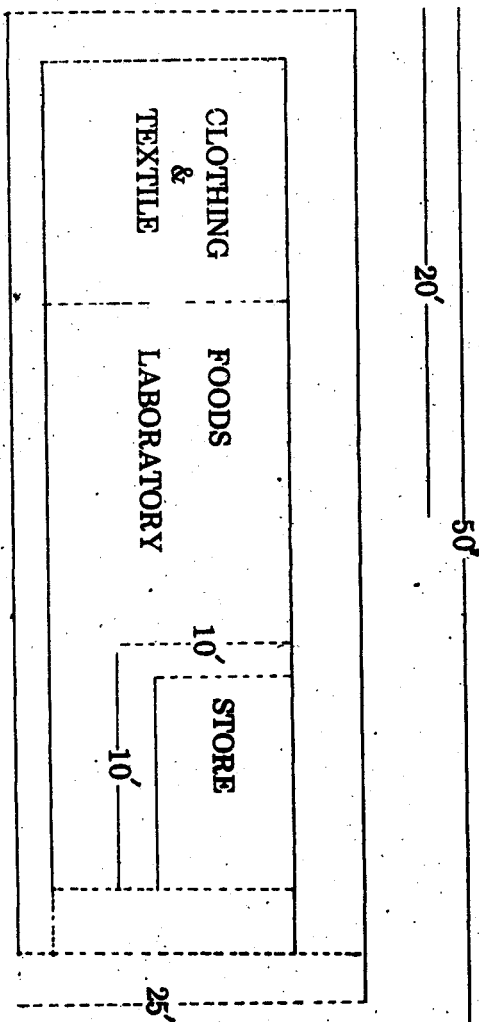
WORKSHOP FOR WOOD WORK/METAL WORK AND APPLIED ELECTRICITY.
(CLASS VI - VIII FOR 60 STUDENTS)
(15" TYPE)

APPENDIX - III(b)



ANNEXURE - III (c)

HOME ECONOMICS
LABORATORY



TOTAL FLOOR AREA 1250 Sq. Ft.
COST @ Rs. 60/- per Sq. Ft. = Rs. 75000/-

APPENDIX IV

INTRODUCTION OF AGRO-TECHNICAL COURSES IN SIND

II. ESTIMATED COST OF EQUIPMENT

1. Industrial Group	UNIT COST	NO. OF UNITS	AMOUNT	
(a) 'A' Type Shop	Rs. 15000/-	360	Rs. 5400	Thousand
(b) 'B' Type Shop	Rs. 30000/-	138	Rs. 4140	"
2. Agriculture	Rs. 1000/-	476	Rs. 476	"
3. Home Economics	Rs. 4000/-	314	Rs. 1256	"
Total			Rs. 11272	Thousand

(ANNEXURE-IV (a))

**LIST OF TOOLS/EQUIPMENT FOR APPLIED ELECTRICITY
WITH 20 WORK PLACES VI, VII, AND VII
CLASSES**

Sr. No.	Description	Rates	Quantity Required	Amount
1.	Boltiaic Cell	10/-	10	100/-
2.	Model of Dynamo, Hand operated	100/-	1	100/-
3.	Permanent Horse Shoe Magnet 3"	5/-	5	25/-
4.	Permanent, Bar Magnet 4"	5/-	5	25/-
5.	Magnetic Compass [¼" dia	2/-	20	40/-
6.	Electric Heater (Plate type)	15/-	1	15/-
7.	Electric Bell 6-12 V.	8/-	10	80/-
8.	Electric-master 6V (Small type)	50/-	5	250/-
9.	Power Source, Transformer 220 V, 5 AMP. 220/6V 12V. 50V	500/-	1	500/-
10.	Lliers side cutting 6" Insulated handle.	10/-	20	200/-
11.	Round Nose Pliers 6"	8/-	10	80/-
12.	Electrician Knife 3"-4 Blade.	2.50/-	10	25/-
13.	Hammer, Ball Pion ½ iss with Handle	5/-	15	75/-
14.	Screw-Driver 4" Plastic Handle	5/-	20	100/-
15.	Screw Driver 6" Plastic Handle	5/-	20	100/-
16.	Screw Driver 12" Plastic Handle	8/-	5	40/-
17.	Try Square Woodn 12"	5/-	5	25/-
18.	Electric Soldering Iron 50 Watts.	15/-	5	75/-
19.	Hand Drilling Machine ¼"	30/-	5	150/-
20.	Drill Bits 1/8", 3/16", ¼"	2 each	10	60/-
21.	Chisel Firmer ½ with handle	10/-	10	100/-
22.	Saw, 10" with handle	10/-	10	100/-
23.	Vice, Bench 4"	60/-	2	120/-
24.	Plumh Bomb Masons 4 ox.	5/-	2	10/-
25.	Voltmeter 0-25 DC/AC.	80/-	4	320/-
26.	Ampere Meter 0-5 Amp. DC/AC.	80/-	4	320/-
27.	Kelle watt Hour meter (House- hold enegymeter 220-230V.	100/-	1	100/-
28.	Meeger 1000 Volt 0-1000	600/-	1	600/-

29.	Rectifier 220V ac 6V, 12V, Dc.	300/-	1	300/-
30.	One display Board 6 x 4"	150/-	1	150/-
31.	Main Board 5x3 for supply	120/-	1	120/-
32.	Work table 6"x4' x 30"	400/-	6	2400/-
33.	Steel Almirah 72"x24"x48".	490/-	1	400/-
34.	Brush floor sweeping 12" with handle	5/-	2	10/-
35.	Brush, hand, for table sweeping	4/-	5	20/-
36.	Flourscent Tube, Starter, Choke & relector (2 feet):	60/-	5	300/-
37.	Main switch Iron clad 5 Amp.	20/-	5	100/-
38.	Wiregauge I.S.W.G.C. to gauge.	40/-	1	40/-
39.	Earphones Pairs	50/-	2	100/-
40.	Crystals Fixed.	2.50	10 No.	25/-
41.	Metal rectifier.	6/-	5	30/-
42.	Variable Resistance (Rheostat)	100/-	2	200/-
43.	Pipe dies 1/2"x3/4 with wrench, & Pipe vice.	150/-	1 Set	150/-
44.	Pipe wrinch 10"	100/-	1 Set	100/-
45.	Wooden Board for wiring 3 x 3 (wood deodar).	50/- each	10	500/-
46.	Electric Iron 450 wolls (simple)	40/-	2	80/-
Approximate Total				<u>10,000/-</u>

(Appendix IV (a))

**LIST OF TOOLS AND EQUIPMENT FOR METAL
WORK FOR VI, VII, VIII CLASSES**

Sr. No.	Description	Quantity Required	Estimate Rate	Estimate Amount
1.	Work Bench 90" x 36" x 30	4 No.	500	2000/-
2.	Bench Vices Machinist 3½" or 4"	20"	100	2000/-
3.	File Flat Bosterd 100"	24"	15/-	360/-
4.	H. Round Rough.	6	20/-	120/-
5.	H. Half Round Smooth 10"	6	25/-	150/-
6.	H. Round Medium 8"	5"	15/-	75/-
7.	Brush for file	4	2.50	10/-
8.	Handles Wood for files	48"	7.50 P.D.	30/-
9.	Try square 6"	10"	36/-	300/-
10.	Scriber with handle 6"	4	6/-	24/-
11.	Divider 4"	5"	4.50	22.50
12.	Caliper Outside 6"	6	6/-	36/-
13.	Caliper in-side 6"	6	6/-	36/-
14.	Caliper odd leg 6"	6	9/-	54/-
15.	Centre Punch 3/8" x 4½"	5"	4.50	22.50
16.	Hammer boll open ½ w/handle	10"	11.50	115/-
17.	Mallet Wooden 4" 2½" or 3"	10"	4.50	45/-
18.	Steel Rule 12"	10	15/-	150/-
19.	Hacksaw Frame 12"	6"	15/-	100/-
20.	—do— Blades	24"	1/-	24/-
21.	Tin man snip stright 3" Cut 9", 10"	6	15/-	90/-
22.	Tin man snip covered 3" cut 3 9", 10".	3	15/-	45/-
23.	Soldering Iron with handle	6"	10/-	60/-
24.	Stakersteel set complete with stake holder plate set consist of a Bick Iron 15th (D) funnel 20"			
	b. Hatchet 15th (E) creasing	10" 1 set	200/-	200/-
	c. Half moon 10"	"		
25.	Bench Drilling machine Power operated. ½" size of chuck.	1 No.	650/-	650/-
26.	Drillbittes 1/8", 3/16", ¼"	4 No.		100/-
27.	Amvil 50 lb. with stand.	1 No.	400/-	400/-
28.	Hand forge medium size 20"x20" x30" high with, Blower	1 No.	400/-	500/-
29.	Metal Melting ladle dia of Bowl 4" 4-5"	1 No.		
30.	Moulding Boxes wooden or Metal 8" x 10"	5"	20/-	100/-
31.	Crucible Foundry 6"	2"	85/-	170/-
32.	Foundry Showel square Nos.	1 No.	8/-	8/-

33.	Foundry Riddles 12" dia 16 15 inch.	2 No.	8/-	16/-
34.	Moulders Tools 8 items.	2"	50/-	100/-
35.	Crucible Tong.	1 No.	55/-	55/-
36.	Tapes & Dies set B.S.W. with Tench ¼" 3/8", ½" (3 m.m. to 12 m.m.)	2 set		300/-
37.	Out side micro-meter- 0—1"	1"	110/-	110/-
38.	B.S.W. & Sheet Metal Gange. o. 36.	1"	25/-	25/-
39.	Oil can/2 pent, plungetype	2"	8/-	16/-
40.	Bench grender power Drive cold chisel 5", ½"	1"	525/-	525/-
41.	Black Smith Hammer 2 lb	4"	15/-	60/-
42.	Plicers side cutting 6"	3"	10/-	30/-
43.	Wooden Almira 72" x 18" x 36".	1"	300/-	300/-
44.	Sheer Hand	1"	150/-	150/-

Approxmiately

10,000/-

LIST OF TOOLS/EQUIPMENTS FOR WOOD WORKSHOP WITH 20 WORK PLACES

Sr. No.	Description	Quantity Required	Rates	Total Amount Rs.
1.	2	3	4	5
1.	Planes Jack Iron 14"	2	125/-	250/-
2.	Planes Smoothing 10" Wooden	20	50/-	1000/-
3.	Planes Rabbet Iron 7", ¾" cutter	1	30/-	30/-
4.	Saw Ten on 12" with Handle	12	20/-	240/-
5.	Saw Hand with Handle	6	15/-	90/-
6.	Saw Coping 6" with Handle	2	30/-	60/-
7.	Chisel Firmer 1" with handle	10	9/-	90/-
8.	Chisel Firmer ¾" in the"	10	9/-	90/-
9.	Chisel Firmer ¾" with handle	10	6/-	60/-
10.	Chisel Firmer ¾" with handle	10	6/-	60/-
11.	Marking gange 8"	12	8/-	96/-
12.	Mellet Wooden 2"½"x5"	12	8/-	96/-
13.	Hammer Claw ¼ lbs	2	10/-	20/-
14.	Hammer crass pain.	10	5/-	50/-
15.	Rules wooden folding 2 ft.	10	7/-	70/-
16.	Screw Drivers "6	6	6/-	30/-
17.	Screw Drivers 10"	6	10/-	60/-
18.	Hand drill ¼" with 8 bits	2	52/-	104/-
19.	Rachit Brace 10"	2	55/-	110/-
20.	Conter Sink bit ½"	2	12/-	24/-
21.	Saw set.	1	30/-	30/-
22.	C-Clamps 4", 6"	4	30/-	120/-
23.	Bar Clamps 3 ft.	2	50/-	100/-
24.	Pincer 6"	4	20/-	80/-
25.	Combination Pliers 6"	2	10/-	20/-
26.	Oil stone fine & rought	2	28/-	56/-
27.	Oil oan ½ pint plunger type	2	75/-	75/-
29.	Saw File 6" Triangular Slim	3	10/-	30/-
30.	File Flat Rough 10"	4	15/-	60/-
31.	File Half Round Bostered	6	20/-	120/-
32.	Rasp File 8"	6	20/-	120/-
33.	Carpenter adge with handle	1	30/-	30/-
34.	Pint Brushes 1½"	1	10/-	10/-
35.	Pint Brush 2½"	1	10/-	10/-
36.	Work Bench 5 x 3 ¾"	10	400/-	4000/-
37.	Steel Almirah 72" x 18-36"	1	300/-	300/-
38.	Carpenter Vice 7"	10	130/-	1300/-
39.	Try square 6"	12	20/-	240/-
40.	Spok shave	2	20/-	40/-
41.	Handle for files			37/-
Total Rs.				9,500/-
Approx.				10,000/-

**LIST OF EQUIPMENT FOR CLOTHING AND TEXTILES
LABORATORY FOR A HOME ECONOMICS UNIT IN SCHOOL**

Sr. No.	Name of articles	Qty.	Cost per Unit	Total Cost
1	2	3	4	5
1.	Pak Made Hand Sowing Machine	2	300/-	600/-
2.	Scissors Tailors 9"	3	15/-	45/-
3.	Tracing Wheel.	2	2/-	4/-
4.	Iron Pak Made	2	2/-	4/-
5.	Ironing Board	1	75/-	75/-
6.	Noodles Hand Sewing (Assorted)	2 Gross	3/-	6/-
7.	Measuring Tapes	6	1/-	6/-
8.	Noodles Machine Sewing	6 Doz	6/-	36/-
9.	Teachers Desk with Drawer 3"x 5" 2½"	1	150/-	150/-
10.	Office Chair	1	25/-	25/-
11.	Wooden Stools 1½" x 1½" x 2'	6	20/-	80/-
12.	Tables 6' x 4' x 2½ for cutting	1	150/-	150/-
13.	Tables 4½ x 2 x 2½	2	100/-	200/-
14.	Chairs armless, Plywood Seat	4	20/-	80/-

Total: Rs. 1.461/-

LIST OF EQUIPMENT FOR HOME NURSING AND FIRST AID

Sr. No.	Name of articles	Qty	Cost per Unit.£	Total Cost
1.	Bed (Chaipies)	1	40/-	40/-
2.	Bedding for the patient	1	150/-	150/-
3.	Feeding Cups	2	6/-	12/-
4.	Hot Water Bottle.	2	6/-	12/-
5.	Ice Cap	2	10/-	20/-
6.	Thermometer Clinical	2	3/-	6/-
7.	First aid Kit.	1	35/-	35/-
8.	Splints (Different type & Size)	1	40/-	40/-
9.	Sponges.	2	3/-	6/-
10.	Basin Enamel (18")	2	13/-	24/-
11.	Basing Small (12")	2	8/-	16/-
12.	Mugs Medium size	2	5/-	10/-
13.	Jug (enamled)	2	25/-	50/-
14.	Bucket Galvanised Iron	2	10/-	20/-
15.	Medicines Measuring Glass	2	6/-	12/-
16.	Macintosh sheet	1	11/-	11/-
17.	Flower Vases	2	5/-	10/-

18.	Kettle	1	10/-	10/-
19.	Bed Side Table 2' x 2' x 2½'	1	50/-	50/-

G. Total approx. cost
of Rs.

4,000/-

LIST OF EQUIPMENT FOR FOOD AND NUTRITION LABORATORY FOR A HOME ECONOMICS UNIT OF 20 STUDENTS

Sr. No.	Name of articles	Qty	Cost per Unit	Cost
1	2	3	4	5
1.	Oil Stoves (Single)	3	50/-	150/-
2.	Anghethi	3	15/-	45/-
3.	Degchies (Medium size 8")	6	8/-	48/-
4.	Frying Pan (Iron)	2	5/-	10/-
5.	Karachi Iran (Medium)	2	10/-	20/-
6.	Frying Spoon	2	5/-	10/-
7.	Tawa (Doma Shape & Flat shape)	2	10/-	20/-
8.	Kettle Medium size	2	8/-	16/-
9.	Tin Opener	1	3/-	3/-
10.	Chalin	2	3/-	6/-
11.	Tasla (Aluminium Medium Size)	2	5/-	10/-
12.	Grinding stone	2	10/-	20/-
13.	Hamam Dasta	2	15/-	30/-
14.	Wooden Spoon	3	2/-	6/-
15.	Rolling Pin & Board	3	12/-	36/-
16.	Vegetable Knives	3	3/-	9/-
17.	Utility dishes (Plastic)	6	2/-	12/-
18.	Serving Tray Good quality	3	5/-	15/-
19.	Grater (Tin)	2	5/-	10/-
20.	Chimta	4	1/-	4/-
21.	Glass Jars Medium size	6 No.	36 Doz.	18/-
22.	Glass Jars Large	6 No.	72 "	36/-
23.	Glass Jars small	6 No.	72 "	6/-
24.	Juice extractor	4	6/-	24/-
25.	Handi	4	2/-	8/-
26.	Basin (Plastic) Large	2	12/-	24/-
27.	Basin (Plastic) Medium size	2	8/-	16/-
28.	Basin Plastic small size	2	6/-	12/-
29.	Tub (Plastic)	1	20/-	20/-
30.	Serving Dishes (Stainless steel)	2	25/-	50/-
31.	Plate Rice	6	10/-	60/-
32.	Plates (Quartor)	6	6/-	36/-
33.	Bottles & Jars for storing supplies	2 Doz	12 Doz	24/-
34.	Tin for storing supplies	2 Doz	12 Doz	24/-
35.	Weighing Machine	1	60/-	60/-
36.	Teacher Desk with Drawers 3x5 2½	1	150/-	150/-
37.	Wooden Stools 1½ x 1½ x 2	6	20/-	80/-
38.	Tea Set	1	50/-	50/-
39.	Extra Cups & Saucors	6	3/-	18/-
40.	Tea Spoons	1 Doz	15 Doz	15/-
41.	China Plates (Half)	1 "	15 "	15/-

Total:

1,226/-

**LIST OF EQUIPMENT/IMPLEMENTS REQUIRED
FOR THE TEACHING OF AGRICULTURE TO
MIDDLE CLASSES**

Basis for Estimating Cost

1. The requirements have been worked out for a group of 20 students.
2. The requirements of implements and equipment have been worked out for the three (VI to VIII) Classes.
3. For meeting the laboratory needs, existing laboratory facilities for the teaching of other Sciences will be shared. However, where such facilities are not already available, a laboratory will be provided.
4. About 20% of the capital cost of the equipment and implements will be provided every year to compensate losses on account of breakage and wear and tear.

NON-RECURRING AGRICULTURE

1. Spade small size 20 Nos.	Rs. 100.00
2. Ramba (Khurpa)	Rs. 40.00
3. Dori 100 yards.	Rs. 60.00
4. Tape 100 yards	Rs. 50.00
5. Sprinklers	Rs. 20.00
6. Badket	Rs. 2.00
Total.	<u>Rs. 272.00</u>

POULTRY

1. Cage for 12 birds 3'x5'x2½'	Rs. 200.00
2. Feeder One	Rs. 8.00
3. Water container One	Rs. 15.00
4. Egg container	Rs. 5.00
Total:	<u>Rs. 228.00</u>

FOOD (SQUASHES)

1.	Bucket Plastic One	Rs. 15.00
2.	Mug One	Rs. 4.00
3.	Tub small size plastic	Rs. 15.00
4.	Hievinen small size	Rs. 35.00
5.	Sieve One.	Rs. 2.00
6.	Bottles 4 Dozon	Rs. 30.00
7.	Knife One.	Rs. 5.00

Total: Rs. 106.00

BEE KEEPING

1.	Cages complete One or two set.	Rs. 300.00
2.	Show case	Rs. 50.00

Total: Rs. 350.00

HORTICULTURE

1.	Budding Grafting Knives different type	Rs. 50.00
2.	Earthen Posts 100 No.	Rs. 60.00

Total: Rs. 110.00

Grand Total: Rs. 1066.00

Appendix-V

TEACHER TRAINING PROGRAMME FOR AGRO-TECHNICAL COURSES IN SIND

1. ORIENTATION OF MASTER TRAINEES

1.	No. of Resource persons	3
2.	No. of Master teacher	30
3.	Duration of the course	Two weeks

COST ESTIMATES

	<u>No.</u>	<u>Rate</u>	<u>Amount</u>
1. Honrarium for the Resource persons @ Rs. 15/- per lecturer of 24 lectures for each.	3	360/-	1080/-
2. TA for the Resource Persons (non-local) @ Rs. 100/- (arrange)	2	100/-	200/-
3. C.A. for the local Resource Person @ Rs. 5/- per working day (12).	1	60/-	60/-
4. TA/DA for the Master Trainers (non-local) on arrange of Rs. 120/-	20	120/-	2400/-
5. Conveyance allowance for the local Master Trainers @ Rs. 5/- per working day (12 days)	10	60/-	600/-
6. Remuneration for office staff and clerk + One Peon + One Sweeper Rs. 50 + 20 + 20.		90/-	90/-
7. Stationery and Instructional material		500/-	500/-
8. Consumable material for the practical work.	30	20 pertain	650/-
9. Honrarium for centre administrator	1	200/-	200/-
10. Hostel facilities (Honorarium for the Hostel Superintendent).		100/-	100/-

Total Rs.

5880/-

TEACHER TRAINING PROGRAMME**ESTIMATED COST FOR THE TRAINING OF 30 TEACHERS
AT ONE CENTRE FOR FOUR MONTHS**

1. No. of Trainees	10 Locals 20 Non locals <u>30</u>
2. No of Master Trainers	3

Cost Estimate	No.	Rate	Amount		
			Industrial Group	Home Eco.	Agri.
1. Honrarium for the master @ 3. 250/- p.m.	3	250/-	3000.00	3000.00	3000.00
2. TA for Master Trainers (non-local)	1	100/-	100.00	100.00	100.00
3. CA for Local Master trainers @ Rs. 5/- per working day (25 days in a month). 925 x 5 x 4 x 2)	2	5/- per working day	1000.00	1000.00	1000.00
4. TA/DA for non local trainees DA Rs. 5/- per day and average TA Rs. 50/- (5 x 30 x 4 x 50)	15	650/- each	9750.00	9750.00	9750.00
5. CA for local trainee @ Rs. 5/- per working day (25 x 5 x 4)	15	500/- each	7500.00	7500.00	7500.00
6. Consumable material					
i. Industrial Group 30/- p.m. per trainee (30 x 4 x 30)	30		3600.00		
ii. Home Economics 15 (15 x 30 x 4)	30			1800.00	

iii.	Agriculture 5/- p.m. per trainee	30	—	—	6.00.00
7.	Cost of stationery + Ins- tructional material + Misc. Contg.	1000/-	1000/-	1000/-	1000/-
8.	Remuneration for the office staff (One clerk + One Peon + One Sweeper).	400/-	400/-	400/-	400/-
9.	Hostel Facilities	200/-	200/-	200/-	200/-
10.	Honrarium	200/-	800/-	800/-	800/-
			<u>27,350/-</u>	<u>25,550/-</u>	<u>24,350/-</u>

Cost of training 30 teachers of Industrial
Group for one year (4 months training at
a time).

27350
x3
82050

Plus cost of training of Master trainees
cost per trainee

5880

87930.00

Cost per trainee

= 87930/30
= 2931/-

Say Rs.

3000/-

2. Cost of training of Home Economics
teachers, for one year.

25550
x3

76650

Plus cost of Master training

5880

82530

Cost per trainee
(Home Economics)

= 82530/30
= 2751
= 2800

3. Cost per trainee
(Agriculture)

Rs.

2700/-

RECURRING EXPENDITURE TEACHING STAFF

1975—76

<u>INDUSTRIAL GROUP</u>	<u>UNITS</u>	<u>SET</u>	<u>JET</u>
'A'	120	120	120
'B'	46	46	138
AGRICULTURE GROUPS	158	158	158
HOME ECONOMICS	104	104	104
Total:	<u>—</u>	<u>428</u>	<u>520</u>

Amounts

1. Pay of S.E. Ts (350-25-750)
 $350 \times 428 \times 12 =$ 17,97,600.00
2. Pay of J.E.T's. (200-12)
 $200 \times 520 \times 12 =$ 12,48,000.00
3. Pay of Sheet attendants,
 (100-2-116)
 $(120+46+104 = 270)$
 $100 \times 270 \times 12 =$ 3,24,000.00

Total. (1) 1797.6 Thousands. Allowances
 =Rs. 1871.30

(2) 1248.0
 324.0

3369.0 Total Pay + Allowances
 =Rs. 5241.30

TEACHING STAFF

1976-77

1. Pay of S.E.T.S.
 $375 \times 428 \times 12 =$ 1926 Thousand. $350 \times 428 \times 12 =$ 1797.6

2. Pay of J.E.Ts
 $212 \times 520 \times 12 = 1322.8$ " $20 \times 520 \times 12 = 1248.00$

3. Pay of O.S. attendants
 $102 \times 270 \times 12 = 330.48$ $100 \times 270 \times 12 = 324.00$

3369

3579.36 (1)

Grant Total (1) + 2 3579.36
 3369.6

6948.96

Allowances = Rs. 4743.40

Total Pay + Allowances
 = Rs. 10692.36

6949 Thousands.

APP-V

RECURRING EXPENDITURE TEACHING STAFF THIRD
PHASE (1977-78)

(Rs. in Thousand)

1. Pay of S.E.T.
 $400 \times 428 \times 12 \times 2054.4$ $375 \times 428 \times 12 = 1926.00$ $350 \times 432 \times 12 = 1814.4$

2. Pay of J.E.T.
 $224 \times 520 \times 12 = 1397.16$ $212 \times 520 \times 12 = 1322.88$ $200 \times 524 \times 12 = 1257.6$

3. Pay of W.S. attendants
 $104 \times 270 \times 12 \times 336.96$ $102 \times 270 \times 12 = 330.48$ $100 \times 2274 \times 12 = 324.00$

3789.12
(1)

3579.36
(2)

3369.6
(3)

GRAND TOTAL:— 3789.12
3579.36
3369.60

Rs. 10728.08

Thousands. Allowances =
Rs. 5615.10
Total Pay + allowances =
Rs. 16343.18

TOTAL PAY + ALLOWANCES (Year Wise)

1975-76	=	Rs.	5241.36
1976-77	=	Rs.	10692.36
1977-78	=	Rs.	16343.18
Grand Total		Rs.	<u>32276.84</u>

Appendix—IV

INTRODUCTION OF AGRO-TECHNICAL COURSES IN SIND

III. TEACHING CONTINGENCIES (CONSUMABLE)

Year		<u>No of Students</u>	<u>Rate</u>	<u>Amount Rs.</u>	
1975-76	1. Industrial Group	10,000	15/-	150.0	Thou- sand
	2. Agriculture	9,330	5/-	46.7	"
	3. Home Economics	7000	10/-	70.0	"
	Total:-			266.7	Thou- sand
1976-77	1. Industrial Group	20,000	15/-	300.0	Thou- sand
	2. Agriculture	18660	5/-	93.3	"
	3. Home Economic	14000	10/-	140.0	"
	Total:-			563.3	
1977-78	1. Industrial Group	30,000	15/-	450	Thou- sand
	2. Agriculture Group	28,000	5/-	140	,
	3. Home Economics	21,000	10/-	210	"
				800	Thou- sand

ABSTRACT

1.	1975-76	266.7
2.	1976-77	563.3
3.	1977-78	800.0
<u>Total Rs.</u>		<u>1630.0 Thousands</u>

INTRODUCTION OF AGRO-TECHNICAL COURSES IN SIND

PHASING OF THE SCHEME

I.	Construction of Workshops	Year 1975-76	Units	Cost in Rupees
1.	Industrial Group			
	'A' Type		120	9000 Thousand
	'B' Type		46	8280 "
2.	Home Economics		104	7800 "
Total Rs.			25,080	Thousand

1976-77

1.	Industrial Group			
	'A' Type		120	900 Thousand
	'B' Type		46	8280 "
2.	Home Economics		104	7800 "
Total Rs.			25080	"

1977-78

1.	Industrial Group			
	'A' Type		120	9000 Thousand
	'B' Type		46	46 "
2.	Home Economics		106	7590 "
Total Rs.			25,230	"
Grand Total Rs.			75,390/-	Thousand

**INTRODUCTION OF AGRO-TECHNICAL COURSES
IN SIND**

PHASING OF THE SCHEME

II. ESTIMATED COST OF EQUIPMENT

		<u>1975-76</u>		<u>Amount</u>	
		<u>No. of Unit</u>	<u>Rate</u>		
1.	Industrial Group				
	'A' Type	120	15000/-	1800/-	Thou- sand
	'B' Type	46	30000/-	1380/-	"
2.	Agriculture	158	1000/-	158/-	"
3.	Home Economics	104	4000/-	416/-	"
Total Rs.				3754/-	Thou- sand

1976-77

1.	Industrial				
	'A' Type	120	15000/-	1800/-	"
	'B' Type	46	30000/-	1380/-	"
2.	Agriculture	158	1000/-	158/-	"
3.	Home Economics	104	4000/-	416/-	"
Total Rs.				3754/-	Thou- sand

1977-78

1.	Industrial				
	'A' Type	120	15000/-	1800	"
	'B' Type	46	30000/-	1380/-	"
2.	Agriculture	160	1000/-	160/-	"
+	Home Economics	106	4000/-	424/-	"
Total Rs.				3764	"

GRAND TOTAL Rs.	3754	Thousand
	3754	"
	3764	"

Rs. 11272

Thousand

INTRODUCTION OF AGRO-TECHNICAL COURSES IN SIND

TEACHER TRAINING PROGRAMME

	<u>No. of</u>	<u>Rate</u>	<u>Amount</u>	<u>Remarks</u>
	Teachers			
1. 1975-76 (1) Industrial Group	424	3000/ per trainee per year	1272 Thousand	4 month training in each of the three disciplines of wood work metal work & applied electricity
(2) Agriculture Group	316	2700/- per trainee	853.2	" The training has to be undertaken simultaneously alongwith the introduction of the courses in schools.
(3) Home Economies	208	2800/-	582.4	"
Total Rs.			2707.6	
2. 1976-77 Industrial Group		424 3000/-	1272.0	
Agriculture Group		316 2700/-	853.2	
Home Economics		208 2800/-	582.4	
Total			2707.6	
			= 2708	Thousand

TEACHER TRAINING

	<u>No. of Teachers</u>	<u>Rate</u>	<u>Amount</u>	<u>Remarks</u>
1977-78 (1) Industrial Group	424	3000/-	1272 Thousand	
(2) Agriculture Group	320	27000/-	864.	"
(3) Home Economics	212	2800/-	593.6	"
	956		2729.6	"

ABSTRACT

1975-76	2708	Thousand
1976-77	2708	"
1977-78	2730	"
	<u>Rs. 8146</u>	"

UNIT-6

IMPLEMENTABILITY OF PROJECTS: PROJECT ENVIRONMENT

**By
Dr. M. Athar Khan**

OBJECTIVES

Having studied this Unit you will be expected to:—

- a. have analysed the concept of the project environment;**
- b. get acquainted with the factors which constitute project environment and influence implementation and operation of a project;**
- c. understand the nature and influence of environmental factors on projects;**
- d. foresee, the events and situations which may interfere with the implementation and operation of a project;**
- e. analyse and understand a project environment with a view of checking their impeding effects.**

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INTRODUCTION

The concept of a project environment is the outcome of the experiences of project planners and managers in general area projects as well as in projects specifically related to education. In this Unit, therefore, there would be so much that might appear to be familiar events or situations to you. Of course, the factors which constitute a project environment, are so varied and numerous that it is not possible to name and list them all. In this Unit, however, an attempt has been made to describe them in reference to their nature and kinds.

The concept of project environment is comparatively a recent development in the field of project planning and management; not much has been written about it. In education, the concept of project environment perhaps for the first time has been used in this course on "education project implementation and monitoring", and it is expected that it will help to improve the efficiency in project planning and management. Also the awareness of the project environment will contribute to improving the quality and implementability of development projects in general and of the education projects in particular.

Dr. M. Athar Khan

1. WHAT HAPPENS TO MANY EDUCATION PROJECTS

Both formal and informal evaluation of several major education projects in the country shows that most of them failed to achieve their objectives. Projects over-running in time and cost are so numerous that it hardly surprises anyone to see a project not being completed within the stipulated time and cost. The Pilot Secondary Schools established in the later half of the 1950s were intended to provide a laboratory for experimenting on educational innovations before they were introduced to other schools: but, as it is the case today, except for a name, the Pilot Secondary Schools are in no way different from other high schools. Guidance and counselling services for secondary schools have long been forgotten. The comprehensive high school scheme of 1965-66 did not achieve its goal of catering to the educational needs of the youths of the area where the comprehensive school was situated. Agrotechnical Scheme of Education was lost in the labyrinth of the educational management systems of the country. The primary school teaching kits are safely locked in steel boxes, or they are kept in show cases to decorate the headmaster's office. The Pakistan Primary Education Project-IV, after six years of its beginning, has had no impact on the improvement of the primary education in the country.

2. WHAT IS PROJECT ENVIRONMENT

The factors responsible for failure of most education projects to achieve their objectives are many. They are both internal as well as external. The internal factors may be ascribed to the limitations of the project format. For example, education is often planned on a national scale; projects do not necessarily take the national view. Or, the project approach uses partial analysis, meaning that a project is planned and appraised, assuming all other things remain equal. But often the size of education projects and their consequent impact means that other things do not remain the same. Another example in this connection could be the change of responsibility for a project when it passes from its planning to implementation and then to its operation stage. The projects planned and implemented by the specialized agency eventually have to come under the control of a regular education agency. The transition itself may be complex and resentment may exist at the increased work load of the recipient agency. Other such examples of project failure or problem projects could be cited with particular reference to the project plans where the project data have been inadequate, poorly recorded, little used and handled superficially and un-critically.

The external factors which have their impacts on implementation and operation of projects comprise the condition which surround a project and the events which may occur during the implementation and operation of a project. Such factors and events together constitute the 'project environment'.

Burnett and Youker (1980) ask the question, "what is this project environment"? and go on to answer it. According to them:

A dictionary definition is a useful place to begin. The environment, according to the Random House Dictionary is "the aggregate of surrounding things, conditions or influences". Thus the environment includes virtually everything out-side the project: "its technology (i.e. the knowledge base it must draw upon), the nature of its products, customers and competitors, its geographical setting, the economic, political and even meteorological climate in which it must operate, and so on" (Mintzberg 1979). These factors and especially changes in them — can affect the planning, organizing, staffing, directing and so on which constitute the project managers chief functions (p. 1).

Burnett and Youker's (ibid) description of the project environment refers to projects in general and particularly the projects outside the education sector. However, it could be easily applicable to education projects simply by replacing "technology" by 'personnel and technology': "products" by 'outcome: "customers" by beneficiaries and "competitors" by "similar institutions and organizations".

2.1 System's Approach

In system's approach the project environment comprises "the system itself, its boundry with the environment, and the inputs and outputs that link it to its environment" (Schoderheck 1975 taken from Burnett and Youker, 1980, p. i) The following figures 1, 2, and 3 reproduced from Burnett and Youker (1980) illustrating the system's approach to management depict the concepts of the project environment. The 'system' here could be seen as "an organized or complex whole: an assemblage or continuation of things or parts forming a complex or unitary whole" (Cleland and King 1983, p. 17).

A Diagrammatical Presentation of a System's Parameters, Boundary, and Environment

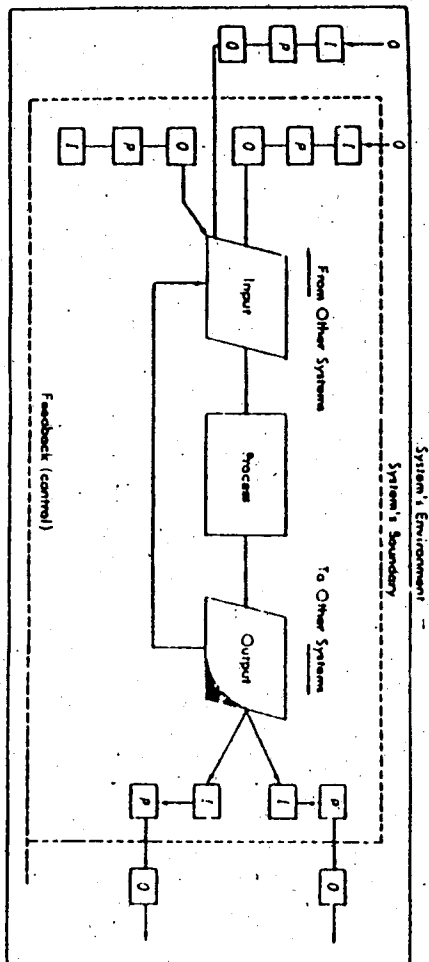
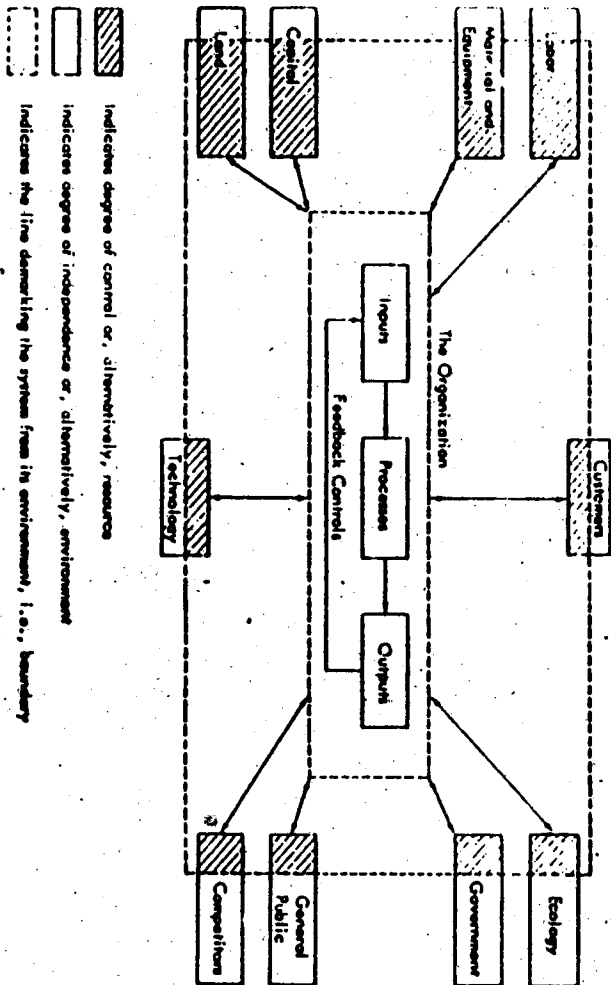


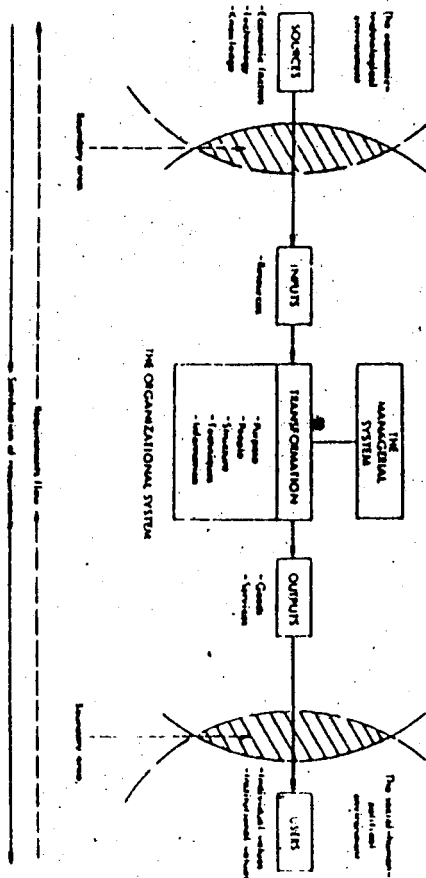
Fig. 1

The Organization, its Resources and its Environment The Environment



Source: (1) & (11)
Schoderbek, P.P. et al
Management Systems.
Business Publications
Inc., 1975.

EXHIBIT 6-4. The organization as an open input-output system



Source: (11)

Shrode, W., and Voich,
D. Organization and

Management: Basic
Systems Concepts.

Richard Irwin, 1974.

The system's approach to project environment explains the environment in the context of a project's relationship with sub-systems and organizations which constitute the matrix of the project management organization. This relationship is that of interdependence. The project environment idea emphasises that the project manager must be watchful and ready to encounter the conditions and events interfering with, or impeding the project-implementation or operation at any time.

The system's approach emphasises more on dependence of a project on the sub-systems and organizations, some of which are not under the control of the project manager. The environmental factors could at times be far removed and yet have their impacts on the project. For example, supply of certain equipments or materials needed in a project could be disturbed by a labour strike at the manufacturing company. Or a construction project could be delayed by the contractor's involvement in other projects etc. Certainly, there is little that a project manager could do to avoid such situations. Such environmental factors however, warrant an all-time alertness of the project manager to whatever is happening in the project environments. It also implies that project plan, and the project are exposed to the environmental influences. To quote Burnett and Youker (1980, p. 3) "the Key conclusion to be drawn from the systems perspective and the concept of the project environment is that the project environment has relationships with other sub-systems or other organizations in the environment. These create dependency relationships on both sides. To be ultimately successful, therefore, the project manager must look outside the project. He must study and try to manage or adapt to the relevant external forces on which the project's success depends.

2.2 Force Field Analysis

Stephen Doherty (1985) has suggested the term "force field" to denote the project environment. According to him:

Force field analysis involves listing all those forces (people, organisations, economic-social-physical-political aspects, in fact anything) that will impede the realisation of project objectives. The more suggestions of possible impediments to the project, the better the analysis is likely to be; the more risky the project becomes, the greater the likelihood that impediments are identified and eliminated early in implementation.

Force field analysis undertaken at a later stage in planning may also provide a check on any social analysis or institutional interest analysis which has been undertaken. Social analysis, as opposed to social cost benefit analysis, attempts to define the costs and benefits according to the point of view of different entities. A person who is an intended beneficiary of a project may not perceive himself to be so. In order to make a project successful it is essential that intended recipients of benefits do in fact view the results of the projects as benefits. An attempt must be made, therefore, to measure the images or views that the intended beneficiaries have of their own circumstances and assess objectively their likely reactions to a project. Social analysis also involves identifying and seeking the support of opinion formers and leaders in a community to support the project. Identifying the factors which will motivate intended beneficiaries to take part in development projects form part of social analysis. In addition to normal survey methods and such creative techniques as brain-storming, it is likely that role playing will be a useful tool when undertaking social analysis, so as to put the planner in the shoes of the project participant.

Institutional analysis seeks to anticipate any political, social, religious or general institutional obstacles to the progress of a project. Once a social analysis has revealed the location, number, attitudes, groupings etc. of beneficiaries, and preconceived an assessment of what has to happen if some of them may worsen the position of certain groups of people, the losers may, therefore, be expected to oppose the project.

Force field analysis encompasses the main elements of both social and institutional analysis, and at the same time it looks for suggestions about how to remove impediments and harness favourable forces in the project environment. Force field analysis may be applied to a whole project or just to problems which are encountered in implementation. A suggested procedure is given as under:

1. Use brainstorming to list as many likely impediments as possible.
2. Use brainstorming to generate as many suggestions of supportive factors as possible.

3. Once the two lists are established, consider each item in them briefly and decide whether it is important and merits further consideration.
4. For each problem, brainstorm to find the maximum number of ways of eliminating or reducing its effect.
5. For each supportive factor, brainstorm to assess how that factor may be used in support of the implementation of the project.
6. Finally consider all suggestions judiciously and then make practical recommendations.

Although, Doherty (ibid) has used the term force field with specific reference to social and institutional factors which might impede the implementation of a project, he also tends to use the terms force field and project environment interchangeably.

2.3 Concept of Uncertainties

The concept of the project environment introduced by Galbraith (1973-1977, taken from Burnett and Youker, ibid) relates to the 'uncertainties' associated with the elements in the project environment. The uncertainties happen because of the dependence of the project on the elements in its environment. Galbraith's view of project environment emphasises the identification of the problems and the probability of their occurrence and checking them and solving them. In this connection, he suggests the following actions for the project manager:—

- 1) identification of the organizations or sub-systems in the project environment,
- 2) defining the nature of the dependency of the project in its relationships with the organization or the sub-systems constituting the project environment; and
- 3) determining the nature of the uncertainties which might exist or occur during the planning implementation or operation of the project.

Galbraith takes into account the variations from project to project and that project environment may be different for different projects. However, he mentions the following three factors which, according to him are peculiar to a project:—

- 1) The product (service)/Market(User)/context of the project in most education projects. They could be referred to the benefits or outcomes and the demand for them.
- 2) The technology involved in education context. It could mean the involvement of personnel, methodology, instructional or other technology.
- 3) The physical location.

Burnet and Youker list the elements on which the project manager should focus. These elements are given below:—

- 1) Elements that are *suppliers of input, consumers of outputs, competitors and regulators* (in education project, these elements may have reference to the project funding agencies i.e. Ministry and Departments of Education etc, as suppliers of input and consumers of out-put in education projects are the beneficiaries of a project such as students, communities, teachers of a project such as students, communities, teachers etc. Competitors in education project may be the private institutions and organizations regulators in education projects are the administrators and policy makers).
- 2) Elements that are physical (e.g. climate) infrastructural (e.g. power supply) technological (plant genetics) *commercial/Vocational/ Economic* (e.g.) Banks) *Psychological/Socio-Cultural* (e.g. attitude towards credit risk) or *political/Legal* (e.g. local Government).

The elements underlined above could easily be translated to any educational project except that banks should be replaced by budget provision and project budget,.

- 3) Elements that are hierarchy and sometimes geographical, such as Government at various levels *National Regional, and local*.

- 4) Elements that are actors (e.g. individuals, groups, institutions) or *factors* (e.g. attitudes, trends, laws, etc.).
- 5) Elements that are controlable (Manager/project can affect these without affecting the project), *influenceable* (the manager/project can affect these but they can also affect the project) or *appreciated* (the manager/project must react to these but cannot affect them).

Analysis of the project environment discussed above shows that they are narrow in their scope so far as each of them represents an extremist point of view. For example, Burnett and Youker (1980) emphasise the "external environment" of a project. The system's approach views environment in direct relationship with the system and emphasises dependence of a project on the sub-system and organizations which constitute a total project management matrix. The systems approach, therefore, relies solely on the idea of the external environment. Doherty's (1985) concept of the project environment derives from the environmental factors which impede the realisation of project objectives. He, therefore, suggests ways to check the retarding effects of the environmental factors and turn their effects to "glorious gain." Galbraith (1973-77) concerns himself with those significant factors in the project environment which are associated with uncertainties in a project management situation.

3. A MULTI FACTOR APPROACH

The concepts of the project environment discussed so far have references to projects in general. They are aimed to alert a project manager against the situations which may cause problems to him during the implementation or operation of a project. Projects in education sector are also subject to the influences of these environmental factors. But it is well understood that in the world of education, sometime things have special connotations which would be a useful exercise to discuss project environment with particular reference to education project.

The environmental factors could be identified under the following groups:

1. Social Factors
2. Political Factors
3. Economic Factors

4. Physical Factors
5. Technical Factors
6. International Factors
7. Incidental Factors

Following are brief descriptions of each of the above groups of factors comprising project:

3.1 Social factors

The social factors which constitute a project environment are the following:—

- i. General social philosophy of the community and the society where a project is located;
- ii. rate of literacy among the community members for whom the project is undertaken;
- iii. religious attitudes and affiliations of the people of the project area;
- iv. social stratification of the community;
- v. residential mobility of the people;
- vi. occupational mobility of the people;
- vii. local traditions and institutions.

i. *General Social Philosophy of the Community and the Society where a Project is Located:* The general social philosophy of a people is reflected in their general behaviour i.e. their thoughts, attitudes and reactions to what exists or happens in their lives. The general social philosophy influences most development projects especially in the rural areas. It determines acceptance or rejection of the project. In Pakistan, there are still communities which resist female education and any project which aims to educate women, meets opposition of the community.

ii. *Rate of Literacy Among the Community Members for Whom the Project is Undertaken:* The rate of literacy in the community and the type and level of education of the people in a project area determines the

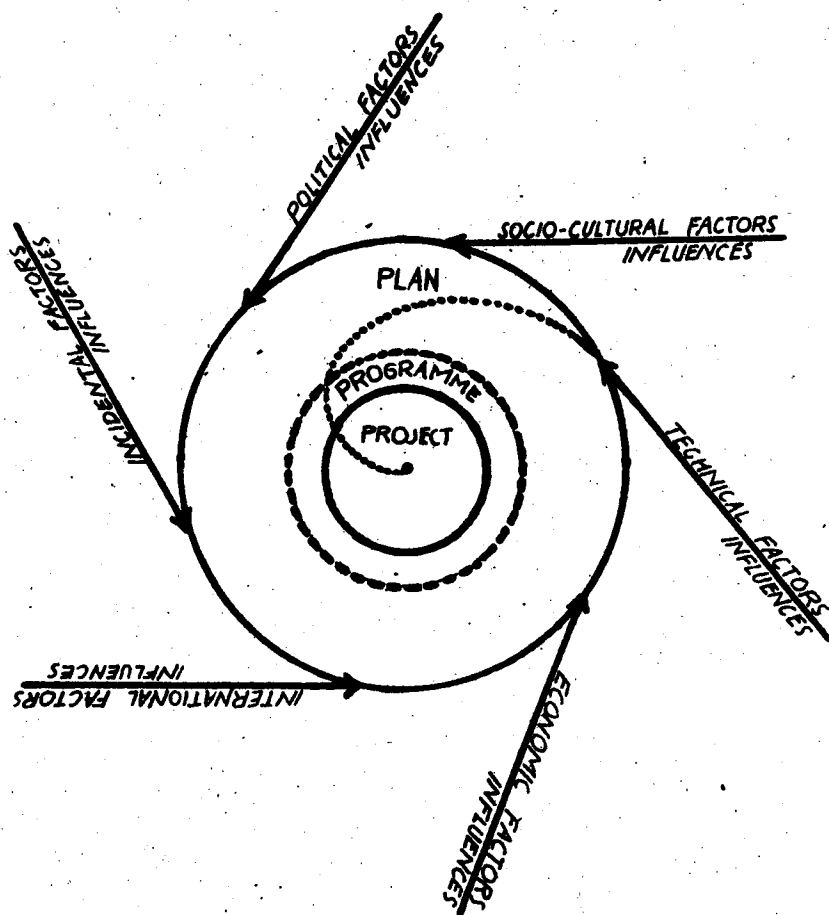


Figure: 2
Multi-factor Project Environment

local peoples' and community leaders' support or otherwise for the project. Implications of education of people may have both internal and external influences on the project. Internal influences may affect the availability of right type of personnel needed for the project, whereas the external influences could be visible in the relationship of the project management with the community and other parallel organizations which might have some sort of linkage with the project. Local contractors and suppliers of material etc. are examples of influences in this regard. Trends and changes in the rate of literacy are directly related with a community's desire to have or not to have educational facilities in the area. In many areas of the country today it is seen that people want to have Girls' Schools, High Schools, Technical and Vocational Education facilities. Also in many areas there is a strong need (as expressed by people and community leaders) for betterment and expansion of education facilities. Education projects which pertain to the expressed and strongly felt needs of people, are sure to get community's support. It is also a matter of experience that in certain rural areas where rate of literacy is very low and people, especially adults, don't yet realise the importance of education and thus the projects concerning adult education, are usually seen with indifference. A study of a number of Adult Education Projects launched by Allama Iqbal Open University and other organizations shows that the investment in Adult Education Projects has not yielded the desired results.

iii. *Religious Attitudes and Affiliations of the People of the Project Area:* Religious attitudes and affiliations of the people of a community have often their own way of viewing at an education project. A project which in anyway is in disagreement with their faith or belief is opposed. The experience of establishment of Mosque Schools in some communities had met the opposition of the local communities on the basis that some parents having a certain sectarian beliefs did not want their children to go to a particular mosque for education. On the other hand, community people were against the use of mosque for children's education.

iv. *Social Stratification of the Community:* From a sociologist's point of view, it is not an easy task to categorise people living in a community, into various social strata. But there is still something in the people which labels them with upper, middle and lower class people. Each class and, of course, sub-classes within each class, has its own peculiar characteris-

tics which determine their attitude toward education and education related projects in the community. Their attitudes toward education project are also influenced by the peculiar value system of each class. It is the experience of many people that in 1950s when Government started establishing Polytechnique and Commercial Institutes, these Institutions were not very popular in the country. The main reason for this was that the social class structure which existed at that time had a dominant lower class people for whom education meant little. At the same time for the small middle class which existed at that time the Polytechnique and Commercial Institute Diplomas and Certificates were far below the level of their aspirations. They would have preferred to send their children to Engineering, Commerce and Medical Colleges rather than being content with their entering these Institutes.

v. *Residential Mobility of the People:* In developing countries of the world today there is a trend to move from rural to urban areas. Use of automation in agriculture, industrialisation combined with facilities and the opportunities which the city life provides is causing a good many people to move from their rural residences to urban places. This shift of population from rural to urban areas has its own implications for education development projects of rural as well as urban areas. One very apparent affect of this mobility on rural based projects of education is that the projects located in the rural areas don't mostly serve the purpose for which they have been designed: education facilities especially created under such projects are under-utilised. At the same time, the projects as building of institutions of vocational and technical education, building of schools etc. become crowded due to unwarranted increase of population. An example of the effect of such mobility could be given from the agro-technical scheme of education. The scheme was affected in the rural area of the following:

- (a) Local teachers trained in Agro-tech. and vocational courses especially in technical and commercial subjects preferred to serve in the cities with the result that the personnel required for implementation and operation of the project were not available in many schools. In cities this trained manpower became surplus and the projects intended to absorb this type of skilled manpower could not absorb them all.
- (ii) The Agro-tech. subjects which aim to augment the productivity of rural population became unpopular among the actual beneficiaries of the project as they were more interested in prepar-

ing themselves for an urban way of life and for adjustment to city life.

vi. *Local Traditions and Institutions:* Local traditions and indigenous institutions especially of rural communities have very strong influences on any development project. For education development projects, they pose challenge as education of masses threatens the existence of some traditions and institutions. In Sind, for example, institution of "DAIS" (untrained village midwives assisting at child-birth) would oppose education projects which aim at creating awareness among village women about the implications of birth of baby and the needs for sanitary methods of health and hygiene or establishment of an institution which would force traditional "DAIS" to undergo a training for certification for their profession. Traditions of keeping women folk illiterate in many communities caused resentment among the masses for the establishment of girl's schools and appointment of teachers from cities. Institution of WADARIAISM (Feudalism) has been known to oppose the very establishment of educational institutions in their areas of influence. Some of these institutions and traditions are so powerful that they can upset or contribute to the promotion of a project beyond the imagination of a project manager and a project planner.

vii. *Occupational Mobility:* With the changing concepts of standard of life and due to growth of industries and means of communication, patterns of life have been rapidly changing in the past few decades. Growth of service industries vis-a-vis other things in the society, there has been a change in the peoples' attitudes toward various occupations. A barber, a washerman, a truck driver, a welder, a plumber and all such people were not treated with as much respect as today. The value which dominates most in the society is material gain and a person's ability to have more. This has resulted in peoples' changing their occupations for better life opportunities. Education development projects are therefore, often viewed as sources of extending material benefits to all those who are associated with or affected by project. Project Manager who disregards this fact often faces with the problems of non-cooperation both from within and without. Take the example of the Pakistan Primary Education Project-IV. The monetary benefits as they are distributed go largely to the Project Manager Establishments, foreign consultants and to certain local contractors etc. The primary school teachers the master trainers, the school supervisors and other similar personnel get no benefit of the project. The communities which are supposed to be the beneficiaries of the project get perhaps no more than what is available in out-

side the project schools and institutions. The achievements of such a project are well known to the teachers and administrators.

The Intergrated Functional Education Projects of the Allama Iqbal Open University provide another good example of little incentive for the adult educators who work in the field and receive minimum benefit out of the project. The situation is very discouraging to the persons' adherence with the project and their motivation to work for the achievement of the objectives of the project. The situation also creates a sort of an adhocism in the project management organisation which has its own effects on the implementation and operation of an education project.

3.2 Political Factors

In Pakistan, where almost all education projects are in the Public Sector, the projects are always subject to political influences which may be grouped as follows:—

- a. National Government's education and other sectoral policies.
- b. National priorities
- c. Power and authority structure.
- d. Party manifestos
- e. Political bargainings
- f. Leadership influences
- g. Community demands and pressures
- h. Project exploitation for political purposes

a. National Government's Education and other Sectoral Policies

The changes in the political structure and Government power is a phenomenon of many developing countries of the world today. Changes in the Government or the national leadership naturally results in changing National Government's developmental policies in education and other Sectors which in turn also influence one another. In Pakistan less than four decades we have seen education policies changing half a dozen time. These changes have definite influences on all kinds of education projects, but their influences are more visible in major education projects of national significance.

The education projects which should have been conceived under the first Six Year Plan of Education of 1951 could not be possible because of the political situation of the country in the 50s. The Pilot Education

Project in the late 50s was badly affected and almost lost its purpose and directions as a result of change in the Government's policies in 1959. The Allama Iqbal Open University which was associated with a particular political Government suffered as a result of the change in the Government and if it were not for the insightful immediate action of the then Vice-Chancellor, this national Institution perhaps would never have survived. The establishment of the Agha Khan Medical University and Government's support for it, is certainly a manifestation of Government's policy to encourage establishment of educational institutions in the private sector. As we all know the Government's policy to nationalise educational institutions in the 70s had badly affected the growth private education.

b. National Priorities

Changes in the national priorities also have their impact on education projects. They differently contribute to Government's support or neglect to education projects. Government's inter-sectoral priorities determine the support which education projects would receive from the Government. Similarly, intra-sectoral priorities within the sector of education have their influences on project in various sub-sectors of education. For example, a Government priority for developing higher education in the country resulted in a rapid growth in Universities and Government's financial support for establishment of a University Grants Commission (UGC), whereas primary education sector projects such as Production and Use of Teaching Kit hardly came into operation and appeared to be totally ignored and whatever the money invested in the project was nothing but high wastage.

c. Power and Authority Structure

The power and authority structure in a country like Pakistan has so much to do with the planning and implementation of an education project. In Pakistan, as it is the case today, policy decisions for many development projects are taken at the Centre. From there they are passed down to the provinces for implementation. The provinces, while they are autonomous in matters relating to education, they also have their resources for education limited. This often results in problems of financing and managements of projects.

For example, decision to set up Mosque Schools say, in the province of Sind was taken at Centre and national grant in this connection was

also released to the province for the implementation of the project. It was assumed that in due course of time the province will take up the project for itself. It was found that the Provincial Government did not have sufficient funds to finance the operation of the project and showed its reluctance to continue the project. The result was a big upset for the Director of the Project and for the project itself.

The Primary School Teaching Kit Project which was initially a Central Government Project was passed to the provinces for implementation and operation without releasing the cost of the Project which the provinces would have to bear. The result was obvious. The Teaching Kit remained locked in the Steel Boxes and in some cases did not even reach the schools where they were intended to be used.

d. Party Manifestos

Manifestos of the political parties are sorts of promises made to win the general support of the people. They also point to the direction which, if the party gains power, would follow. These manifestos also have a bearing upon the education sector developments. For example, nationalisation of major industries, banks and educational Institutions etc. had great impacts on education development programmes. One very apparent impact was in the financing of education projects.

e. Political Bargainings

Political bargainings and their influences on development projects are not limited only to the developing countries like Pakistan but also they have a universal application. To win the support, both human and material, the political parties both in power and the ones struggling to come in the power, do bargain with significant communities, business organisations, trade unions and individuals. One very important effect of these bargainings on education project is seen in the form of the project work assigned to certain contractors, placement of personnel in the project, location of the project and also the operation of the Project.

f. Leadership Influences

Education projects which are meant for rural areas or backward communities in particular are subject to leadership influences especially when it comes to the location of the project, especially, the projects for creation or expansion of educational facilities. Establishment of Schools,

Colleges etc. in places where they are so much needed and where they are not maximumly utilised, are common examples of leadership influences. These influences are not limited only to the location of the projects but they also influence financing of projects, personnel selection, project organisation behaviour and exploitation of project facilities including project material and equipments etc. In some cases, the leadership influences have been found so strong that they can cause a total change of the project, or even its termination.

g. Community Demands and Pressures

Since all education projects are for the communities and they are located within communities they continue to be susceptible to the community influences during their implementation and operation alike.

h. Project Exploitation for Political Purposes

Education development projects have been found sometimes to serve more for political propaganda of individuals and parties. Such projects are only secondarily concerned with the development of education in the real sense of the term, and the justification is sought in remotely visible targets.

3.3 Economic Factors

Economic factors which may influence an education project during its implementation and operation are the following:

- a. type of economy;
- b. condition of economy
- c. inflation
- d. changes in the prices of material and equipment;
- e. fluctuations in the rates of Foreign Exchange;
- f. Government Budget

a. Type of Economy

Types of national economy such as agricultural economy, industrial economy or mixed economy and consequent shifts in the types of economy have their influences on education projects both at the time of their implementation and their operation. The type

of economy usually determines the importance which both Government and public attach to a project. Government and private sector investment in the establishment of technical and commercial training institutions in the 50s were manifestation of a shift in the national economy from a predominantly agricultural economy to a gradual change to an industrial economy.

Agricultural extension projects of the early days were influenced by the then agricultural economy. As the country developed a mixed economy, projects like Agro-technic scheme of education were conceived and implemented at a large scale in the country. However, as it was seen, since the shift to mixed economy was not very well planned and organised, the Agro-technic scheme as a national project was badly affected.

b. Conditions of Economy

The condition of economy refers to the stability of economy, the per capita income, GDP., and GNP. The projects in education sector, especially the long-term projects, are subject to the influence by the economic conditions of the country. Instable economic conditions of the country have often resulted in under financing or even termination of education project. They have also resulted in projects over-running in time and in the consequent upset of the project estimates.

c. Inflation

Since the projects' estimates are usually based on the current price index, the rate of inflation directly influences the cost and budget of the project and the estimates are disturbed. Usually, there is a difference between the rate of inflation declared by the Government and the actual rate of inflation which determines the value of money in the society. The projects which had been delayed, curtailed or even discontinued are the examples of influences of inflation in the society. Sometimes, the rate of inflation in the country from where certain equipments have to be imported for a project also affects the estimates of the local projects.

d. Changes in the Prices of Material and Equipment

As it was in the case of price index of money, the changes in the prices of materials and equipments needed for a project are

based generally on the current market prices. For planners, it is difficult to predict price trends in the days to come. Also from the time a project is conceived and planned to the time it is approved for implementation, the gap of time is so much that the cost estimates of the materials and equipments of the project are not the same as they were at the time of the planning of the project. The effects in the changes of the price on the implementation of a project have been common and had disastrous effects on the project.

e. Fluctuations in the Rates of Exchange

Since most developing countries depend on foreign loans and aid for their developmental projects and for that purpose they usually import goods from those countries within the limited amounts of the sanctioned foreign loans or aid, the supplies of such goods become a problem when the rates of exchange are affected by national and international policies and pressures. Devaluation of Pakistani currency by more than 100 per cent in the 70s and the continued devaluation of the Pakistani Rupee in the international exchange market has had its influences on all education projects which in any way required to purchase foreign materials and equipments. The cost of such projects sometimes goes so high that the outcome of the project fails to justify it and the project ends up by becoming a white elephant project.

f. Government Budget

As it is a fact that most of our education project are derived from Five Year Plans of national development, their implementation follows the annual programmes of plan implementation. The project budget is accordingly allocated and released on a year-to-year basis. The project budget is dependent entirely on the national budget and the portion of the national budget which goes to the education sector development projects. Since the size of national Government Budget and its sectoral distribution is subject to changes as a result of the condition of national economy, trade imbalances, GDP etc., the implementation of a project is dependent entirely on the budgetary changes. The idea and practice of the rolling balance is the outcome of this situation.

3.4 Physical Factors

Physical factors in the project environment comprise following:

- a. Land
- b. Location
- c. Climate

a. Land

The structure and nature of the land where a project is located constitutes immediate physical environment of a project. Projects in hilly and mountain areas, deserts and arid zones, planes and the location of rivers, hills, railway stations, road links all have their immediate effect on the projects. For example, construction of a school in a plain area near a town and easily accessible by road or railway communication will not have the problems of a similar project which happens to be located in a hilly area away from a city and not easily accessible by road transport. In some cases, it is not only the cost of construction of transportation and supplies but the geographical environment of the project also have their effect on availability of personnel required for implementation and operation of a project. In some cases, for example, the supply of Teaching Kits to rural schools situated in remote desert areas of Sind and Baluchistan, even the cost of transportation was so high that it hampered the supply of the material which had been produced under the project. It was found that the planners of the project, while preparing the estimates of the supply of Teaching Kits to these schools, had ignored the factors of land, distance and means of communication. For example, the land where an education project is located is a Primary School located in the hills adjoining the Federal Capital territory. A primary school located on one side of a ravine was not accessible for long periods of rains and floods to the children living on its other side since there was no bridge over it. The location of education projects especially schools etc. in remote areas of hills, deserts etc. also have implications for supervision and administration.

b. Location

Location of projects in and outside a city, in rural or urban areas, their distance from towns have their own effects on project

which could be in the form of interference of the community people in the project matters, safety of the men and material of the project. Utilisation of the project which could be on two extremes i.e. under-utilisation or over-utilisation, availability and cost skilled manpower required for the project and so on. A very common example of this is the location of agro-technical schools in many places in provinces of Baluchistan and Sind where it is difficult to find a suitably qualified person to go and teach. Cases of Girl's Schools built in rural areas provide a common example of non-availability of teachers because of the location of schools. The colleges with 15 teachers and 10 students are not just imaginary institutions. They exist and provide evidence of the effects of environmental factors in their locations.

c. **Climate**

The climate of the project area is an important environmental factor which has its multiple effects both on the work of the project team and people working under conditions such as humidity, heat, rains, cold, or temperature climatic conditions. Each of these climatic conditions has its effects on persons' output. Also the climatic conditions have their effects on the materials and equipments that are used in a project. For example, installation of a computer in a place of hard climatic condition "too hot or too cold" would certainly affect the functions of the computer and even cause damage to it unless an efficient airconditioning is provided. This would certainly increase the cost of operation of the computer.

Examples of the projects which have been disturbed by the climatic conditions of an area are many schools located in the desert areas whose design is not appropriate for the climatic conditions of the area. They usually have the following problems:

- i. in hot desert areas of Sind, schools are usually closed at around 11 O'Clock because the school building becomes so hot and it is not also too convenient to students to walk to their houses under the burning sun if it gets high. The result is reduced time of schooling for children.
- ii. in places where cold weather continues for a long time, students suffer because of cold. During the construction of

educational facilities reduced working hours can not be avoided which certainly would upset any cost and time estimates if the project planner and the manager are not aware of the effect of such environmental effects on the output of project men.

3.5 Technical Factors

The technical factors constituting the environment of a project include the language and the quality of the plan to be implemented; personnel and structural organisation of the project management Unit; procedural matters relating to the allocations, approval and release of finances; power and authority structure within the large organisation of which the project management unit is a part; personnel selection placement and training programme, and utilisation of consultancies and expert services.

3.6 International Factors

International environment of a project refers to the events taking place outside the boundaries of the country of the project. The interdependence of the countries of the world has grown so much today that even the most developed countries of the world are affected by changes and events which take place even in the third world countries. A recent example of this could be the war between Arab and Israel and the resulting oil embargo which had shaken the economies of the countries like America and Europe. also. The involvement of America in Victorian War in 1950s had a direct impact on the implementation of the First Five Year Plan and its project. The opening of job market in the Middle East in the 1970s resulted in a rush of people to the technical education programmes in the country and an exodus of skilled manpower of Pakistan to the Middle Eastern countries. If carefully analysed, it would be seen that many of the education projects in the 70s and after that were gradually influenced by this situation. The education projects are also affected by the technological advancements which take place outside the country. For example, a technology installed in Pakistan sometimes becomes obsolete in three to four years as the new model of that technology is introduced and the technology already installed in the country becomes obsolete and even the spares are not available. This situation upsets badly the project which is dependent upon foreign technology. The wastage that is caused by the changes in technologies is no secret to the people associated with educational organisations of the country.

The projects which are dependent for their financing on foreign countries or international organisations are also affected by the policy changes outside the country. In March, 1977 when the USA changed its policy about financing new projects in Pakistan due to the political situation in Pakistan should have affected many projects. The student personnel project for Pakistan which had to be implemented with the cooperation of Mississippi State University and Ministry of Education could never take off because of the change in the policy of the United States' Government about financing projects in Pakistan in 1977 and for sometime after that period.

3.7 Incidental Factors

Incidental factors that constitute a project environment are those unforeseen events which could happen at any time. In the context of management of projects, they could be caused by incidents of death among the project staff, disturbances in the work and communications as a result of labour strikes, damages caused to the material and equipments of a project by fire, floods etc., breach of contract between the project management and the suppliers and construction management etc. Sometimes, these incidental events may have been in the form of delays due to procedural steps.

4. CHALLENGES FOR THE PROJECT PLANNERS AND MANAGERS

The environmental factors and their consequent effects on implementation of education projects, as they have been presented in the foregoing pages, pose many challenges for educational project planners and project managers. Some of the factors in the project environment as you should have read are such over which the planners or managers of a project has no control at all. One has simply to learn to live with these challenges and steer a project through these unforeseen circumstances. It, however, helps to be ready to meet any situation and foresee the events and their effects. In this connection, the following points may be of help to both project planners and managers.

1. the job of project planning and management should be taken as a challenging responsibility and one should be ready to meet any upsetting situation in the process of project implementation or operation;
2. though it is not easy, yet it is always helpful to have an allowance of flexibility in the management of a project;
3. in some cases alternative planning, steps, and ways can help minimize the effects of environmental factors on projects;
4. usually the events cast their shadows before they take place. This should alert the project manager to meet them;
5. the job of the education project planner and manager in today's world demands that besides being equipped with the professional and technical skills, one should also keep himself informed with what is happening in the world around him
6. many effects of environmental factors can be avoided at the stage of planning a project if the conditions of the environment, where a project has been located, are taken into consideration;
7. discussions with relevant persons before planning or at the time of the implementation of a project could help a project manager overcome many environmental problems;

8. factors which in some cases might create hindrances to the implementation of a project may be used to support the project only it would require a personal initiative of the project manager;
9. many environmental problems both internal and external become threatening to the implementation of a project because of the alienation of the project manager to the situation. An orientation with the envioning conditions, procedures, systems and mechanisms of management matrix could help eliminate many problems. Brain storming sessions, discussions, surveys, analysis of situations could help the project planner and project manager foresee the events which could interfere with the implementation and operation of an educational project. The project manager should have hours of making appropriate decision for adapting to the changing environmental conditions.

The above points are just a few of the suggestions to overcome the effects of environmental factors in project implementation. Situation or situations relating to each project may be different and it is only the project manager who would be facing it. The only thing that can help is his own alertness to meet the situation.

5. SELF ASSESSMENT QUESTIONS

Before you go over to the next Unit, see if you know the answers to the following questions (in case you have any difficulty read the relevant portion again):

1. What is project environment?
2. What are various approaches to defining project environment?
3. In what do various concepts of project environment differ from one another?
4. What are the factors which constitute the multi-factor approach to describing a project environment?
5. Each of the factors listed under the multi-factor approach comprises a number of events and situations. Which of them
 - a. are controllable?
 - b. can be exploited to improve implementability of education projects?
6. What measures do you suggest to check the impeding effects of project environments?

REFERENCES

Cleland, D.I., and King, W.R., *System Analysis and Project Management*, McGraw-Hill, International Book Company, London, 1983.

Doherty, S. Miscellaneous papers and notes — 1985.

Youker, R. and Burnett, N., *Problems in Implementing Development Projects*, EDI, World Bank, May, 1980.

Youker, R. and Burnett, No., *Analysing the Project Environment*, EDI, World Bank, July, 1980.

UNIT-7

WORK PLAN FOR IMPLEMENTING PROJECTS

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INTRODUCTION

The Gantt Charts, the CPM and the PERT discussed in the units 7 and 8 are most commonly known and used network techniques of project management. They are simple and flexible and can be adapted for multiple uses in project management. In this course these techniques have been presented in greater simplicity and with references to education projects in Pakistan. These techniques have evolved out of the project managers' experiences and their need for efficient project management. They are known to have the following advantages over the traditional methods of project monitoring and control (Goodman and Love, 1980, pp. 179-81):

1. The network concept brings a logical and scientific discipline to the planning, scheduling, and control of projects.
2. It separates planning from scheduling and control, leading to more effectiveness and flexibility.
3. It presents the interdependencies among various activities and the effects of their changes on one another.
4. It presents the project plan and schedule, graphically. Plans are no longer hidden in the thoughts of the project manager; networks allow other people, whose activities are interlocking, to review the network and express their views.
5. It usually reduces the total duration of the project.
6. It estimates project duration more accurately.
7. In the process of preparing the network diagram for a project, the attention of the project manager is focused on one activity

or a related group of activities at a time. Therefore, the manager has to think about the project from the start to completion. The manager cannot draw the network unless he or she makes decisions about the sequence of various project activities one at a time. Thus, preparing the network diagram facilitates project decision making.

8. A network simply represents the logical sequence of the execution of activities. If activities take a longer or shorter time than estimated, the network diagram does not generally change.
9. It considers the constraints on project time or resources.
10. It can be used as a simulation model to examine alternative methods for carrying out one or a number of activities with different time and resource requirements.
11. Change in plans and modification of policy can be easily incorporated into the network. The impact of these changes on the project as a whole can be assessed easily and quickly.
12. It identifies the critical sequence of activities or events from project beginning to completion.
13. Network analysis identifies the most critical activities in the plan and focuses the attention of project management on these critical activities, thus leading to management by exception.
14. Promptness and delay in the performance of all groups involved in carrying out various activities are easily discovered.
15. Deviation and slippage from the network schedule is easily and quickly discovered, thereby allowing better monitoring and control of the project.
16. Costs can be incorporated into the scheduling of activities. The whole project can be finished on schedule at minimum cost. The extra cost of expediting a project can be estimated by time and cost trade off curves. Networks can be used for cost control and forecasting.

17. Networks encourage a more detailed and longterm planning of projects.
18. The resources needed for the project can be scheduled by shifting noncritical activities or the peak demand for use of scarce resources can be reduced to available limits by extending the project completion date.
19. Networks provide a standard method for communicating and documenting project plans, schedules, and time and cost information.

OBJECTIVES

On completion of this unit you will be expected to.

1. differentiate between concept of a work plan as opposed to a project plan;
2. explain the basic concepts used in a work plan;
3. elaborate techniques used in implementing projects,
4. select and use various techniques of project implementation;
5. change PC-I of education projects into work plans for implementation.

1. PROJECT PLAN

In the preceding units we have discussed the preparation of a project plan and major considerations in this regard. As it has been pointed out elsewhere a project plan (PC-I) is a document which outlines the objectives of the project, presents justification of the project, identifies the resources or inputs of a project and figures out a scheme for implementing the project. The PC-I form is the standard form used for preparing a work-plan. Ideally a project plan should provide the project manager complete guidelines for implementing it: the project plan should on the one hand tell the project manager what the project is about and what the strategies should be followed to implement it. However, the present PC-I form has a very limited use. Its basic purpose appears to be that of casting a project, and one is not very wrong in interpreting PC-I form as "project casting" proforma (though a PC-I is an abbreviation of Planning Commission Proforma). A PC-I form is not prepared keeping in view the needs of a project manager, but the major purpose of it seems to be obtaining appropriate authority's approval for financing of the project and using it as a tool for decision making about the choice of projects or utilization of funds available for the education sector.

It is a matter of common experience that once a project has been approved in the form of a PC-I, it becomes the responsibility of the project manager to reinterpret it and sometimes even restructure it for the purpose of implementation. Since the person who prepares initial plan of the project is not the person concerned with its implementation and his major interest in preparing a project appears to be in getting it approved, he is liable to completely ignore the implementability of the project. This fact has already been recognized by the Planning and Development Division and it was once suggested to develop "a more scientific and modern methods of monitoring progress of projects and control their costs through network analysis which would be prepared by the execu-

ting agencies and attached with the PC-I form at the time of its submission for approval". This implies working together of planning and executing agencies or persons at the initial stage of project formulation. This working together of the planning and executing agencies or persons should aim at reviewing on every step of project planning, its implementability and also preparing "work-plan" for implementing the project. As opposed with the PC-I form a work-plan should outline the steps for implementation of the project and its monitoring. A good project work-plan includes the following —

- Project scheduling
- Budgeting the project
- Management responsibilities, and
- Project management information system.

Following are the detailed description and illustrations of various parts of the work-plan.

2. THE WORK PLAN

It represents a breakdown of a project into manageable tasks each of which can be scheduled and allocated to an individual or an organisation who will be responsible for its execution. In addition the project scheduling also makes impossible to monitor the accomplishment and progress of the project. The project breakdown also provides basis for the network planning which ensures that all tasks are done in the most appropriate sequence. It also helps to ascertain what resources are required and when they are required and gives the project manager control over the implementation of the project.

In order to guide the students and readers of this course we are presenting, in a logical order, various steps involved in the scheduling of a project. The techniques involved in the scheduling of a project. The techniques used for this purpose are also illustrated with examples.

(For the purpose of illustration we are going to use an actual education project — T.K. Project. See Annex. 'A').

The project which we are going to illustrate in the use and preparation of a workplan for implementing projects is known as "the Scheme of the Provision of Teaching Kits to Primary Schools of Pakistan". The project was initiated by the Curriculum Wing of the Ministry of Educa-

tion in December, 1975. The Teaching Kit Project is not typical of the education projects in Pakistan nor does it represent the types of projects of education in this country. The project document will be used more to illustrate and provide students guidance in preparing a workplan for implementation of a project. The basic steps in preparing the workplan will be the same for all kinds of education projects except where the specific needs and ingenuity of a project manager lead him to make certain deviations or changes.

Following steps and techniques for preparing a workplan for implementing an education project are suggested and discussed:

1. Preparation of a Project Break-down Structure (PBS);
2. Project Break-down in the Manageable Tasks/Activities;
3. Preparation of a Gantt Chart or a Bar Diagram
4. Preparation of Milestone Charts;
5. Critical Path Scheduling (CPS) or Critical Path Analysis (CPA),
6. Programme Evaluation and Review Technique (PERT).

The each of the steps listed here represent certain methods or techniques of project implementation. The steps are intended to guide a project manager to proceed logically in developing a workplan for implementing a project. The project manager may not always feel need to follow all the steps but he may skip some of them if he so decides. Following are illustrated descriptions of each of the steps listed above:

2.1 Step 1: The Project Break-down Structure

The Project Break-down Structure (PBS) is the first step in preparing a workplan for implementing a project. According to Goodman and Love (1980) the Project Break-down Structure is "a systematic and disciplined approach for breaking down a project into its main components and subcomponents". PBS lists all the activities that must be carried out to complete the project in a systematic and structured way (p. 136). The project break-down presents the activities which are to be carried out at various levels. The Fig. 1 illustrates the break-down of the Teaching Kit Project. There are three levels of activities for the Teaching Kit Project. For other projects depending upon their specific nature the levels may be more or less.

In Fig. 1, the first level of activity presents the identification of the project. The second level of PBS identifies major elements of the project

or sub-projects within the larger project. The second level activities of the Teaching Kit Project includes:

- i) designings and developments of Teaching Kit;
- ii) kit distribution;
- iii) teaching training;
- iv) project operation;
- v) project evaluation.

These sub-projects or activities highlight the preparatioinof Teaching Kit which could be considered as the major product of the project; delivery and distribution of a product (Teaching Kit) to its users (Primary School Teachers); training of teachers which represents a sub-project essential for implementation of the project; operation of the project which means use of the Teaching Kits by the teachers in the Primary Schools for achieving the objectives for which the Teaching Kits have been developed and supplied to the schools; and finally the evaluation of the project to assess its practibility and relevance with the objectives of the Kit. The third level of the project break-down presents a further sub-division of the sub-projects identified at the second level. The third level of the breakdown structure of the Teaching Kit project presents the major components of each of the second level activities. This break-down, depending upon the needs of a project manager or any other project depending upon the nature of the activities may continue even beyond the third level of a point where all the items or operations which can be allocated to the charge of one individual or organisations are identified.

a) Benefits and Uses of Project Break-down Structure

Goodman and Love (1980), (P. 137) identify benefits and uses of the Project Break-down Structure. They are:

1. It forces the project manager, the supporting staff, and personnel incharge of various related organisations to study entire project and to think through all its details.
2. It is a systematic way to look at the project.
3. It can be used as framework for the project information system as far as planning, budgeting, accounting and control are concerned

Lower Levels ←

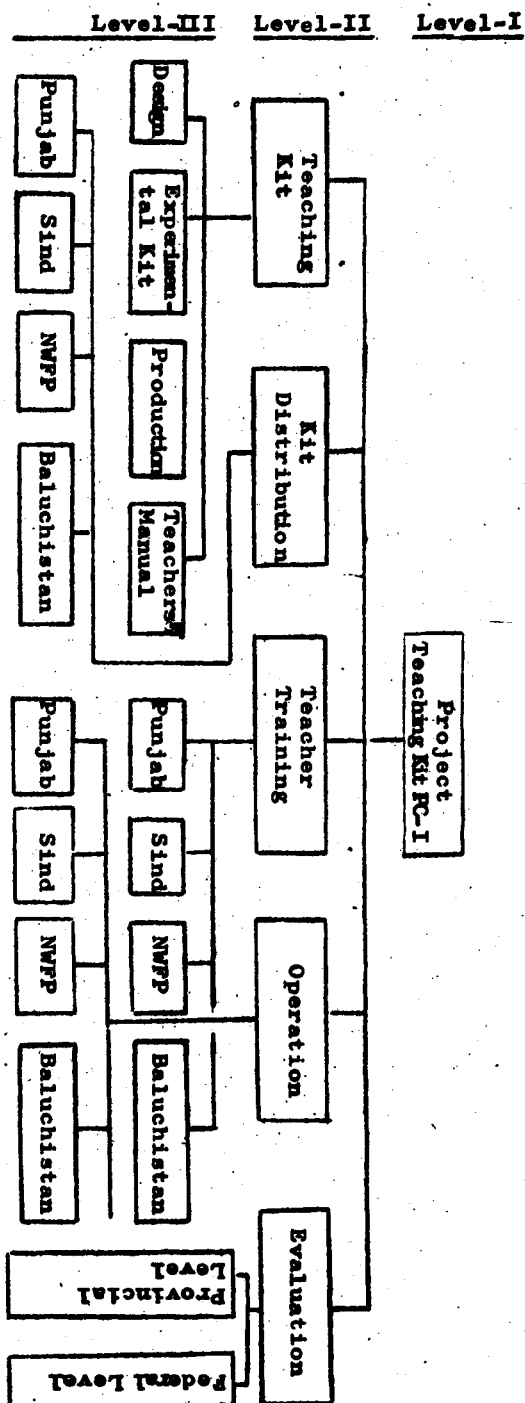


Fig. 1
Project Breakdown Structure

4. The PBS Diagram is a first step in the preparation of Gantt and Milestone Charts and network for projects.

In addition to the above benefits the project Break-down Structure can also provide a short-cut to understanding the project by the person who, under certain emergent conditions may have to take-over as the manager of the project during its implementation. The PBS also explains the logic behind the workplan of the project and simplifies the preparation of network planning. The process of project break-down ensures that all necessary operations are carried out and that no resources are devoted to unnecessary work.

2.2 Step 2: Project Break-down into Manageable Tasks

In the process of development of the workplan for implementation of a project the Project Break-down Structure is followed by the identification of the project's manageable tasks and activities for network analysis. The Fig. 2 presents a project break-down into manageable tasks and activities for network planning. This step also helps identifying the parallel activities within the project. The parallel activities are those tasks which can be and should be organized or undertaken simultaneously. In sequencing project activities they constitute group activities as compared with single activities.

Teaching Kit Project

PBS	Activity Number	Manageable tasks/activities
Project Management Organization	1.	— Project Manager and Staff (appointment)
	2.	— orientation and training
Designing teaching kit	3	— initial design
	4	— Review
	5	— approval for Design
Experimental teaching kit	6	— production of teaching kit items
	7	— experiment in selected schools of Punjab, Sind, N.W.-F.P. and Baluchistan.
	8	— review, improvement and final selection of the teaching kit items
	9	— development of a prototype
Production of teaching kit item	10	— assigning contract
Teachers' manual	11.	— production of teaching kits
	12	— writing of teachers' manual
	13	— review and approval
	14	— printing of the manual
	15	— handling over to the contractor for including into the teaching kit
Teacher Training (to begin simultaneously in all the provinces)	16	— First level Master trainer programme
	17	— Second level master trainer programme
	18	— Third level master trainer programme
	19	— training school teachers
Distribution of teaching kits	20	— provinces
	21	— districts
	22	— individual schools
Follow-up and evaluation	23	— Project operation begins in schools
	24	— Evaluation

*See unit 11 also

*1) Central organization
2) Provincial organization

Fig: 2
Project Break-down into Manageable Tasks

Project Break-down into Manageable Tasks

As it is evident from the Fig. 2, the project break-down into manageable tasks is an elaboration of the project break-down structure. The manageable tasks help project manager or project planner conceive and list the activities which must be carried out to accomplish a project. The manageable tasks or activities should have the following characteristics:

1. They should be clearly defined.
2. They should point to specific activities which constitute a sub-project.
3. The activities should be listed in the order in which they must be carried out. Each sub-project identified under the second or third level project break-down should have direct relevance with the sub-project and sufficient number of activities should be listed to cover the total range of activities in a sub-project.

2.3 Step 3: Preparation of Gantt Chart or Bar Diagram

The Gantt Chart is also known as a Bar Chart or a Bar Diagram. The Gantt Chart is named after its originator Henry L. Gantt, who is considered to be the pioneer of the scientific management movement. The Gantt Chart is designed to graphically schedule to monitor the progress of a project with reference to and within the framework of schedule time within which the project has to be completed.

Gantt Chart is a usual management control device which was developed during the world war one. It is a "Linear Calendar on which future time is spread horizontally and work to be done is indicated vertically". Scheduling of time Chart is the basis of the Gantt Chart. The Time Chart can use months, weeks, days or even hours.

The following two forms of the Gantt Chart are in use:

1. *The Planning Chart*: In preparing the Planning Chart it is customary to use symbols. The description of such symbols is usually given somewhere in the Planning Chart. The Planning Chart has its value in monitoring and reviewing the progress of a project.

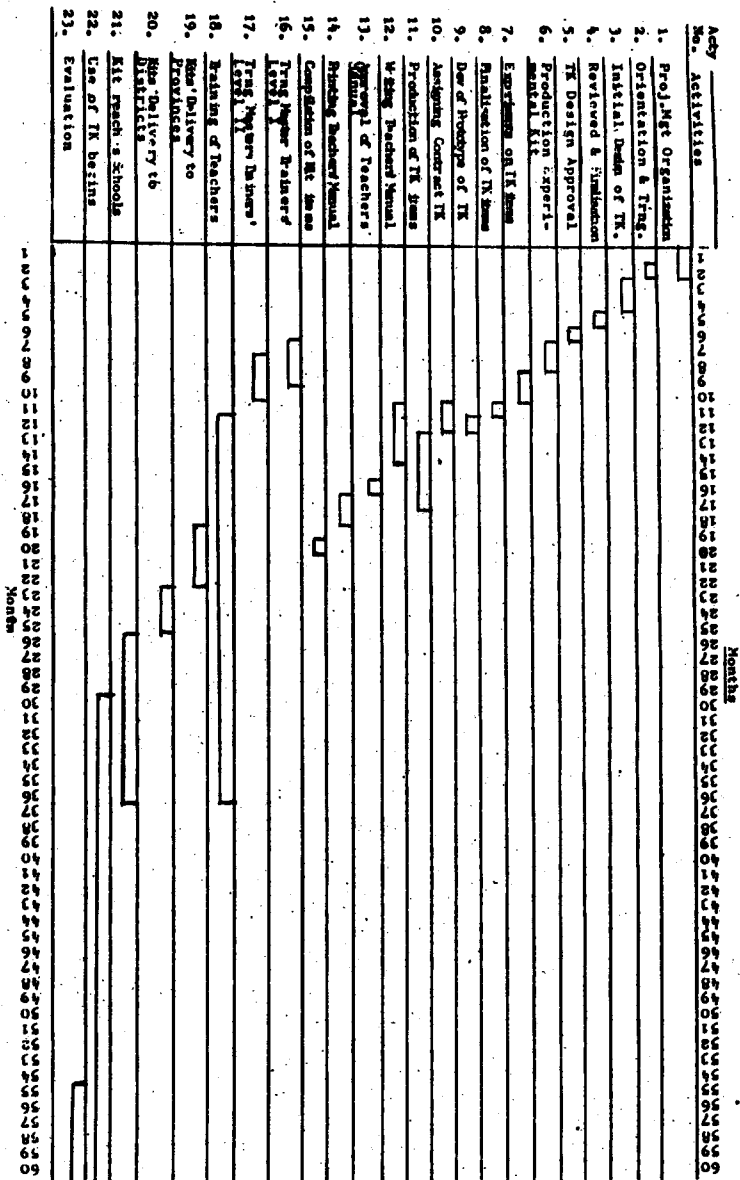


Fig. 3
Gantt Chart: Plan of Teaching Kit Project

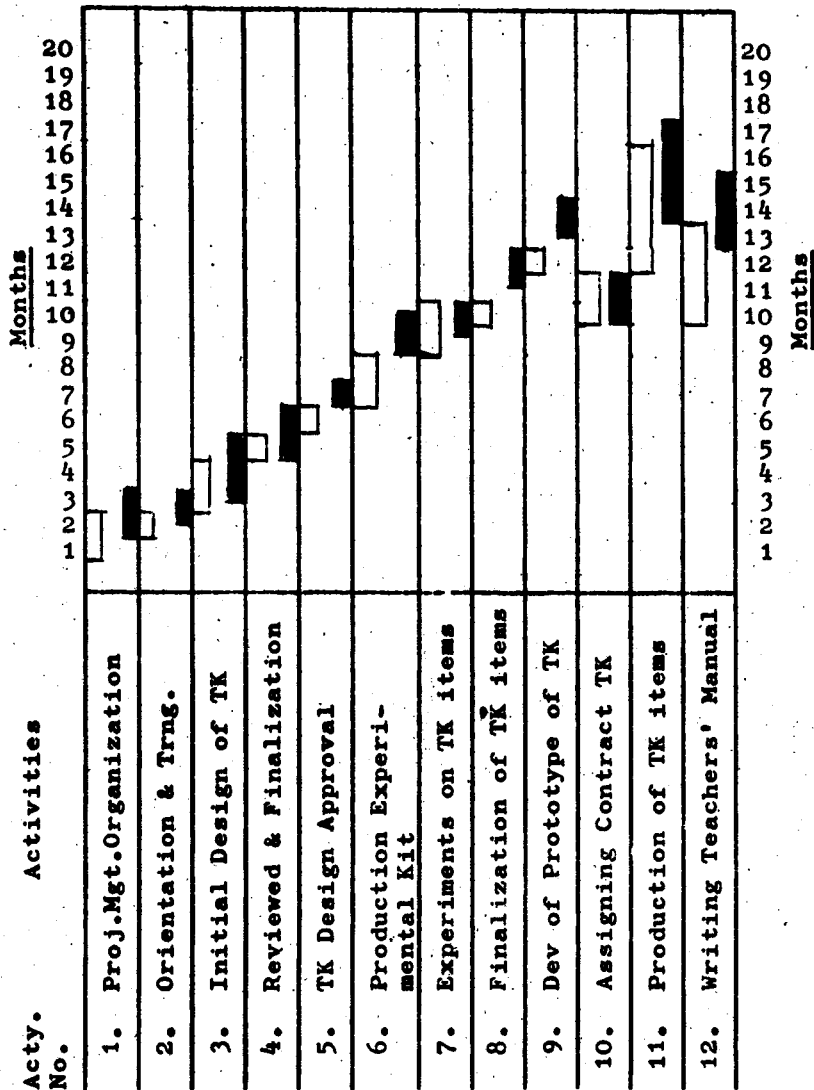


Fig: 3(a)
Gantt Chart showing project implementation plan and
as it actually happened

2. *The Progress Chart:* The Progress Chart is used to show accumulative work against time in relation to schedules. For the purpose of this course we will be using the Planning Chart. (See Fig. 3 for illustration).

a) **Uses of Gantt Chart**

In scheduling and monitoring the progress of a project the Gantt Chart has the following general uses (adapted from Goodman and Love, 1980, pp. 139-143).

1. The Gantt Chart can be used for scheduling the execution of various project activities by taking the earliest and latest starting and finishing dates (time) for an activity from the network. The planning can choose the exact timing of the activity taking into account resource availability, weather, spreading the work-load, manufacturing continuity etc.
2. It can be used as a simple and easily understood model for communicating information to all levels of project management and supervision. It is a possible plan which is easy to observe, interpret and use.
3. It can be used as a tool for monitoring the progress of the project by comparing the planned dates (time) for completing activities within dates. (Also see Unit-12 for use of Gantt Chart for monitoring project implementation.
4. The Gantt Chart makes it possible to graphically record and present on a single sheet of paper planning, scheduling and actual progress of a project.
5. It singles out the activities that are either behind or ahead of schedule so that extra resources can be committed or withdrawn.
6. It leads to management by exception i.e. level of those activities which are going satisfactorily and straightening those which are going badly.

b) Limitations of the Gantt Chart

Although the Gantt Chart has its uses and advantages in project planning and monitoring, it has certain limitations which a project manager should know. He has to be aware of them particularly because the other techniques of network analysis or project monitoring are used to overcome these limitations and each of the techniques (suggested for use in this Unit) are, in practice, complementary to each other and guide to progressive planning and implementation of projects. It is to be particularly noted that for monitoring the progress of a project the project manager should not rely solely on the use and application of any one technique. The author has visited several Project Management Centres in the country and he found that the most project managers tend to prepare and use Gantt Chart as the only project monitoring device. In some cases, the Gantt Chart appears to be used for decoration of office walls rather than for the practical uses. The very apparent reason for the situation appears to be the fact that many project managers do not fully understand the Gantt Chart and they don't balance between their advantages and limitations.

The illustrations of a Gantt Chart include:

1. A slip from schedule of project activities cannot be assessed in the schedule of the other activities. To overcome this difficulty a project manager must refer to the network analysis and the Critical Path Chart;
2. Up-dating of the Gantt Chart is carried out annually on the basis of changes in the network. It, therefore, can be slow and the information on the Gantt Chart may also sometime become outdated. It may also need to be completely redrawn with each rescheduling. Micro Computers can be used in certain projects to do this automatically;
3. Gantt Charts showing many activities cannot include sufficient planning and scheduling the details and become unnecessarily complex;
4. The Gantt Charts are efficient tools for the small projects with a limited amount of activity. They are not suited for use in the large and complex projects.

c) Structuring of a Gantt Chart

The following steps are suggested to be followed in structuring a Gantt Chart:

1. The project has to be broken down into discrete component activities (See Fig. 2),
2. The sequence (See Fig. 2) of execution of these activities should be especially based on the logical order of completion which ensures that all the prerequisite conditions created by one job exist for the next;
3. The duration of these activities must be estimated. This is done in random order for each activity is based on experience or the knowledge of the time needed for each component of the activity (See Fig. 4),
4. List the activities in sequence of time and determine those that could be carried out simultaneously and those that must be carried out sequentially. The list should include a column to show which activity must precede or follow each activity of the project (See Fig. 2).

2.4 Step 4: Milestone Chart

Although the Gantt Chart is considered to be primarily a tool of scheduling the activities which make up a project, it can with adaptation also measure the progress of a project. The concept of Milestones has been introduced as a modification and refinement of the Gantt Charts. The Milestone Chart provides points on the Gantt Chart for measuring progress. The Milestones represent significant events or important points of time in the life of the project or each project activity. (Goodman and Love 1980). The Fig. 4 shows the development and conversion of a Gantt Chart into a Milestone Chart.

a) Uses of Milestone Chart.

A Milestone Chart is used to serve the following purposes:

1. Milestones can be checked up as they are reached. They thus help to monitor the schedule of a project activity and record

any slip in the schedule of a project activity;

2. The Milestones transform tasks into related events and activities and so a relationship between the starting and finishing time of various activities;
3. Besides providing an extension in the use of Gantt Charts, Milestones have also led to the development of the system of network analysis and planning for project implementation. The use of dependency arrows in Milestone Charts as shown in the Fig. 5 determine the time and place of each important event in the project and thus set out a logical precedence of the project activity. This, in turn, provides a basis for project evaluation and review technique (PERT) approach to project implementation planning.

b) Determining Milestones from the Gantt Chart

Milestones		Activities
No.	Description	
1	Setting up project management organization:	1 — Project Management Organization 2 — Orientation and Training
2	Teaching Kit design and development of experimental Kit	3 — Initial Design of TK 4 — Review and Finalisation 5 — TK Design approval 6 — Production of experimental Kit 7 — Experiments on TK items 8 — Finalisation of TK items
3	Development and production of Teaching Kit	9 — Dev. of prototype of TK 10 — Assigning contract TK 11 — Production of TK items 12 — Writing Teacher's Manual 13 — Approval of Teacher's Manual 14 — Printing Teacher's Manual 15 — Compilation of Kit items
4	Teachers to be trained in the use of Teaching Kit	16 — Trng. Master Trainers' Level I 17 — Trng. Master Trainers' Level II 18 — Training of Teachers
5	Delivery of Kits	19 — Kits delivery to provinces 20 — Kits delivery to Districts 21 — Kits reach schools
6	Use of Teaching Kits begins in schools	22 — Use of TK begins
7	Education	23 — Evaluation

Figure 4—a

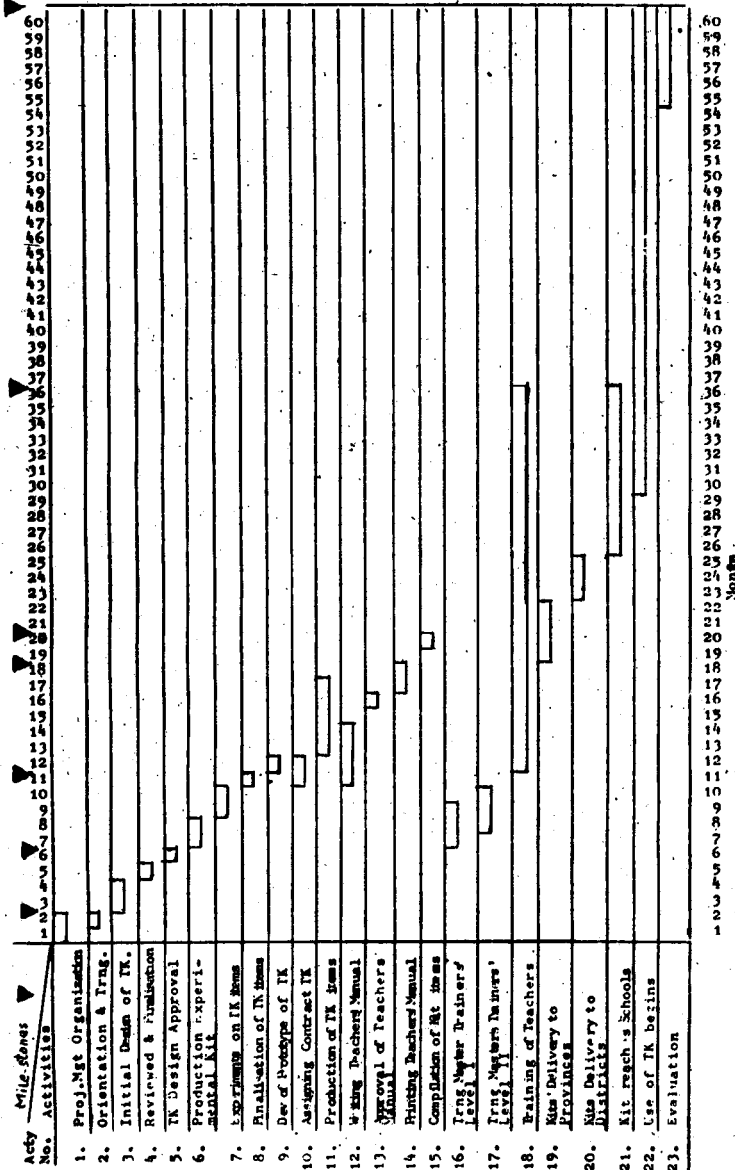


Figure 4-b
Gantt Chart: Plan of Teaching Kit
Project showing milestones

b) Project Breakdown into Manageable Tasks/Activities (for network analysis)

i) Project Activities

Set-up project management organization
 Design the teaching kit
 Prepare teaching kit for experimentation
 Prepare the prototype of teaching kit
 Manufacture teaching kit item
 Prepare and print teacher's manual
 Train teachers for use of teaching kit
 Train teachers for use of teaching kit
 Distribute teaching kits to schools

Use of Teaching Kits Begins in Schools

Sequence Number	Project activities for basic network Planning	Activity time in months
0	Project implementation activity begins	—
0 — 1	Set-up project management organization	—
1 — 2	Design the teaching kit	—
2 — 3	Prepare teaching kit for experimentation	—
3 — 4	Prepare the prototype of teaching kit	—
4 — 5	Manufacture teaching items	—
4 — 6	Prepare and print teacher's manual	—
4 — 7	Production of teaching kits for distribution and use	—
7 — 8	Train teachers for use of teaching kits	—
7 — 9	Distribute teaching kits to schools	—
9 — 10	Use of kits begins in schools	—

Fig: 5
Project activities and estimated time for drawing a critical path

2.5 Step 5: Critical Path Method (CPM)

The Critical Path Method is also known as Critical Path Scheduling (CPS) or Critical Path Analysis (CPA). Therefore, the terms and their abbreviations are usually used interchangeably to denote the same thing. The CPM evolved out of the scheduling network. The CPM was first used in 1957 as a device to improve the planning, scheduling and coordination of a plan construction (Heyel 1963 p. 142). As described in the Encyclopaedia of Management (1963) "the CPM is a mathematically ordered system of planning and scheduling for programme management, assisted by electronic data processing which makes possible a balanced, optimum, time-cost schedule to assure timeliness and minimum use of resources. One of the new families of planning and control techniques developed in the recent years, it is in many respects very similar to Programme Evaluation and Review Technique (PERT)." For some time the CPM was not made public by its inventors and first users. However, it soon became public and with this the CPM based routine project management became very popular. Within a couple of decades many new elaborate and sophisticated editions were developed and added to the basic techniques of CPM.

a) Preparation of a CPM

The CPM is based on the principles of network analysis and in the development of a workplan for implementing a project. The following steps are to be followed (Goodman and Love, 1980, p. 150):

1. Identification and listing of project activities. These project activities are already identified and listed at Step 2 (Fig. 2). However, as a project planner or a project manager proceeds with his work he may conceive more or few activities or sub activities. But, it is always feasible to include many activities in the CPM network because, more elaborately a CPM network lists the activities more control it provides over the project implementation.
2. *Preparation of the Project Graphic Model or Arrow Diagram:* In this Unit, for the purpose of this course, in general, we will be using the Arrows Diagram of a CPM because it is comparatively easier to draw and follow. (See Fig. 6).

3. Estimating activities' duration and introduction of time in the network (See explanations of the concepts used in CPM network in the following pages).
4. Calculating the scheduling time of the activities and events and determining floats and critical paths.

The Fig. 6 represents a typical CPM network plan. The following concepts are used in relation to a CPM network plan and the reader is advised to study and follow them (see figure 7):

1. *Activity*. An activity in a CPM Diagram represents a work item, a job, or a task necessary for completion of a project that uses time and other resources and has a definable beginning and an end.
2. *Arrow Diagram*. An Arrow Diagram shows the plan and the logical interrelationship among the opening activities of the project. Each arrow refers to a separate activity (representing one activity only). An arrow, therefore, has one tale and one head and cannot be interrupted. The tale of an arrow marks the starting point of a project activity and the head represents the completion of that activity.
3. *Nodes or Events*. The starting and ending points of activities are the intersection of two or more activity arrows are called Nodes or Events which represent a point in time. All activities ending into an event must be completed before any activity starting from that event can begin.
4. *Milestones*. The events represent accomplishment of important intermediate project objectives within the network are called Milestones. The Milestones are used in monitoring the progress of the project.
In the Fig. 6 the readiness of the Teaching Kit for distribution is an example of a Milestone.
5. *Precedents*. Each arrow within the network implies the logical precedents of the activity represented by that arrow.
6. *Dependency or Dummy Arrows*. In the CPM network a Dependency or Dummy Arrow is represented by a broken

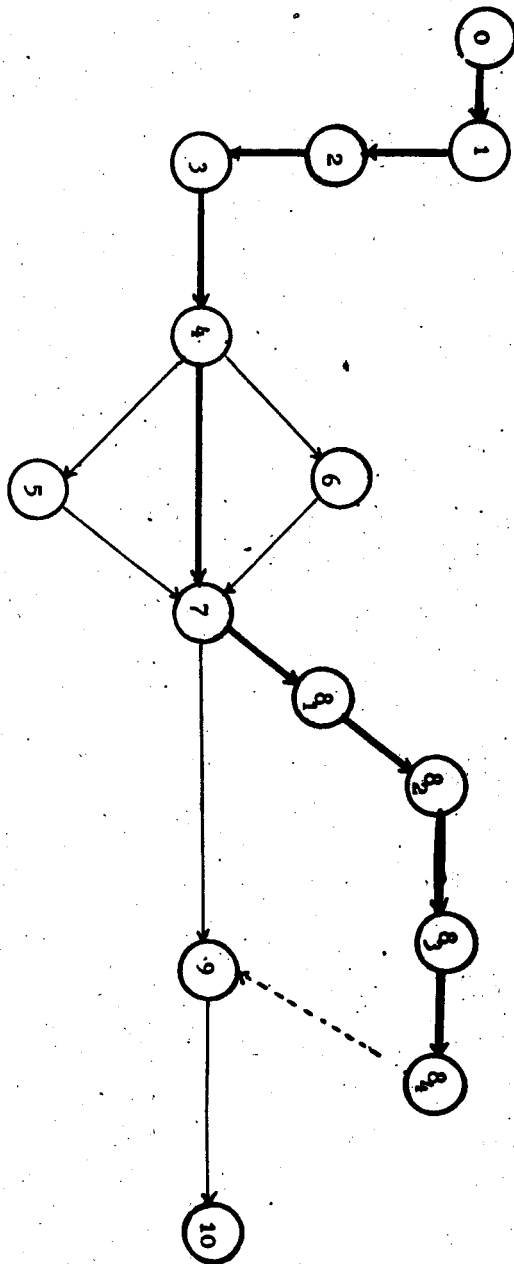


Fig: 6
The network with activity duration and critical path
(The Teaching Kit Project)

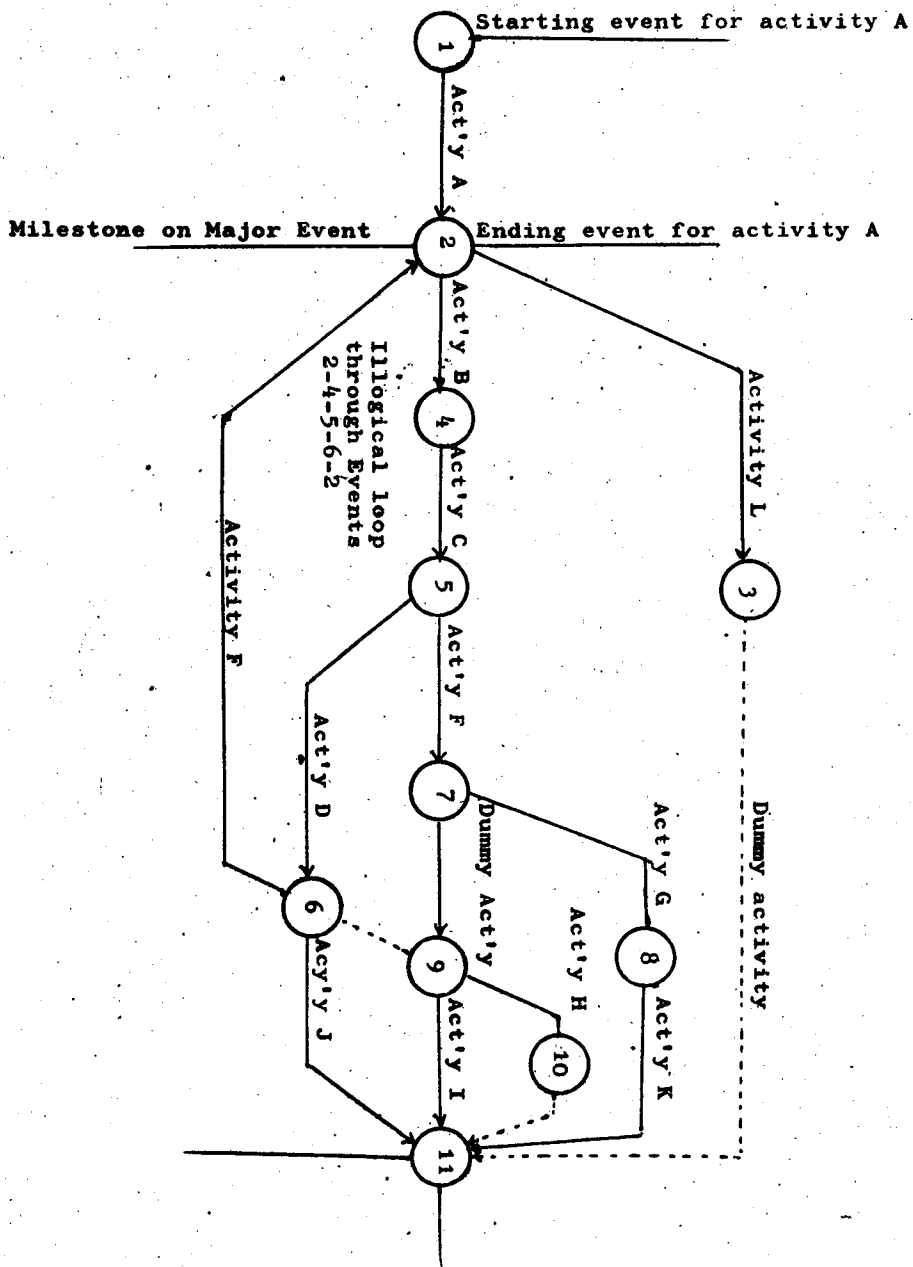


Fig: 7
Illustrations used in CPM Network

arrow (— — — —). It represents a dummy activity that uses zero resources or time. (For example the arrow linking the activities of distribution of Teaching Kit and use of Teaching Kit in schools). The purpose of a Dummy Arrow is to show that activities earlier in the network must be completed before the activity at the end of the Dummy arrow is completed.

7. *Illogical Loop.* Formation of illogical and absurd loop in the CPM network plan shows that the planning is illogical. It has, therefore, been avoided in the CPM network plan. However, it should be remembered that arrows cannot go backwards in a CPM network plan. An arrow going backwards is tantamount to showing that before this activity begins it must end. This precisely explains what an illogical loop is.
8. *Time Estimation in Network.* The time estimates in network planning, denotes duration of each project activity within the network and determines the time cost likely needed for completion of an activity assuming that it is carried out in a normal way by a normal work, and under normal conditions using a normal level of resources.
9. *Time Estimation.* The estimation in preparing a CPM network plan is not an easy job nor can it be done by simple guess work. As Grey (1981, p. 35) says "the intuitive methods for . . . don't do the job in complex network": In fact intuitive methods may even give mis-direction. For project managers it is essential that they have a basic understanding of what the time means and how it is estimated. The project managers should be able to interpret the results of the manual or computer generated events and activities and slack time.

Estimating time for each activity is, perhaps, the most successful and demanding part of the exercise. It requires knowledge and experience of each constituent of an activity and is best undertaken by a specialist in the field covered by the activity. For example, estimates of time to construct a building should be done by an architect or surveyor. estimates of time to produce a text book should be made by a publisher or a printer. The procedure is to select activities at random, calculate the time they will take and repeat the process until all activities have been covered. Only then should the times be added up and the total time

estimated. This approach will give a more realistic estimate of the time or resources that the project will require for completion.

If the total and dissipated time for the project is used as the starting point there exists the temptation to estimate each activity to fit to the total time. The result will be that each activity will overrun and the whole project will fall behind schedule. The random order, selection of activities will avoid this problem.

c. Event Time

An Event Time in CPM refers to the time from which a project activity is planned to begin and end. There are three types of Event Time that need to be completed for CPM network plan (Grey 1981):

- a) *Early Event Time (T_e)*. The Early Event Time for a project activity is the longest path from the initial project started event to the selected event in the network — the initial project point always starts at Zero. This assumes that the activity starts at the earliest time after long for the computation of all preceding activities.
- b) *Late Event Time (T_l)*. The Late Event Time is reverse of computing early event time. It is the latest allowable time for an event to occur. But it doesn't change the occurrence of the project ending event. The T_l is set on the basis of working days. It means that the commencement of the activity is left to the last possible date to allow all the following activities to be completed within the total time estimated for the project.
- c) The event slack refers to the amount of time for which an event can be delayed without disturbing the completion time of the final event in the network. A number of events cannot be delayed without extending the duration of the project. These activities are said to lie on the critical path and must be started as soon as the preceding necessary activities are completed.
- d) **Other Implications of Time Estimation**

The time estimation in CPM also has its implications for cost and

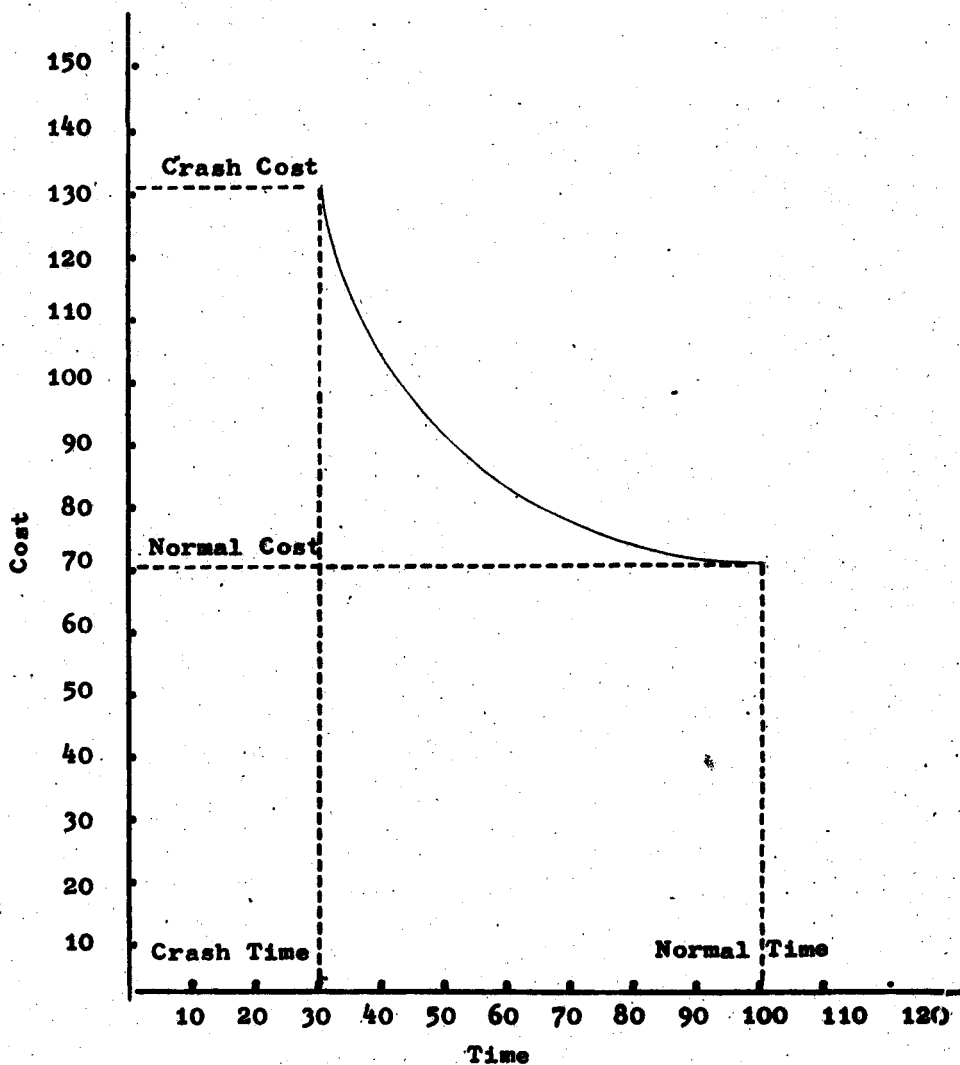


Fig. 8
CPM Time-Cost Relationship

Project: TEACHING KIT PROJECT

Activity* Numbers	Normal		Crash	
	Duration	Cost	Duration	Cost
0-1	—	—	—	—
1-2	—	—	—	—
2-3	—	—	—	—
3-4	—	—	—	—
4-5	—	—	—	—
4-6	—	—	—	—
4-7	—	—	—	—
7-8	—	—	—	—
7-9	—	—	—	—
9-10	—	—	—	—

*See Fig: 5 for Project Activities

Fig: 8 (a)
Estimates of normal crash cost and duration
of project activities

scheduling of a project. Since there is always a possibility of an activity being delayed in its start and, therefore, needing to be finished earlier than the normal schedule so that the objectives of the project can be accomplished without disturbing the date of the completion of the project, the concept of normal and crash time has also been introduced in the network plan to overcome such situations.

- a) *The Normal Time.* The Normal Time denotes the time most likely needed for completion of an activity under the assumptions that it is carried out under the conditions anticipated.
- b) *The Crash Time.* The concept of Crash Time is based on the assumption that an activity has to be completed in less time than estimated whether because a project starts late or the accomplishment of a project has to be accelerated. In either case this need for acceleration of a project activity can be achieved by a crash time programme which implies that the work has to be carried out more quickly usually by the utilisation of more resources under the changed conditions. The normal and crash time are related directly with the cost of the project or an activity of the project (See Fig. 8).

2.6 Step 6: Programme Evaluation and Review Technique

The Development of Programme Evaluation and Review Technique (PERT) followed immediately the introduction of the CPM. In a way it can be called an improvement of the CPM. The two techniques are so similar that sometimes they are confused with each other. The two techniques have a close resemblance as they both use arrow diagrams in identical manner. However, there are the following differences between the two techniques.

“PERT was initially designed to handle research and development projects using a computer. The first important step in this technique is the identification and scheduling of key events or Milestones which, if they are not met on schedule, will cause the project to fall behind schedule. Minor Milestones within the major ones also are identified, schedules and their occurrences monitored regularly.

Because the PERT system was originally developed for monitoring and controlling the progress of projects, the major emphasis in the

PERT network is on accomplishment of events or Milestones in contrast to the CPM network in which the major emphasis is on the status of activities. Consequently, in the past decade there has been a trend in the PERT network towards recognition of the importance of the activities.

Another important difference between CPM and PERT is in the way each considers uncertainty in estimating the activity duration and the project completion date. CPM assumes only one time and one time estimates for each activity during, in PERT in addition, by using statistical calculations, the probability of the earliest and latest occurrence of important project Milestones is obtained (Goodman and Love 1980 p. 162),

a) **Steps in Preparing a PERT Network***

The following steps are suggested to be followed in preparing a PERT NETWORK:

- a. *Identification of activities and Milestones.* Identification of activities and Milestones is the first step in the preparation of a PERT network. The techniques used in this connection have been presented in detail under the project break-down structure and under CPM network production.
- b. *Preparation of the project graphical model.* As in CPM, the project graphical model in PERT is constructed by linking together in logical order the various project events as shown in Fig. 8. This is usually done in a table using all the activities and then adding the immediately preceding activities on the left and immediately following activities on the right.
- c. *Introduction of time element.* In PERT Diagram, the rough time estimates are given for each activity. These time estimates are represented by:
 - i) t_o = the *most optimistic* duration
 - ii) t_m = the *most likely* duration
 - iii) t_p = the *most pessimistic* duration

* Adopted from Goodman and Love

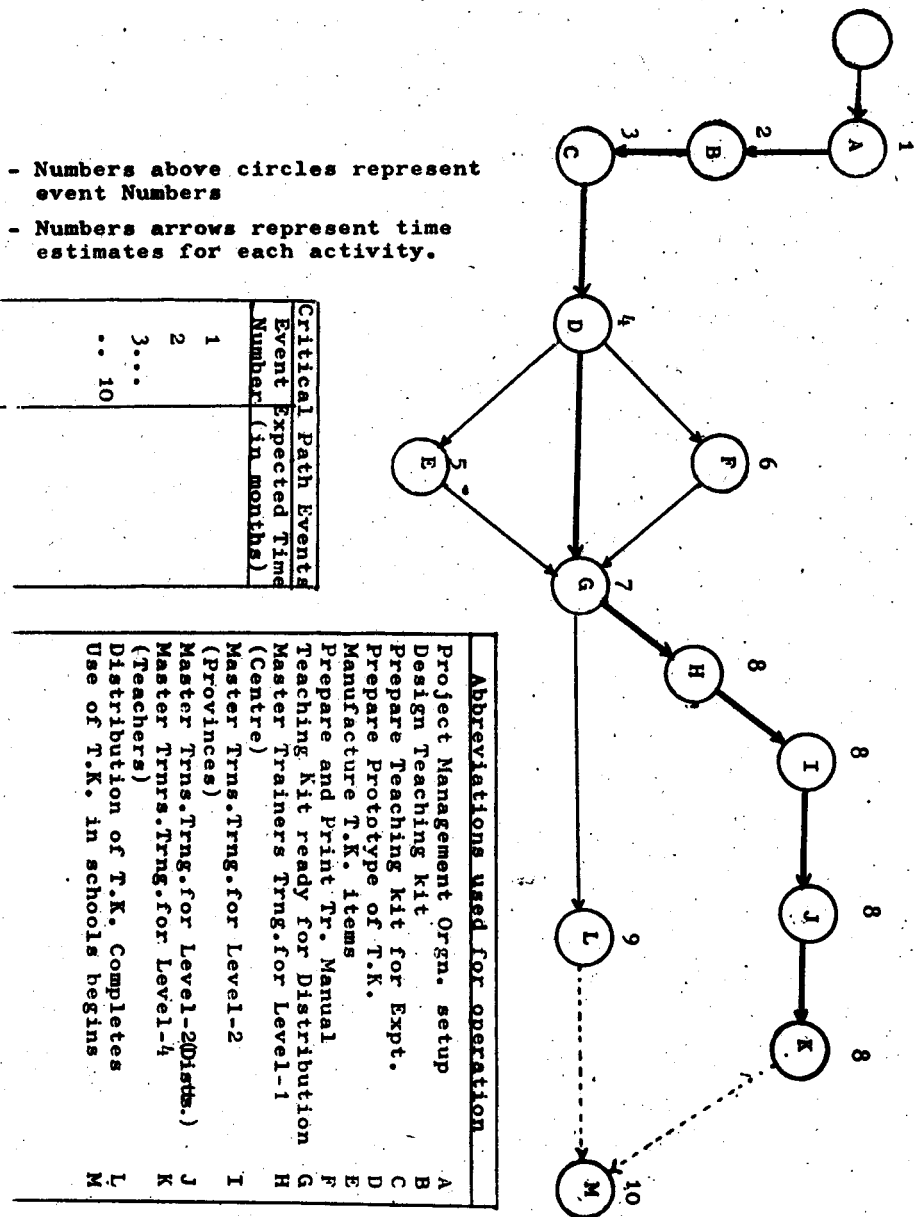


Fig: 9
(Programme Evaluation and Review Technique)

iv) t_e = the *estimated time or expected time*

$$t_e = \frac{t_o + t_m + t_p}{6} \quad (\text{Lock 1969, pp. 62-63})$$

In this connection it is important to note that whichever statistical basis is chosen the PERT will produce a critical path in just the same way as the critical path method. The emphasis in PERT, however, changes for cost-time analysis to a statistical prediction on completion probability against time.

b) Advantages of PERT over CPM

The PERT Diagram is known to have the following advantages over the CPM:

- a) The PERT gives the project management or the project manager the ability to plan the best possible use of resources to achieve the even goals within the overall time and cost limits;
- b) it enables the executives to manage "one-of-a-kind" programmes, as opposed to repetitive production situations. It means that each project is taken as a project of its own kind. It helps avoid repetition of experiences and situations in the similar project;
- c) it helps the project manager handle the uncertainties involved in programmes where no standard time data of the Taylor-Gantt variety is available because the PERT Diagram presents activities in the sequence in which they should take place to complete a sub-project or the project;
- d) the PERT Diagrams utilize a so called "time network analysis" as a basic method of approach to determine manpower, material, and capital requirements. A time network analysis determines the approximate time which each activity requires for completion. (Heyl—1963 p. 685).

3. SELF ASSESSMENT QUESTIONS

1. What are the elements of a good project work-plan?
2. What are the steps which a project manager should follow to prepare a work plan for implementation of a project?
3. What is meant by project break-down structure and what is its use in a project work-plan?
4. What are the uses and limitations of a Gantt Chart?
5. What are mile-stones? And how do they complement a Gantt Chart?
6. What is CPM and what advantages does it have over Gantt Chart?
7. What are the various concept used in a CPM?
8. What are the complications of time estimation in project implementation?
9. Describe a PERT diagram and compare it with CPM as a tool of planning and monitoring project implementation?

REFERENCES

Goodman, L: J & Love, R.N. (Editors) *Project Planning and Management*, Pergamon Press, New York, 1980.

Gray C.F., *Essentials of Project Management*, Petrocelli Books, Inc. 1981.

Heyel, C. (Ed.) *The Encyclopedia of Management*, Van Nostrand Reinhold Company, New York, 1963.

Lock, D., *Project Management*, Gower Press Limited, London, 1969.

**SCHEME FOR THE PROVISION OF
TEACHING KITS TO PRIMARY SCHOOLS OF PAKISTAN**

**Audio Visual Teacher Education Unit,
Ministry of Education
(Curriculum Wing)
Sector H-9
Islamabad
December, 1975**

PART — A PROJECT DIGEST

1. **Name of the Project,** Provision of Teaching Kits to Primary Schools of Pakistan.

2. **Authorities responsible for:**
 - i) **Sponsoring** Curriculum Wing, Ministry of Education, Govt. of Pakistan.
 - ii) **Execution** Provincial Departments of Education.
 - iii) **Operation and maintenance:** Provincial Departments of Education in collaboration with the Bureaus of Curriculum, Education Centres and the Bureaus of Audio Visual Aids.

3. **Time required for completion of project.** 1976-81

4. (a) **Plan provision** NIL
- (b) **If project is not in the plan what warrants of its inclusion in the Plan.** The Education Policy (1972-80) has stressed a great deal on the provision of Teaching Kits and instructional materials to the educational institutions throughout the country. This decision of the Education Policy has not yet been fully implemented. In order to effectively implement the new curriculum, it is highly essential to provide these basic facilities to the teachers.

5. **Relationship of the project with the objectives of the Sector.** The project has been designed to implement the following decisions of the Education Policy.

- 10.4 A large-scale in-service teacher assistance programme will be undertaken to enable practising

teachers correctly and effectively to teach the new curricula.

- 2.13 Adequate library books, educational toys and other audio vido visual aids will be provided to all schools.

6. Capital cost of project

In lakh Rupees

Local Cost	400.00
Foreign Exchange Component:	—

Total: 400.00

7. Annual recurring expenditure after completion

Nil

8. Objectives of the project preferably in quantitative terms

1. To provide teaching kits to all the primary schools (numbering about 80,000) in the following subjects:—

1. Urdu, 2. Maths, 3. Social Studies, 4. Science, 5. Islamiyat,

Prepared by:

Mohammad Ilyas,
Assistant Educational Adviser,
Ministry of Education
(Curriculum Wing)

Checked by:

Dr. Shaukat Ali Siddiqi,
Deputy Educational Adviser,
Audio Visual Teacher Education Sector,
Ministry of Education.

Approved by:

Dr. R.A. Shah,
Joint Educational Adviser,
Curriculum Wing,
Ministry of Education.

Date:

1.12.1975.

PART - B
PROJECT DESCRIPTION AND FINANCING

9. Location of the Project:

(a) Name of the place and administrative district in which the service centre will be located

1. Curriculum Wing,
Ministry of Education.

2. Department of Education in all the provinces and Azad Kashmir

3. Directorate of Central Government Educational Institutions, Islamabad.

(b) Total area which will be served

Primary Schools of the entire country (1976-1981)

10. Existing facilities

Very little exploratory work has been done in the provinces to provide any equipment/aids/teaching kits to the primary schools of their respective regions.

DESCRIPTION OF THE PROJECT

Pakistan Government has firm commitment for universalization of elementary education for boys by 1985 and for girls by 1990 along with the desire to design the system of elementary education in such a way that those who drop out after 8th class must carry with them, basic knowledge, skills and attitudes which they can use in their future vocations and thus contribute positively to the economy of his local community. The new system, therefore, needs to be designed to produce an open minded citizen with a dynamic, creative and objective out look of

life and a deep concern for the improvement of the society in general and his community in particular.

The Education Policy, inter-alia, envisages that.—

“The system of elementary education will be so designed that the knowledge and skills imparted, attitudes implanted and the learning methods employed will ensure that those not proceeding to secondary education can be usefully absorbed into the economy of the local community . . .”

This is a commitment both in quantity and the improvement of quality of instruction. If we continue increasing the number of schools without taking into consideration the quality factors under the given financial and human constraints, the real purpose of universalisation of education may not be achieved. By using outdated approaches to teaching, doing cook-book type experiment/activities in the class room, it is just impossible to improve the quality of education. It is only through new innovative techniques and effective use of instructional technology that we can achieve the desired long range goal of producing citizens who could positively contribute in the economic growth of the country effectively in whatever jobs they may be assigned in future. In order to implement this aspect of the Education Policy, it was deemed necessary that some concrete steps must be taken to improve the quality of education at the elementary stage.

The most strategic entry point in bringing a forward looking change is to reorganise and reorientate our outdated and outmoded Teacher Education Programme in line with the emerging socio-economic changes in the country. The new curricula can not be implemented unless the entire school system has facilities in terms of equipment and trained manpower of qualified teachers to incorporate the new spirit and philosophy which has inspired the entire process of curriculum reforms in the country.

Keeping these considerations in view, the Curriculum Wing has developed a comprehensive project on teaching kits to be provided to all the primary schools of Pakistan for the improvement of primary education. UNICEF has provided a generous grant to collaborate with the Ministry of Education in its efforts in the improvement of quality education at the primary level. This project is to be launched in a phased manner.

We know that an understanding of the basic Science and Mathematics is essential for our future Farmer, Technician, Doctor, Scientist and Teacher. The rapid march of Science and Technology in the last two decades has caused educators to realise that teaching in today's 'space era' must differ in emphasis, purpose and kind from that of 'pre-space' exploration era. The emerging socio-economic changes in Pakistan are geared to rapid shift towards Science and Technology and demand a programme of education with entirely new dimensions.

Present knowledge explosion demands that our students must learn to identify problems, seek their solutions, interpret their conclusions with statistical principles and laws. This means acquiring an understanding of basic principles and developing skills of observation, experimentation and an attitude of questioning and exploring.

Most people in real life encounter their environment as a whole. They do not experience Physics/Chemistry/Maths/Social Studies as such. Most citizens do not have to have all of contemporary knowledge at their fingertips, nor do they need to be able to conduct sophisticated scientific research. They do need, however, to learn how to seek information effectively, how to make sensible judgement from inadequate data, how to get answers for themselves about the situations they experience.

It is on this philosophy, that teaching kits for primary level were designed and developed. They are designed to promote understanding of the process rather than facts. This unique innovation in experimentation aims at the total development of the personality of the learner through the effective involvement of the senses in the observation, exploration and understanding of the natural as well as man made environments through inquiry and open-ended activities which children can perform at home, at school or even under a tree with the help of a self contained, self sufficient package of essential activities without necessary paraphernalia of additional laboratory facilities.

This scheme is being envisaged as a comprehensive programme for the age group of 5-10, based on Piaget's stages of the development of children. Instead of stressing learning of facts, development of basic scientific concepts and principles in the context of their natural environments and applications of process has been emphasised. In short, experimentation has been based on understanding of the process. It is the process of observing, investigating, exploring and analysing that can bring knowledge deemed necessary for living better in this world activated by

science and technology. The Education Policy has emphasised the need for the improvement of quality of instruction by providing teaching kits and audio visual materials to the educational institutions at all levels in the country. The Government has, therefore, established a National Instructional Technology Unit within the Curriculum Wing of the Ministry of Education to provide the necessary leadership role for the production and supply of new teaching materials to the educational institutions.

The Instructional Technology Unit has constituted a National Committee on the production of teaching kits. This Committee has already prepared a list of items which are to be included in the proposed teaching kits. The prototype of the National Teaching Kits has already been produced at the National Educational Equipment Centre, Lahore.

I Summary of the Steps Already Taken for the Development of the Kit.

The following steps were taken in the process of prototype kit development:

1. Content analysis: Content was analysed from level I—V keeping in view the sequential aspects of concepts from simple to complex.
2. Some major concepts were selected in view of their importance and role they play in the understanding of the fundamental concepts likely to trigger the curiosity of child by creating interest and motivation in learning.
3. On the basis of these selected concepts, activities were planned and written.
4. Out of the numerous activities that could be performed in the class room situation, only those activities were chosen which in the opinion of the national committee were likely to be interesting, exciting and motivating for children of age group 5--10.
5. A comprehensive list of the equipment/materials needed to conduct these selected activities was then prepared.

6. Keeping in view the professional experience of the experts and their areas of specialization, the national committee assigned specific activities to various experts to be prepared in their institutions for possible use in the prototype of national teaching kit.
7. From among the numerous activities/models/toys developed by the individual experts during their last 1—2 years independent research, suitable activities/models/charts/experiments were chosen by the committee of experts for inclusion in the proposed National Teaching Kit.
8. On the recommendations of the National Committee, the National Educational Equipment Centre, Lahore, was commissioned to develop a prototype of the national teaching kit.
9. The National Committee also decided that a teacher's manual on 'how to use the kit effectively' should also be prepared. This teacher's manual is now in the final stages of development and during next meeting of the National Committee the manual will be discussed, modified and approved. Soon after its approval, it will be printed for distribution along with the kit to the selected primary schools for experimental trial.
10. The National Educational Equipment Centre, Lahore, on the recommendations of the National Committee has now finally prepared a prototype of the National Teaching Kit for selected trial and after suitable modifications, it is likely to be distributed to all primary schools of Pakistan.
11. This multipurpose teaching kit consists of self-contained and self-sufficient package of open-ended activities in Science, Maths, Social Studies and Urdu along with a teacher's basic tool box and teacher's manual describing possible ways of conducting the activities for slow learners, average learners, and suggests additional activities for talented students, thus meeting the individual differences of children — a very crucial aspect of human learning.
12. This teaching kit will be partially tested in the selected primary schools of Pakistan on population (rural-urban and boys-

girls) basis and on the basis of the results, it will be modified and changed. After this limited experimental try-out, the kit will be distributed to all the primary schools of Pakistan according to a phased programme.

13. Orientation workshops are now being planned by the Ministry of Education to train the master-teacher trainers in the know-how of the kit so that teachers are acquainted well before they actually start teaching through kit. In this connection, a comprehensive in-service and pre-service programme for training teachers is also under way.
14. The potential of this innovation in improving teaching — learning situation at primary level would be further explored as more research and experience is accumulated over a period of years.

II. Recommendations of the National Committee on Teaching Kit

The National Committee on Teaching Kit consisting of scientists, educators, curriculum experts, equipment experts, and working teachers made the following recommendations:

1. This Committee strongly recommends that this National Teaching Kit may be approved by the Federal Ministry of Education and be distributed to all the schools of Pakistan as soon as the desired number of Teaching Kits have been manufactured through a phased programme.
2. The Ministry of Education should impress upon UNICEF to get all the items manufactured from local manufacturers of Pakistan.
3. The quality control should be made the responsibility of the National Educational Equipment Centre, Lahore.
4. For supply and distribution purposes the first priority should be given to all the Teacher Training Institutions, both in-service and pre-service, Curriculum Bureaux and the Teacher Training Colleges. The kit should be distributed to urban and rural institutions on the basis of population figures.

5. The Committee also decided to prepare a Teacher's manual to go along with the Teaching Kit, consisting of basic equipment lists in simple line diagram, concepts to be developed, materials needed and procedures in line with the spirit of the new curricular approaches. The manual will also include guidelines for the teachers, suggested activities for talented students with special instructions for maintenance and procurement of expendable materials and evaluation form for feed back information etc.
6. The Committee also proposed that a provision of some suitable recurring expenditure for the schools which are to be supplied with these kits be made by the provincial governments concerned.

III. Mode of Operation:

For the mass production and distribution of the Teaching Kits, the amount involved in this project will be issued as grants-in-aid to the National Educational Equipment Centre, Lahore.

Details of the kits in science, mathematics, urdu and social studies alongwith teachers tool kits are appended in annexures 'A' — 'E'.

12. Date of estimation of capital expenditure 1.12.1975

13. Capital cost	(In Lakh Rupees)				
	76-77	77-78	78-79	79-80	80-81
Local.	100.00	100.00	100.00	50.00	50.00
F.E.C.	—	—	—	—	—
Total:	100.00	100.00	100.00	50.00	50.00

14. Basis of cost estimates A National Committee on the production of Teaching Kits was constituted by the Federal Ministry of Education. This Committee held its first meeting at the National Educational Equipment Centre, Lahore,

in the month of February, 1975. This Committee prepared a list of items which are to be included in the teaching kits. The Committee also worked out the cost of each item. The lists prepared by the Committee are enclosed with this scheme.

- | | |
|---|--|
| 15. Estimate of annual re-curring expenditure after completion. | Nil |
| 16. Unit cost output | All the 80,000 primary schools will be provided teaching kits. |
| 17. Expected income | The scheme is intended to provide adequate facilities for the improvement of instruction in the country. Better education will result in better manpower training which is the essence of all developmental activities in the country. |
| 18. Annual phasing of physical requirements | <p>(In Lakh Rupees)</p> <p>76—77 77—78 78—79 79—80 80—81</p> <hr/> <p>Local cost 100.00 100.00 100.00 50.00 50.00
 (for detailed phasing of physical equipments, please see table-1).</p> |
| 19. Foreign Exchange Expenditure | Nil |
| 20. (a) Likely sources of foreign exchange | Nil |
| (b) Present position regarding availability, commitment or negotiations | UNICEF has agreed to provide Rs. 25 lakhs for the production of Teaching Kits for the primary schools. |

21. Sources of rupees
component

Government of Pakistan

22. Results of the Project

i) Direct benefits

About 80,000 primary schools will have teaching kits to effectively implement the new Curriculum.

ii) Indirect and other
benefits

The provision of teaching kits to primary schools would provide the teachers with the essential resources required for the improvement of instruction. The qualitative improvement of instruction would help introduce the curricula in a more effective manner.

23. (a) Approximate number and categories of job opportunities likely to be created

(a) the production and distribution work of the teaching kits will be done in the private enterprises throughout the country under the supervision of the National Educational Equipment Centre, Lahore.

(b) Economic life of components of project.

(b) About 25 years.

24. (a) Manpower

Nil

(b) Likely shortage of manpower

Nil

(c) Steps to be taken to assure availability of manpower

Nil

(d) Approximate number of persons re-

Nil

quired to be trained
per year.

(e) Total capital outlay Nil

25. Physical and other facilities required for the project. Nil

26. Materials, supplies and equipment requirements

A-I. Total requirements of building The Production of 80,000 teaching kits will be entrusted to the private enterprises throughout the country. The prototype of the teaching kit is being produced at the National Educational Equipment Centre, Lahore.

A-II. Materials, spares and supplies and equipment for operation of project These institutions involved in the project already have adequate manpower/equipment facilities to produce these materials.

27. Imported materials and equipment for execution a) Justification for imports Nil.
b) Proposed source/sources of supply Nil.

Table—I
PROVISION OF TEACHING KITS TO THE PRIMARY
SCHOOLS DURING 1976-81.

(In Lakhs)

Sr. No.	Name of item	76-77	77-78	78-79	79-80	80-81	Total
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Provision of Teaching
Kits to the Primary Schools
with the following break-up

for different subjects:

- 1) Science list (See Annex-A)
- 2) Mathematics list (See Annex-B)
- 3) Urdu list (See Annex-C)
- 4) Social Studies list (See Annex-D)
- 5) Teachers' Tool Kit (See Annex-E)
- 6) Include Boxes, Packing/ transportation expenses.

Total Rs. 500/-
Complete package of kits
for each school

Approximate number of schools* to be covered each year	0.20	0.20	0.20	0.10	0.10	0.80
--	------	------	------	------	------	------

Estimated expenditure involved Rs. 500/- per teaching kit package per school	100.00	100.00	100.00	50.00	50.00	400.00
Total.	100.00	100.00	100.00	50.00	50.00	400.00

* The present number of schools is 55,000. It is estimated that on the existing trend of increase, the number of primary schools in 1980-81 will be about 80,000.

**LIST OF EQUIPMENT AND OTHER COMPONENTS OF A
TEACHING KIT FOR PRIMARY CLASSES**

TEACH

**LIST OF EQUIPMENT AND OTHER COMPONENTS OF A
TEACHING KIT FOR PRIMARY CLASSES**

Annexure "A"	—	Science List ...	Rs.200.00
Annexure "B"	—	Mathematics List ...	Rs.100.00
Annexure "C"	—	Urdu List ...	Rs. 40.00
Annexure "D"	—	Social Studies ...	Rs. 60.00
Annexure "E"	—	Tools/Instruments ... for Teachers	Rs. 35.00
		Packing etc. ...	Rs. 40.00
		Miscellaneous ... including trans- portation, meet- ings etc.	Rs. 25.00
Total			<u>Rs.500.00</u>

ANNEXURE "A"

**NATIONAL TEACHING KIT
FOR PRIMARY CLASSES
(I - V)**

SCIENCE

Sr. No.	Item	Specifications	Qty	Cost in Rupees
1.	Bottles wide mouth.	8 OZ. capacity	2	3.00
2.	Box for mounting insects.	250 x 200 x 89mm with thick polythene cover	1	3.00
3.	Insect net	Curtain lining cloth-mosquito net with rust-proof frame	1	3.00
4.	Killing bottle for insects	An open mouth bottle with a vial full of choloroform and some cotton	1	3.00
5.	Balloons	Good quality	10 Nos.	1.00
6.	White Bamboo sheets	Half sheet ivory card	1	0.500
7.	Monocotyledon and dicotyledon seeds	Six kinds: wheat; caster beans; maize; date; gram.	50 grm each	1.500
8.	Plastic cups for seed germination	89mm dia. and 51mm height	4	1.50
9.	Cotton wool		¼ pkt.	0.50
10.	Plastic flower pots	153mm. height, 102mm dia.	5	10.00
11.	Cover polythene	Colourless envelope Urea	2 OZ	1.00
12.	Cover polythene	Colourless envelope	1	0.50

13.	Fertilizer	Urea	2 OZ	1.00
14.	Magnetic needle local made	North pole red painted 76mm length	1	1.00
15.	Iron fillings	51mm dia	2 OZ	1.00
16.	Magnifying hand lens.	With plastic handle	1	3.00
17.	Spirit lamp metallic	47mm dia. 54mm height	1	4.00
18.	Thermometer Clinical	Foreign made	1	3.00
19.	Spring balance		½ OZ	0.50
21.	Charts of plants, flowers, insects, animals and birds.	As per specimen 375 x 250mm.	5	10.00
22.	Glass marbles		20	0.50
23.	Astronomical charts	To be prepared by IER	2	10.00
24.	Balls (rubber)	102mm dia	2	2.50
25.	Sticking plastic tapes	As per specimen	1	1.00
26.	Simple hand made weights	Weight of 1 gm 1 : 2 gm 1 : 5 gm 1 : 10 gm 1 :	1 set	1.00
27.	Plasticine		100 gm pkt	2.00
28.	Light kit with 2 mirror strips	Consisting of card board box 300mm x 153mm x 102mm with inner walls blackened. The kit comprises of the following items		
		i) Two mirror strips	1 set	18.00
		102mm x 25mm		

- ii) Crescent and star as per kit.
- iii) Model of cock
- iv) Plain glass 2mm x 155mm x 95mm
- v) Mirror 2mm x 75 x 100mm
- vi) 4 spring steel strips 40mm x 6mm x 1½mm
- vii) One card board sheet 190 x 145 x 1½mm
- viii) One perspex sheet 1½mm x 95mm x 155mm
- ix) One perspex opaque sheet 155 x 95 x 1½mm
- x) 4 sheets of card board ¼ x 155 x 95mm
- xi) One plastic ball 12mm dia
- xii) One card board sheet 155 x 95 x 1½mm
- xiii) Three rubber bands
- xiv) Hook 18mm size
- sv) Plastic prism 25mm x 25mm x 25mm length.

29.	Measuring cylinders	100ml. plastic	2	4.00
30.	Sound box with memberan'e kit	As per specimen	1	2.00
31.	Monocord sound box	As per specimen	1	5.00
32.	Microscope kit local	The clips must be made of spring steel; reflecting mirror should be revolving one.	1	65.00

33. Animal picture cards	Comparable size, actual colour and the skin to be clearly shown (as per specimen).	7	7.00
34. Slotted weights with hanger for spring balance	As per specimen	1 set	8.00
35. Periscope	As per specimen	1	3.00
36. Comb	Small, plastic	1	0.50
37. Electroscope, plastic kit	As per specimen	1	1.00
38. Common pins		½ pkt	1.00
39. Methylated spirit		4 OZ	2.00
40. Cart. folding type	As per specimen	1	8.00
Total.			200.00

ANNEXURE "B"

MATHEMATICS

Sr. No.	Item	Specifications	Qty	Cost of Rupees
1.	Open abacus	140 plastic beads of 144mm dia in 7 different colours	1 set	36.00
2.	Counting tray	As per specimen	1	10.00
3.	C. B. Strips	As per specimen	500	3.00
4.	Number cards (place value and expanded notation).	As per specimen	46	3.00
5.	Number cards with picture cards (CB)	As per specimen	18	3.00
6.	Number cum picture cards (CB)	As per specimen	45	3.00
7.	String	1 mm dia.	10 yds.	1.00
8.	Signed number cards (CB)	As per specimen	20	2.00
9.	Symbol cards	As per specimen	1 each	1.00
10.	Models of geometrical figures (triangle; square; rectangle; parallelogram, quarrilateral; trapeziam, rhombus; circle.)	Made of unflexible 16swg gauge steel wire	9	8.00

11. Shapes showing regions of geometrical figures mentioned in item	Sand paper	9	3.00
12. Models of hollow cube and cuboid	5cm x 5cm cube Hard board 5 x 3 x 2 cm cuboid	1 each	4.00
13. 1cm square strips	As per specimen	110	2.00
14. Wooden models of cylinder, sphere, hemisphere and cones	Sphere should be seamless; model of hemisphere should be provided separately, sphere; 300mm dia; cylinder; 50mm dia; 80mm. length. Cone: 47mm dia; 82mm length	1 each	12.00
15. Meter rod	As per specimen	1	5.00
16. Decimeter rod	Plastic	2	1.00
17. Coloured chalks	As per specimen	1	2.00
18. Graph paper	35cm x 30cm (In centimeters)	1	1.00
Total:			<u>100.00</u>

UNIT-8

SCHEDULING OF RESOURCES

Written by
Dr. M. Athar Khan

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REFERENCES

OBJECTIVES

After having studied this unit you will be expected to:

1. Identify and workout resources requirements of a project which includes:
 - a) manpower;
 - b) materials and equipments;
 - c) finances;
2. schedule resource requirements of a project by using the Gantt Chart and CPM diagram.

INTRODUCTION

Resource scheduling has been a concern of project planning organizations for a long time and so much has already been written on the subject. Accordingly, several models of resource scheduling are available now to the managers. Some of these models, however, are very technical because they were not designed specifically for education projects nor were they particularly designed for use in a country like Pakistan where the nature of education projects, structure of project management organisations and responsibilities of project managers are different from other countries and have their own problems and limitations. In this course, therefore, an attempt has been made to develop a resource scheduling model which is simple and which suits to the needs of most projects in the country. It is, however, possible that in some cases these models may have certain limitations and problems of use. But it is hoped that with little ingenuity the project managers and planners would overcome them.

The unit on "Scheduling of Resources" is in fact an extension of the previous unit — "Workplan for Implementing Projects". In describing the work-plan, the focus had been on project break down structure; Gantt Chart; Mile-stone Chart; Critical Path Scheduling and Programme Evaluation and Review Technique. These are techniques and tools available to project planners and managers for ensuring good planning and management of projects. The emphasis was on project activities and their time-scheduling. In this unit some of the above tools and techniques will be taken up with a view to their uses for scheduling of resources needed for a project.

1. Identification of Resources

A project is planned keeping in view the resources which would be available, and which would be ensured before or during the implementation of a project. At first place it involves identification of resources needed for implementing the project. These resources, usually comprise (a) finances, (b) manpower, (c) material and equipment.

Identification of resources needed for a project must necessarily follow the project break-down into sub-projects or manageable tasks. A sub-project may comprise a single activity or a set of activities and tasks to be completed as part of the projects; it consumes resources.

Unless these resource needs are known, their quantities are pre-determined, and their availability is ensured, it would be difficult to manage a project without causing upsets in its cost and time estimates. A careless identification of resources and uncertainties of its supplies are known to have often resulted in a chaotic end of some education projects in the country.

In large-size projects, identification and estimation of resource requirements for the project activities and the whole project is difficult job. Use of a computer is advisable in such case. However, in simple and small size projects manual methods can be conveniently used. For example, Gantt Chart of a project, in many cases would provide a basis for determining the resource needs of a project. Accordingly, the Gantt Chart shown in the Fig. 3 of the previous Unit 7, could be used for determining the activity or sub-projectwise requirements of money men and materials. Each of the activity as shown in the Gantt Chart, is presented with reference to the time required for its completion. But, the chart also yields the following information about resource needs:

- a) money needed to:
 - i) engage manpower required for project management and related activities
 - ii) meet the expenses involved in transportation, travelling and allowances.
- b) type of manpower required to perform specific jobs alongwith the duration for which it is required.
- c) requirement of material; in this example the pieces of articles which form the Teaching Kit.

Similarly, CPM and PERT Diagrams could be used for manual scheduling of resources. It should, however, be remembered that each of these methods has its uses and limitations and, therefore, at times is feasible to use more than one methods for good resource identification.

2. RESOURCE SCHEDULING

Resource scheduling is the process of converting a project work plan into an operating time table of resource needs of the project. Depending upon the nature of a project and the estimated time to complete the project, the scheduling could be in weeks or months whichever is convenient to the project management organization. As it is in case of project-activity and time schedule described in the last unit, project planners and managers can use the models of Gantt Chart, CPM and PERT Diagrams for scheduling of financial, manpower and material resources of a project.

2.1 Why Resource Scheduling

For any public or private sector project availability of resources is generally limited. Resources such as money, men, material and machinery are seldom available in an unlimited amount for use in any project. When resources are limited, the project manager has to schedule the activities in such a way that the available amounts are not exceeded (Goodman and Love, 1980 p. 174). A careful resource scheduling makes it possible for a project planner to avoid crude guesses, under-estimation or over-estimation of project cost resulting from unchecked use of materials and money and over or under employment of men in a project. Resource scheduling also helps project managers against the problems of changing levels of resources required during a project. For example, in a project 'X' in the first month it may be sufficient to engage a project manager, a typist-clerk and a 'daftari' perhaps the full staff would not be required till the third month after the project begins. In the months which follow the number of field staff required could fluctuate or in some cases even part time people could do the job. Certainly in such case appointing the whole staff in the first month and engaging them throughout the project period would not be economical. They may even create management problems in the project. Similarly, machinery and material which is procured before it is actually needed may have its own problems. An example of this situation was the purchase of workshop tools and machines for a Polytechnic institute before the building was ready to properly store and install them. This happens in many cases and causes so much loss of money and material. A careful scheduling of resources not only helps to minimize wastages in project, but they also provide the project managers a means to monitor and control the project as it progresses.

2.2 Methods for Resource Scheduling

The following methods are known to be in use for project resource scheduling:

- a) *Computer methods.* In projects which are large, complex and utilize shared or multiple resources for project activities, it is only feasible to do computerized resource scheduling. Computerized method uses the RAMPS (Resource and Man-power Scheduling Systems), RPSM (Resource Planning and Scheduling Methods and RPC (Resource Planning and Control).
- b) *Manual methods.* The manual methods for resource scheduling are both economical and feasible for small-size and simple projects. Most education projects fall under this category. For manual resource scheduling a project planner or manager can use any one or more of the project network models—the Gantt Charts, CPM (Critical Path Method), and the PERT (Programme Evaluation and Review Technique).

Since this course has been written keeping in view the most common types of education projects in Pakistan, and the responsibilities and on-the-job training needs of the project planners and managers only, manual methods for resource scheduling have been included in this course. Detailed descriptions and guide-lines on the use of computer methods in project planning and management will be presented in some other course of the Educational Planning and Management Programme.

3: USE OF GANTT CHART FOR RESOURCE SCHEDULING

The Gantt Chart, like the one shown in Figure 3 of the previous unit—7, provides a basis for scheduling project resources. While a reference to a set time limit is essential, depending upon the nature of the sub-project or project activity resource scheduling could be done for months, weeks or even days. In some cases it may be feasible to use an open time schedule. This is particularly done in cases where a project activity has a long float time which means the estimated time for completion of this activity and the project activity of which this activity is a part can be extended without affecting other activities. Fig. 1 presents a model of a resource scheduling chart based on a Gantt Chart. It is a

multi purpose chart and can be used for scheduling of all types and kinds of resource needs for project. The project resource needs should be specified under the following:

3.1 Multiple Resource Needs

The multiple resource needs are project resource requirements such as which represent several different kinds of resources within a larger group such as 'manpower, material and equipment' etc. For example resource needs of a project for manpower may require several different categories of work force such as project managers; clerks; professionals like engineers; designers; teachers; skilled and unskilled workers; consultants; part time and adhoc employees and volunteers etc. Similarly, equipments and material could be of several specifications and kinds.

3.2 Single Resource Needs

The single resource needs represent a particular kind of a resource within multiple resource needs. For example a particular category of workers — say, unskilled labourers within the manpower resource needs of the project.

4. STEPS IN RESOURCE SCHEDULING BY GANTT CHART

The following steps are suggested to be followed in resource scheduling by Gantt Chart method. (For the purpose of illustration the Teaching Kit Project will be used in this section).

Step 1: List the project activities which would require financial manpower and material resources on the pattern of the project activities listed in Fig 2 of the unit 7. In some cases it could be possible to use the table of the project breakdown into manageable tasks but depending upon the needs of a project the project manager may develop a list of activities which help the resource identification more efficiently.

Step 2: Separate and list the activities or elements according to the resources they would require.

Example 1:

Project:	Teaching Kit Project
Resource requirement:	Manpower
Project activities requiring the resource:	1. Setting up project management organization; 2. Orientation and training of project staff; 3. Designing Teaching Kit; 4. Revision and finalisation of Teaching Kit; 5. Experiments on Teaching Kit; 6. Finalisation of Teaching Kit; 7. Writing Teachers' Manual; 8. Training of master trainers; 9. Project operation.

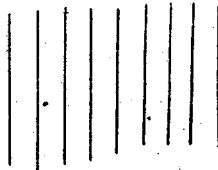
Project:	Teaching Kit Project
Resource requirement:	Material
Project activities requiring the resource:	1. Experimental Teaching Kit; 2. Teachers' Manual; 3. Teaching Kits to be supplied to the schools.

Project:	Teaching Kit Project
Resource requirement:	Financial
Project elements for requiring the resource:	1. Salaries and allowances of staff of management organization; 2. Allowances and remuneration of orientation and training staff; 3. Initial design of Teaching Kit;

Index No.	Months	Resource Needs
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
	.	
	.	
	.	
	.	
	60	

Figure 1
Resource Scheduling Chart

Project: _____
 Resource requirement: _____
 Project activities requiring the resource: _____



4. Finalisation of Taching Kit;
5. Production of experimental Kit;
6. Experiments and finalisation of Teaching Kit items for production
7. Manufacture of Teaching Kit items;
8. Writing of Teachers' Manual;
9. Printing of Teachers' Manual;
10. Training of master trainers, level-I;
11. Training of master trainers, level-II;
12. Training of master teachers;
13. Kit delivery to provinces;
14. Kit delivery to Districts;
15. Repair and maintenance of Teaching Kits items;
16. Evaluation.

Step—3: Prepare a resource scheduling chart on the pattern of Fig. 1. However, details of step 3 are given in the following pages with reference to scheduling of particular resource requirements.

5. SCHEDULING MANPOWER REQUIREMENTS BY GANTT CHART METHOD

Manpower resource needs could be scheduled at two levels. At first level the manpower requirements could be scheduled as multiple resource needs. For this purpose the manpower resource scheduling chart could be prepared as follows:

From the Gantt Chart of project activities and durations the project manager would calculate the total number of men required for each month (or as the case may be on weekly or daily basis). The Fig.2 shows a resource scheduling chart for manpower needs. The Fig.2-a presents an example of manpower schedule for first four months of a project. Indexes may be used for details of manpower requirements within each monthly schedule. For example, the project manager is appointed in the first week of the month whereas various categories of secretarial staff could be employed in the second, third or fourth week. The index sheet would record not only the duration for which persons would be

Index No.	Month	Manpower requirements
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	..	
	..	
	60	

Figure 2
Manpower requirement scheduling

Name of Project
Description of manpower required

employed but it would also give details of the levels and categories of project employees. In second month of the project while the staff appointed in the first month continues, some more persons would be engaged on a part time or adhoc basis or by utilising existing resources of some other organizations to provide orientation and training in specific project work to the project management staff. In the third month, the project management staff appointed in the first month and trained in the second month continues. Some experts from outside project management organization would be engaged on part time or adhoc basis for designing the Teaching Kit under a contract or some other arrangement to be worked out by the project manager. In the fourth month the men engaged during the third month would continue to work as required. Similarly, depending upon the schedule of activities, manpower requirements could be scheduled for the remaining period of the project.

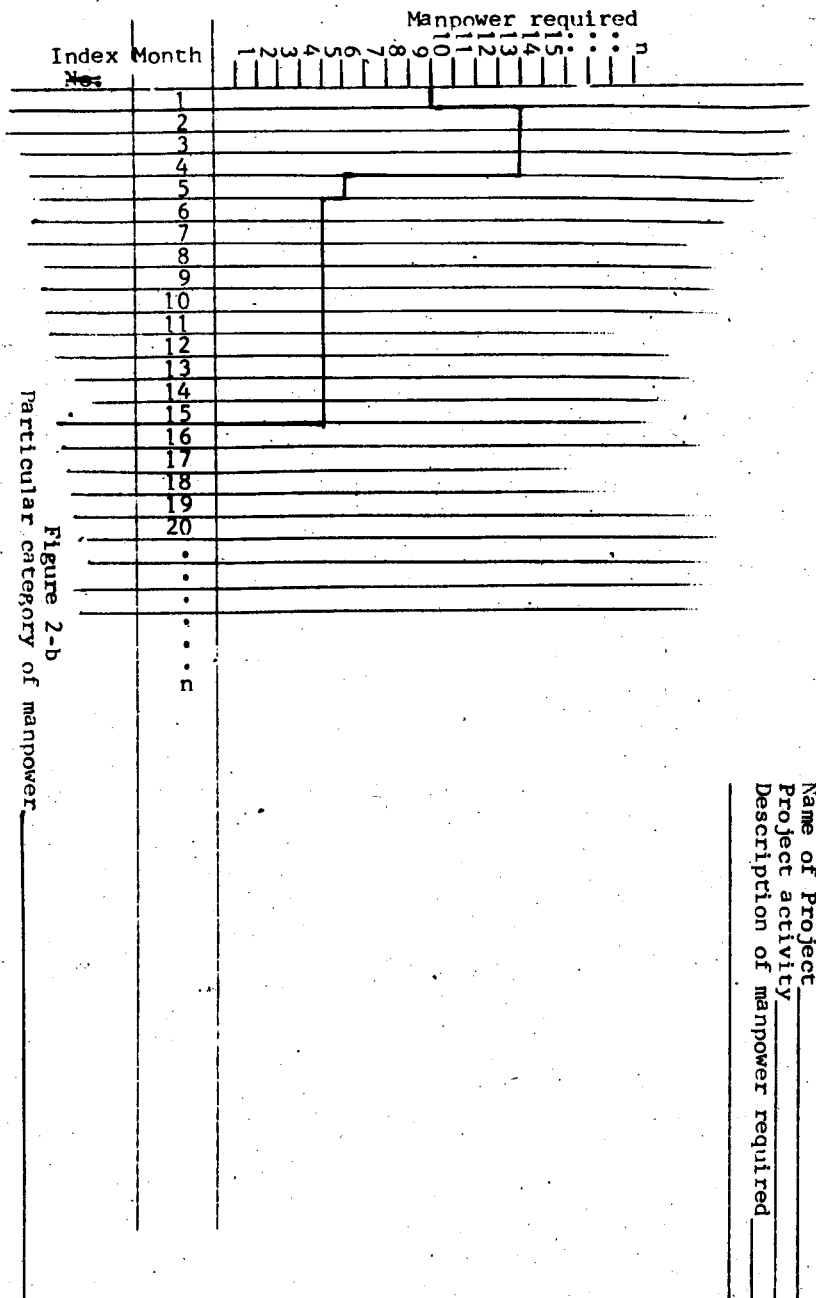
In cases where scheduling of men of different categories is needed, the chart in Fig.2 could be conveniently used simply by making a slight modification in it as shown in the Fig.2-b. The manpower requirements and their fluctuations throughout the project duration could be drawn by using the numbers of persons under the manpower requirements. The Fig. 2 can be used for scheduling the manpower in a particular category for each month during the project. As it was said earlier the index sheets could be used for further specifications of manpower requirements, wherever necessary. The project manager can adapt the chart to suit his specific needs of a project. For example, in a project which hires a varying number of unskilled members on monthly basis could be shown on the chart as presented in the Fig.2-b. It could be seen from the chart that in the first month ten persons were employed, in the second month the number went up to fourteen and the same number continued till the end of fourth month; in the fifth month only six persons were required and from six to fifteenth month only five men were required for the project. The requirement of this category of manpower ends at the end of the eighteenth month. Similarly, manpower requirements in individual categories could be worked out for any number of persons for any period during the project.

With slight modifications the Gantt Chart as illustrated in Figs 2, 2-a, 2-b, can be used for scheduling of money, materials and equipments required for a project.

Manpower requirements

Months	1	2	3	4
Index No.	1- Project management staff (1) Project Manager (2) Secretarial staff (a) ----- (b) ----- (c) -----	1. Project management staff (as for the first month) 2. Orientation and Training Personnel (1) ----- (2) ----- (3) -----	1- Project management staff (as in 2nd month) 2- Personnel to be engaged for designing kit	Same as for the 3rd month

Fig: 2-a
An example of scheduling manpower resource needs



Activity 1: From Fig 3 of the Unit 7 workout requirements of manpower and materials for the first 30 months of the project and prepare their schedule using the example of Figs 2-a and 2-b.

6. SCHEDULING MATERIAL AND EQUIPMENT REQUIREMENTS BY GANTT CHART METHOD

The scheduling of material and finances could be done more or less, on the same lines as the scheduling of manpower requirements. The project scheduling models presented in the Fig 2-a and 2-b could be used for scheduling requirements of materials and equipments. The Fig 2-a model could be used for scheduling multiple material and equipment needs whereas the model shown in Fig 2-b could be used for particular materials or equipment required for the project.

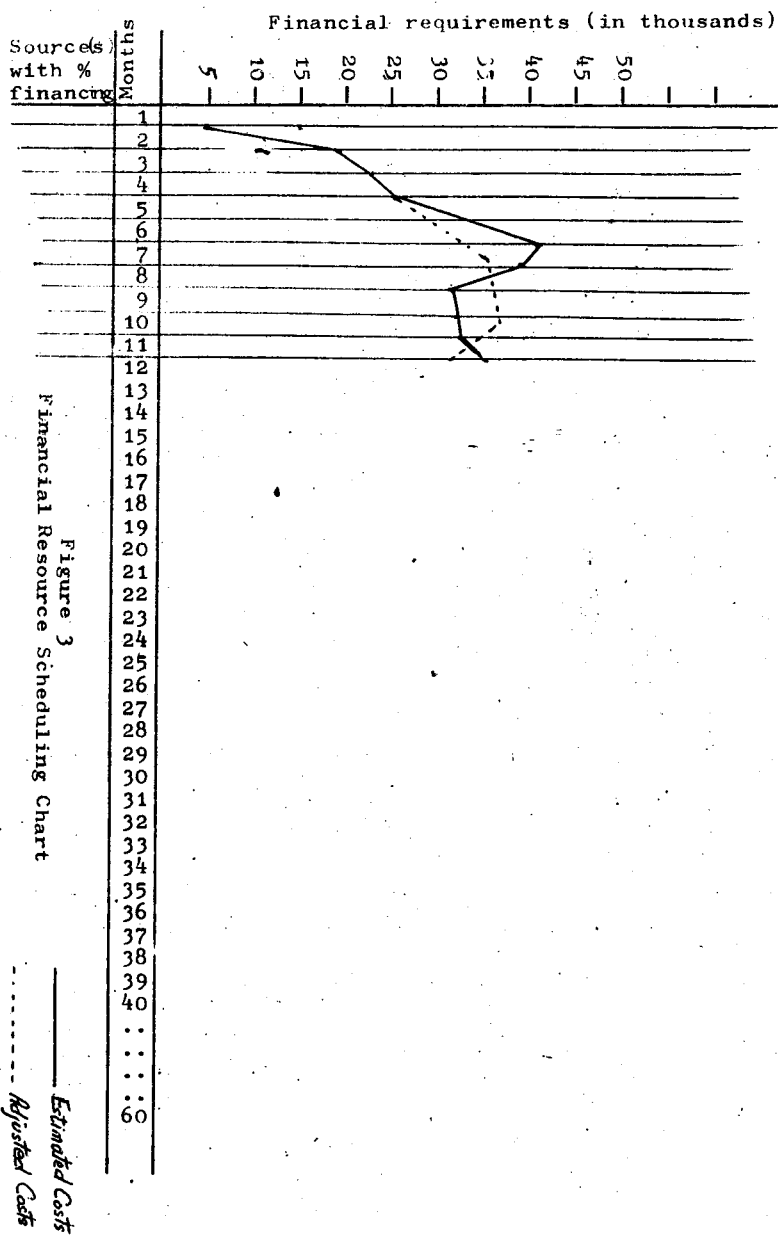
Separate index sheets, as suggested in case of manpower requirement, could be used for details of the materials and equipment: such as identification of sources, quantities, qualities, costs and nature and extent of their usage in the project.

Activity 2: Prepare a Gantt Chart of the requirements of materials and equipments for an education project for a period of three months on weekly basis. Use the examples of Fig 2-a and 2-b.

7. SCHEDULING FINANCIAL REQUIREMENTS BY GANTT CHART METHOD

The scheduling of finances is essential as an aid to manage the planning and control of a project. The financial requirements of a project could be worked out for each month, week, day or as the case may be for any length of time on the basis of the financial requirements, and costs of the project elements consuming financial resources.

Scheduling of financial requirements by Gantt Chart method necessitates a careful costing of financial requirements and distributions over the length of the project time. Scheduling of financial requirements of the project is a lengthy and time consuming activity and requires a team work.



Project _____

		Financial requirements (in thousands)										
Source(s) with % financing	Month	5	10	15	20	25	30	35	40	45	50	
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
	11											
	12											
	13											
	14											
	15											
	16											
	17											
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	28											
	29											
	30											
	31											
	32											
	33											
	34											
	35											
	36											
	37											
	38											
	39											
	40											
	..											
	60											

Figure 3-d
Financial resource Scheduling Chart
of project elements

Estimated Costs
Adjusted Costs

Project _____
Project element _____

The Gantt Chart model presented in Fig.3 could be used for scheduling monthly requirements of finances and for identification of the sources of financing. It should, however, be remembered that in scheduling resources by Gantt Chart method a reference to the time for which a particular resource is needed is essential, and, therefore, it is always useful to keep in view the Gantt Chart of project activities. (The one suggested in the Fig.3 of the unit 7 for reference)

Activity 3: Using the information given in the Gantt Chart in the Fig. 3 of unit 7 prepare a schedule of financial requirements for tenth and twenty fifth month of the project period.

In cases where financial resource scheduling of specific elements of project is required to supplement total project scheduling or for other project management requirements, the Gantt Chart model given in the Fig.3 can be easily used for scheduling financial requirements of individual project element. The Fig. 3-a presents a model chart for this purpose.

7.1 Limitations of the Gantt Chart

The use of Gantt Chart for resource scheduling, as illustrated and described in the preceding pages, in fact, provides for a time table of resource requirements and utilisation. The problem which could be foreseen in using Gantt Chart method is in its constant updating as result of fluctuations caused by the environmental factors (see Uni-6). The Gantt Chart provides for scheduling the resources with reference to the time for which they are required. It does not help in scheduling and monitoring resources with reference to the project activities or specific tasks. In cases where an activity has to be completed with limited resources and unlimited time and in cases where the situation is reversed i.e. limited time and unlimited resources, the Gantt Chart method is not of much help in scheduling resources as it is based on the time available for the completion of a project activity. Also in cases where a project activity has to be adjusted to a time table by crash time or cost, the Gantt Chart doesn't provide a simple and efficient method of resource scheduling to be followed.

8. RESOURCE SCHEDULING BY CPM METHOD

Although the Gantt Chart method provides for the simplest manual technique for scheduling project resources of all kinds, it has its limita-

tions which need to be supplemented for efficient resource scheduling and monitoring. The CPM method, as in case of network planning, also serves to help overcome the difficulties faced due to the limitations of the Gantt Chart in project resource scheduling.

As described earlier, the CPM Diagram is based on a schedule of activities, when accomplished in a succession which contribute to the completion of a sub-project on the project itself. The method of resource scheduling by CPM furnishes a basis for scheduling of resources with reference to project activities. This method, as explained in this section, caters for the flexibility which is essential to accommodate fluctuations and adjustments of time and resources during the implementation of a project. The following steps are suggested to be followed in resource scheduling by CPM method:

Step 1: Prepare a list of project activities as shown in the Fig 4. Depending upon the project needs, resource supplies or the management structure of a project the activities could be few or many as it was illustrated in the Fig 2 and 5 of the Unit 7.

Step 2: List the resources required for each activity.

Step 3: Draw a CPM network Diagram as the one suggested in the Fig 5.

Step 4: List the resources required to complete each activity over or under arrows showing starting and ending event for activities (See Fig 5-a, b, c).

Symbols	Project Activities
a)	Setting up project organization
b)	Designing the Teaching Kit
c)	Preparing Teaching Kits for experimentation
d)	Experiments on Teaching Kit and its finalisation
e)	Manufacturing Teaching Kit items
f)	Production of Teachers' Manual
g)	Compilation of Teaching Kit items for distribution and use
h)	Training of teachers
i)	Distribution of Teaching Kit to schools
j)	Project operation and evaluation

Figure 4
Project Activities for Scheduling
Resources by CPM Method

The resource requirements for each activity could be listed at one or two levels as the situation may demand;

Level 1: Total resources of a particular kind such as money, men or material could be listed in such a way that the CPM diagram shows the requirement of each type of resource need.

Level 2: In cases where it is essential to prepare CPM diagrams for particular resources within a resource group separate diagrams could be prepared for different types of resources: for example, a certain category of manpower, material or equipment needed for a project.

8.1 Advantages of CPM Method for Resource Scheduling:

Resource scheduling by CPM method has the following categories:

- 1) it facilitates monitoring of resource requirements with reference to project tasks or activities;
- 2) it helps make adjustments of resources within the project activities or sub projects;
- 3) it clearly shows the slack times of project activities so that it is possible to make easy adjustments of resources within project activities, without disturbing the time schedule of the project;
- 4) supplemented by the activity time, the CPM network scheduling of resources affords a project manager greater control over project resource management.
- 5) it helps resource scheduling adjustments with a view to accommodate slack time, crash time or normal time activities and over consumptions, savings or delays etc. in resource supplies.

8.2 Manpower Resource Scheduling by CPM Method

Use of CPM diagram for manpower scheduling is a convenient way of scheduling and monitoring manpower resource requirements for a project. The Fig 5-a shows an example of manpower resource scheduling

Project _____
 Resource requirement _____

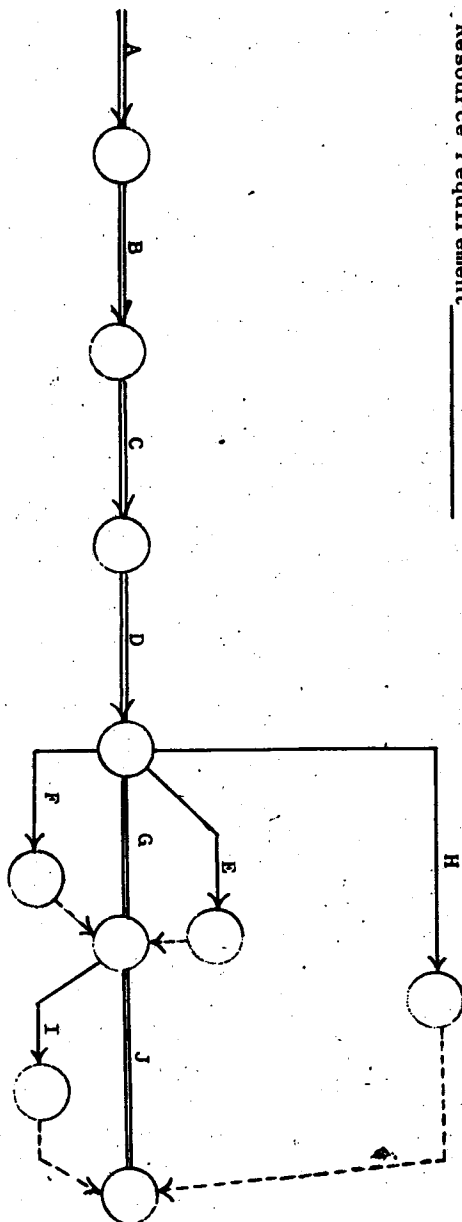


Figure :5

==== Critical Path
 == Activity Arrow
 - - - - Float Time

Project Teaching Kit
Resource requirement Manpower

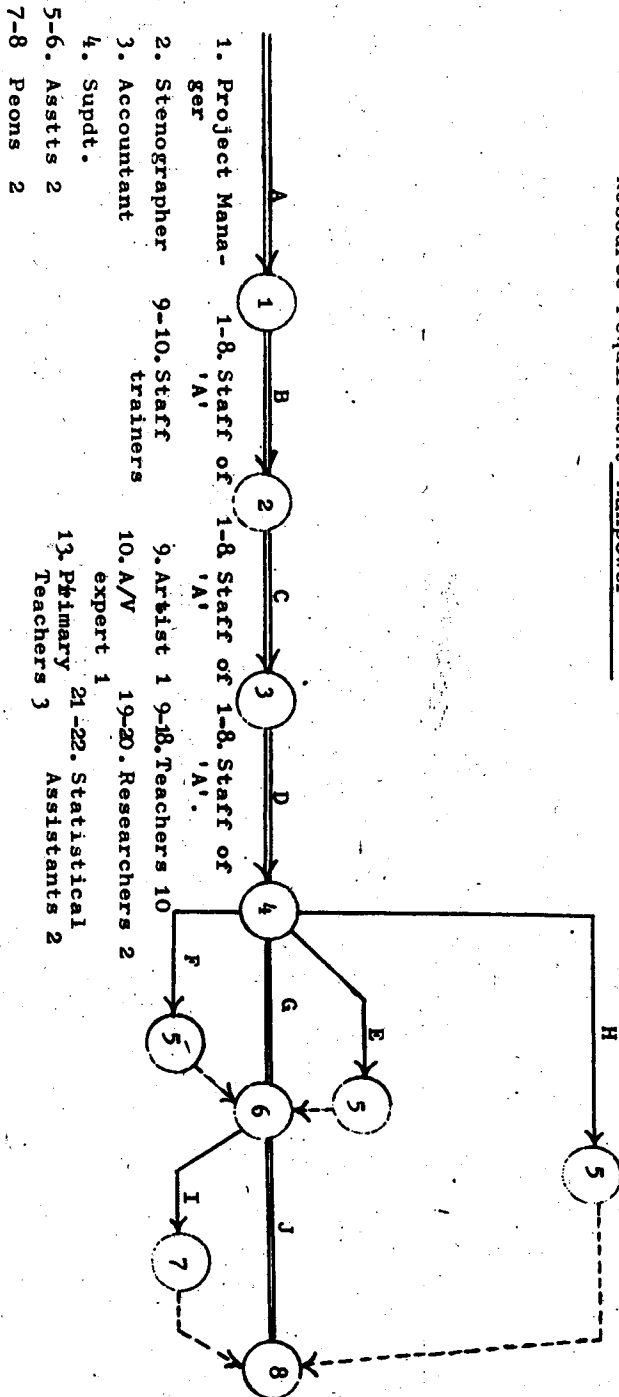


Figure 5-a
An example of manpower resource scheduling by CPM method

Project Teaching Kit
Resource Equipment and Materials

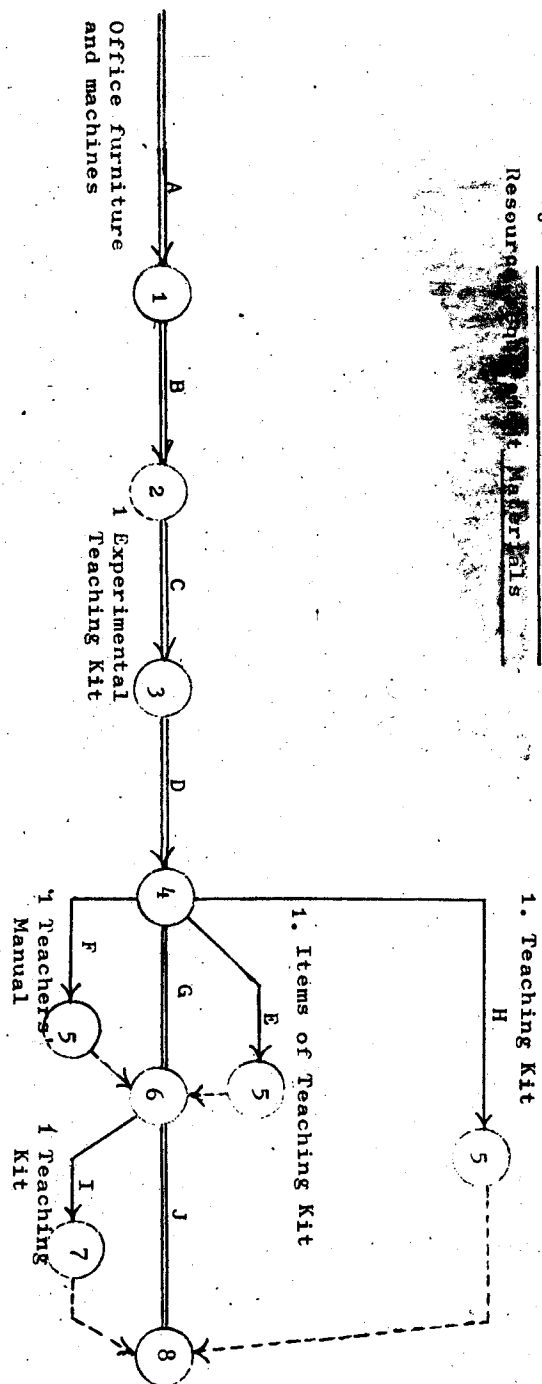


Figure 5-b
An example of material resource scheduling
by CPM method

Critical Path
Activity Arrow
Float Time

Project Teaching Kit
Resource requirement Finances

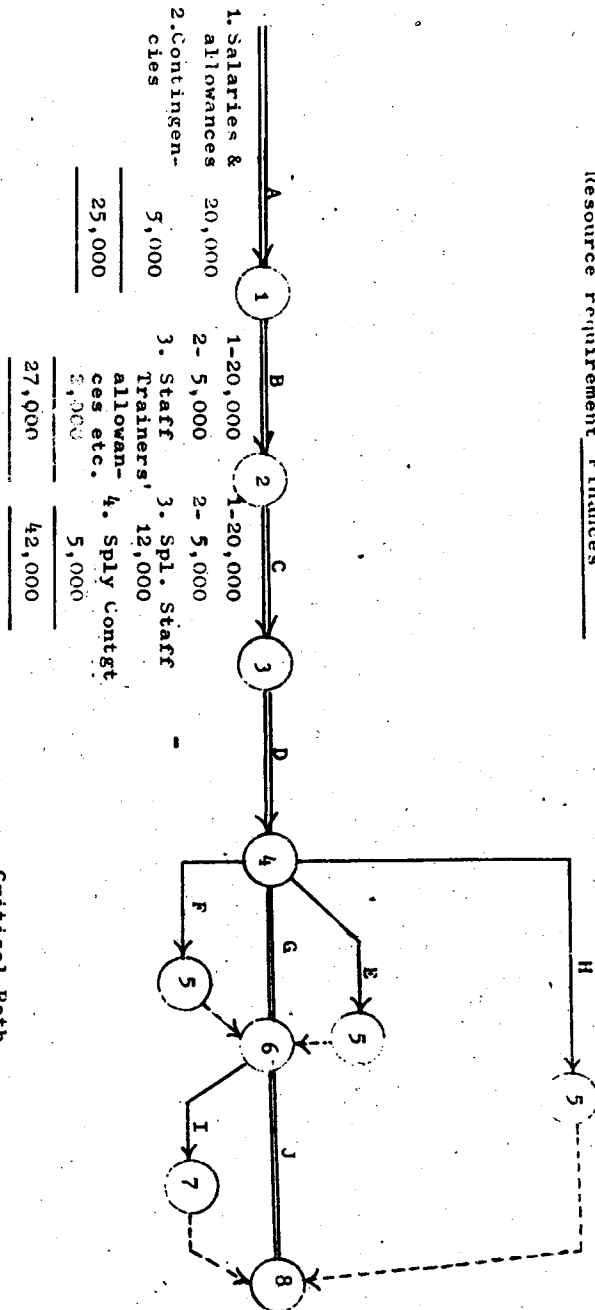


Fig. -c
An example of financial resource scheduling by CPM method

by CPM method. The manpower requirements for each activity are listed under or over the activity arrows. The diagram shows the manpower requirements with reference to each particular activity. As could be seen from Fig 5-a the manpower required for each activity varies from activity to activity.

The manpower scheduling by CPM method has its limitations in so far as it does not show the actual duration for which a certain type of manpower is required to complete an activity. The information could be found in a Gantt Chart a reference to which has been made in this course elsewhere.

Activity 4: In Fig 5-a manpower requirements for some activities have been given. Using the example and diagram as basis for manpower requirements complete the entries for the remaining activities of the project.

Fig. 5-a, 5-b, 5-c

8.3 Scheduling of Materials/Equipments Requirements by CPM Method

As it was in case of manpower requirements, the scheduling of materials and equipments could be done by CPM method with reference to project activities as shown in the example of material resource scheduling given in the Fig 5-b. It is to be noted that not all the activities require materials. It is to be remembered, however, that in some cases where it is not possible to list all the materials required (and their description) it is advisable to use separate index sheets for details. For example, in Fig 5-b the activity 'E' requires items of Teaching Kit. A list of Teaching Kit items as given in the PC-I form may be reproduced on a separate sheet. However, as the Teaching Kit's items are supposed to be prepared on contract basis it may not be necessary to prepare a separate list of these items for the purpose of CPM diagram and here it would suffice to specify the requirement as "Teaching Kit items".

Activity 5: Prepare a schedule of material resources required for an education sector project. Show activity-wise material resources required for the project.

8.4 Financial Scheduling by CPM Method

On the patterns of manpower and materials resource scheduling, financial scheduling could also be done by CPM method. Financial scheduling of project is based on costing of the project. The only adjustments which the costing of project needs for scheduling by CPM method, involves break-up of project costs by activities. The elements of cost usually involve the following:

Direct Materials: Materials identified with and allocated to cost units or cost centres.

Direct Wages or Labour: Wages or labour costs identified with and allocated to cost units or cost centres.

Overhead Expenses: Indirect materials, labour and other costs which cannot be allocated to cost centres but are apportioned.

Fixed Overheads: Indirect expenses which do not change with level of output or production.

Variable Overheads: Indirect expenses which vary with level of output or production.

Activity 6: The Fig 2-c presents a CPM model for financial scheduling of project activities. Complete the cost of activities according to your estimates and compare the total cost estimates of the project as given in the PC-I form of the project.

REFERENCES

Goodman, L.J. & Love, R.N. (Editors) *Project Planning and Management*, Pergamon Press, New York, 1980

Khan M.A., 'Scheduling of Resources', *Project Implementation, Monitoring and Evaluation*, Deptt. of EPM, Allama Iqbal Open University, Islamabad, 1986.

UNIT-9

**PROJECT PERSONNEL ORGANIZATION
AND MANAGEMENT**

**Written by
Dr. M. Athar Khan**

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INTRODUCTION

Most management organizations are known to have a permanent structure and have designated functions to be carried out by the persons constituting the organization. Such organizations have some sort of permanence. They are stable and have clearly defined organizational objectives and personnel functions. The personnel serving in these organizations usually have a security of job and benefits of accumulative experience of a particular job or type of work. In the context of Education, Ministry of Education, Departments of Education and their subsidiary Departments, organizations and Institutions, and some of the Semi-Government and private organizations are also known to have the stability, clearly defined organizational goals and personnel functions and they are characterised by some sort of permanence which means they have a past, a present and a future, and that the organization has no foreseeable end in future. A project organization, as it is implied in its name, exists to accomplish a particular job and comes to a natural end with the accomplishment of that particular job. A project organization, therefore, is characterised by an adhocism and the personnel associated with that organization have a temporary association with the organization. As it is the case in most education projects in Pakistan, the project management organization is either temporarily created as a part of Ministry, Education Department or its subsidiaries or the job is assigned to the permanent employees of these organizations. The larger projects sometimes necessitate hiring people temporarily to form the project management organization. In this latter case the relationships of the personnels of the project management organization are, therefore, very functional with those of the so-called mother organization.

This Unit deals with management organisations and personnel with specific reference to education projects. References to other than education projects appear only for the purpose of illustration. The Unit introduces two rather recent concepts "matrix organization" and the "strategic management" as aids to project managers.

The author gratefully acknowledges the assistance and expert advice of his friend and co-author of this course Steve Doherty in developing the outline of this Unit, and his contribution in its writing.

OBJECTIVES

After studying this Unit you will be expected to:

1. explain the unique nature of the project management organization;
2. discuss the concepts of the matrix organization and strategic management in the context of education projects;
3. write about the roles of project manager, and other project personnel.

PROJECT MANAGEMENT ORGANISATION

A project management organization is formed as a part of a larger organization to perform a particular job within a fixed period of time. The projects although they are known to be one specific job to be carried out in most cases especially in education projects it includes several different jobs that are performed under the project management organization and the project manager or the organization as a whole is also responsible for coordinating various activities. This diversity of functions within a project, therefore, makes it necessary that a temporary interdisciplinary team of personnel from several functional areas are associated with the project organization. It also happens that in the course of implementing a project the project management organization also works in association with several other organizations which are often independent of the control of the project organization or the larger organization of which the project organization is a part. For a project it is, therefore, difficult to conceive an appropriate organisational arrangement which could serve as a model. Therefore, when it comes to setting up a project management organisation which is suited to the unique requirements of the project and finding persons to man such an organisation it becomes more than a routine job of a manager or an administrator. The job of a project manager who is responsible for creating and establishing a project management organisation, therefore, is more challenging and more demanding than the job of a person who takes up as a manager or Head of a permanent organisation.

It is in this context that there is a need to treat project management organisation as a special organisation. The project management organisation as being a special organisation has been realised universally and in the last few decades a concern has been growing for overcoming the problems of project management organisations and for improving their efficiency. The articles on project management organisation which have been published in the last few years about the alternative organisational arrangements for project management, are indicative of the growing interest in this field. However, in view of the complexities of project management it will take some time to evolve the project management organisations which are more appropriate for the purpose of project implementation. According to Grey (1981) the number of articles suggesting alternative or organisational arrangements for projects has increased in the past few years. But as these new approaches to project management have not yet been documented it will be some time before they are available to be

experimented in the education projects. However, one of these approaches which has been gaining popularity in the recent years is known as the matrix organisation.

2. MATRIX ORGANISATION

A project management organisation represents a matrix organisation. A matrix organisation as defined by Paul (1983) is "a form of organisation defined to focus on both diverse outputs or services and the functions related to them. Under this arrangement many members of staff simultaneously report to two bosses. Thus there is a dual authority (control) structure" (p. 136). Doherty (1985) sees problems in the implementation of the matrix organisation approach as described by Paul. Doherty expresses his concern about the problems which would arise because it involves reporting of project personnel to two bosses.

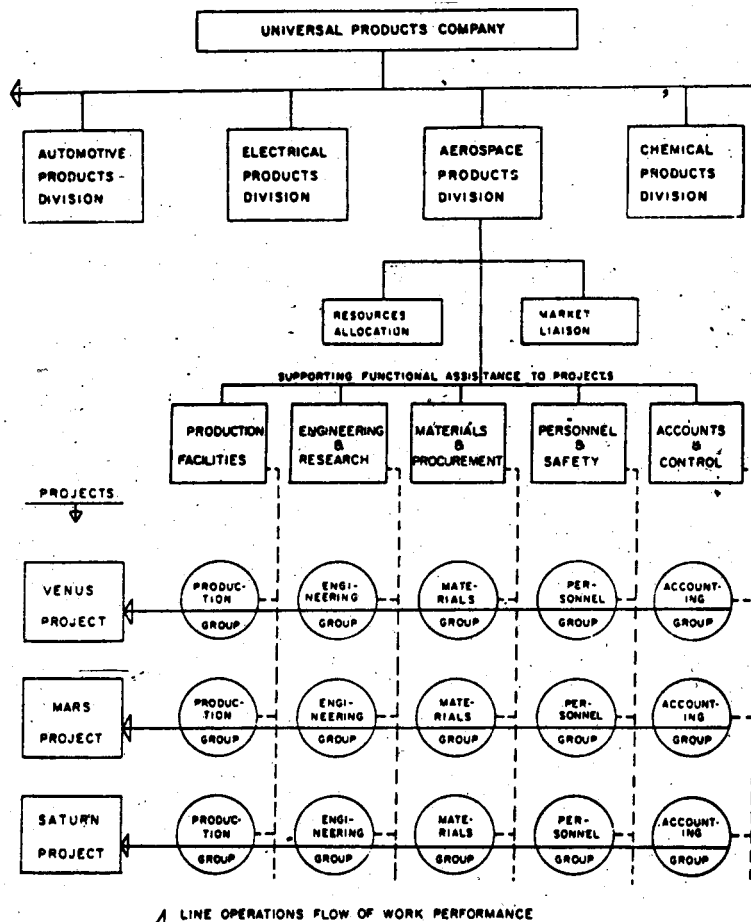
Grey (1981) considers the matrix organisation to be facilitating the formal authority and responsibility relationships between functional sections of the organisation and project management team. (p. 222).

Kingdon (1973) traces the origin of the idea of matrix organisation to the growth of aero-space industry in the United States. According to him, the matrix design "incorporates mixed design principle. First, it is a hierarchy based on a principle of organisational design arising out of economic authority and free enterprise Second, the matrix design is carved of a complex problem solving system based on an organisational principle arising out of a growing technology for problem solving, sometimes referred to as systems engineering. Here one of the goals is the solution, in conjunction with other organisations, of complex societal problems thus the matrix organisation is at one and the same time a normal hierarchy and problem solving entity " (p. 18). The merit which Kingdon sees in this approach is that "it is based on principles of organisation purpose — i.e. normal hierarchy and problem solving. Of course, these two principles, or organisational purposes may not always be in accord with one another. In fact, it is nearly the case that the two are in conflict with one another and that conflict resolution is a necessary part of the matrix organisational form. According to the Encyclopaedia of Management "1984" "the purpose of the matrix organisation is the establishment of a flexible and adaptable system of resources and procedures to achieve a series of objectives. The Figure 1 reproduced from the Encyclopaedia of Management presents a structure of a matrix organisation of the aero-space technology. The Figure 2 is a translation of

the same into an educational project organisation with the example of the primary School Teaching Kit Project of Pakistan. The Figure 2 presents the normal hierarchy of the project management and also figures the organisational structure of the project which identifies sources and possible solutions to project implementation as they relate to the mixed design principle of matrix management.

As shown in the Fig. 1, the Bureau of Curriculum, a wing of the Ministry of Education is a permanent organisation which is responsible for the implementation of the project. On top of this matrix organisation is the Ministry of Education. The other organisations which are involved in the implementation of the project Teaching Kit are Provincial Education Departments and Private Sector Enterprises. In their relationship with the Bureau of Curriculum of the Ministry of Education the Provincial Education Departments do by Act enjoy an independent status. They are neither subordinate nor answerable to the Ministry of Education. Each Provincial Education Department in its part has an independent existence and thus each of the four Provincial Education Departments constitute four different organisations. Their association with the project is only through Bureau of Curriculum. In the project, the roles of these two organisations are those of policy formulation and implementation respectively (which in this case comprises initiation and partial financing of the project). For purpose of implementation, the project is passed down by the Provincial Education Departments to the Education Extension Centres and District Education Offices in each province. The private sector enterprises are independent organisations and they are associated with project through the Bureau of Curriculum on contractual basis. The matrix organisation outlined in the Fig. 1, presents a broad management organisation and the Units of work which have to be carried out. The circles before each Unit of work show the environment of various organisations in the job. The dotted circles indicate partial involvement. The matrix organisation represented in the Fig. 2, is intended to acquaint the student with the foundation on which can be developed a matrix organisation structure of a project. If we have a careful look into the Fig. 2, we perceive that few things are missing in this organisation.

- (1) Bureau of Curriculum of the Ministry of Education which is mainly responsible for implementation of the project is a permanent organisation and has its own functions to perform. Certainly the project has been placed there as an additional



{Reproduced from the Encyclopaedia of Management (1984)}

Fig. 1

MATRIX ORGANISATION (AEROSPACE DIV.)

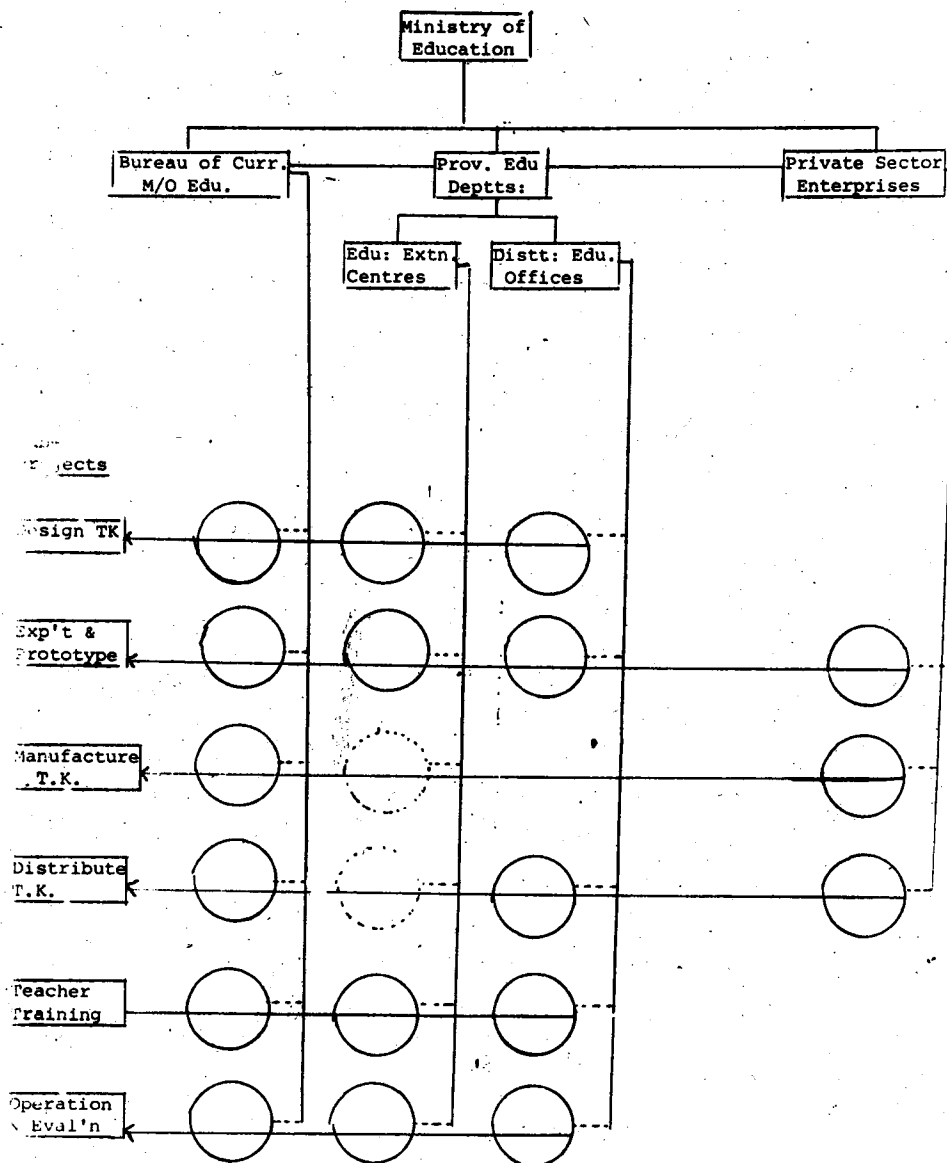


Fig. 2

Matrix Organisation (Teaching Kit Project)

work. Accordingly the persons who might be working on the project must be engaged in the project on a part time basis only. In order that the project could be implemented efficiently and successfully it was essential to have a separate sub-organisation created within the Bureau of Curriculum for implementation of the project;

- (2). The other organisations which are involved in the project implementation should have clearly defined relationships and a system of some sort of control of the central project management organisation.

The description of the project as given in the PC-I form of the project has been reproduced from the (Annex 'A') original document for reference and with a view to providing the reader of this Unit a basis for understanding the matrix organisation given in the Fig. 2.

Activity 1: Read the description of the project (Annex 'A') carefully and develop a matrix organisation Chart which in your opinion, most appropriately shows the inter-linkages between organisations involved in carrying out various activities of the project.

3. DEVELOPING A MATRIX ORGANISATION

The following guideline is suggested for developing a matrix organisational chart:

3.1 The Matrix Organisational Form

The first step in the development of a matrix organisation chart is to form a general idea to have a general picture of the participating organisations, hierarchical order of their functions and responsibilities, inter linkages between them, special projects or project activities as they are planned to be carried out by participating organisations.

3.2 Organisational Complexities

Each of the organisations participating in the project has its own individual organisational structure and personnel behaviour system and patterns. Participation in a project, besides other things, places a demand on organisation and behaviour of the members constituting that organisation. No matter how simple a project is, it necessitates adjustments of organisational and personnel behaviour within the project matrix organisation. It is, therefore, essential that the functions and the nature of each organisation and also the environmental conditions under which working are clearly understood by the participating organisations and individuals before they begin their work on the project;

3.3 Identification and Order of Sub-Projects and Activities

As any project organisation's main concern is the achievement of the objectives of the project by carrying out a number of activities or work units, it is essential that the sub-projects and activities of a project are clearly laid down and arranged in a logical order in which they must happen to accomplish the objectives of the project.

The matrix organisation while facilitating control over the project makes following demands on the project manager:

- (a) the project manager has to have a total picture of the project activities, its goals and the participating organisation and its personnel;

- (b) maintain a relationship with and among the participating organisations and personnel;
- (c) monitor and coordinate project activities and maintain a supportive relationship with persons and organisations. The project manager in a matrix organisation system works in a situation which places him at one and the same time with the following groups:
 - (i) those superior to him and to whom he is responsible;
 - (ii) those who form independent organisations and have only a working relationship with a project manager.
 - (iii) the line of persons placed under him.
- (d) As the matrix organisation is built around a project which continues to terminate relations with the organisations and persons who have completed their share of work and established contacts for carrying out new jobs and activities, the project manager is working in a fluid situation which demands great deal of flexibility and adaptability on his part.

4. THE PROJECT MANAGEMENT

The matrix organisation presented in the foregoing pages, although appears to be suited most to the project management it may also have its problems due to its complexities. In fact much of the success and scheduled completion of a project depends upon the project manager. The concept of matrix organisation is suggestive of a system aimed at facilitating the job of a project manager and is not the only one approach to project management. In managing a project or establishing a project management organisation there are, however, a few facts which should always be kept in view. They are following:

- (1) nature of project management organisations in a given environment;
- (2) personnel constituting the project management organisation;
- (3) skill-gap analysis and management;

- (4) strategic management of project.

5. PROJECT MANAGEMENT ORGANISATION

As said earlier, a project management organisation has certain characteristics which distinguish it from the other organisations. In essence a project is "an organisational unit" dedicated to the attainment of a goal — the successful completion of a developmental product in time within budget, in conformance with pre-determined performance specifications" Gaddise (1963). The project management organisation thus represents the operational mechanism of a project. It is also to be remembered that by any definition a project is a unit of work to be completed within a given time. A project management organisation always has a limited time and existence for a predetermined period of time. This characterises a project management organisation by a sort of adhocism. Even the cases where more or less a permanent organisation exists (as it is the case with the Ministry of Education) for implementation of education projects, the responsibilities of the project manager or director keep changing with the changing project which he is asked to implement. This permanence, therefore, also has an element of adhocism in it. This adhocism of project management organisations has its greater implication for the staff required for a project. Because each project is unique in itself, therefore, it requires a special skill, trainings and attitudes of the project personnel. Availability of appropriate personnel to form a good project team has been a problem for most project managers especially in the Government organisations (such as Ministry of Education or Provincial Education Departments) where most of the staff is appointed either under the regulations of the Government which offer comparatively low salaries, allowances and benefits to its employees as compared to the private organisations. Where permanent staff is available the practice of transfers and retransfers of personnel within an organisation creates problems for the project manager in having persons of his choice and required experiences, trainings and professional background. In the education projects of Pakistan the problem of the project manager in finding appropriate personnel relate to both permanent employees of the Departments and persons appointed on adhoc basis.

5.1 Problems with Project Employees

Since projects usually have some added benefits as compared to the routine job of a person in his permanent position they use their influen-

ces to be associated with a project. Such persons may have a financial motive more than an interest in the project goals and, therefore, they would be more interested in the benefits which could be drawn from the project. Since such persons would have both influences and a security of job in the organisation they might feel less accountable to the project manager. Also in such cases often persons with inappropriate qualifications are placed in the projects. The problem with the adhoc employees lies in persons working on a project on a temporary basis having no security of job with it. It is, therefore, quite natural that while associated with the project management organisation, in any capacity, they are constantly in search of better job opportunities where they have more benefits and sense of security; It is liable to affect both their motivation and association with the project organisation.

Although a project manager may have problems with both the permanent and adhoc members of the project organisation there are benefits of each category of project personnel which a project manager can use to his organisation's advantage. Following are the advantages of having permanently employed personnel in the project management organisation:

- (a) These persons have a sense of security about their jobs (their job is not subject to be terminated with the completion of project) rather by their association with the project they get some extra benefits which may provide incentive to them for improving their worth in the organisation and maximum contribution to the achievement of the objectives of the project.
- (b) The persons who are permanently associated with the mother organisation have better understanding of the functions and procedures of the organisation of which the project management unit is a part. Since they already have their relations with persons and sections of which the project management organisation is a part they may serve to facilitate the work of the project manager when it comes to his dealings with the larger organisation or other parallel organisations.
- (c) The persons in the permanent employment within an organisation may have that desired experience and qualifications which are essential for management of a project.

- (d) Since a project, directly or indirectly, offers certain benefits to its employees which are not available in the permanent organisation, it may provide incentive for better work and more devotion to the project as their performance in one project may pave a path for them to be associated with other projects in view.

While there are disadvantages in having persons in a project on **adhoc basis** they are not without their benefits to the project, for example:

- (1) Since **adhoc appointments** are fresh appointments, usually the salary of personnel is minimum as compared to national salary of an equal job in the Government Deptt. it is economically beneficial to the project.
- (2) Since an **adhoc appointment** can be permanent at any time generally at the discretion of the project manager persons on **adhoc positions** are liable to feel more responsible of the project manager and more respectfully to his authority more than a permanent employee.
- (3) The provisions of **adhoc appointment allowance** for adjusting number of persons to the changing job requirements of the project, allows the project manager a chance of employing better qualified people on contract basis and avoiding unnecessary expanses on training of employees and for retaining them while they are not needed.

5.2 Irregular Employees

This category of employees refers to those personnel who are permanent employees of an organization but they are temporarily associated with a project and they are frequently transferred from project organisation to other organizations and vice-versa. In the education projects of the Ministry of Education, in particular, employees of this category are very common. They range from the director or manager of a project to the lowest stratum of project service. This transferability of personnel to and from a project organization has the benefit of changing employees in the project organization to find the better ones for doing specific jobs. But there are also certain disadvantages of having such irregular employees in the project organization. It is the experience of many edu-

cation projects in the country that the project personnel — established at the job management level — shows that when a person was transferred from a project organization he usually took his implementation programmes and ideas with him and the person who took his place started things afresh for good or worse. In any case not only the continuity of project work was upset but it also caused to disturb the tempo of the implementation of the project. Pakistan Primary Education Project-IV provides typical example of the situation. An other category of irregular employees is of those personnel who are employees of a permanent organization and they are only occasionally associated with the project. As the experience shows a project management organization cannot always rely on the availability of the services of such persons because they are spared only on the convenience of their parent organization or Institution and the project management has no control over them.

6. STRUCTURE OF A PROJECT MANAGEMENT ORGANIZATION

As said earlier, a project management organization is a complex organization and has to deal simultaneously, with several organizations in different relationships. It is not easy to prepare a viable organizational structure of a project management organization. Examples of such complex education projects could be found in the Ministry of Education's projects like 'Scheme for the Provision of Teaching Kits to Primary Schools of Pakistan', and "the Programme of Introduction of Agro-technical Subjects in General School System". The difficulty of preparing a project organization structure lies in divided responsibilities of more than one organization for implementation and operation of a project. For example, the organization responsible for the sponsorship of the project was the Curriculum Wing of the Ministry of Education while its execution was assigned to the Provincial Departments of Education; for operation and maintenance of the project the responsibility was placed with the Provincial Departments of Education, Bureau of Curriculum, Extension Centres and the Bureau of Audio-visual Aids. The problem in this case arises because the project document doesn't specify the nature of relationships between various organizations, sources of funds required by each organization for implementation and operation of the project and the system of coordination of the functions of various organizations for achievements of the overall objectives of the project. More or less, the Agro-Technical Scheme of education had the same problem. The project was initiated and initially sponsored by the Education Division of the Ministry of Education. The execution, operation and maintenance of the project was to be managed jointly by the Provincial

Education Departments and the Education Division of the Ministry of Education. There appears to have been no specially created management organization for implementation of the project. The structuring of a project management organization in these projects would have been made more complex because of the involvement of contractors and suppliers from Private Sector for production and supply of material required for the project. Also at provincial level several sub-sections and administrative units had to be associated for implementation of these projects.

The projects of individual Institutions like Universities which usually have permanently established project management organizations have the advantage of being more organized. The fate of many good and apparently viable education projects could have been better and they should have succeeded in achieving their objectives only if they had had a well structured permanent organization for their implementation.

6.1 Lesson of Experience

The experience of many incomplete and ill-accomplished education projects suggests that an education project should not be initiated and undertaken without first having conceived its management organization. The idea that planning, implementation, monitoring, evaluation and operation of a project should be the function and responsibility of one and same organization specially created for the purpose must needs be propagated and translated into action. Also it has to be remembered that the simpler an organization is the greater potential it has for management of many education projects.

6.2 Relationship of Project Management Organization with Other Organizations

As it was discussed earlier in reference to the matrix organization, a project management organization also functions in relationship with organizations other than ones mentioned under structure of a project management organization. These organizations may be grouped under two broad categories: Parallel Organizations and contributors to project organizations.

a. Parallel Organizations

The parallel organizations represent those organizations which are associated with the project but their relationship with the pro-

ject organization is neither that of a subordinate organization nor that of any hierarchical superiority. The bond of relationship which exists between the project organization and of other organizations is, in reference to carrying out project activities, on contractual or sometimes voluntary basis. These organizations may belong to public or private sector.

b. Contributors to Project Organization

In addition to the organizations which function parallel to the project organization there are organizations and persons who are associated formally or informally with a project and in some way contribute to the implementation and operation of an education project. These contributors may be inside the organization of which the project organization is a part or they may be outside organizations or persons. In education projects, community leaders, experts, philanthropists, public welfare organizations, consultants and various social and volunteer organizations are examples of contributors of outside the project management organization. The contributors inside the mother organization are persons and sub-organizations or administrative sections who are not directly associated with the project but they facilitate the work of the project manager.

7. PROJECT PERSONNEL

So far the discussion has centred around the project management organization. The project management organization like other organizations, however, represents an organized group of persons who work together for achievement of certain objectives or goals the attainment of which would not be possible otherwise. A project organization, because it is a complex organization and because of the environmental influences to which it is susceptible, the position of each member of the project organization becomes very important and much of the success depends on the working of the project organization members as a team.

7.1 Team Building

Organizing a project management unit evolves a process of team building in which the most important consideration should be the behavioural aspect of the organization. The personnel constituting a pro-

ject management organization, therefore, should have the following characteristics.

(a) Motive for Joining the Organization

In Government organizations where people are transferred from one organization to the other organization and similarly they happen to be placed with a project organization which might or might not be of interest to them may not contribute to the team. Similarly persons joining a project may sometimes have motives which could clash with the objectives of a project. A group of people who have such common motives for joining a project organization, which is contributing to the achievement of the objectives of the project, would certainly form a good team and the results will be visible in the form of mutual cooperation, accelerated work, better quality and increased productivity.

(b) Communicability

Communicability in a project management organization connotes the ability and willingness of each member of the organization to communicate with others. The work teams which regularly, openly and effectively communicate ideas and solutions help to improve the quality and productivity.

(c) Personal Experience, Qualifications and Expertise Complementary to the Project Team

No matter how simple an education project is, it employs more than one activities for which persons with different experiences, qualifications and expertise are required. A good project team provides a pool of such experiences, qualifications and expertise which are all the time available for carrying out the project activities.

(d) Attitudes, Skills and Knowledge

Spirit of a project team is the embodiment of attitudes, skills and knowledge of the personnel, which are combined and orchestrated for the accomplishment of the objectives of the project.

8. THE PROJECT MANAGER

Although such member of the project management organization has a definite place and a role to perform the most significant and crucial are the place and role of the leader of the organization — in this case the director or manager of a project. His job in the project is complex, diverse, fluid and on occasions frustrating as well. In view of the job which a project manager has to perform in a given situation it is essential that he is a man of integrity, ingenuity, vision; and has appropriate training and experience for managing a particular type of project. Also as it was indicated elsewhere a project manager has to function in a complex relationship with organization and persons. It is essential that he can well establish and maintain good and productive human relations. It is, therefore, essential that before selecting a person for a leadership position in the project management organization a resume of his functions, situations relating to the environmental considerations interpersonal and interorganization relationships and functions should be prepared and an appropriate person should then be selected to the position.

8.1 Employment Status

A project manager should preferably be permanent employee of the Ministry or Department of Education and should be placed at a higher level of management position. He should be appointed as project manager for the life of the project and should not be transferred from his position during the implementation or operation of the project. It is better if he is associated with the project from its planning. While appointing a person as project manager it should be assured that

- (a) he is not on the verge of retirement;
- (b) he is not due or expected to be promoted to a position higher than that of the project manager or to a position which carries more benefits;
- (c) he is not intending to proceed on long leave or for a long term education or training programme. He is willing to serve as project manager.

8.2 Job Experience

Most education projects vary from one another so much that one person may not fit to all positions. For example a construction project (construction of college buildings, Poly-technic Institutions, Comprehensive High Schools etc.), a staff development project (agro-technical teachers training institutions, Academy of Educational Planning and Management, Regional Education Extension etc.), a curriculum and Text Book project (introduction of agro-technical scheme of education, Teaching Kit Project, development and printing of Text Books etc.), Institution building project such as University or an academy and an experimental project like Pakistan Primary Education Project—iv, and a developmental project such as the Third Education Project.

The experience of a particular project, therefore, could not be used for management of different education projects. However, keeping in view the size and type of a project and the previous job experience in a project management or other capacity a prospective manager could be selected. In this case it will be helpful to find the large number of elements common between the project and project manager's previous job.

8.3 Skill-Gap Analysis

Finding a project manager who ideally suits to the nature and requirements of an education may not be possible. Chances are that there will be a gap between what experience, training, education and personal qualities a person possesses and the ones required for management of a particular project. There could be one or more areas of project management in which the project manager may not have required skills to manage. It is, therefore, essential to analyse both the management skills of the person and the requirements of the project to identify the skill gaps which must needs to filled to ensure efficient performance of a person as manager. The following measures are commonly adopted in this connection:

- (a) Recruitment of specialists: Project areas in which the project manager or other personnel in the project management organization do not have appropriate knowledge and skills, specialists from other organizations are engaged to assist the manager. These specialists sometimes could be retired persons with required experience and skills. Usually, such specialists are

associated with the project for certain period on contract basis and usually they work as part of the project management organization.

- (b) **Consultancies:** Use of consultants in the skill gap areas in project is very common. The consultants' services are acquired mostly for advisory purposes and their association with the project varies with the need of their services. Sometimes services of foreign consultants are obtained or made available for a project to fill certain skill gaps in the project management organization but as in education projects it is not always very beneficial and it does cost to engage a foreign consultant to assist in an indigenous project. For a foreign consultant it is sometimes like jumping into the dark. A foreign consultant needs to acquaint himself with the local environmental conditions, problems of personnel management and organization, authority structures, systems and procedures of project financing and procurement etc.
- (c) **Training of project manager:** In certain cases it might be desirable to provide appropriate training to the project manager in or outside the country. This training can be arranged before the project implementation begins or during the project implementation. The trainings outside the country cost a lot. In education projects it may not be easy to provide a project manager a job specific training and, therefore, such trainings may not develop required skills in the project manager. In such cases it is essential to consider all the alternatives i.e. recruitment of specialists, engagement of local or foreign consultants and finally the training of the project manager.

9. THE OTHER PERSONNEL

The position of personnel other than a manager in project is also very important. The personnel engagement, selection and their assignments have to be made very carefully to ensure the maximum utilisation of the expertise and services of each person and minimise the chances of wastage in terms of manpower available and required.

Following pages are reproduced from a case study applying the techniques of project formulation, appraisal and implementation planning to a real settlement project by Doherty and Potts (1985) which

provides a guideline in identifying project personnel. Although this case study does not relate specifically to education, but there are so many elements identical between an education project and this case study that they can easily be translated to suit the requirements of any education project.

10. A CASE STUDY

10.1 Background Information

On the basis of a 1976 feasibility study (updated in 1977), it was decided to proceed with further planning of the project. A number of personnel were appointed.

In December, 1977 a project coordinator was appointed within the Social Development Commission to oversee the project and to coordinate arrangements with the foreign agencies involved. In the same month an Israeli/OAS technical team, comprising an irrigation engineer and an agricultural economist (with local counterparts from the Ministry of Agriculture and the National Planning Agency), were brought in for six weeks to conduct more detailed planning and surveying of the proposed project site. Unfortunately the site had not yet been purchased, access was limited, and the area was covered with shrubs and trees which made surveying very difficult. However, it became clear that the land area of the site was in fact only about 2,000 acres rather than the 2,100 acres originally estimated.

The land was purchased for the project in February, 1978. Clearing of the land by bulldozer started in April, 1978 in preparation for a more detailed survey. Shortly afterwards a local resident was appointed as assistant farm manager, and an Israeli farm manager arrived under a two year technical assistance programme. At the same time, a project manager was identified and appointed. During the period April to December, 1978 the major activities were the supervision of clearing the land and a preliminary survey of potential settlers. Aerial photographs of the project area were taken in December and new maps were prepared in January, 1979 for more detailed surveying.

In February and March, 1979 the first 35 settlers were selected by a committee consisting of the project manager (previously project coordinator), representatives of the Ministry of Youth, the Social Development Commission, the Ministry of Agriculture, and representatives of various

local youth organizations. The first project coordinator was appointed as project manager and a new project coordinator (who was already a tenured member of the SDC staff with other duties) was brought into liaison between the project manager and the SDC.

Other staff were appointed, including a local counterpart farm manager, a social worker and (for part of their time) an accountant and accounts clerk, a clerk typist, a stores clerk and a driver. At a later stage a works manager was also appointed.

The line of responsibility for the project is as follows: The Ministry of Youth and Community Development has overall responsibility at the political level. Below this is the Board of Management of the SDC. At the next level down is the first project specific body, the Project Advisory Board. The function of the Board is to monitor the implementation of the project and to ensure that an integrated approach to development is achieved. It meets monthly to approve major items of expenditure, consider any major changes of plan, and make final decisions on the expulsion of unsatisfactory settlers. The project coordinator is Secretary to the Board. The project manager is also a member of the Advisory Board whose members are representatives of various ministries and government agencies, including the Jamaica National Investment Company (JNIC), the Jamaica Development Bank (JDB), the Ministry of Agriculture, the 4 H Clubs, and local government organisations in Clarendon Parish.

The Project is supervised from the SDC by the Project coordinator, who reports to the Board of Management of the SDC.

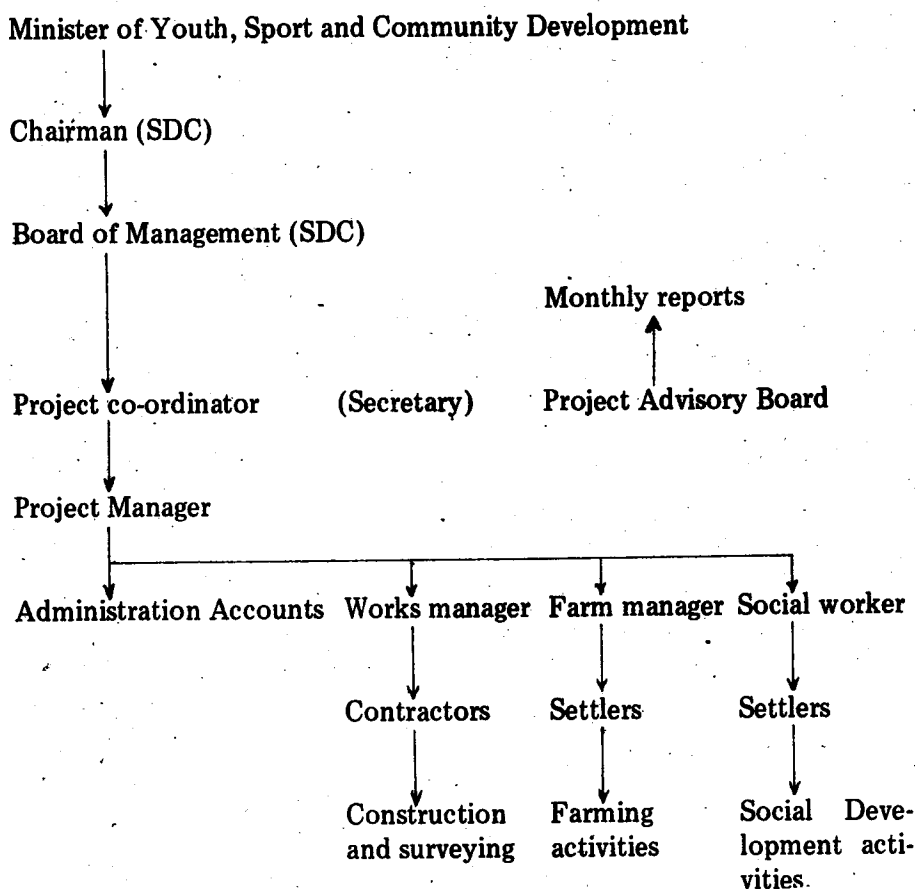
Overall responsibility for the day to day running of the project lies with the project manager. Other than the general administration and the keeping of accounts, three separate areas of activity can be defined for which the project manager has responsibility. The project involves farming activities (for which there is an expatriate farm manager and local counterpart as well as an assistant farm manager), social development and education (for which there is a social worker), and construction (for which there is a works manager). Both the farm managers and the social worker have responsibility for some settlers activities, while the works manager is concerned with supervising the activities of building contractors and surveyors. The project manager is responsible to the project coordinator at the SDC.

The project is monitored by the National Planning Agency (NPA) and the Project Analysis and Monitoring Company (PAMCO).

In the first place of the project, the settlers are paid a weekly wage and work at the direction of the project staff. The idea is that in undertaking such work the settlers should learn the various farming techniques associated with the intensive cultivation of mixed crops. For the first two years of settlement the settlers are on probation and can be dismissed. They are, therefore, to all intents and purposes paid employees, at least for the first year. The ultimate aim is to develop a self-reliant multipurpose cooperative community which will eventually fulfil all the functions at present undertaken by the project management staff.

An outline diagram of the organizational structure of the project, Figure 6, is shown below.

FIGURE 6: THE ORGANISATION OF PROJECT OASIS – 1979



10.2 The Linear Responsibility Chart

So far we have used a number of management techniques which constitute part of a project management information system providing information about:—

- the objectives of the project (logical framework)
 - the tasks that need to be done (work breakdown)
 - the order in which they need to be done (precedence)
 - the duration of tasks)
 - the critical path)
 - the scheduling of non-critical activities)
- networking
and
Gantt Chart

Among questions that remain to be settled are:—

- who does what?
- what indicators may be used to assess progress of the project?
- what funds are required for the project?
- when will the funds be needed and from where will they be obtained?
- are there any constraints or considerations which have not emerged so far?

It is to the first of these questions that this section is addressed. The technique for presenting this information is called the Linear Responsibility Chart. The chart is a grid that lists on a horizontal axis the personnel who will have some responsibility for implementing the project. On the vertical axis the activities or tasks required for the project to be implemented are listed. At the intersections of the columns, one or two of a number of letters may be inserted to indicate:—

- I — who is responsible for initiating an activity?
- S — who is responsible for general supervision?
- C — who must be consulted?
- M — who may be consulted?
- N — who must be notified?
- F — who must give financial approval?
- T — who must give technical approval?

The breakdowns undertaken in earlier stages of this case study involve dividing the project into separate sections and tasks at different levels:—

- components (large units)
- elements (several of which combine to comprise a component)
- activities

So far the project has been said to have 30 activities. Some of these activities may now require breaking down further into smaller parts called tasks in order that work in each task may be allocated to the appropriate person, since Linear Responsibility Charts are usually used at the task level. The key to this breakdown lies in defining tasks to be done which is undertaken by a single management agency, thus 4.1.1. "obtain water and construct sump" involves both legal work and construction and therefore is likely to be the responsibility of two separate agencies.

a) Assignment on the Identification of Tasks and the Linear Responsibility Chart

1. Given the level three list of activities (Solution 7) into which the project has been broken down, identify any operations which you feel need to be further broken down, and produce a level four breakdown into tasks using Worksheet 11.

(Upon completion of the breakdown into tasks please ask for Solution 11 and Worksheet 12).

2. Referring to the Project Organisation Chart (Figure 6), list on the horizontal axis of the Task and Linear Responsibility Chart the persons to whom tasks can be allocated.
3. Insert, where relevant, the code letters to identify who is responsible for initiation (I), and general supervision (S) of each activity, who needs to be consulted (C), who may be consulted (M), who must be notified (N), and who must give financial (F) and technical (T) approval?
- 4
 - a Do you think that the process you have carried out is useful?
 - b Are the 7 given categories of responsibility and authority satisfactory?

c What alternative or additional categories would you suggest?

11.5

d Is there anybody else who ought to be included in the horizontal axis of persons responsible for the project in some way?

WORKSHEET 11: LEVEL FOUR BREAKDOWN (TASKS)

Level three activities	Level four (tasks)
1.1.1 Confirm agreement on project financing 1.1.2 Prepare financial plan 1.2.1 Appoint project manager and co-ordinator 1.2.2 Appoint all other staff 1.3.1 Adopt monitoring and control system 1.3.2 Formulate action plan	
2.1.1 Obtain land 2.2.1 Clear land 2.2.2 Make detailed survey 2.2.3 Stake out lots	
3.1.1 Commence farming operations 3.1.2 Cultivate agricultural land 3.1.3 Purchase farm inputs 3.1.4 Prepare orchard land 3.2.1 Collect and store produce 3.2.2 Negotiate sale of produce	
4.1.1 Obtain water and construct sump 4.1.2 Purchase and install irrigation equipment 4.2.1 Formulate physical plans 4.3.1 Improve access road 4.3.2 Connect water and electricity 4.3.3 Renovate farm buildings 4.3.4 Construct settler houses and community centre 4.4.1 Purchase farm tools and equipment	
5.1.1 Conduct preliminary survey of would-be settlers 5.2.1 Select 35 settlers 5.2.2 Train settlers on communal plot 6.3.1 Move settlers to individual plots 5.3.2 Move settlers to houses	

SOLUTION 11: LEVEL FOUR SUGGESTED BREAKDOWN (TASKS)

Level three (Activities)	Level four (Tasks)
1.1.1 Confirm agreement on project financing	Confirm foreign finance Confirm local finance
1.1.2 Prepare financial plan	Prepare financial plan
1.2.1 Appoint project manager and co-ordinator	Appoint project manager and co-ordinator
1.2.2 Appoint all other staff	Appoint all other staff
1.3.1 Adopt monitoring and control system	Adopt monitoring and control system
1.3.2 Formulate action plan	Formulate action plan
2.1.1 Obtain land	Obtain land
2.2.1 Clear land	Clear building land Clear farming land
2.2.2 Make detailed survey	Make survey for construction Agricultural survey
2.2.3 Stake out lots	Stake out communal plot Stake out individual plots Stake out construction site
3.1.1 Commence farming operations	Commence farming operations
3.1.2 Cultivate agricultural land	Plant first crop Plant second crop (etc.)
3.1.3 Purchase farm inputs	Buy seed Buy fertiliser Buy pesticides
3.1.4 Prepare orchard land	Prepare orchard land
3.2.1 Collect and store produce	Collect and store produce
3.2.2 Negotiate sale of produce	Negotiate sale of produce
4.1.1 Construct sump and obtain water	Construct sump Obtain water
4.1.2 Purchase and install irrigation equipment	Purchase equipment Install irrigation equipment
4.2.1 Formulate physical plans	Formulate physical plan
4.3.1 Improve access road	Improve access road
4.3.2 Connect water and electricity	Connect water Connect electricity
4.3.3 Renovate farm buildings	Renovate farm buildings
4.3.4 Construct settler houses and community centre	Construct village A Construct community centre Construct village B
4.4.1 Purchase farm tools and equipment	Purchase farm tools and equipment
5.1.1 Conduct preliminary survey of wouldbe settlers	Conduct preliminary survey of wouldbe settlers
5.1.2 Off-site orientation of pre-settlers	Off-site orientation of pre-settlers
5.2.1 Select 35 settlers	Select 35 settlers
5.2.2 Train settlers on communal plot	Train settlers on communal plot
5.3.1 Move settlers to individual plots	Move settlers to individual plots
5.3.2 Move settlers to houses	Move settlers to houses

WORKSHEET 12: TASKS AND LINEAR RESPONSIBILITY CHART

[illegible]

b. The Linear Responsibility Chart — Some Comments and Suggestions

Certain personnel are excluded from the completed chart (Solution 12), including the consultants hired to examine irrigation and agro-economics, the reason being that their tasks could be subsumed under the project manager. Furthermore, some of the categories of action which were given on page 116 may not be wholly appropriate; in particular, technical approval may need considerable widening in scope. Another criticism is that many activities may be too large for one person, or at least may involve others very closely.

Like many of the project management information tools, compilation of an LRC can be an exacting task. However, the careful preplanning of project actions contributes significantly to smoother implementation. It is impossible to foresee all the detailed actions that will be required or all the problems that will need solving, but a well thought out network and linear responsibility chart will at least enable the project management team to anticipate some of the problems of scheduling and to pinpoint responsibility for delays or inaction. It is also possible to see if any major project task has been overlooked, or if no person has responsibility for an activity, especially (as in this case) when the project is of a new kind, of which the people involved have little or no previous experience.

It may be noted from the LRC that the project idea is initiated at a high level and a chain of command passes down to initiate smaller and more circumscribed activities. The chain of communication passing downward involves mainly the appointment of expertise while that moving upward is essentially one of notifying and gaining approval. This is the principle and practice of delegation. In the given list of personnel, the level of a person in the hierarchy of administration is roughly indicated by his nearness to the left hand side, though this structural convention is not essential in an LRC by any means. It has been done here simply for convenience. It should be mentioned that the LRC is a delegating, reporting and monitoring device for the use of the project manager and it is not intended to provide a ready made management structure, the design of which is, as was shown earlier, a much more problematical job.

Further use will be made of the task breakdown and LRC to establish project milestones, and to complete activity description sheets. The latter are a means of assessing the detailed resource requirements of a project, and enable a project budget to be planned in detail. The project budget, and in particular the rate at which it builds up, may be used along with a chart of milestones; as a progress monitoring device. These three things:

- identifying milestones and preparing milestone charts;
- preparing activity description sheets;
- drawing up the project budget

are the subject of following sections of the case study.

**SOLUTION 12: SUGGESTED TASKS AND LINEAR
RESPONSIBILITY CHART**

		Min. of Youth	Chairman (SDC)	SDC Board	Proj. Co-ord. for	Proj. Adv. Board	Proj. Manager	Works Manager	Farm Manager	Social Worker	Contractors	Admin./Accounts	Settlers
1.1.1.a	Confirm foreign finance	C	I	F							N		
1.1.1.b	Confirm local finance	C	I	F							N		
1.1.2	Prepare financial plan	C	I	F							N		
1.2.1	Appoint manager and co-ordinator		I	T							N		
1.2.2	Appoint all other staff			T	I	C	C				N		
1.3.1	Adopt monitoring and control system		T	T	I	S	C				N		
1.3.2	Formulate action plan			N	I	F	T				N		
2.1.1	Obtain land				I	N	N				N		
2.2.1.a	Clear building land				N	C	I				M	N	
2.2.1.b	Clear farming land				N	I		C			M	N	
2.2.2.a	Making survey for construction				N	N	C	I			M	N	
2.2.2.b	Agricultural survey				N	N	C	I			M	N	
2.2.3.a	Stake out communal plot				N	N	T	I					
2.2.3.b	Stake out individual plots						C	I					
2.2.3.c	Stake out construction site				N		C	I		I			
3.1.1	Commence farming operations					C	I				N		
3.1.2.a	Plant first crop				N	C	I	N			N	N	
3.1.2.b	Plant second crop (etc.)				N	C	I	N			N	N	
3.1.3.a	Buy seed				F	T	I				N	M	
3.1.3.b	Buy fertiliser				F	T	I				N	M	
3.1.3.c	Buy pesticides				F	T	I				N	M	
3.1.4	Prepare orchard land				M	C	I						
3.2.1	Collect and store produce					N	C				N	I	
3.2.2	Negotiate sale of produce				C	N	I	N			N	N	
4.1.1.a	Obtain water				F	I	C	C		C	N		
4.1.1.b	Construct sump				F	N	C	I	C		N	N	
4.1.2.a	Purchase irrigation equipment				F	N	I	T	T		N	N	
4.1.2.b	Install irrigation equipment				F	N	I	C			C	N	
4.2.1	Formulate physical plans				F	N	I	C			N	N	
4.3.1	Improve access road				F	N	C	I			N	N	
4.3.2.a	Connect water				F	N	C	I			N	N	
4.3.2.b	Connect electricity				F	N	C	I			N	N	
4.3.3	Renovate farm buildings				F	F	C	I			C	N	
4.3.4.a	Construct village A		F		F	M	C	I			C	N	
4.3.4.b	Construct community centre		F		F	M	C	I			N		
4.3.4.c	Construct village B		F		F	M	C	I			N		
4.4.1	Purchase farm tools and equipment				F		C	I			N		
5.1.1	Conduct preliminary survey of wouldbe settlers				N		T		C	I	N		
5.1.2	Off-site orientation of pre-settlers						T		C	I	N		
5.2.1	Select 35 settlers				N		T		C	I	N		
5.2.2	Train settlers on communal plot						C		C	I		M	
5.3.1	Move settlers to individual plots				N		C		C	I		M	
5.3.2	Move settlers to houses				N		C		C	I		N	M

11. STRATEGIC MANAGEMENT

In the preceding part of this Unit the discussion has mainly centered round a project matrix management organisation and the personnel selection and responsibilities. In the management of development programmes and projects, different groups of people emphasise different things. For some it is a good management control which ensures performance. For some it is community participation in the project. There are some of the view that political and bureaucratic bargaining is essential. These and other similar views are based on generalisation of experiences of people of particular projects undertaken under certain conditions. The concept of strategic management presents a more comprehensive view of management of development projects. It combines the project environment, programme strategy, organisational structure and the organisational process. As Paul (1983) points "the performance of a programme is influenced not only by each of these factors, but also by how they interact i.e. by the degree to which they are consistent with and reinforce one another. So top managers should try to influence each factor and also their interaction" (P. 35). Paul goes on to define each of these key factors as follows:

11.1 Environment

The environment includes the forces outside a programme which create opportunities for, as well as constraints on, its growth. The environment of industrial enterprises includes their consumers and their income levels. The environment of an agricultural development programme includes the farming population, their levels of technology, water and soil conditions and climate. The environment of most development programmes includes prevailing political conditions and the local institutional and bureaucratic set-up. These conditions change at different rates, and from place to place. Top managers must not only be familiar with them, but also appraise the environment in order to identify opportunities for the programme's growth while minimising the impact of any emerging constraints. Favourable environments improve a programme's potential for survival and expansion. Unfavourable ones provide programme managers with difficult struggles.

11.2 Strategy

Strategy is the set of long-term choices the programme leaders make in terms of goals, services, policies and action plans. Successful strate-

gies must meet both the broad programme objectives set by government and by the environment. For example, a governmental programme to promote small-scale industries throughout the country must have goals and services consistent with the literacy and background of potential entrepreneurs, the potential demand for various goods and gaps in the infrastructure. Strategies that meet the government's objectives and match the environment are more likely to succeed than those that do not.

11.3 Organisational Structure

The organisational structure of a programme is the durable arrangement within a programme agency to perform the tasks defined by its strategy. These include the distribution of authority and responsibility, the reporting relationships and the mechanisms for integrating its functions. Some strategies and environments require decentralised structures, other require centralised ones. When diverse services are offered, divisions based on the type of service may be appropriate. When the programme operates in far flung regions, a structure based on regions may be justified. Structures, therefore, are not fixed or permanent. Existing structures often limit the choice of strategies. Rigidities in government structures often limit the ability of conventional government departments to engage in commercial operations. Hence the practice of setting up government corporations when such needs arise. No single structure is good for all strategies and environments. Many development programmes fail because they are unable to adapt their structures rapidly to evolving strategies and changing environments. Many development programmes fail because they are unable to adapt their structures rapidly to evolving strategies and changing environments.

11.4 Organisational Processes

Organisational processes are the instruments for influencing the behaviour of employees and beneficiaries of a programme. If the staff of an organisation are to accomplish common goals, managers need the means to motivate and influence their performance. Participative methods used to set goals, allocate resources and implement the programme are one set of organisational processes. The monitoring methods for evaluating and controlling performance are another. Such processes and systems are commonly found in industrial enterprises. They are equally relevant in public programmes. Processes for human resource development (selection of staff, training, etc.) are another set of instru-

ments. Too few programme managers seem to realise that these are not fixed processes and that to be effective, they must be adapted to particular strategies and structures. Thus the motivation processes for a family planning programme may have to be quite different from that used in a commercial crop development programme. The right mix of processes can improve performance; an inappropriate mix will be counter-productive. Proper organisational processes are sources of power and influence in the hands of top management when they are tailored to the strategy and structure of the organisation.

Paul (1983) has also suggested a line of action for strategic management of programmes and projects. According to him the strategic management begins with the thinking that proceeds formulation of a project. In this connection he suggests the following:

- (a) clear understanding of government objectives;
- (b) analysing the environment and influencing key factors;
- (c) launching of pilot projects for clearing environmental insight;
- (d) phased replication of development programmes to avoid the pitfalls of a "grand slam";
- (e) assessment of the degree of organisational autonomy required for implementation of the project.

The actual work of a manager which requires strategy management begins when he starts implementing a development project. The strategy management which Paul suggests takes into consideration a situation where the project manager may not have been given adequate power and autonomy to change a situation when the project is in trouble. He suggests several things which a manager can do to improve the situation, and which are reproduced here under the Copyright provision of the ILO.

11.5 Operational Versus Strategic Management

In theory, there should be no conflict between strategic and operational management, the latter being used to implement strategy and monitor the everyday course of a development programme. In practice,

however, many senior administrators and managers are totally absorbed by the course of operations. They claim that they have little time for strategic management. In reality, their problem is that they spend too much time on operational problems. They usually argue that middle managers and officials at lower levels are neither competent nor motivated to make the right decisions. The answer lies in strengthening the skills and motivation of the staff through training and development. When little attention is given to equipping people to perform their tasks well, it is not surprising that they are unable to discharge their duties. This important area in programme management deserves urgent attention. Top managers will be able to devote more time to issue of strategic management only when they develop their subordinates and delegate operational decisions increasingly to them.

11.6 Strategic Audit

It is often possible to initiate a formal comprehensive review of an ongoing programme to identify and evaluate strategy that has been followed since programme inception and propose changes in strategy and in the management system of the programme. Such a strategic audit might follow the line of thought presented in this book, using the questions given at the end of chapters 2 to 8. In any case, the programme goal and objectives, environment, strategic choices, resources, organisational structure and internal processes must be reviewed.

This might be time-consuming and technically difficult. Also, political objections may be raised and resistance to change found among the managers who have developed certain habits and who might think that strategic management would demand more than their competence and commitment permit.

There is, therefore, an important question of tactics: how should a strategic review of a programme be started so that it has a good chance of success right from the start? In particular, programme managers must consider the attitudes and policies of government as well as the experience and attitudes of the managerial staff. Thus, there might be situations where a strategic review of an ongoing programme should start from the outside, e.g. by appointing a review committee to examine the facts, interview all people concerned and come up with concrete proposals for changes. However, such external review committees might often be perceived by the programme managers as too administrative a tool for solving complex technical and human problems, and even good review

reports may be given no follow-up. Initiating a strategic review from the inside with the active participation of the programme manager may be a more viable approach. The group should start by identifying the key problems faced by the programme and the causes of deficient performance. This tends to be more effective for three reasons: (1) the analysis can be concrete, starting from the problems faced by the staff in everyday operations; (2) it can be important learning exercise, since analytical, planning and other skills of managers will increase during the exercise, and (3) it generates more commitment to applying and utilising new ideas and proposals thus developed than would be the case if the proposals came from an external body known to the managers concerned only through a few interviews.

If inadequacies in strategic management are identified, the programme manager should initiate action to inform, educate and influence the key actors in his supervising ministry and other collaborating agencies (if he has to manage a network structure). This has to be done tactfully, in both formal and informal ways. Obviously, common (shared) goals could be achieved, though the proposed changes will come in handy at this stage. This applies particularly where a programme manager has to achieve his goals through collaboration with a network of agencies. A great deal however will depend on how much bargaining power or clout he has vis-a-vis his ministry and other agencies.

11.7 Step-by-step Approach to Changes

Where reforms are necessary and feasible, the wise manager does not start with the most difficult and complex changes. Resistance and organisational problems will be more severe here. Instead he should attempt to introduce simpler performance inducing changes. For example, initiating a participative planning process with the staff or introducing a simple, yet regular monitoring system may help to build confidence and credibility, and in the process prepare the ground for more complex changes necessary for strategic management. This means that while the programme manager needs an over-all concept of the directions in which the programme should move, he is prepared to feel his way through, for tactical reasons. This approach may take considerable time in the case of complex ongoing programmes. But this approach is likely to be more rewarding than attempts to rush in with a formidable set of drastic reforms. In the final analysis, it is the programme manager in consultation with his ministry who should decide on the alternative most appropriate in his situation.

11.8 Workshops and Seminars

Many managers of development programmes have never had an opportunity to exchange experience about strategic management with their peers and learn about new trends in the practice and theory of strategic management in training workshops and seminars. In general, more such training is needed in most developing countries. However, general lectures and discussions, based on foreign materials and experience are not enough. Wherever possible, strategic management workshops should be tailor-made and pay considerable attention to the specific problems that exist in given programmes. Theoretical knowledge can also be provided, but this has to be related to concrete problems faced by the managers involved. The managers' active participation is to be encouraged; it may well be that such a workshop will become an effective starting point for an internal strategic review of an important development programme.

11.9 Using Consultants

Training efforts can be coupled with consultancy on strategic management; sometimes, consultancy may be the best starting point, especially if the top management is convinced of the need to introduce strategic management. Often, a combination of consultancy and training turns out to be a powerful tool. Consultancy should not be viewed as a mere "design job" with the consultants disappearing as soon as the report is finished. Consultants should see through the critical phase of implementation and assist in resolving issues and providing training support wherever necessary. While this approach is well known in industry, in development programmes consultancy is often viewed as a one-shot affair. Hence there is a need to emphasise the continuing and supportive nature of the role consultants ought to play in the development context. Management schools and consulting organisations must both recognise this requirement and assist programme leaders in appreciating the importance of this approach.

However, not all consultants fully appreciate the special problems of managing development programmes. Thus, programme managers who decide to invite consultancy organisations to help implement strategic management should carefully specify their requests and screen the proposals to ensure that the consultants are fully competent, both in strategic management and the problems of development programmes.

12. SELF-ASSESSMENT QUESTIONS

Now ask yourself following questions and see if you can answer them. If you have any difficulty, go over the relevant portion again:

1. What are the features of a project management organisation which distinguish it from other management organizations?
2. What is a matrix organization?
3. What in your opinion are the problems and benefits of matrix organization?
4. How will you go about selecting and appointing a project manager?
5. As a project manager, what type of personnel will you select for managing the implementation of an education project? What criteria will you use?
6. What is strategic management?
7. How does strategic management facilitate the work of a project manager?

REFERENCES

Doherty, S. Personal notes

Doherty, S. and Potts, D.J., *Project Oasis: a case study*, The Teaching Materials Development Group, Project Planning Centre for Developing Countries, University of Bradford, England, March, 1985

Grey, C.F., *Essentials of Project Management*, Petrocelli Books, Inc., 1981.

Kingdon, D.R., *Matrix Organization: Managing Information Techniques*, Tavistock Publications Limited London, 1973.

Paul, S., *Strategic Management of Development Programmes*, Management Development Series No. 19, International Labour Office, Geneva, 1983.

The Encyclopedia of Management, Heyel, C. (ed.), Van Nostrand Reinhold Company, London, 1963.

The Encyclopedia of Management, Hoyel, C. (ed.), Van Nostrand Reinhold Company, London, 1984.

PROJECT DESCRIPTION AND FINANCING

19. Location of the Project.

- | | |
|--|--|
| (a) Name of the place and administrative district in which the service centre will be located. | 1. Curriculum Wing,
Ministry of Education.

2. Departments of Education in all the provinces and Azad Kashmir.

3. Directorate of Central Government Educational Institutions, Islamabad. |
| (b) Total area which will be served. | Primary Schools of the entire country (1976-1981). |

20. Existing facilities.

Very little exploratory work has been done in the provinces to provide any equipment/aids/teaching kits to the primary schools of their respective regions.

DESCRIPTION OF THE PROJECT

Pakistan Government has firm commitment for universalization of elementary education for boys by 1985 and for girls by 1990 along with the desire to design the system of elementary education in such a way that those who drop out after 8th class must carry with them, basic knowledge, skills and attitudes which they can use in their future vocations and thus contribute positively to the economy of his local community. The new system, therefore, needs to be designed to produce an open minded citizen with a dynamic, creative and objective out look of life and a deep concern for the improvement of the society in general and his community in particular.

The Education Policy, inter-alia, envisages that:—

“The system of elementary education will be so designed that the knowledge and skills imparted, attitudes implanted and the learning methods employed will ensure that those not proceeding to secondary education can be usefully absorbed into the economy of the local community . . .”

This is a commitment both in quantity and the improvement of quality of instruction. If we continue increasing the number of schools without taking into consideration the quality factors under the given financial and human constraints, the real purpose of universalisation of education may not be achieved. By using outdated approaches to teaching, doing cook-book type experiment/activities in the class room, it is just impossible to improve the quality of education. It is only through new innovative techniques and effective use of instructional technology that we can achieve the desired long range goal of producing citizens who could positively contribute in the economic growth of the country effectively in whatever jobs they may be assigned in future. In order to implement this aspect of the Education Policy, it was deemed necessary that some concrete steps must be taken to improve the quality of education at the elementary stage.

The most strategic entry point in bringing a forward looking change is to reorganise and reorientate our outdated and outmoded Teacher Education Programme in line with the emerging socio-economic changes in the country. The new curricula can not be implemented unless the entire school system has facilities in terms of equipment and trained manpower of qualified teachers to incorporate the new spirit and philosophy which has inspired the entire process of curriculum reforms in the country.

Keeping these considerations in view, the Curriculum Wing has developed a comprehensive project on teaching kits to be provided to all the primary schools of Pakistan for the improvement of primary education. UNICEF has provided a generous grant to collaborate with the Ministry of Education in its efforts in the improvement of quality education at the primary level. This project is to be launched in a phased manner.

We know that an understanding of the basic Science and Mathematics is essential for our future Farmer, Technician, Doctor, Scientist and Teacher. The rapid march of Science and Technology in the last two decades had caused educators to realise that teaching in today's 'space era' must differ in emphasis, purpose and kind from that of 'pre-space' exploration era. The emerging socio-economic changes in Pakistan are geared to rapid shift towards Science and Technology and demand a programme of education with entirely new dimensions.

Present knowledge explosion demands that our students must learn

to identify problems, seek their solutions, interpret their conclusions with statistical validation rather than just memorize bunch of facts, principles and laws. This means acquiring an understanding of basic principles and developing skills of observation, experimentation and an attitude of questioning and exploring.

Most people in real life encounter their environment as a whole. They do not experience Physics/Chemistry/Maths/Social Studies as such. Most citizens do not have to have all of contemporary knowledge at their fingertips, nor do they need to be able to conduct sophisticated scientific research. They do need, however, to learn how to seek information effectively, how to make sensible judgement from in-adequate data, and how to get answers for themselves about the situations they experience.

It is on this philosophy that teaching kits for primary level were designed and developed. They are designed to promote understanding of the process rather than facts. This unique innovation in experimentation aims at the total development of the personality of the learner through the effective involvement of the senses in the observation, exploration and understanding of the natural as well as man made environments through inquiry and open-ended activities which children can perform at home, at school or even under a tree with the help of a self contained, self sufficient package of essential activities without necessary paraphernalia of additional laboratory facilities.

This scheme is being envisaged as a comprehensive programme for the age group of 5 – 10, based on Piaget's stages of the development of children. Instead of stressing learning of facts, development of basic scientific concepts and principles in the context of their natural environments and applications of process has been emphasised. In short, experimentation has been based on understanding of the process. It is the process of observing, investigating, exploring and analysing that can bring knowledge deemed necessary for living better in this world activated by science and technology. The Education Policy has emphasised the need for the improvement of quality of instruction by providing teaching kits and audio visual materials to the educational institutions at all levels in the country. The Government has, therefore, established a National Instructional Technology Unit within the Curriculum Wing of the Ministry of Education to provide the necessary leadership role for the production and supply of new teaching materials to the educational institutions.

The Instructional Technology Unit has constituted a National Committee on the production of teaching kits. This Committee has already prepared a list of items which are to be included in the proposed teaching kits. The prototype of the National Teaching Kits has already been produced at the National Education Equipment Centre, Lahore.

I. Summary of the Steps Already Taken for the Development of the Kit.

The following steps were taken in the process of prototype kit development:—

1. Content analysis: Content was analysed from level I—V keeping in view the sequential aspects of concepts from simple to complex.
2. Some major concepts were selected in view of their importance and role they play in the understanding of the fundamental concepts likely to trigger the curiosity of child by creating interest and motivation in learning.
3. On the basis of these selected concepts, activities were planned and written.
4. Out of the numerous activities that could be performed in the class room situation, only those activities were chosen which in the opinion of the national committee were likely to be interesting, exciting and motivating for children of age group 5—10.
5. A comprehensive list of the equipment/materials needed to conduct these selected activities was then prepared.
6. Keeping in view the professional experience of the experts and their areas of specialization, the national committee assigned specific activities to various experts, to be prepared in their institutions for possible use in the prototype of national teaching kit.
7. From among the numerous activities/models/toys developed by the individual experts during their last 1—2 years independent research, suitable activities/models/charts/experiments

were chosen by the committee of experts for inclusion in the proposed National Teaching Kit.

8. On the recommendations of the National Committee, The National Educational Equipment Centre, Lahore, was commissioned to develop a prototype of the national teaching kit.
9. The National Committee also decided that a teacher's manual on 'how to use' the kit effectively should also be prepared. This teacher's manual is now in the final stages of development and during next meeting of the National Committee the manual will be discussed, modified and approved. Soon after its approval, it will be printed for distribution along with the kit to the selected primary schools for experimental trial.
10. The National Educational Equipment Centre, Lahore, on the recommendations of the National Committee has now finally prepared a prototype of the National Teaching Kit for selected trial and after suitable modifications, it is likely to be distributed to all primary schools of Pakistan.
11. This multipurpose teaching kit consists of self-contained and self-sufficient package of open-ended activities in Science, Maths, Social Studies and Urdu along with a teacher's basic tool box and teacher's manual describing possible ways of conducting the activities for slow learners, average learners, and suggests additional activities for talented students, thus meeting the individual differences of children — a very crucial aspect of human learning.
12. This teaching kit will be partially tested in the selected primary schools of Pakistan on population (rural-urban and boys-girls) basis and on the basis of the results, it will be modified and changed. After this limited experimental try-out the kit will be distributed to all the primary schools of Pakistan according to a phased programme.
13. Orientation workshops are now being planned by the Ministry of Education to train the master-teacher trainers in the know-how of the kit so that teachers are acquainted well before they actually start teaching through kit. In this connection, a comprehensive in-service and pre-service programme for training teachers is also under way.

14. The potential of this innovation in improving teaching-learning situation at primary level would be further explored as more research and experience is accumulated over a period of years..

II. Recommendations of the National Committee of Teaching Kits

The National Committee on Teaching Kit consisting of scientists, educators, curriculum experts, equipment experts, and working teachers made the following recommendations:

1. This Committee strongly recommends that this National Teaching Kit may be approved by the Federal Ministry of Education and be distributed to all the schools of Pakistan as soon as the desired number of Teaching Kits have been manufactured through a phased programme.
2. The Ministry of Education should impress upon UNICEF to get all the items manufactured from local manufacturers of Pakistan.
3. The quality control should be made the responsibility of the National Educational Equipment Centre, Lahore.
4. For supply and distribution purposes, the first priority should be given to all the Teacher Training Institutions, both in-service and pre-service, Curriculum Bureau and the Teacher Training Colleges. The kit should be distributed to urban and rural institutions on the basis of population figures.
5. The Committee also decided to prepare a Teacher's manual to go along with the Teaching Kit, consisting of basic equipment lists in simple line diagram, concepts to be developed, materials needed and procedures in line with the spirit of the new curricula approaches. The manual will also include guidelines for the teachers, suggested activities for talented students with special instructions for maintenance, procurement of expendable materials and evaluation form for feed back information etc.
6. The Committee also proposed that a provision of some suitable recurring expenditure for the schools which are to be

supplied with these kits be made by the provincial governments concerned.

III. Mode of Operation

For the production and distribution of the Teaching Kits, the amount involved in this project will be issued as grants-in-aid to the National Educational Equipment Centre, Lahore.

Details of the kits in science, mathematics, urdu and social studies alongwith teachers tool kits are appended in annexures 'A' — 'E'.

12. Date of estimation of capital expenditure. 1.12.1975.

13. Capital cost.	(In Lakh Rupees)				
	76-77	77-78	78-79	79-80	80-81
	100.00	100.00	100.00	50.00	50.00
Local.					
F.E.C.	—	—	—	—	—
	100.00	100.00	100.00	50.00	50.00

14. Basis of cost estimates

A National Committee on the production of Teaching Kits was constituted by the Federal Ministry of Education. This Committee held its first meeting at the National Education Equipment Centre, Lahore, in the month of February, 1975. This Committee prepared a list of items which are to be included in the teaching kits. The Committee also worked out the cost of each item. The lists prepared by the Committee are enclosed with this scheme.

15. Estimates of annual recurring expenditure after completion Nil

16. Unit cost output All the 80,000 primary schools will be provided teaching kits.

17. Expected income The scheme is intended to provide adequate facilities for the improvement of instruction in the country. Better education will result in better man-power training which is the essence of all development activities in the country.

18. Annual phasing of physical requirements.	(In lakh rupees)				
	76-77	77-78	78-79	79-80	80-81
	100.00	100.00	100.00	50.00	50.00

Local cost. (for detailed phasing of physical equipments, please see table 1).

19. Foreign Exchange expenditure. Nil

20. (a) likely sources of foreign exchange. Nil

(b) Present position regarding availability, commitment or negotiations. UNICEF has agreed to provide Rs. 25 lakhs for the production of Teaching Kits for the primary schools.

21. Sources of rupees component. Government of Pakistan

22. Results of the Project

(i) Direc benefits About 80,000 primary schools will have teaching kits to effectively implement the new Curriculum.

(ii) Indirect and other benefits The provision of teaching kits to primary schools would provide the teachers with the essential resources required for the improvement of instruction. The qualitative improvement of ins-

truction would help introduce the curricula in a more effective manner.

- | | | |
|---------|--|--|
| 23. (a) | Approximate number and categories of job opportunities likely to be created. | (a) The production and distribution work of the teaching kits will be done in the private enterprises throughout the country under the supervision of the National Educational Equipment Centre, Lahore. |
| (b) | Economic life of components of project. | (b) About 25 years |
| 24. (a) | Manpower | Nil |
| (b) | Likely shortage of manpower | Nil |
| (c) | Steps to be taken to assure availability of manpower | Nil |
| (d) | Approximate number of persons required to be trained per year | Nil |
| (e) | Total capital outlay | Nil |
| 25. | Physical and other facilities required for the project | Nil |
| 26. | Materials, supplies and equipment requirements. | |

A-I.	Total requirements of building	The Production of 80,000 teaching kits will be entrusted to private enterprises throughout the country. The prototype of the teaching kit is being produced at the National Educational Equipment Centre, Lahore.
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A-II. Materials, spares and supplies and equipment for operation of project.

These institutions involved in the project already have adequate manpower/equipment facilities to produce these materials.