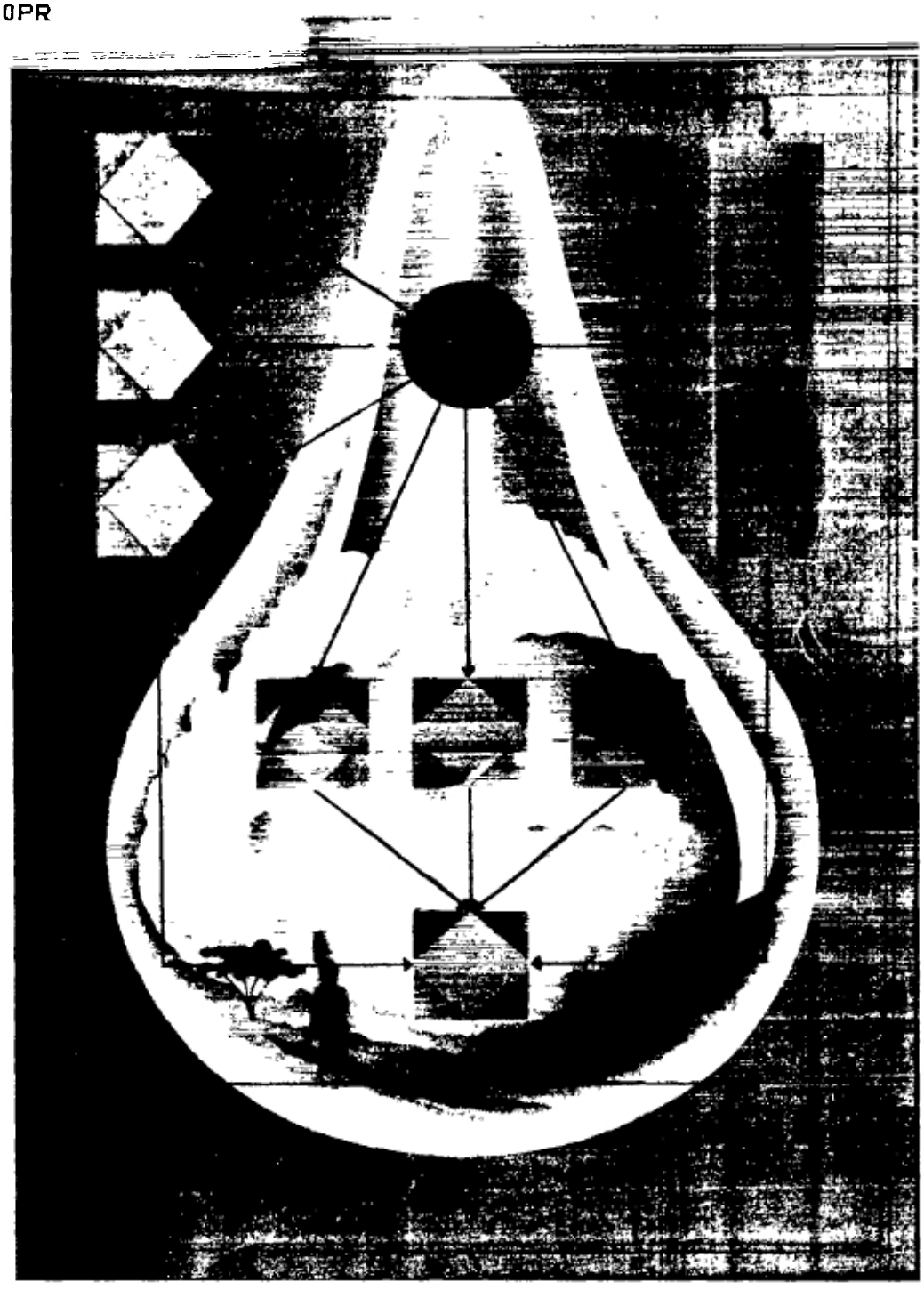
PROJECT MANAGEMENT HANDBOOK

FOR WATER SUPPLY AND SANITATION PROJECTS



ENVIRONMENTAL HEALTH DEPART
MINISTRY OF H

Ministry of Health

Department of Environmental Health Services

Project Management Handbook

for Water Supply and Sanitation Teams

PREFACE

This Handbook has been prepared to assist staff of the Ministry of Health who are tasked with the implementation of water supply and sanitation projects. The Handbook is primarily tailored for staff working at the Provincial level, but it is hoped that it might also be of use to staff at Head Office and District level. Whilst the examples used throughout are those of water supply and sanitation projects, the project management procedures introduced and explained are universal and could be applied to any small construction project.

The Handbook is divided into three major sections. Section 1 (Chapters 1 - 2) provides a background to the water supply and sanitation sector at a national level and to the general principles of project management. Section 2 (Chapters 3 - 6) explains the techniques and step by step procedures of project implementation. Section 3 (Chapters 7 - 13) details particular aspects of project implementation (for example, Financial Management and Procurements, Manpower and Training).

The Handbook was commissioned by the Ministry of Health, Government of Zimbabwe and was generously sponsored by the Swedish International Development Agency. It was prepared by Colleen Butcher of Plan Inc. Zimbabwe. The author would like to acknowledge with thanks the assistance given by numerous members of staff of the Ministry of Health at District and Provincial stations throughout the country and at Head Office Health Inspectorate staff.

J C Mvududu, Director Environmental Health Services

March, 1990

Table of Contents

List of Figures

CHAPTER 1 : NATIONAL FRAMEWORK

International Drinking Water Supply and Sanitation Decade; Zimbabwe's National Master Plan for Water Supply and Sanitation; Goals of the water supply and sanitation programme; Objectives of the water supply and sanitation programme; Concerns not covered by the Water Master Plan; Funding of the national programme; Procedures for project identification and approval; National Action Committee; Role of the National Co-ordinating Unit; Responsibilities of different Ministries in the national water supply and sanitation effort; Inter- and intra-sectoral co-ordination is needed; National level; Provincial level; District level; Village level; Summary of established national water supply and sanitation guidelines.

International Drinking Water and Sanitation Decade

On 10 November 1982 the Government of Zimbabwe adopted the national goals and methods proposed by the United Nations' International Drinking Water and Sanitation Decade.

Zimbabwe's National Master Plan for Water Supply and Sanitation

The purpose of the International decade within the Zimbabwean context was formulated further by the draft National Master Plan for Rural Water Supply and Sanitation prepared through the Ministry of Energy, Water Resources and Development in December 1985. Whilst the Master Plan has not yet been formally adopted by Cabinet, it nonetheless is already providing a useful, co-ordinating framework for all efforts in the rural water supply and sanitation sector being undertaken by various Ministries, Sections/Departments and Non-Governmental Organisations in the country.

Goal of the water supply and sanitation programme

The goal of the national water supply and sanitation programme as laid down in the National Water Master Plan is:

> "To provide the entire communal areas and resettlement population with access to safe (quality) and adequate (quantity) rural domestic water supply and sanitation facilities by the year 2005 in a cost-efficient way"[1]

Objectives of the water supply and sanitation programme

1 It should be noted that since the draft Water Master Plan's completion, the Rural District Councils Act, 1988 has been passed. Therefore it is both inevitable and desirable that future District and Provincial Development Plans (including the sectoral water supply and sanitation plans) should take into account the needs of the rural population living in the commercial farming areas (both large and small scale) as well. At the time of preparing this Handbook, no province had as yet explicitly considered how to integrate its water supply and sanitation projects across the new administrative boundaries.

The draft National Water Master Plan goes on to state that the above goal is to be achieved by the following objectives:

1. **Piped water supplies**
   To implement the phased construction (or upgrading where possible and appropriate) of 576 piped water supplies to service the domestic needs of an estimated 330 000 people living in growth points[2], district and rural service centres and selected resettlement areas by the year 2005.

2. **Primary water supplies**
   To implement on (or upgrading where possible and appropriate) of 36 000 primary water supplies (i.e. boreholes, protected hand dug wells, protected springs and roof rainwater catchment) to serve an estimated 8,6 million people by the year 2005.

3 **Ventilated improved pit latrines**
   To construct 1,4 million ventilated improved pit latrines (at a construction rate of 80 000 VIPs per annum) reaching the entire population of the communal and resettlement areas by the year 2005.

Concerns not covered by the Water Master Plan
It is worth emphasising with respect to the above policies that:

(i) Since 1988, the Rural and District Councils have been amalgamated. The Water Master Plan does not deal with this changed administrative structure.

(ii) Only the communal and resettlement areas are covered; commercial farming areas and industrial centres are committed.

(iii) The population to be served by the year 2005 may have increased beyond the projections of the Plan owing to the erratic progress of the resettlement programme.

(iv) Only domestic water supply needs are covered; livestock and irrigation consumption needs are committed.

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2 Only those growth points within the communal areas and resettlement schemes are dealt with by the draft Water Master Plan. Large industrial growth points (such as Chitungwiza, Renco, Ruwa) are excluded from this supply system. Water supplies to such centres are the responsibility of the local authorities with capital loan assistance from the Ministry of Local Government, Rural and Urban Development.

Funding of the national programme
In order to achieve this very ambitious programme within the prescribed time, the water supply and sanitation sector is being financed primarily through Government sources (Public Sector Investment Programme and Ministry of Health's Disease Prevention Control field vote) - 30%; bilateral donor agency funding - 50%; and community self-reliance efforts - 20%.

Procedures for project identification and approval
Detailed project plans for rural water supply and sanitation facilities are planned and budgeted for by implementing agencies and recipients with technical and some capital assistance from Government Ministries, non-governmental organisations and donors.

Thus in the case of primary water supply and sanitation projects a local community identifies a need and priority and requests a particular project. This project request is then screened by the Village Development Committee (VIDCO), then the Ward Development Committee (WADCO) and finally by the District Council. (Ideally the water supply and sanitation projects are then incorporated into the relevant District and Provincial Annual Development Plans.) The project is then implemented with assistance from the Ministry of Health (either using the field vote or an identified donor).

National Action Committee
The National Action Committee for Water Supply and Sanitation is a multi-Ministerial forum for co-ordination and co-operation between all Ministries involved in the sector. The NAC is chaired by the Ministry of Local Government, Rural and Urban Development.

Role of the National Co-ordination Unit
At the national level, a National Co-ordination Unit has been established within the Ministry of Local Government, Rural and Urban Development. This Unit is tasked with the co-ordination of the water supply and sanitation sector activities being undertaken by various Ministries throughout the country.

Responsibilities of different Ministries involved in the national water supply and sanitation effort

1. **Ministry of Local Government, Rural and Urban Development (MLGRUD):**
   - is the sector lead Ministry for co-ordination through its National Co-ordination Unit of all the water supply and sanitation sector development at national, provincial and district levels; and
   - is responsible for formulating integrated regional water supply and sanitation plans.

2. **District Development Fund (in MLGRUD):**

- is a technical Department responsible for the development of primary water supplies (boreholes and deep wells) and small/medium dams; and
- is responsible for the maintenance of boreholes and deep wells.

3. **Ministry of Energy, Water Resources and Development (MEWRD):**

- is a professional, technical service Ministry;
- is responsible for advice on technical design and exploitation of water resources nationally;
- is responsible for the investigation, design and construction of all piped water schemes (on behalf of MLGRUD) and their maintenance until such time as the responsible local authorities take over this responsibility;
- is also responsible for siting and drilling boreholes and the construction of dams; and
- is responsible for the co-ordination of updating the National Water Supply and Sanitation Master Plan and for providing an information and planning office for all water-related activities.

4. **Ministry of Health:**

- is the lead Ministry in rural sanitation;
- is the lead Ministry for health education;
- is responsible for the implementation of the hand-dug wells programme and other small-scale water supply programmes (e.g. spring protection, roof rainwater catchment); and
- provides financial assistance by way of locally available materials and supervisory and technical advice..

5. **Ministry of Community and Co-operative Development**

- is responsible for community mobilisation

6. **Local Authorities (Provincial and District Councils)**

- screen and approve all project proposals put forward from VIDCOs and Wadcos and ultimately preparation of a District Water Supply and Sanitation Development Plan for every district;
- are responsible for the operation and maintenace of piped water supplies (presently assisted in this by DDF) ;and
- are assisted in the above tasks by the Provincial and District Development Committees.

7. **Local Communnities**

- identify their needs and priorities;
- have an important role in planning and siting facilities;
- assist in construction of facilities by contibutions of labour and locally available materials and;
- are responsible for maintenance of supplies.

Inter- and intra-sectoral co-ordination is needed

As can be appreciated, in order for the very ambitious objectives of the Water Master Plan to be achieved, the efforts and expenditures of all Ministries and donors within the sector need careful co-ordination. Furthermore it is important for the activities of the water supply and sanitation sector to fit into inter-sectoral plans, thus complementing the efforts of other Ministries in the general national development effort. This inter- and intra-sectoral co-ordination is achieved through the work of a number of committees and sub-committees at national, provincial and district levels.

National Level

National Action Committee (formed in 1987):

- has overall responsibility for the national coordination and management of the rural water supply and sanitation sector.
- is composed of MLGRUD (Chair), DDF, MEWRD, MOH, MCCDWA, MLARR and MFEPD.

Provincial Level

Provincial Development Committees (established in 1986 under the Provincial Councils and Administration Act):

- have responsibility for the provincial co-ordination of all sectoral Ministries' development programmes;
- in three of the seven provinces sub-committees specifically for water supply and sanitation have been formed, generally composed of MLGRUD (Chair), MOH, MCCDWA, MEWRD and DDF. (In other provinces water and sanitation falls under the more general sub-committees on Social Development).

District Level

District Development Committees (established in 1985 by the (then) Prime Minister's directive):

- have responsibility for the district co-ordination of all sectoral Ministries' development programmes;

- sub-committees specifically for water supply and sanitation have only been formed in a limited number of the 55 districts; in the majority of cases this sector is co-ordinated through the sub-committees on Health and Education or on Water and Agricultural Development and must fit in to the concerns of these wider sub-committees.

Village Level
Village Development Committees (established in 1985-1987), each representing 100 households:

- where there are rural water supply and sanitation projects being carried out, sub-committees to the VIDCOs have been established and trained and have the responsibility of siting facilities, assisting in the construction of facilities and daily maintenance of the primary water supplies.

Summary of established national water supply and sanitation guidelines[3]

1. Integration of health activities

In order to achieve maximum health benefits for the target population, the water supply, sanitation and health education activities should all be integrated.

2. Integration of water supply and sanitation projects in to District and Provincial Development Plans

In order to achieve maximum use of available resources and co-ordination of national development efforts, all local, district, provincial and national water supply and sanitation sectoral planning should be fully integrated into the existing framework of District and Provincial Development Planning.

3. Provide appropriate technological levels of water supply depending on the environmental constraints

With few exceptions, piped water supplies are currently only under consideration at growth points, district and rural service centres and selected resettlement areas. Primary water supplies should be provided in the rest of the communal and resettlement areas. The service level to be provided in Phase 1 to these areas is:

1 shallow well unit (SWU) to serve a maximum 50 people,

1 deep well (= 3SWUs) to serve a maximum 150 people,

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3 These guidelines are summarised from the draft National Water Master Plan, the Ministry of Health's "Zimbabwe Health For All Action Plan" and the National Action Committee on Water Supply and Sanitation's Draft Guidelines.

1 borehole (= 5SWUs) to serve a maximum 250 people.

Shallow wells are to be fitted with bucket pumps and standard headworks; deep wells and boreholes are to be fitted with bushpumps and standard headworks.

4. Provide a mix of technologies in the provision of water supplies

In the planning of primary water supplies a mix of both hand-dug (shallow) wells and boreholes should be specified. If technically (hydrogeologically) feasible, this mix should be in the ratio of at least 4 wells : 1 borehole. The advantages of hand-dug wells are their low intallation costs, ease of maintenance and possible proximity to the user population (particularly where existing wells are selected for protection and upgrading). However boreholes are called for where wells are not possible (e.g. very deep water table) and as an assured dry-weather backup supply to the well network.

5. Water supplies at institutions

For design purposes, the water requirements of an individual consumer are 30litres/person/day. In the case of supplies to institutions the following are recommended:

Institution	Water requirement	Supply type
Schools (day scholars)	10 litres/scholar/day	Boreholes
Schools (boarders)	80 litres/scholar/day	Boreholes
Clinics (outpatients)	10 litres/person/day	Piped*
Clinics (overnight)	100 litres/person/day	Piped*
Rural Health Centre	750 litres./day	Piped*
Hospital	200 litres/person/day	Piped*
Offices, shops	100 litres/day	
Cattle (1 = 10 goats)	20 litres/head/day	
Diptank	600 litres/tank/week	

* If possible

6. Community participation is essential

Strong community participation is an essential component in planning and implementing primary water supply and sanitation programmes. Thus VIDCOs should supply information about existing water supply and sanitation facilities in their areas and supply a list of new water points required (prioritised). The District Water Supply and Sanitation Sub-committtee then develops a draft District Water Supply and Sanitation Development Plan which is sent on to the District and Provincial Development Committees for recommendation. The Plan is then put to the District and Provincial Councils for approval before being forwarded to the National Co-ordination Unit for inclusion in the national plans.

Furthermore local communities should assume responsibility for the day to day maintenance and simple repairs of primary water supply facilities (through the trained VIDCO subcommittees).

7. Shared responsibilities for maintenance of water supplies

Operation and maintenance of primary water supplies is to be carried out as follows:

a) at the VIDCO level by the sub-committee on water supply and sanitation and by voluntary pump caretakers;

b) at the WADCO level by paid DDF pump attendants;

c) at the District level by paid DDF maintenance units

8. Geographic concentration/saturation of water supply and sanitation services

In order to maximise local participation, reduce supervision and equipment costs and shorten construction times, water supply and sanitation services should be geographically concentrated so as to "saturate" local demands before moving on to other areas. However district budgets may be used to include areas of especial need.

9. Sanitation types and design criteria

Blair VIPs are to be built, at least 1 per household. At schools, clinics and similar public institutions, modified Blair latrines are to be built at a ratio of approximately 1:20 squathole per person.

10. Where possible existing facilities should be upgraded

In order to reduce costs any existing facilities (e.g. piped water supplies, boreholes, unprotected wells and unimproved pit toilets) should be rehabilitated rather than replaced by completely new facilities.

CHAPTER 2: PROJECT MANAGEMENT

What is a programme?; What is a project?; What is the project cycle?; What is management?; What is project management?; Project management by intuition; Intuitive management can lead to management by crisis; What is the purpose of project management?; What is the role of a project manager?; Management responsibilities and styles; What are the qualities of an effective project manager?; Duties and functions of a project manager.

What is a programme?

A programme is a series of individual projects connected either by sector (e.g. water supply and sanitation), location (e.g. Mudzi district programme) or time (e.g. 1988/89 public sector investment programme). It is therefore a co-ordinating framework for a number of individual projects.

What is a project?

A project is broadly defined as a series of activities (linked to each other through time) that convert resources/ inputs (be they material or personnel) into results/outputs[1]. Put in another way, a project can be said to be a commitment of present resources in the expectation of future benefits.

What is the project cycle?

In order to achieve the logical outcome of desired results, a cycle of inter-related activities is undertaken by the project implementors. This project cycle consists of:

a) **project identification** - what is the proposed project all about?, what are its general goals and available resources?

b) **project preparation** - what are the specific inputs available for project implementation and the outputs reqiured. This stage of the project cycle requires detailed and careful definition, so as to guide the decision-making process at a later stage as the project proceeds and so as to ensure that all parties involved in the project are fully aware of their expected contributions;

c) **project design appraisal** - will the project, as conceived in a) and b) above be worth implementing as against a set of specified criteria? i.e. Will the project as conceived achieve the established goals?

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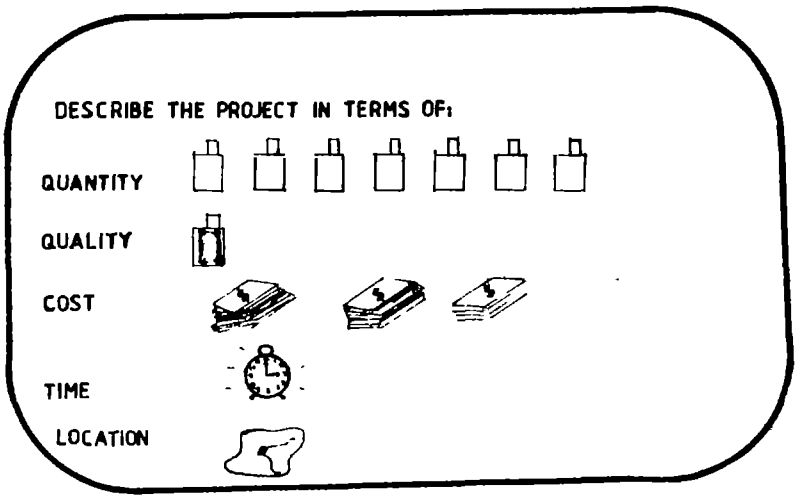
1 The term "project" is used throughout this Handbook to refer to all water supply and sanitation implementation activities including those funded through the Disease Prevention Control Programme field vote. It is not limited to merely "donor funded projects".



d) **project implementation** - the actual carrying out of the specified activities;

e) **project monitoring and review** - are all the components on course to achieving the desired results and if not,what corrective actions are required?

f) **project evaluation** - has the project, as conceived and implemented, achieved the originals goals and objectives? have those goals and objectives solved the initial problem/need?

What is management?
Management may be defined as the process of:

- planning
- organising
- co-ordinating and
- controlling

human and material resources for the purpose of attaining specified goals and objectives.

What is project management?
Project management is the process of planning, organising, directing and controlling human and material resources for the construction of a facility to serve a predetermined objective within the constraints of time, cost and quality,quantity and location.

In other words, project management is the design, planning and co-ordination of all steps of the project cycle. It involves technical, financial, social and managerial skills all rolled into one.

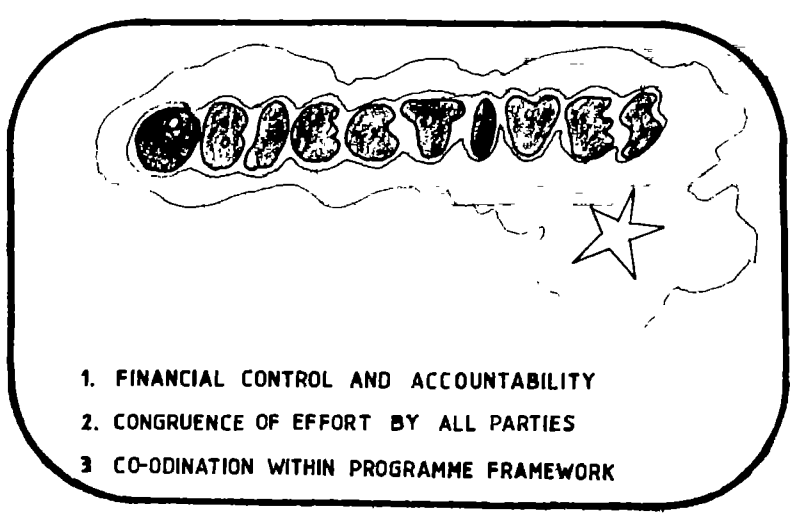
Depending on the extent and complexity of the project, project mangement may be carried out purely intuitively. For example every parent carries out "project management" functions on a daily basis in the running of his/her household: identification of goals and resources (getting children to school, getting oneself to work by 8.00am, making use of public transport):

- project preparation (ironing the clothes and making sandwiches the evening before, setting aside enough money each week for bus fares);
- project design appraisal (if the parent accompanies the small child to school on the bus will there still be time for him/her to get to work on time or should they take an earlier bus or should they pay extra and use an emergency taxi?);and
- project monitoring and review (little Johnny forgot his sandwiches at home and went hungry the whole day; in future put the sandwiches by the door so that he sees them on his way out).

Intuitive management can lead to management by crisis

Although some projects are a little more complex than running a household, many managers still like to manage their projects intuitively. Often this leads to "firefighting" or "management by crisis" - things go wrong before the manager realises it and s/he then has to take desperate corrective action which may or may not be effective. Generally speaking, the more complex a project becomes, the more necessary it is to use rational, systematic project management techniques.

What is the purpose of project management?



Even on fairly small-scale projects (such as the construction of primary water supply and sanitation services with complementary health education activities) methods and techniques of rational project mangement are called for. This is so because of:

a) **The need for financial accountability**
The project involves public finances (be they from a donor agency or direct from Treasury) and there is therefore a need for sound financial accountability to show that the money has been spent on those items for which it was allocated and that it has been spent in as timely a way as possible before construction costs rise or before the financial year ends and unspent monies have to be returned to Treasury.

b) **The need for congruence of effort by all parties**
The project involves a number of different Ministries and Departments, different individuals within the community and mass community mobilisation in the project. It is both disappointing and sometimes demoralising for all concerned if project activities do not happen when expected and if the results of the project are delayed. A failed project makes cooperation and mobilisation of others much more difficult a second time around.

c) **The need for co-ordination within the programme framework**
Projects are generally conceived of within an overall co-ordinating programme. For example, the primary water supply and sanitation projects are part and parcel of the national Master Plan for Water Supply and Sanitation. Equally, the water supply and sanitation projects are part of the five year District and Provincial Development Plans which are in turn part of the national development effort.

It is important for the achievement of the overall programmes that individual projects be carried out as planned. It is further important from a point of view of commiting materials, equipment and staff to know that projects are being completed as planned and when allocations can be made to new projects.

What is the role of a project manager?
The project manager is responsible for the design and management of all the elements of the project cycle. As already described above s/he is responsible for planning, organising, co-ordinating and controlling (POCC) the activities of the project.

However, in practice the parameters of this management role are far broader than a Provincial Environmental Health Officer may at first imagine and the neat theory of POCC activities is not always a true reflection of the pressures facing the typical project manager. Promotion to the post of PEHO is primarily on the basis of technical skills and knowledge in the field of public health. Yet as one is promoted upwards one finds one's technical responsibilities decreasing in direct proportion to an increase in administrative duties. Often the only time that one learns these administrative skills is on the job.

Henry Mintzberg, a controversial but renowned international authority on management has some interesting views on the role of the typical manager. His views are summarised below as one example of the many types of roles a manager may be called upon to carry out.

Mintzberg argues that in practice management roles are extremely complex and diverse. The formal authority of the manager gives rise to 3 "interpersonal" roles; these in turn give rise to 3 "informational" roles; and together, the manager is then able to undertake a further 4 "decisional" roles.

Interpersonal roles

(i) *Figurehead role* - "protocol" or "courtesy" duties which are important to the smooth functioning of the project organisation (e.g. attending some District Council meetings, being present at some of the staff and builders training workshops, etc).

(ii) *Leader role* - motivating and encouraging project team staff.

(iii) *Liason role* - contacts outside of the vertical chain of command, i.e. contacts with peers in other provinces, Departments, etc. This is done (often unconsciously) so as to build up the manager's information base.

Informational roles

By virtue of the above interpersonal contacts with subordinates and peers, the manager is a "nerve centre" of his/her organisation - s/he may not know everything but s/he does know more than any other member of staff.

(iv) *Monitoring role* - perpetually scanning the project environment and collecting information.

(v) *Disseminator role* - passing on some of this information to subordinates.

(vi) *Spokesman role* - sending some of this information to people outside the project unit (e.g. informing and satisfying the donor agency, visiting Head Office staff, etc.)

Decisional roles

The information constantly being gathered by a manager is not an end in itself but is a basic input to decision-making.

(vii) *Entrepreneur role* - voluntarily improving the project unit, adapting it to changing circumstances, adopting new ideas, etc.

(viii) *Disturbance handler* - reacting to changes and pressures imposed on the project from externally (e.g. the national shortage of cement, disagreements between builders and households.) It is impossible even for a well run project to

consider all possible contingencies in advance; the manager must be ready to deal with the unknowns.

(ix) *Resource allocation role* - the responsibility of deciding how work is to be allocated and co- ordinated between project staff; authorising other's decisions; etc.

(x) *Negotiator role* - for example negotiating with suppliers to deliver on particular dates; with Provincial Development Committees to give priority to water and sanitation projects; with donor agencies to include staff housing in their project budgets; etc.

(For further reading refer to : H.Mintzberg "The Manager's Job : Folklore and Fact" in Harvard Business Review, July-August 1975.)

Management responsibilities and styles

The project manager is responsible for all of the above complex roles and therefore it is not possible (or desirable) to prescribe a particular management style. Management styles vary from manager to manager and under different project conditions. Styles typically found are those of:

- telling
- selling
- consulting or
- joining

in relation to other project staff and the user community. Thus the management style may vary from autocratic to laissez-faire.

Modern management theory holds that there is no one management style which is better than another. The effective manager adopts a particular style depending on the project environment, using whichever is appropriate under a given set of circumstances.

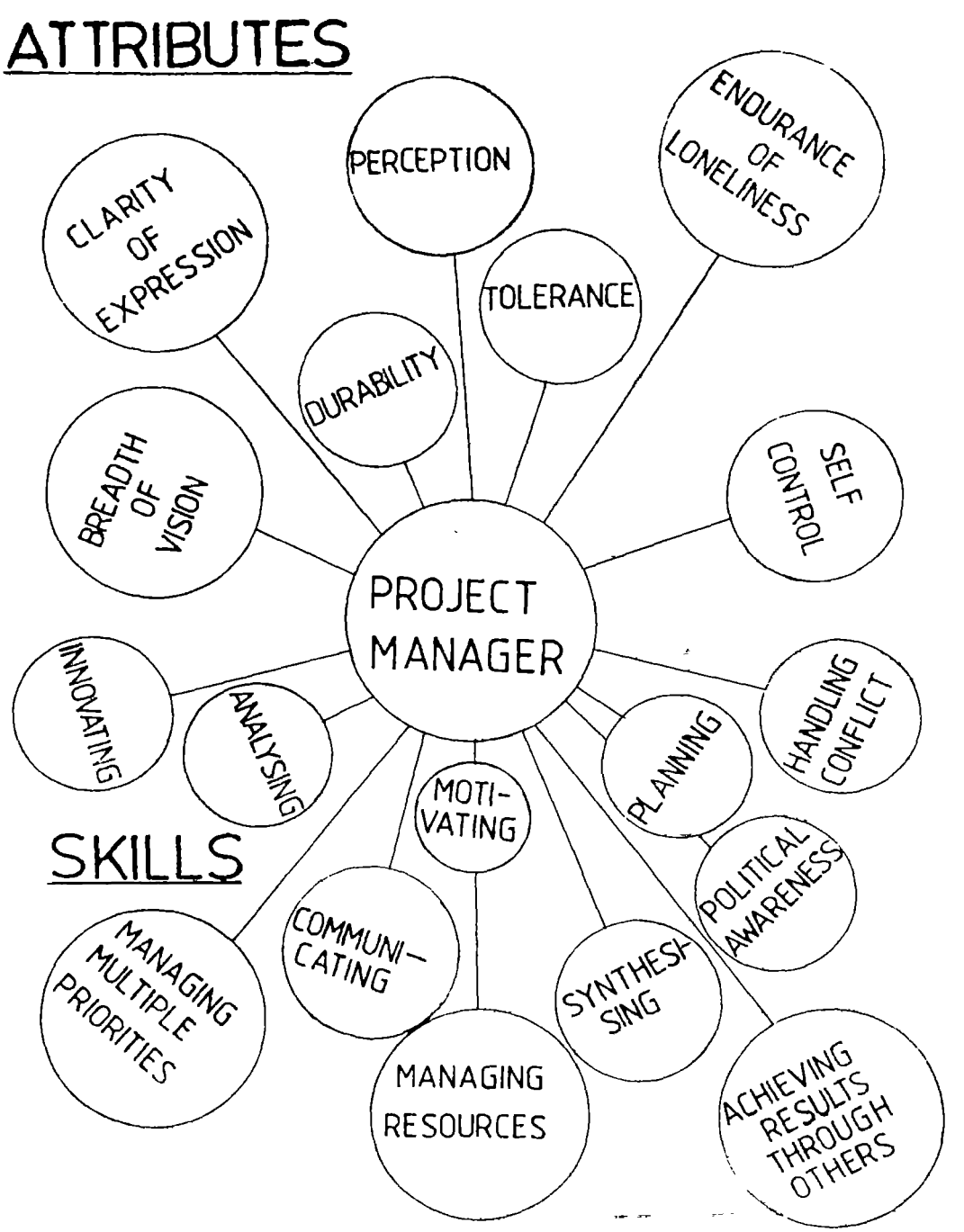
What are the qualities of an effective project manager?

An effective project manager is expected to have a wide variety of skills. Modern management theory holds that people are not so much "born" leaders/managers as that they can actually develop the necessary appropriate skills. By constantly examining the way s/he is performing, a project manager can improve continuously on the job.

Amongst the most important skills of an effective project manager are:

a) **Technical knowledge-**
If the project manager is to be able to plan the project successfully and then co-ordinate and control the inputs made by others s/he must have a good technical grounding (for example, how is a Blair VIP built? how are the strength of bricks tested? how is the quality of water tested?)

Figure 2.1: Attributes and Skills of a Project Manager



This is not to say that the project manager is expected to know and carry out all details of the project. But s/he should have a good idea of what is involved so as to be able to delegate to others and to periodically check that their work is being carried out in accordance with acceptable minimum performance criteria.

b) **Financial knowledge**
Given the high priority accorded to financial accountability, the project manager must be able to plan a project budget in advance, check on expenditures and constantly monitor cost over-runs and possible misappropriation of funds and materials.

c) **Personnel skills**
The effective project manager must be able to motivate project staff to make their best efforts as well as oversee the general community mobilisation efforts. This calls for a pleasant demeanour, ability to communicate, ability to reward effort and take punitive measures where necessary, ability to resolve conflicts, etc.

d) **Administrative and decision-making skills**-All of the above qualities lead to sound administration practices and increase the project manager's self-confidence to make well-informed decisions as and when necessary.

Duties and functions of a project manager
The duties and responsibilities of a project manager can therefore be summarised as including:

a) Identify and establish the relationship between all parties involved in the project (community and groups within the community, VIDCO members and chairmen, Head Office, donor agency, project staff, local builders, etc).

b) Design the project.

c) Advise and recommend the appointment of suitable suppliers of materials.

d) Expedite the requisitioning of materials, transport and equipment.

e) Obtain the necessary resources to carry out the work in accordance with the approved project plan.

f) Organise, instruct and supervise subordinate staff as well as keeping such staff informed of the direction and progress of the project.

g) Final acceptance of the appointment of suitable local builders based on the recommendations of the District Council.

h) Ensure effective community liason procedures.

i) Set up and periodically review the project budget.

j) Ensure that financial control takes place in conformity with established procedures and routines.

k) Set up and periodically review the timetable and resource plans for the project.

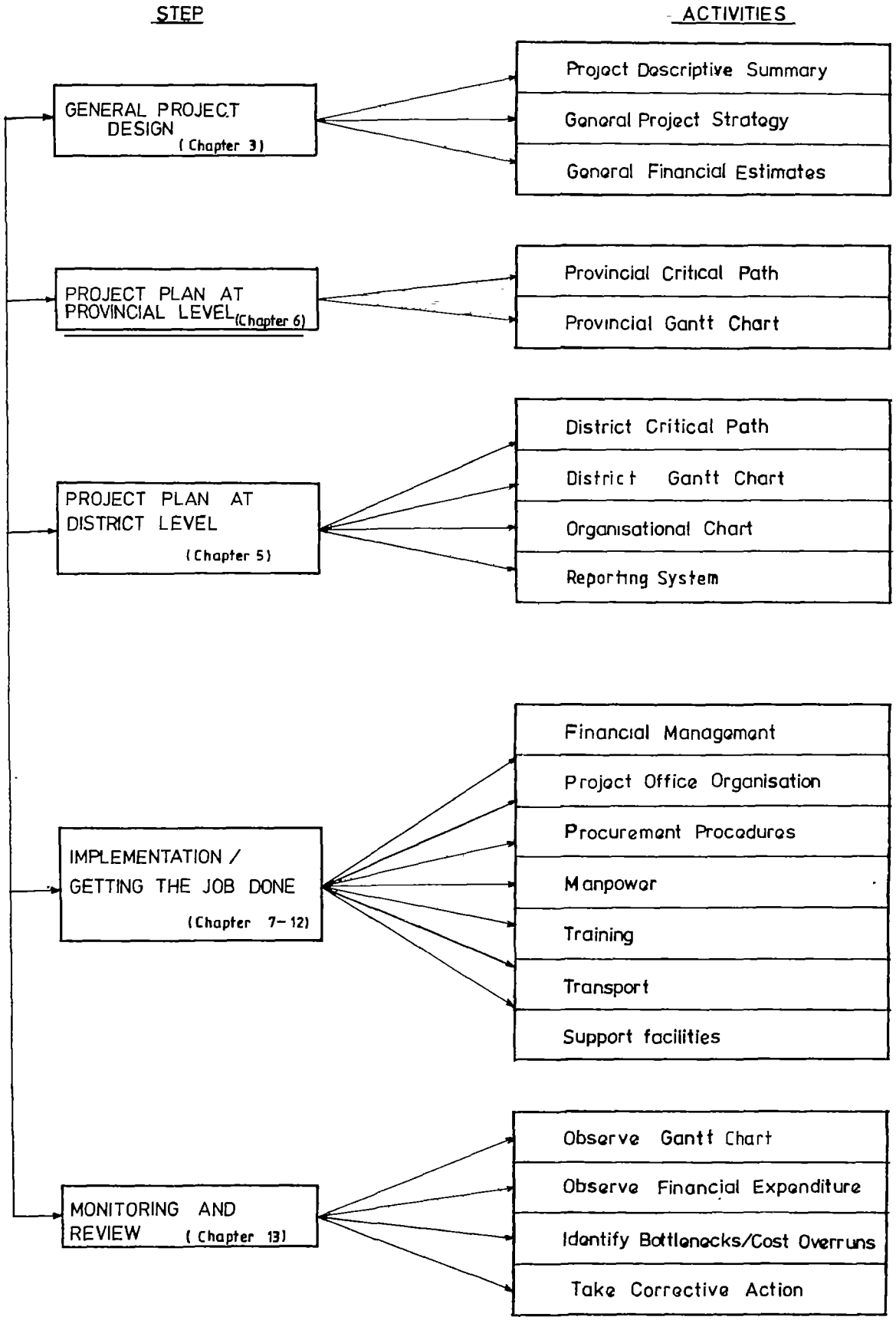
l) Making use of established reporting procedures, brief the National Action Committee on project progress, cost and quality of work and seek policy advice where necessary.

m) Convene and chair project meetings and ensure that accurate minutes are kept and distributed to all interested parties.

The responsibilities and qualities described in this Chapter form the basis for understanding sound management practices. However they cannot, on their own, manage a project.

> "Projects are managed by people, who have to make decisions and enforce procedures that affect other people. Project management must be seen as a dynamic, difficult and often abrasive art, based on well proven principles but not solely devoted to their slavish or rigorous application".
>
> (Austen and Neale, 1982, p42)

Figure 2.2: The Project Implementation Cycle



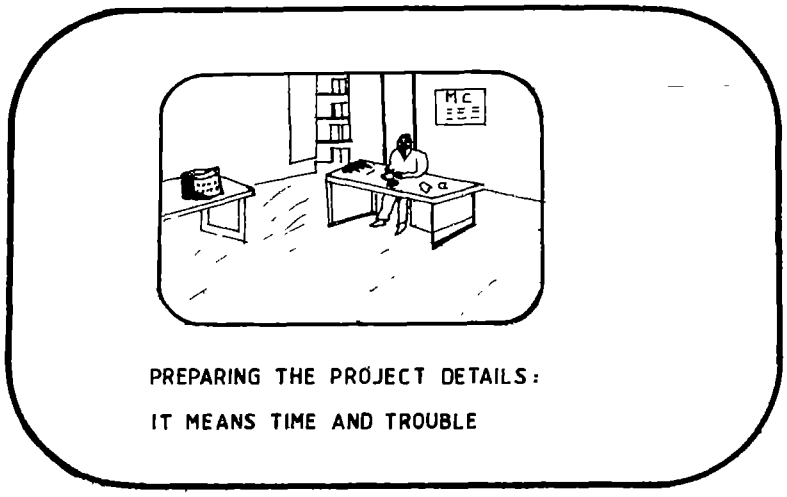
CHAPTER 3: THE PROJECT PLAN

Project planning is fundamental to project success; What is the purpose of the project plan?; How is the project selected?; What is the difference between project planning and water supply and sanitation development plans?; Who is responsible for preparing the project plan?; Objections raised against project planning; Replies to these objections; Positive reasons for undertaking project planning; Crucial components in the planning of any project; Pointers for drawing up the project plan; Example of drawing up a project plan.

Project planning is fundamental to project success

Project planning (also sometimes referred to as project design) is the first step in the implementation of a project and is fundamental to the eventual success or failure of a project. With pre-project planning, there is a better chance during implementation for ensuring that adequate resources will be available at the right time; adequate time will be allocated to complete each activity; and all the various component activities will start at their appropriate times.

Therefore it is as well to spend some time and careful attention to detail at the project planning stage. A few extra hours spent carefully planning the project in advance in the office will usually save many wasted hours or even days on the ground. Remember that planning is a means to an end – it is a tool for getting the project successfully completed.



What is the difference between "project planning" and "district water supply and sanitation development plans"?
The National Action Committee for Rural Water Supply and Sanitation has adopted the policy that all districts in the country should strive to prepare a "District Water Supply and Sanitation Development Plan". The main objectives of these development plans are:

(i) To make an inventory of the existing water supply and sanitation facilities in the district;

(ii) To establish the need for additional water supplies and sanitation;

(iii) To prioritise the future development of water supply and sanitation facilities.

Thus the overall purpose of the development plans is to rationalise the forward planning of the water supply and sanitation sector as a whole - to identify needs and direct available resources to priority areas.[1]

In contra-distinction, the format of a "project plan" is to present a detailed summary of how a project is to be implemented once it has already received approval and funding.

What is the purpose of the project plan?
The purpose of the project plan is to:

- estimate project costs;
- design the proposed works in detail;
- obtain any necessary approvals and support in advance (from Head Office, District or Provincial Development Committees);

How is the project selected in the first place?
This information is fed to the PEHO from two sources:

(i) Head Office (usually at the beginning of each financial year) advises what funds are available in different votes for the operations of the provincial offices and periodically advises the provinces of the Ministry's national policies and priorities for the coming year.

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1 Reports have been written elsewhere on the methodologies for drawing up District Water Supply and Sanitation Development Plans; therefore this information will not be repeated here. See for example:
"Guidelines for District Water Supply and Sanitation Plans" by N. Mutizwa-Mangiza, 1987;
"Draft Guidelines for District Water and Sanitation Development Plans No. 3 " by the National Co-ordination Unit, MLGRUD, October 1988;
"Guidelines for District Water Supply and Sanitation Planning for Communal Areas and Resettlement Areas" by the Office of the Provincial Administrator, Midlands, February 1988.

Thus it might be that $x are available in each province under the Disease Prevention Control vote for a variety of activities. In most provinces the individual districts then decide what percentage of the vote is to be used for water supply and sanitation facilities. The onus now rests on the provincial offices to use these public funds as expeditiously and effectively as possible.

(ii) Provincial and District Councils, through their respective District and Provincial Development Plans which have in turn been developed from the needs and priorities identified by VIDCOs to WADCOs through the Disrict Water Supply and Sanitation Subcommittees, approve particular projects for implementation. If donor funding can be secured for such projects, then once again the onus of co-ordinating and supervising the implementation falls on the Province's Ministry of Health office.

Who is responsible for preparing the project plan?

This should be done by the project manager. At district level this would be the District Health Inspector with assistance from the Provincial Government Health Inspector. At provincial level it would be the PEHO with possible supervision from the Provincial Medical Director. The best situation is for the person who will ultimately be held accountable for the progress of the project to be the one who plans the project in the first place. This planning is always done in consultation with other staff and the user community.

Objections raised against project planning

Some project managers are skeptical of the need for detailed project planning prior to implementation. Some of the most commonly heard objections are:

(i) The time and energy spent on detailing the design of a project are best left to the academics - why not just get on with the job?

(ii) There are often national shortages of materials (e.g.cement or PVC piping) and equipment (e.g. vehicles and spare parts). Therefore there is no point in planning activities in advance because one always ends up having to change the plans.

(iii) Communities often get impatient with all the"backroom" planning. Once they are aware that funds have been made available they want to see results immediately, not 6 months from now.

(iv) During the summer months rainfall causes disruptions to building projects and households are engaged in agricultural activities.This will again disrupt all the planning one has done.

Replies to these objections

Usually the disruptions caused by national shortages and the weather can be minimised by careful consideration of known types of shortages and typical weather conditions of a district. When there are uncertainties, it is surely better to try and identify and allow for them in a project's timetable than to pretend that they do not exist until they actually happen (and then have to start firefighting).

As for the time and effort needed for project planning, if one compares the time and cost of preparing or planning the project (about one week) to the overall value of the project (thousands of dollars spent over many months), it will be seen that it is a very small percentage. Why not face the potential problems beforehand on paper than out in the field in front of the whole community? Give yourself time to think out potential problems before they occur rather than have to deal with them when it may be too late.

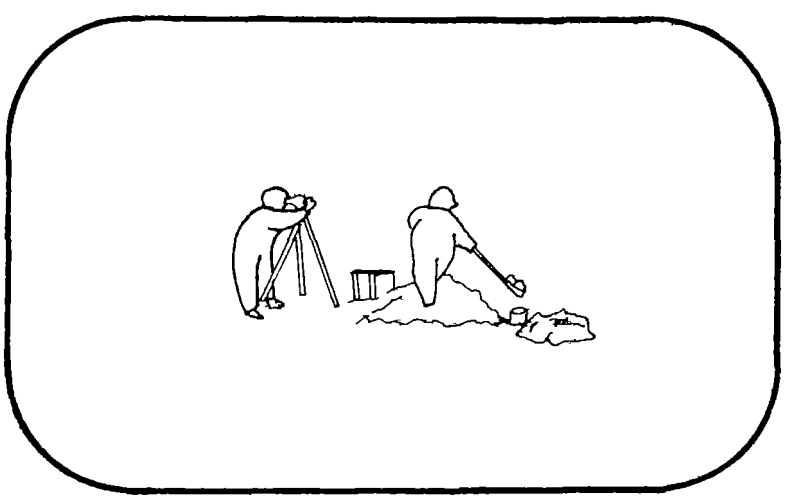
Finally, communities are indeed anxious for visible development and progress. However if one points out to the community what is being done behind the scenes and the value of carefully working out how everyone's future efforts are to be co-ordinated, they will usually be willing to co-operate.

Positive reasons for undertaking project planning

The reasons why project planning are necessary may by now be self-evident:

(i) To determine the best and most economical way of carrying out the project given the District's resources and thereby calculate the possible date of completion of the project.

(ii) To provide a continuous work timetable for the project, showing the sequence and timing of all major activities.



(iii) To show up in advance some of the difficulties that might arise rather than discover them when the project is already well under way.

(iv) To be able to procure in advance, or in good time, all the materials and equipment necessary for the project so that it runs smoothly to schedule.

(v) To assess the manpower needs of the project (staff, local builders, community) and be able to train staff in advance and to allocate specific people or groups to carry out certain activities at appropriate times.

(vi) To indicate the times when local builders will be on site and thus allocate time to check the quality of their work.

(vii) To estimate when and how much money is required to finance the project and as an aid to ensuring that actual expenditures are within the original project budget estimates.

(viii) To provide an easy means of checking and controlling blocks of related activities of the project and ensure that the whole project goes according to its timetable.

(ix) To identify crucial activities which must be carried out on time in order not to delay the whole project and to see how progress on the project can be speeded up.

(x) To enable factual reporting of data for use in planning and implementing future projects.

Crucial components in the planning of any project

The objective at the project planning stage is to detail the rough skeleton of a project provided in the Provincial/District Development Plan, according to resources and finances available.

A project plan generally consists of three components:

(i) A general descriptive summary of the project in which the problems to be solved and project objectives are specified.

(ii) A preferred strategy of implementation in order to achieve the objectives in (i).

(iii) The selected preferred strategy is then detailed with emphasis on the timing of activities, estimating costs and materials needed and manpower requirements.

Pointers for drawing up the project plan

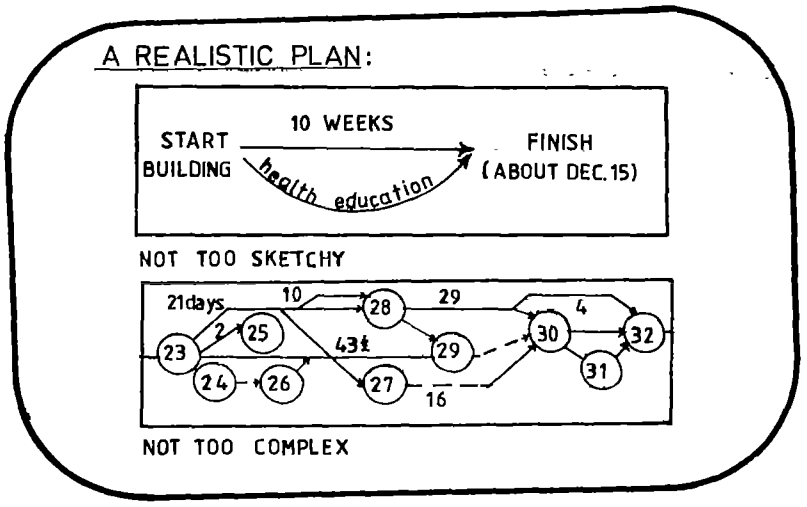
In the initial project planning stage certain aspects are noted in summary which are then planned in more detail prior to implementation. (Detailed project planning is covered in Chapters 4 - 6).

Most of the points to be covered in a standard project plan are already in use by Provincial Environmental Health Officers. However some points to bear in mind are that:

(i) The project plan should provide information in an easily understood format, regardless of how complex the project environment is.

(ii) The plan should be comprehensive and should cover all stages of the project cycle from initial project approval to final completion of works and maintenance of facilities.

(iii) The plan should be realistic. There is no point for example in planning all the toilets to be built within 6 months if cement deliveries take 5 months.



(iv) The plan should be flexible. Circumstances will almost inevitably change during the implementation stages. It must be possible to alter certain activities or their timing without disrupting the entire project.

(v) The plan should serve as a basis for monitoring project progress and for control.

Example of drawing up a project plan

The following is an example of how a project plan may be drawn up. Some donors have their own specific formats which have to be followed but generally the following information should always be covered:

FORMAT	EXAMPLE
Name of Project	Rural water supply and sanitation project; Chaminuka District, Mashonaland Central
Date of Project	July 1988 - May 1989
PROJECT DESCRIPTIVE SUMMARY	
Econonic Sector *This information uses standard MFEPD nomenclature so as to conform with other sectoral projects put forward under PSIP or Provincial/District Development Plans.*	Infrastructure
Source of Funding *All projects should follow standard acceptable implementation and reporting methods, but some donors have their own additional reporting procedures. Thus the need to identify the source of funding at an early stage.*	Disease Prevention Control Vote, MoH
Expected Project Period *Government's financial year is from July to June - this sets time limits to the project. It is unrealistic to expect funds to reach the Province before Sepember and Provincial books are closed by 31 May, by which time all major expenditures must have been made.*	Water: 9/88-5/89 Sanitation: 9/88-1/89
Goals of Project *Specify general output, target group, location, and time. This information is found in theProvincial/District Development Plans.*	Provide domestic drinking water for all households in Chaminuka District in 1988/89 year.
Quantifiable Outputs/Project Results	40 upgraded, protected wells 800 Blair VIPs (29 carried forward from 1987/88). Training 8 VIDCO sub-committees in construction and maintenance. Train 16 local builders in construction and maintenance. Health education in 2 wards on construction and use of toilets.

Target Beneficiaries *This data is important for later monitoring and evaluation of project*	All households inWards 3 and 5
Site Location (Grid References) *This data will highlight areas not yet covered. Grid references avoid the ambiguity of local vs official names of areas. For grid refs. of a large area (ward) choose a central point or school or similar. The grid ref. nos. are: map no, vertical followed by horizontal*	UR 003938 UR 040106
GENERAL PROJECT STRATEGY	
Implementing Ministries	MOH : Lead Ministry in project supervision and implementation. MCCDWA : Support Ministry for community mobilisation. DDF : Support Department for training local builders.
Mode of implementation	Mix of self help labour (40% project costs) with Government financing of 30% materials and donor assistance (30% of materials).
Mode of technology	Hand dug protected wells; hand augured tube- wells and hand dug shallow wells.
General identification of resources to be used	
Materials *(specify quantities of each and whether .Government or community supplied) -*	Bricks, sand, cement, vent- pipes, mesh wire, Vonder rig, pvc casing
Personnel *(specify whether Government or Community)*	1 X PEHO, 1 X DEHO, 2 X PEHT, 4 X EHT. 16 X builders, 1200 X Ward households, 12 X VCWorkers
Sources of materials	
Local:	bricks, sand, water
Bindura:	Mesh wire, cement

Harare:	Reinforcing wire, gauze wire, Vonder rig, pvc casing
Mode of transport	
MoH:	1 X 5 tonner (15000km) 5 X 175cc (7000km each)
DDF:	LandCruiser (1000km)
Private: (Distance from sources of materials for deliveries)	
GENERAL FINANCIAL ESTIMATES	
Total costs	
a) Capital:	Wells 40 X $1500 VIPs 500 X $100 $110 000
b) Recurrent:	Wells spares $10 000
c) Community:	Builders: VIPs 500 X $40 Aprons 40 X $30 $21 200 660 man days p.a. (voluntary community labour)

CHAPTER 4: PROJECT IMPLEMENTATION TECHNIQUES

Project implementation techniques; Broadly speaking, what is CPA? What are critical activities? What are non-critical relationships? What is the critical path? Advantages of CPA; Limitations to the CPA method; Broadly speaking, what is a Gantt Chart? Advantages of the Gantt Chart method; Limitations to the use of Gantt Charts; Is it necessary to draw up both a project CPA and GC? Step-by-step procedures for using a CPA and GC in conjunction with each other.

Project implementation techniques

Having derived a general plan of the project (in Chapter 3) it is now necessary to consider in detail "how" and "when" the project is to be undertaken.

In this Chapter consideration is given to developing a detailed **project implementation plan** which can be applied at the Provincial and District tiers.

As noted in Chapter 2, project management is a common-sense, but logical and rational means of implementing decisions. There are (unfortunately) no magical ways of making a project successful. However, depending on the complexity of the project, a number of explicit management tools can be appropriate in assisting the project manager to get the job done efficiently. Many of these tools were originally developed for the purposes of the outer-space programme - including landing man on the moon! i.e. for highly complex and dangerous projects. However today, the names of many of these methods have become familiar to project officers working on far more "down to earth" projects e.g.

PERT - Planning, Evaluation and Review Technique;
IDEALS - Ideal Design of Effective and Logical System;
PPB - Planning, Programming and Budgeting method;
Cost Benefit analysis;
The Logical Framework;
and so on.

Two time-tested methods which are recommended as appropriate for use in the implementation of water supply and sanitation projects (and other small-scale building projects) are:- **Critical Path Analysis** and the use of **Gantt Charts.**

What is CPA?

Critical Path Analysis (CPA) is a "networking" technique for planning and managing projects. It is also sometimes called the "activity-on-arrow" method.

CPA begins by describing all the various activities necessary to complete a given project. At this stage the activities are merely listed without consideration of resources or timing. Then the time to complete each activity is estimated, taking into account the resources available and the desired performance specifications. The activities are then arranged in a logical sequence from start to finish. The activities which are critical for the timely completion of the project are then highlighted - this is called the "critical path" through the

network. The total time needed to complete the project is then calculated on the basis of this critical path.

What are critical activities?
The term "critical" is used to describe those activities in the project which:-

(a) have to be carried out for the project to proceed; and

(b) have to be carried out either immediately before or immediately after another activity in order for that other activity to succeed. (e.g. cement, which has a very short storage life, particularly in the rainy season, must be bought before the aprons on protected wells are built and is best bought just before apron building commences).

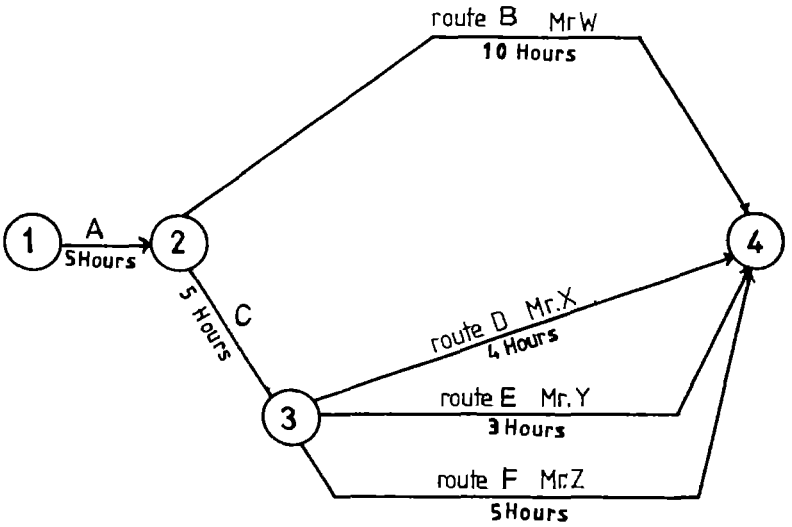
It should be noted that in the language of CPA "critical" only refers to this special inter-linkage between activities. Obviously in other circumstances, the project manager may consider many other activities as critical to the success of the project - for example, working with the community.

What are non-critical relationships?
On the other hand, some activities do not have "critical" relationships with each other i.e. they are not dependent on each other to occur. For example the activity of recruiting local builders can go on at the same time as the purchasing of non-local materials. i.e. materials do not have to be bought before it is possible to recruit builders. Therefore whilst both activities are essential to the ultimate success of the project, in CPA language they are not said to be "critical."

What is the critical path?
The critical path of a project is the shortest possible time for all inter-related activities to be undertaken so as to complete the whole project in the shortest possible time.

Consider the following CPA example (Figure 4.1. below) of 4 men walking by different routes from point 1 to point 4.

Figure 4.1: A Simple Example of Critical Path Analysis



Suppose that 4 men, Mr.W, Mr.X, Mr.Y and Mr.Z, leave the same starting point at the same time and agree to meet up again as soon as possible at a common point some distance away at point 4.

The starting point is the circled point 1. It symbolises both the geographic starting point and the event in time which is the starting out on the journey.

The 4 men all walk together (route or activity A) to a new point (circled 2) some 5 hours away.

At point 2 Mr.W sets off alone along route B to the final point 4.

However the other three (Mr.X, Mr.Y and Mr.Z) decide to set out in a different direction and they go together along route C to point 3. At point 3 they split up and each go along different routes (D, E and F), all eventually arriving at the final meeting/activity point 4.

What is the critical path time of this example?
The question now is, accepting that each of the men has gone off on a different route, what is the earliest time that they will all meet up together again at point 4?

Looking at each man's seperate journey: -

Mr.W (via roads A and B) = 5hrs + 10hrs = 15hrs.
Mr.X (via roads A, C and D) = 5hrs + 5hrs + 4hrs = 14hrs.
Mr.Y (via roads A, C and E) = 5hrs + 5hrs + 3 hrs = 13hrs.
Mr.Z (via roads A, C and F) = 5hrs + 5hrs + 5hrs = 15hrs.

Therefore the earliest time at which all 4 meet again will be the time at which the slowest reached point 4 i.e. 15hrs. (i.e. Mr.W and Mr.Z.)

Therefore the end event (point 4) can occur at the earliest, at 15 hours after the time of the starting event (event 1).

Secondly, as both Mr.X and Mr.Y would have to wait at point 4 (for 1 and 2 hrs. respectively) for Mr.W and Mr.Z to arrive, it would be possible to schedule the starting times of Mr.X and Mr.Y differently. i.e. it is not "critical" that they had started their journey as early as Mr.W and Mr.Z.

Simple rules for drawing up CPA networks for a more relevant project (such as for a water supply and sanitation project) will be discussed in more detail later on in this Chapter. However from the simple example given above, some of the more obvious advantages and disadvantages of this method for project management purposes will be obvious.

Advantages of Critical Path Analysis

1. The project manager can perceive the total project very clearly, given the logical breakdown of all activities to be undertaken and their logical relationships.

2. The project manager can concentrate on a portion of the network at any given time - thus increasing efficiency with which the project is carried out.

3. The project manager can delegate non-critical activities to others, thus involving them in the project whilst allowing her/himself time to concentrate on the critical activities. In larger projects the delegation of responsibilities is crucial and CPA is a useful tool for monitoring progress of different activities being carried out by other project staff.

4. The project manager can not only co-ordinate various activities better but can review the way in which jobs are carried out. It is easy to check that critical activities are on schedule.

5. CPA assists the Project Manager in estimating the minimum total time needed to complete the project.

6. CPA gives the times when activities must be scheduled to complete the project in that minimum time.

Limitations to the CPA method

1. It is necessary to estimate in advance the exact nature and timing of each activity in the project which is not always possible (although amendments can be made to the network diagram at a later date).

2. CPA cannot take account of the limited availability of a particular resource.

3. A CPA network of more than 50 activities is tedious to analyse by hand and would usually need a computer.

4. CPA does not take account of additional information which the effective project manager makes use of, e.g. the relative skills of different staff; the degree of community support for the project, etc.

Replies to these limitations

The point of it being difficult to define all activities in advance is a valid one. Yet as discussed in Chapter 3 (when defending the need to plan projects at all,) the CPA method allows the project manager time to consider all foreseeable activities in advance. It also allows him/her to face, on paper at least, the probable times it will take to complete different activities. In other words it allows the project manager the luxury of a "mock-run" of the project in advance.

There is no denying that CPA is not able to deal with a limited resource in the project. However a useful method for dealing with limited resources (e.g. manpower) is the use of Gantt Charts. These charts are elaborated upon in the section that follows.

As far as Provincial and District water supply and sanitation projects are concerned, no more than 50 activities are likely to be needed. If it were, the use of a computer to assist in drawing up the network would be strongly recommended, but this is unlikely in our circumstances.

The point concerning non-quantifiable project information is an important limitation. In later chapters (particularly 9 and 10), the issue of personnel abilities and how to make the most of them, are discussed in explicit detail.

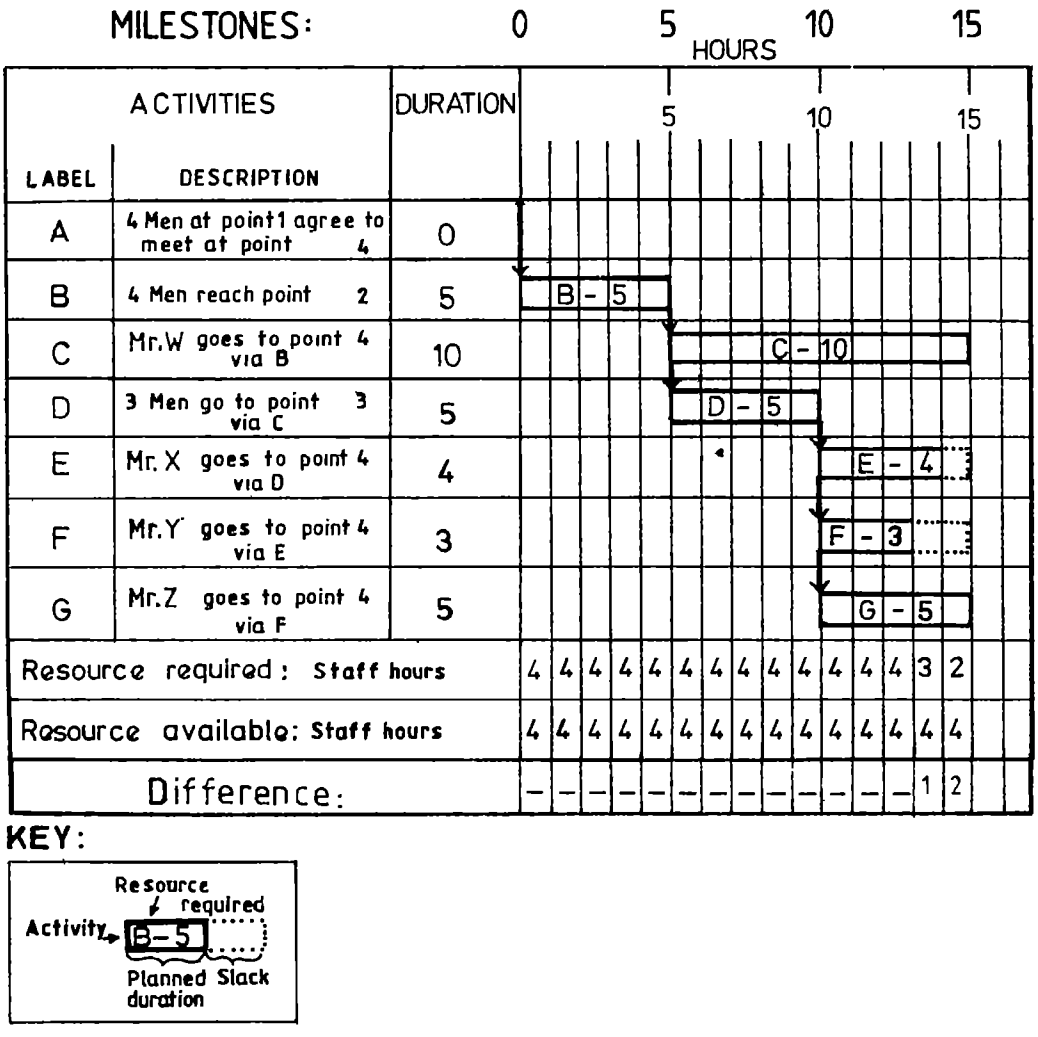
What is a Gantt Chart?

A Gantt Chart (also sometimes referred to as a bar chart) displays the schedule of project activities. Each activity is represented by a bar that extends along a time scale, the length of the bar being the duration time of the activity. The position of each bar along the time scale indicates the starting and finishing points of each activity. Further, on a Gantt Chart, the required amount of a limited resource (eg. manpower) may be tabulated in relation to time. Activities can then be shifted around in time so as to maximise (or not exceed) the use of a limited resource.

A Gantt Chart example : 4 men walking by different routes from point 1 to point 4

From the earlier CPA example (Figure 4.1) it is now possible to derive a Gantt Chart of the same activities (see Figure 4.2 below).

Figure 4.2: A Simple Example of a Gantt Chart



It can be seen that the GC is constructed by identifying all activities involved in the project and determining their sequences. Each activity is drawn as a bar located on a time scale so that the length of the bar corresponds to the duration of the activity and the position of the bar denotes its scheduled start and end.

Advantages of the Gantt Chart method

1. The primary advantage of the Gantt Chart is its simplicity and intuitive appeal; it is popular because the timing of each task is clearly indicated in a graphic way.

2. The critical path or sequence of critical activities is apparent on the GC by direct inspection.

3. Allocation of a specific resource (usually manpower) can be shown explicitly on the chart and activities can be rescheduled or the resource shifted from one activity to another when necessary.

4. Milestones can be clearly marked to show important intermediate stages of the project. The project's progress can be clearly assessed in relation to those milestones and corrective action can then be taken if certain activities fall behind the milestone dates.

Limitations to the use of Gantt Charts

1. The Chart does not emphasise the logical sequence and inter-relationship of activities as clearly as a CPA, particularly when more than one activity succeeds or preceeds another activity. (Thus CPA is recommended in conjunction with the GC).

2. If more than one resource is limited, the GC technique does not ensure an optimum resource allocation - more sophisticated/complex techniques are needed for this. Nonetheless, the technique is still useful for graphically sequencing activities to avoid exceeding the amount of a limited key resource.

Is it necessary to draw up both a project CPA and GC?
At first sight it would appear that the CPA and GC of any project are very similar - they consist of breaking the total project down into its element activities and scheduling these activities over time. Thereafter it seems to be merely a matter of presentation as to whether one chooses to use a Gantt Chart or CPA network diagram.

However, as was pointed out above, each method has particular advantages. The Gantt Chart:-

(i) has simple but clear graphic presentation, so that individual activities and progress of a project may be conveyed to all staff, not just the project manager; and

(ii) can explicitly allocate a limited resource at different times in the project.

Neither of these factors is well handled by a CPA network diagram alone. However, the distinct advantages of CPA are:

(i) it highlights critical activities and the project manager can then concentrate his/her efforts on these at appropriate times to keep them on schedule; and

(ii) it highlights the logical inter-dependence (and in other cases the non-dependence) of different activities in the project. It is therefore a stronger tool than the GC for co-ordinating the timing/scheduling of activities. This is particularly useful when a number of different people are carrying out different activities.

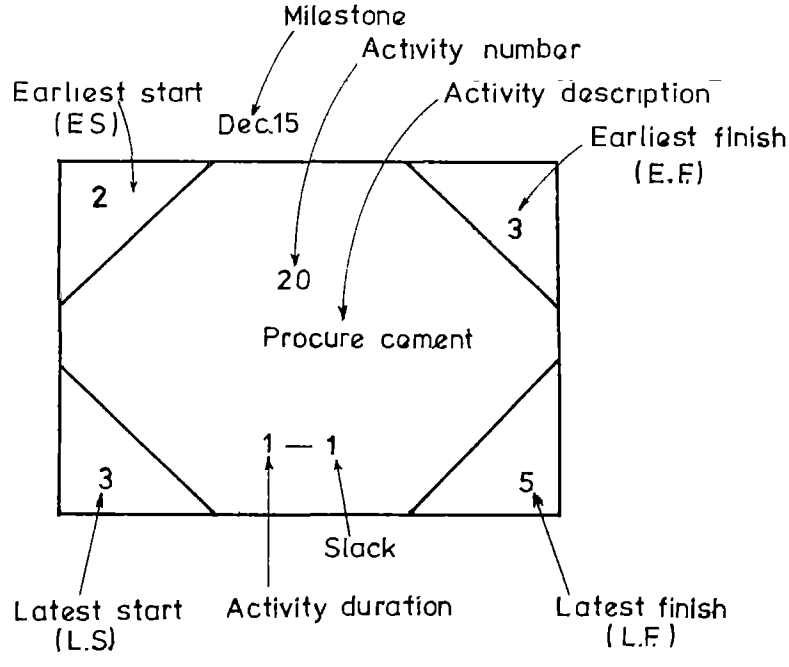
It is therefore strongly recommended that both a CPA and GC be developed for every project for effective implelementation and management.

Step-by-step procedures for using a CPA and GC in conjunction with each other
The following procedure concentrates first on constructing a CPA and then deriving a GC as an extension to that CPA.

I. CONSTRUCT THE CPA FOR THE PROJECT:

NOTE: The CPA makes use of "activity cards". The format of each card, once completed, will be as in Figure 4.3 below.

Figure 4.3: Format of a Completed Activity Card



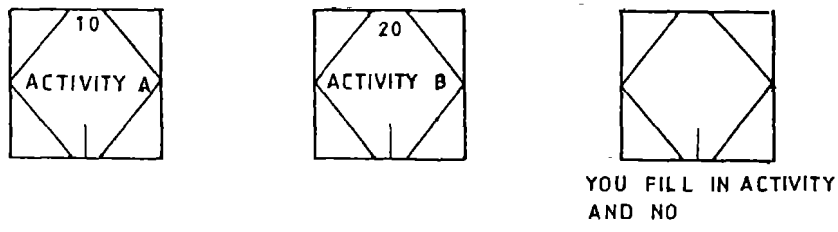
1. Identify and list all activities necessary to complete the project: (Refer to Figure 4.4 below)

(i) Briefly describe each activity in the centre of an index card/suitably trimmed piece of paper (shape of a small card). At the back of this Handbook is a page of cards which can be easily photocopied and then trimmed for use.)

(ii) Examine the activities and modify any which are too detailed when compared with other activities.

(iii) Give each activity an identifying number eg. 10, 20, 30 etc. – leave intervening numbers for activities which may be included later. (Answer is on Figure 4.5)

Figure 4.4: Describe Each Activity and Number it on a Card



The advantage of network analysis over other techniques is that this listing of activities is a preliminary process – one need not get bogged down in considering resources, durations or inter-relationships between activities at this stage.

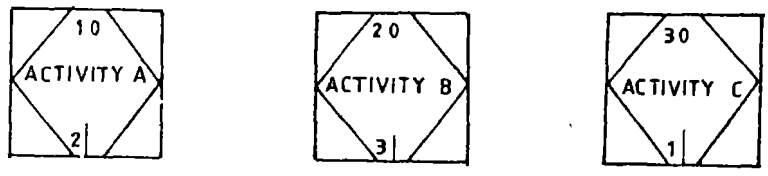
2. Estimate the duration of each activity: (Refer to Figure 4.5 below)

(i) Consider the normal level of resources available to complete the activity, operating at average efficiency.

(ii) Consider the desired specifications for the activities performance.

(iii) Write the estimated duration at the bottom of each activity card.

Figure 4.5: Estimate the Duration of Each Activity



The duration of each activity should be estimated by people who have had past experience managing such an activity before. Rely on records of progress on past activities and use your own judgement and experience or discuss it with staff or colleagues who have supervised such activities before.

3. Draw the project network diagram: (Refer to Figure 4.6 below)

(i) Place all the activity cards on a large sheet of paper.

(ii) Arrange the activities in their logical sequence from left to right (pin/fasten the cards to the paper).

(iii) Use arrows to connect each activity to its immediate predecessors and immediate successors.

(iv) Check the network for logical consistency.

4. Identify the Project Start and Project End: (Refer to Figure 4.6 below)

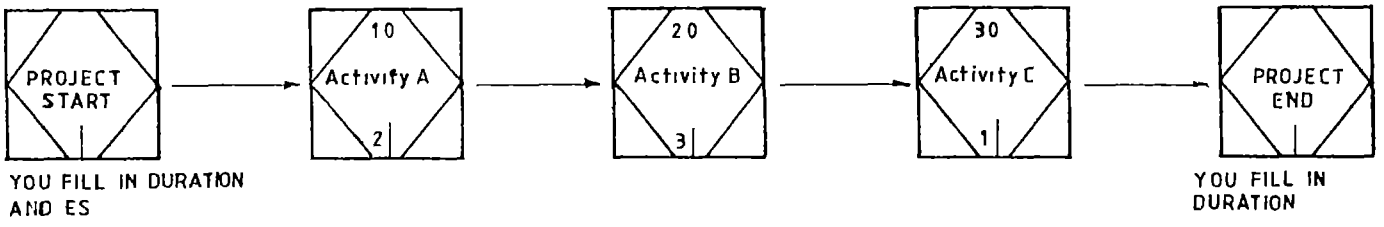
(i) If the project begins with several simultaneous activities (each having no immediate predecessor) then place a PROJECT START card on the left hand side of the network and connect it with arrows to all the initial activities. (The Project Start activity will, of course, have zero duration).

(ii) If the project ends with several simultaneous activities (each having no immediate successors) then place a PROJECT STOP card on the far right hand side of the network and connect it with arrows to these activities. (Again, the Project Stop activity has zero duration).

(iii) Assign the project starting date time (i.e. the Earliest Start) as zero (at the top left hand side of the Project Start card.)

Answers are on Figure 4.7

Figure 4.6: Connect Activities in a logical Sequence and identify the Project start and Project End



5. **Determine each activity's Earliest Start (ES) and Earliest Finish (EF): (Refer to Figure 4.7 below)**

(i) Begin at the ES of Project Start which will = 0 on the top left hand side of the Project Start card and then work forward through the network as described below.

(ii) Calculate the EF for the first activity by adding the activity duration to its ES, and then enter the result on the top right hand side of the card .

EF = ES + Duration

In the example (Figure 4.7) below for Project Start,

EF = 0 + 0 = 0.

(iii) Where activities are sequential, i.e. where there is only one immediate predecessor, set the ES = the predecessor's EF. In the example,

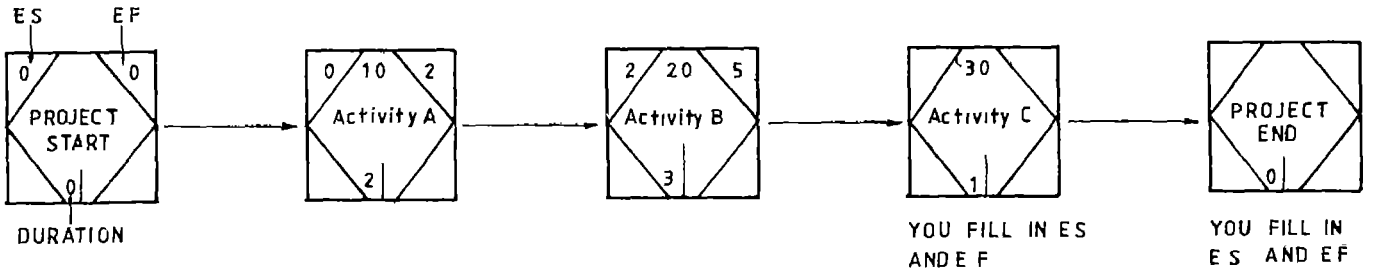
ES of Activity A = ES of Project Start =).

(iv) Calculate the EF for the next activity and enter the result in the following card until the sequence is reached. In the example,

EF of Activity A = 0 + 2 = 2;
ES of Activity B = EF of Activity A = 2;
EF of Activity B = 2 + 3 = 5; and so on.

Answers are on Figure 4.9.

Figure 4.7: Determine each Activity's ES and EF when Activities are Sequential



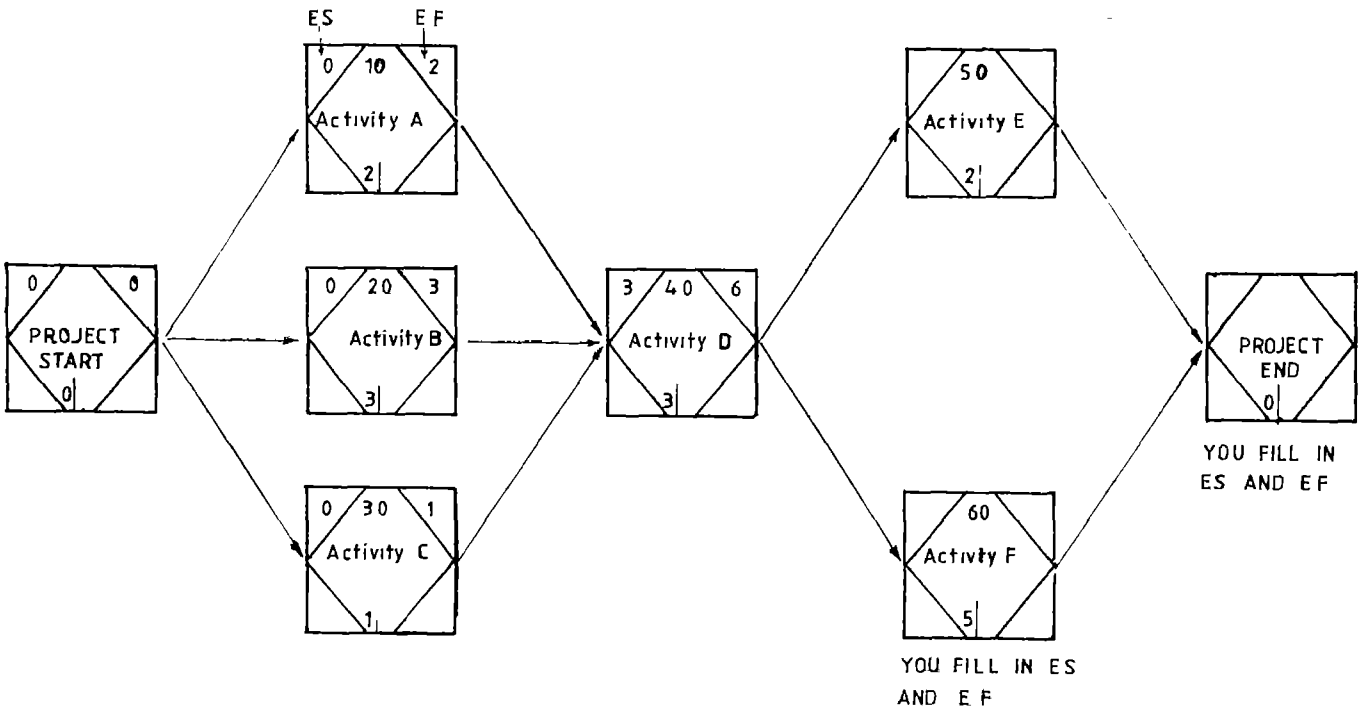
(v) Now refer to Figure 4.8.

When an activity has more than one immediate predecessor, set the ES = the latest EF of all the predecessor activities. This makes sense because the ES of an activity is the earliest time that an activity can start, i.e. assuming that all its immediate predecessors are first completed.

In the example (Figure 4.8),

EF of Activity A = 2;
EF of Activity B = 3;
EF of Activity C = 1.
Thus the ES of Activity D = 3.

Figure 4.8: Determine each Activity's ES and EF when an Activity has more than one Immediate Predecessor



The rule is therefore to take the latest time on the forward pass when there is more than one preceding activity and enter it into the ES of the next activity.

Complete all the ES and EF entries in the example above (Figure 4.8) using the technique described. Answers are on Figure 4.10.

6. Determine each activity's Latest Start (LS) and Latest Finish (LF): (Refer to Figure 4.9 below)

(i) The LF on the bottom right hand corner of the Project End card = its EF (i.e. = 6). Now work backwards through the network as described below.

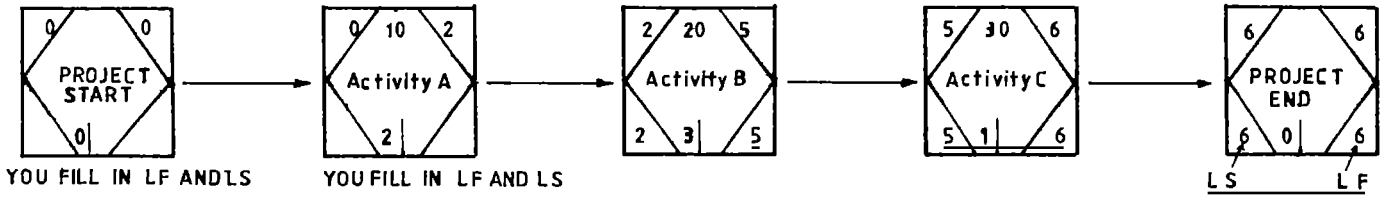
(ii) Calculate the LS for the last activity by subtracting the activity duration from its LF.

LS = LF - Duration.

In the example below (Figure 4.9),

ES of Project End = 6 - 0 = 6.

Figure 4.9: Determine each Activity's LS and LF when Activities are Sequential



iii) Where activities have only one immediate successor, set the LF = the successor's LS. In the example,

LF of Activity C = LF of Project End = 6.

(iv) Calculate the LS for the activity before (to the left) and enter the result onto the preceeding card until the beginning of the sequence is reached. In the example,

LS of Activity C = 6 - 1 = 5;
LF of Activity B = LS of Activity C = 5;
LS of Activity B = 5 - 3 = 2; and so on.

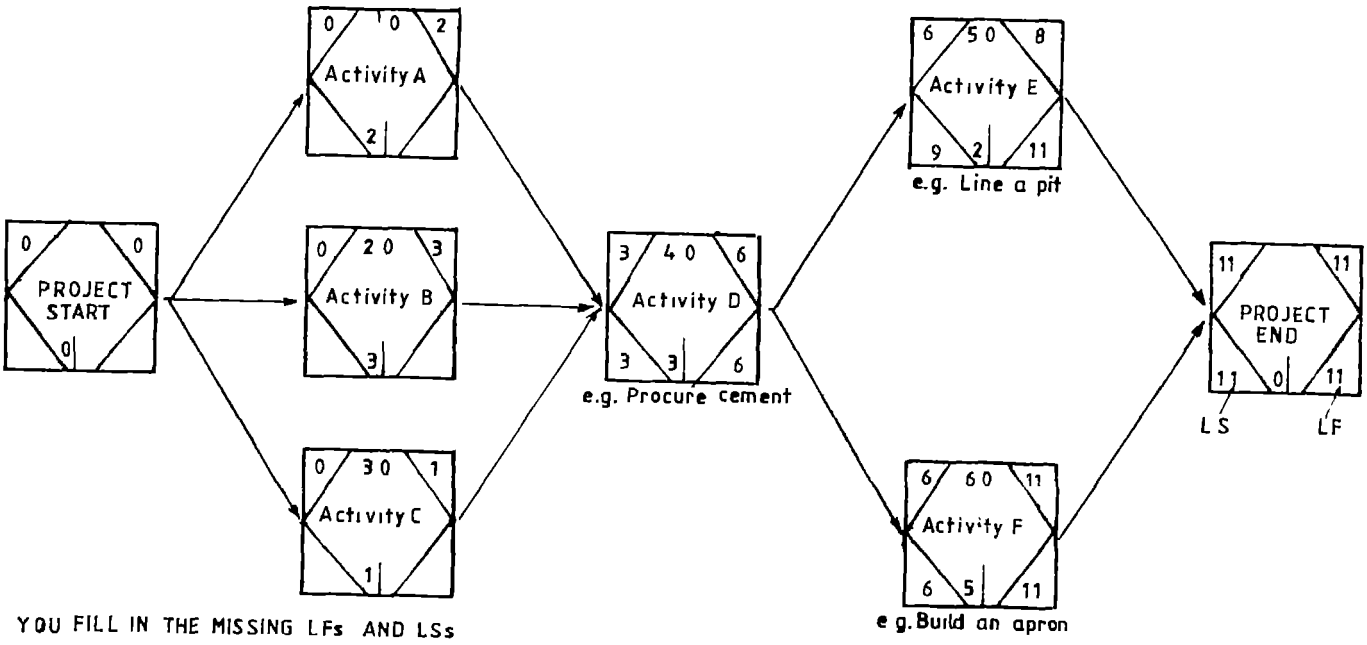
Complete the LS and LF entries in Figure 4.9 using the techniques described above.

(iv) Now refer to Figure 4.10.

When an activity has more than one immediate successor, set the LF = the earliest LS of all the successor activities. This makes sense because the LF of an activity is the latest time that an activity may be completed without delaying the project. Therefore the LF cannot be later than the LS times for all the activities immediate successors. In the example (Figure 4.10),

LS of Activity E = 9;
LS of Activity F = 6;
LF of Activity D = 6.

Figure 4.10: Determine each Activity's LS and LF when an Activity has more than one immediate successor



The rule is therefore to take the earliest LS time on the backward pass when there is more than one succeeding activity and enter it into the LF of the previous activity.

Complete all the LS and LF entries on the above diagram (Figure 4.10) using the techniques discussed above.

Answers are on Figure 4.11.

7. Calculate the Slack or Float times for each activity: (Refer to Figure 4.11)

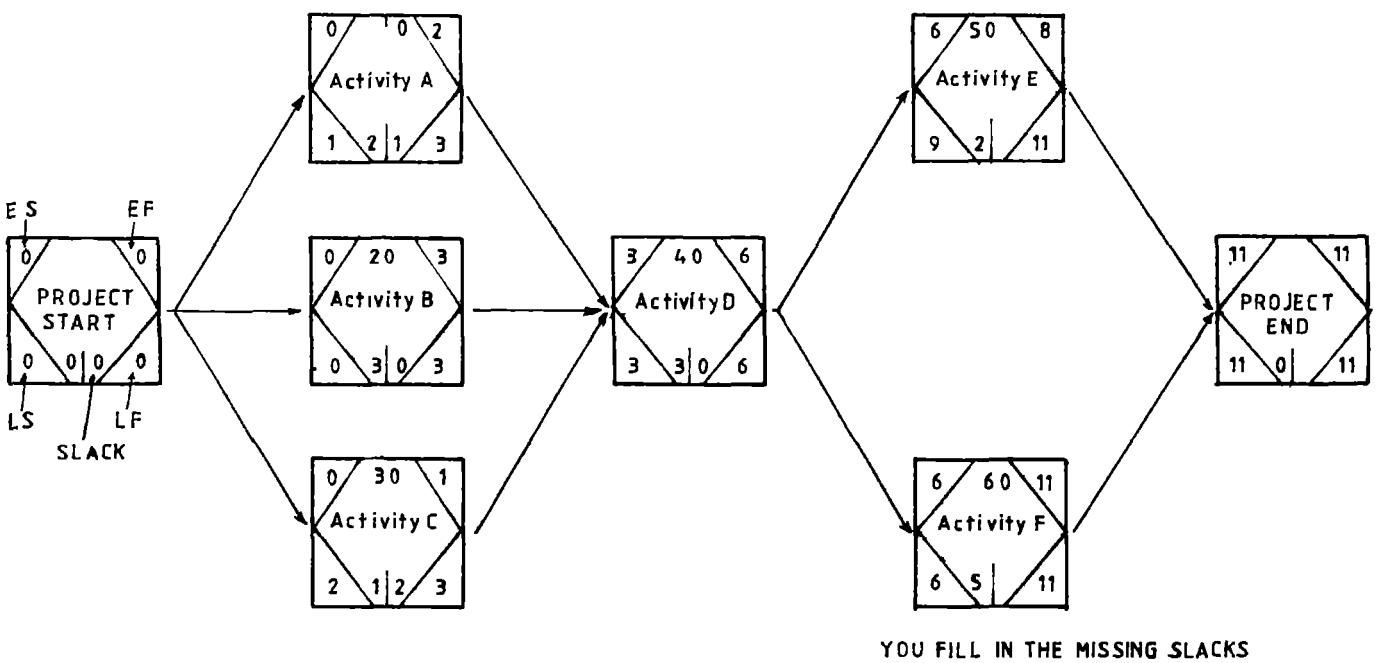
(i) Where the ES = LS or EF = LF, the Slack or Float = 0. In the example (Figure 4.11) below,

Slack of Activity B = 0 because LS = LF or EF = LF

(ii) Otherwise, slack = LS - ES or LF - EF of each activity. In the example (Figure 4.11) below,

Slack of Activity A = LF - EF = 3 - 2 = 1

Figure 4.11: Calculate the Slack of each Activuty



Complete all the slack times on each activity card in Figure 4.11 above.

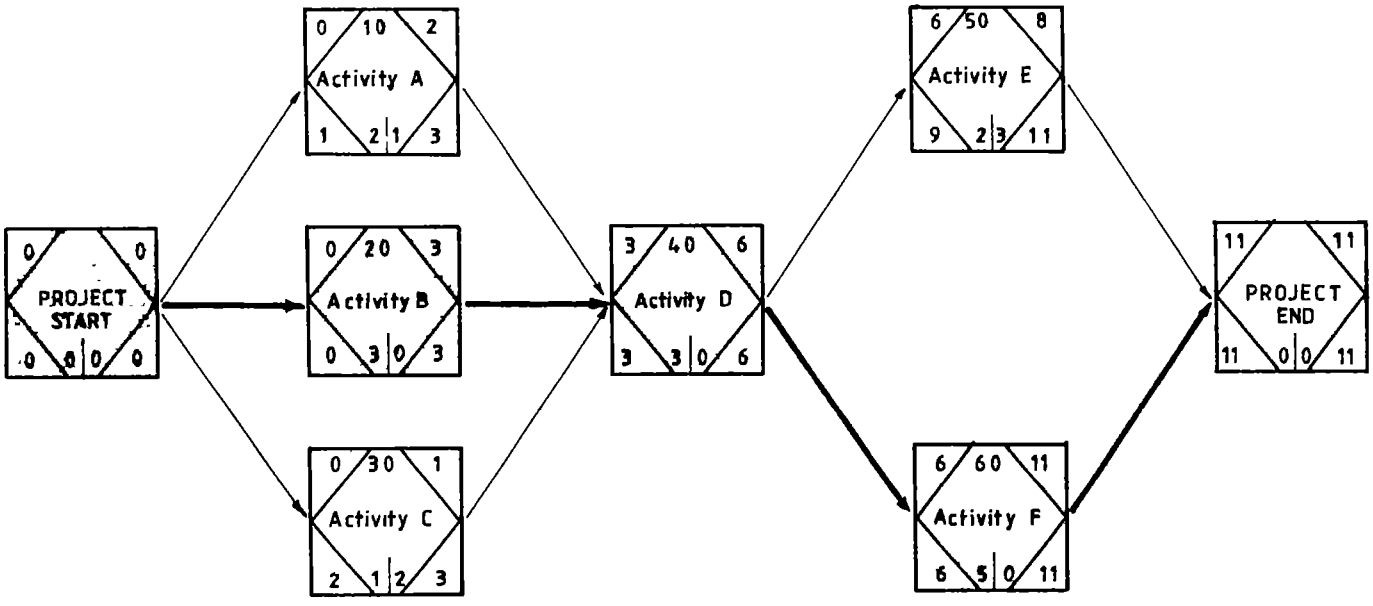
The answers are on Figure 4.12.

8. Identify the critical path for the project: (Refer to Figure 4.12)

(i) Any activity with zero slack is critical. Colour shade or mark all these cards as in Figure 4.12 (i.e. Activities B, D and F.)

(ii) The sequence of critical activities from start to finish is the projects' critical path. Mark the critical path on the network diagram with heavier connecting arrows (linking the shaded cards).

Figure 4.12: Identify the Critical Path



9. Calculate the minimum possible duration of the project:

(i) Examine the sequence of activities to see if they are all necessary or if the project method might be changed.

(ii) Examine the activities on the critical path to see if their duration time may be shortened.

(iii) Consider allocating more resources to shorten the duration time of critical activities.

(iv) Take the duration of the project as the EF of the final activity (the Project End card). For example in Figure 4.12 above,

duration of the project = EF of Project End = 11.

II. CONSTRUCT THE GANTT CHART FOR THE PROJECT

It is now a fairly logical matter to draw the GC from the CPA network diagram (Figure 4.12).

Refer to Figure 4.13 below for the completed Gantt Chart.

1. Mark off a horizontal time scale approximately one third greater than the estimated minimum project duration. (If the unit of time is in days, then include only working days, unless overtime is envisaged). Shade the weekends so that these stand out clearly.

2. Draw a horizontal bar for the first activity lying on the critical path, starting at zero time and extending for the estimated duration of the activity. The start of the bar is plotted against the activity's earliest start time, followed by the bar itself to represent the activity's duration. In the CPA example the first activity on the critical path is Activity B and has a duration of 3 days. Enter this as the first activity on the Gantt Chart.

3. Draw a bar on the chart for the next activity on the critical path. The beginning of this bar must fall on the same vertical time line as the finish of the preceding activity. Continue adding bars consecutively until all the critical activities in the path are represented on the Chart. In the CPA example, the next activities on the critical path are Activity D of 3 days duration and Activity F of 5 days duration. Enter them on the Gnatt Chart.

   As a check, ensure that the end of the bar for the last activity falls on the same vertical time line equal to the estimated minimum project duration time.

4. Add those activities not on the critical path to the chart within the earliest start and finish times of the total project. In the CPA example, Activities A, C and E are not on the critical path. Enter them on the Gantt Chart.

5. Append dotted lines to the right hand sides of all non-critical activities equal to the slack of those activities (as calculated on the CPA), i.e. the distance in time from the earliest finish to the latest finish times). In our example, the slack of Activity A = 1 day, of Activity C = 2 days. These are entered on the Gnatt Chart.

6. Draw vertical arrows between the ends of the bars to show the predecessor activities of each activity i.e. the relationship between activities as derived from the network diagram.

7. Determine the resource requirements of a particularly important limited resource on the GC (e.g. for Resource = Manpower):

   (i) Write the amount of limited resource required for each activity on the activity bar of the Gantt Chart. (This is derived from the activity time/duration on the CPA.)

   (ii) Add up the vertical totals of the resource used for all activities and enter into the columns at the bottom of the chart.

   (iii) Sum these unit totals to give the total resource requirement for the project. In our example = 16 days.

   (iv) Divide this project total by the number of time units to give the average resource requirement per unit of time. This gives an indication of how uniformly the limited resource is used by each of the scheduled activities. In our example average = 16/11 = 1,5.

   (v) If necessary, it is possible to determine the requirements of a number of different limited resources as horizontal lines below one another at the bottom of the Chart (e.g. do for manpower and for vehicles).

8. Adjust the schedule of activities to optimise the use the limited resource:

   (i) Record the amount of limited resource available for each time unit just below the total amount required [the latter as derived in 7 (ii) and (iii)] and compare with the total resource requirement per time unit.

   (ii) If the amount of resource required exceeds the amount available, then the schedule for that time unit must be shifted. Keeping to the logical sequence of activities, shift non-critical activities forwards or backwards along the time scale so that the total resources required do not exceed those available.

   In practice this can be done by making a photocopy of the original Gantt Chart and then redrawing the activities blocks over the original ones using a different coloured pen.

   If necessary, lengthen the duration of non-critical activities (within the total project duration time) to reduce their unit (daily) time requirement. Similarly, two simultaneous activities may have to be rescheduled one after the other (sequentially).

(iii) As a last resort, if necessary, the total project duration time may have to be extended so as to avoid exceeding resource limitations - this can be done on paper on the GC, prior to the limit being exceeded on the ground!).

In practice, the easiest way to do this is to cut vertically down the chart at the point where the resource begins to be exceeded. Then move the whole chart to the right of the cut by however many days as may be necessary. This will ensure that the start and finish times between inter-related activities is maintained.

9. Use the GC to manage the project:

(i) Indicate the significant milestones by drawing a vertical line through the appropriate dates. Milestones should indicate the end of a group of inter-related activities so that the progress of phases of the project can be easily checked on the specified dates.

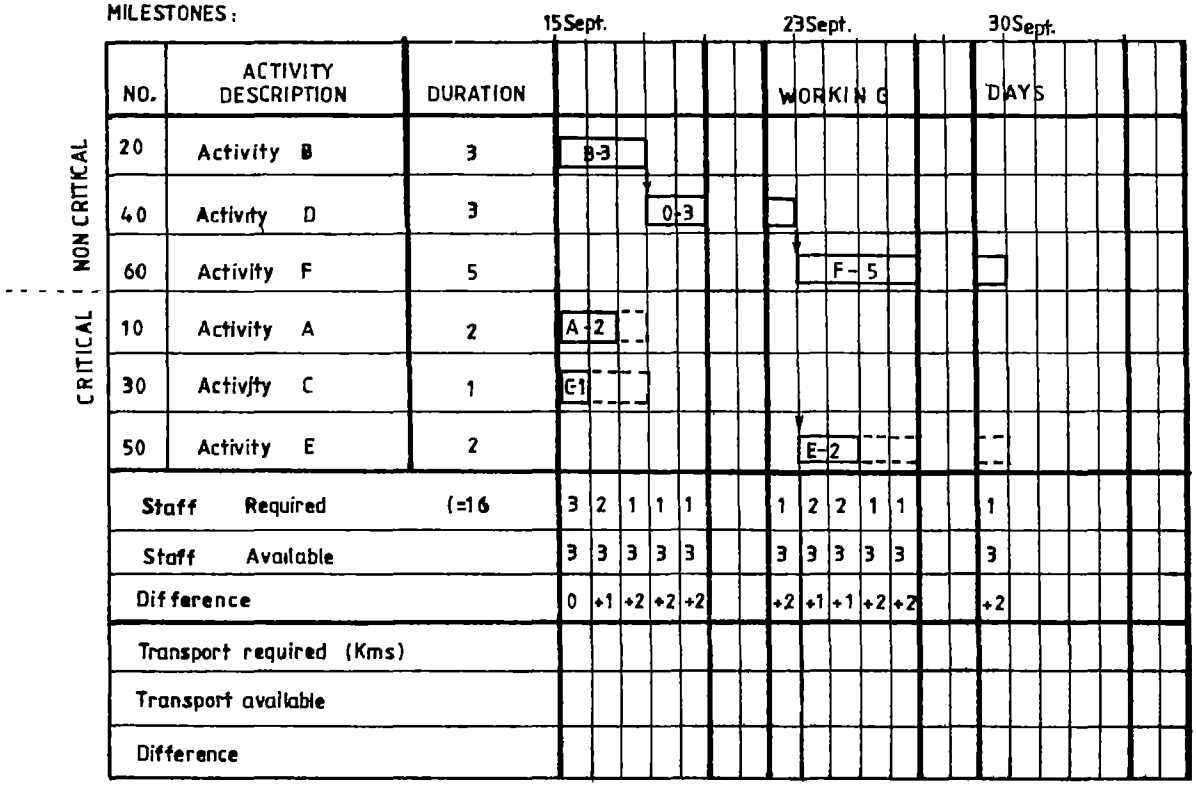
(ii) Consider the scheduling of activities with slack. If the activity is scheduled for the earliest start time, then the slack will occur at the end. However if the activity is scheduled to start at the latest possible time, then the activity might become critical and if the time is exceeded, this will cause delays in subsequent activities (and probably the whole project).

(iii) Assign staff and other resources to each activity and discuss the schedule and their expected performance with the project team as a whole.

(iv) Provide for periodic staff reviews of activities to emphasise the inter-dependency of activities and need for team effort.

(v) If the project fails to meet the schedule, update the Chart and, if necessary, recalculate the critical path of the remaining activities. (This process is made easier if you originally made the chart one third longer than necessary so that the time scale can be expanded.)

Figure 4.13: Construct the Gantt Chart from the Critical Path Diagram



A copy of a standardised format for a basic Gantt Chart is provided in the folder in the back cover of this Handbook. Photocopies of this format can easily be made to assist with the updating or revising of actual project Charts.

This standard format covers a period of time of slightly more than one calendar month. Depending on the complexity of the project, it is recommended that a Chart of activities be drawn up for each month. Carry forward the tail end of activities from one month to the next to show their continuity.

An alternative presentation is to draw the Chart on a large sheet of paper (size A0). However whilst this is very effective for visual presentation, most provincial offices do not have facilities for reproducing charts of this size. There is thus the danger that once drawn, these charts will never be updated or revised.

STEP-BY-STEP PROCEDURES FOR CONSTRUCTING THE CRITICAL PATH FOR THE PROJECT

1. Identify and list all activities necessary to complete the project.
2. Estimate the duration time of each activity.
3. Draw the project network diagram.
4. Identify the Project Start and Project End.
5. Determine each activity's Earliest Start (ES) and Earliest Finish (EF).
6. Determine each activity's Latest Start (LS) and Latest Finish (LF).
7. Calculate the Slack or Float times for each activity.
8. Identify the critical path for the project.
9. Calculate the minimum possible duration for the project.

STEP-BY-STEP PROCEDURES FOR CONSTRUCTING THE GANTT CHART FOR THE PROJECT

1. Mark off the horizontal time scale.
2. Draw a horizontal bar for the first activity on the critical path.
3. Draw in horizontal bars for all the next activities on the critical path.
4. Draw in horizontal bars for all the activities not on the critical path.
5. Draw in the Slack on the right hand side of all non-critical path bars.
6. Draw vertical arrows linking bars in time.
7. Determine the limited resource requirements.
8. Adjust the schedule of activities to optimise the use of the limited resource.

CHAPTER 5: DISTRICT IMPLEMENTATION PLAN

Drawing up a CPA for a district water supply and sanitation project; Drawing up a Gantt Chart for a district water supply and sanitation project.

In Chapter 4, it was shown how to go about deriving and drawing up CPA networks and GCs step-by-step. So far only a very limited example has been used to illustrate these principles. In this and the following Chapter 6, we will now set about deriving CPAs and GCs for use in the primary water supply and sanitation programme at the individual District and then Provincial levels.

The CPAs and GCs that will be drawn up will, of necessity, be "typical" examples and cannot hope to cover all possible project environments of the 8 provinces. However, it should be a simple matter for different project managers to adapt or expand these CPAs and GCs to fit his/her own particular project.

I DRAWING UP A CPA FOR A DISTRICT WATER SUPPLY AND SANITATION PROJECT

A completed CPA diagramme is presented as Figure 5.1. Whilst reading through the following steps refer to Figure 5.1.

1. **Describe each activity:**
   Briefly describe each activity in the centre of an index card or suitably trimmed piece of paper. The more detailed the activities listed, the easier it will be to:

   (a) Allocate adequate manpower and transport (both of which are usually extremely limited); and

   (b) Monitor progress of the project and pinpoint problem areas/bottleneck points.

However activities will have to be grouped to some extent to keep the overall size of the network diagram manageable.

2. **Check activities:**
   After listing all the activities, check through them and discard or modify any inappropriate ones.

3. **Give identifying numbers to each activity:**
   Give each activity card an identifying number (eg. 10, 20, 30) - leaving out intervening numbers so that further activities can be added in later if necessary. Write this at the top of each activity card.

4. **Estimate duration times of each activity:**
Take into account the normal level of resources available (particularly manpower and transport) and the desired specifications for each activity and then estimate the duration time of each activity. Write this at the bottom of each activity card in working days or weeks.

5. **Arrange all the activity cards logically to form the project network:**
Place all the activity cards onto a large sheet of paper, arranging them in their logical sequence from left to right. Use arrows to connect each activity to its immediate predecessor (i.e. to left) and successor (i.e. to right) activities. Check your newly formed network to see that it is logical and consistent.

6. **Identify the Project Start and the Project End:**
Place a PROJECT START card at the extreme left hand side of the network and draw connecting arrows from it to all those activities which begin at the same time at the start of the project. Write the duration time of the Project Start activity = 0.

Place a PROJECT END card at the extreme right hand side of the network and draw a connecting arrow from it to all those activities which end at the same time at the end of the project. Write the duration time of the Project End activity = 0.

7. **Determine each activity's Earliest Start (ES) and Earliest Finish (EF) times:**

EF = ES + DURATION

Begin with the Project Start at the extreme left hand side, and write in its ES = 0 at the top left hand side of the card. Then write in it ES + duration = Earliest finish at the top right hand side of the card. In the case of the Project Start, duration = 0. Therefore for the Project Start card write:

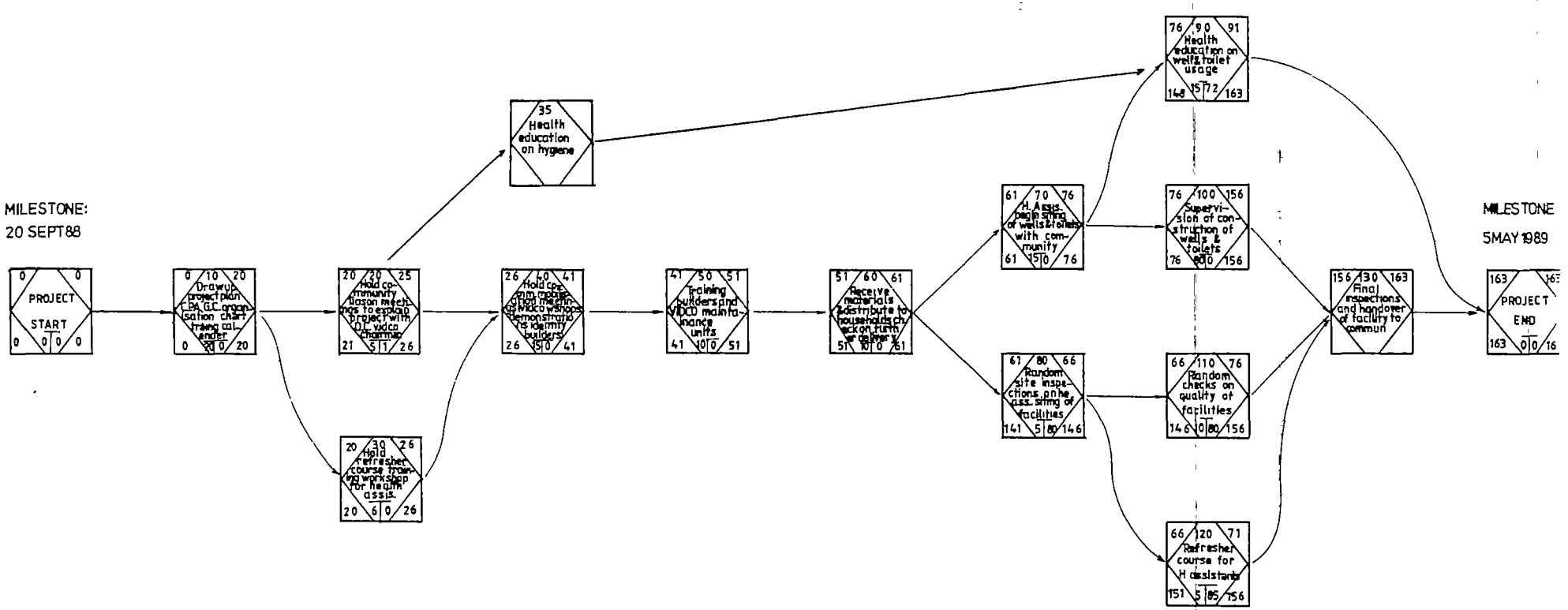
ES = 0; duration = 0; EF = 0 + 0 = 0.

Now, working from left to right, calculate and write in the ES and EF of each activity in turn.

ES of Activity 10 = 0 (= EF of Project Start);
EF of activity 10 = 0 + 20 (duration in days) = 20;
ES of activity 20 = 20 (= EF of Activity 10);
EF of activity 20 = 20 + 5 = 25; and so on.

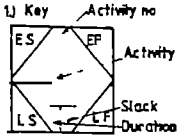
Work through the network until you reach the Project End on the extreme right hand side, writing the ES at the top left hand corner of each card and the EF at the top right hand corner of each card.

FIGURE 5.1: CRITICAL PATH ANALYSIS FOR WATER SUPPLY AND SANITATION PROJECT IN "TYPICAL" DISTRICT



NOTES:

1) Key



2) When calculating the earliest, take the latest time on the forward pass if there are no more than one preceding activities

3) When calculating the latest finish, take the earliest time on the backward pass if there are more than one succeeding activities.

8. **Determine each activity's Latest Start (LS) and Latest Finish (LF) times:**

LS = LF - DURATION

Begin at the Project End at the extreme right hand side and write in the LF of the Project End which will = the EF of the Project End (because the duration = 0). Write the LF at the bottom right hand side of the card. Then work backwards (i.e. to the left) through the network calculating the LF and LS of each activity in turn.

LF of Activity 130 = 163 (EF of the Project End);
LS of Activity 130 = 163 - 7 (duration in days) = 156.
LS of Activity 120 = 156 - 5 = 151

Work through the network until you reach the Project Start on the extreme left hand side writing the LS at the bottom left hand corner of each card and the LF at the bottom right hand corner of each card.

9. **Calculate the slack time for each activity:**

SLACK = LS - ES OR LF - EF

Calculate the slack of each activity. Where ES = LS or EF = LF, then slack = 0.

Write the slack at the bottom of each activity card (just to the right of the duration time).

10. **Identify the critical path for the project:**

CRITICAL PATH = ACTIVITIES WITH 0 SLACK

All activities which have a slack time = 0 (zero) are said to be critical - i.e. they must begin and end when scheduled, there is no slack time or leeway to complete these activities. If they are delayed, the whole project will ultimately be delayed.

Shade/hatch all activity cards where slack = 0 and draw the arrows connecting such activities with a heavier line.

11. **Calculate the total duration of the project and specify the starting and end dates:** Check that:

- the sequence of activities is correct;
- the duration times of critical activities is realistic (shorten or lengthen if necessary).

The duration of the project = the EF of the Project End.

Finally set the Project Start on the earliest feasible date to begin the project. Write this date on the top of the activity card for Project Start. This will be the first milestone carried forward to the Gantt Chart.

II DRAWING UP A GANTT CHART FOR A DISTRICT WATER SUPPLY AND SANITATION PROJECT

A completed Gantt Chart is presented in Figure 5.2 (parts i-ix). Whilst reading through the following steps, refer to Figure 5.2 (parts i-ix).

1. **Draw up the horizontal time scale and fill in critical activity bars:**
Draw up a horizontal time scale in working days (shade out weekend days), approximately one third greater than the estimated project duration. (Project duration = EF of Project End card)

   Then draw in horizontal bars, one under the other, for each of the activities on the critical path. Activity 10 (i.e. the first activity) will start at time 0 (zero). The beginning of each bar must fall on the same time line and the end of the bar of the preceding critical activity. The end of each bar on the critical path must fall on the same vertical time line at the beginning of the next (succeeding) critical activity.

   The end of the bar for the final activity will fall on the vertical time line equal to the estimated minimum project duration. Draw in vertical arrows from the end of each bar to the start of the next activity/ies to show the relationship between activities.

   (Note: The activities on the critical path will, by definition, have slack = 0; i.e. no slack).

2. **Draw in bars for non-critical activities:**
Below the critical path activities, add in bars for all the other activities which do not fall on the critical path.

   The bars must be placed within the project start and project end dates as defined by the critical path. Use the ES of each of the activities to determine each of their starting positions. Show the slack periods of these activities as dotted line bars to the right hand side of the activity bar proper.

   Draw in vertical arrows between the ends of these bars to show the relationship between different activities.

3. **Calculate the limited resource requirement and adjust activity times accordingly:**
In almost all projects, the most limiting factor is availability of manpower. Therefore this is the limited resource given in the District and Provincial

examples. Write the amount of limited resource required to carry out each activity on the activity bar.

The project manager may wish to calculate total manpower requirements or to have a number of seperate calculations for different types/skills of personnel. If the latter system is used, it may only be necessary to calculate for those categories of personnel which are known to be understaffed.

Add the vertical totals of these resource requirements for all activities each day and enter in the daily columns at the bottom of the chart. Then calculate the difference between the amount required and the amount available to show up any deficits.

If the total required exceeds the total actually available, then it will be necessary to shift some non-critical activities (plus their logical successor and predecessor activities), to the right or left of the time scale. Similarly, two activities (at least one of which is non-critical) which were going to be carried out on the same day may have to be carried out may have to be rescheduled one after the other (on different days) so that limited staff may be able to cope with them.

If absolutely necessary, the total project time might even have to be extended slightly so as to avoid exceeding daily manpower (resource) limitations.

4. **Establish Milestones:**
Write in the Project Start and Project End dates (cross-checking against the CPA). Then write in other significant milestone dates by when groups of activities are to be completed so as to keep the total project period in line with the project timetable.

DISTRICT "TYPICAL" PROVINCE: PROJECT: WATER SUPPLY & SANITATION

MONTH: Sept/Oct. YEAR: 1988

MILESTONES:

NO.	ACTIVITIES	DURATION
10	Draw up project plan (CPA, GC, organisation chart, etc)	20
30	Hold refresher course/training w'shop with HA	6
40	Hold community mobilisation meetings, VIDCO w'shops	15
50	Receive materials and distribute, check further	10
60	Train builders and VIDCO maintenance units	10
70	Health Asstnts site wells and toilets with cmty	15
100	Supervise construction of wells and toilets	80
130	Final inspections and handovers to community	7
20	Hold community liason meetings (D Council, etc)	5
80	Random site inspections of siting done by HAs	5
90	Health education on well and toilet usage	15
110	Random checks on quality of facilities	10
120	Refresher course for H.A.s.	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

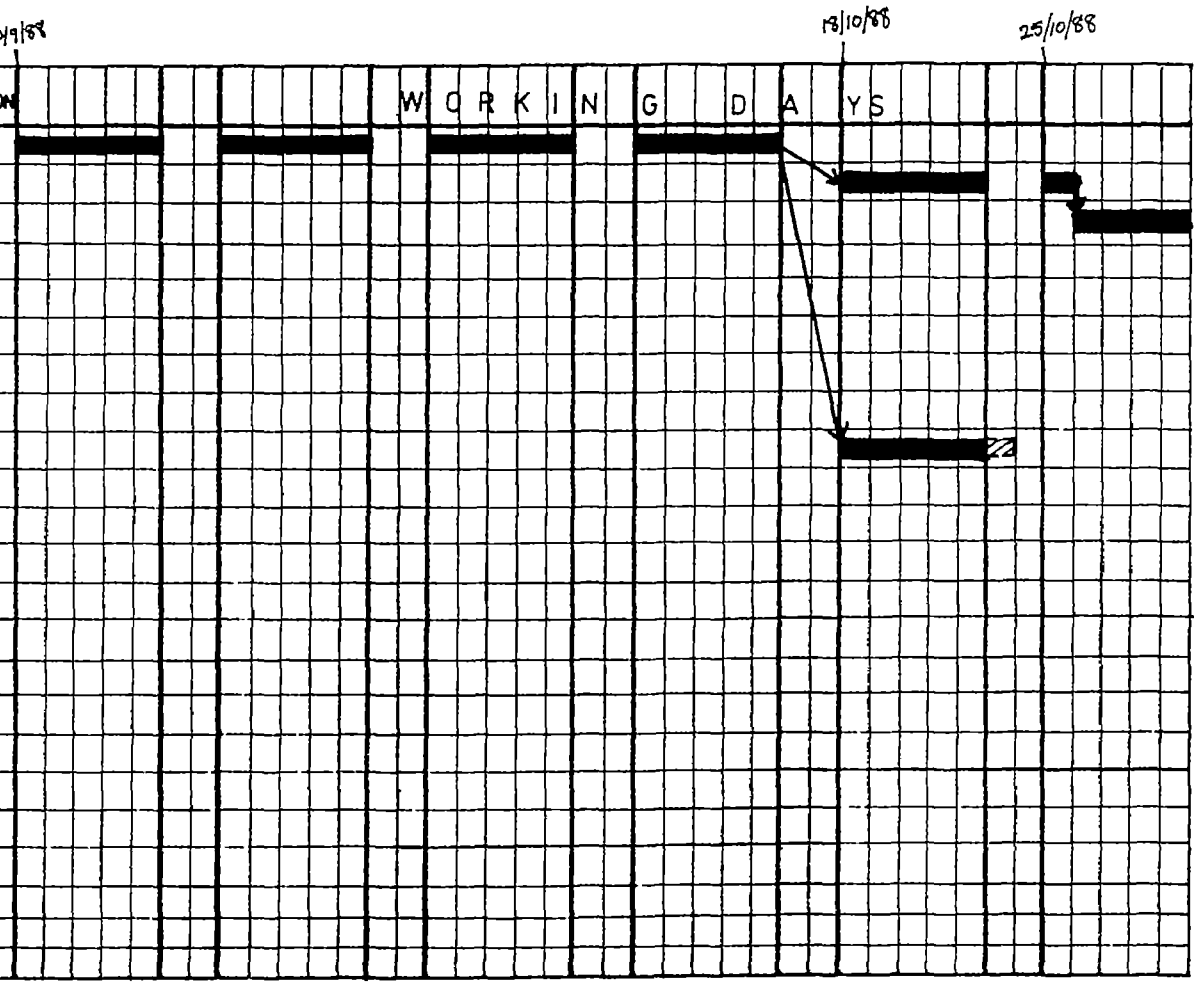


FIGURE 5.2 (part 1): GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date: _____

DISTRICT "TYPICAL" PROVINCE: PROJECT: WATER SUPPLY AND SANITATION

MONTH: Oct/Nov YEAR: 1988

MILESTONES

NO.	ACTIVITIES	DURATION
10	Draw up project plan (CPA, GC, organisation chart, etc)	20
30	Hold refresher course/training w'shop with HA	6
40	Hold community mobilisation meetings, VIDCO w'shops	15
50	Receive materials and distribute, check further	10
60	Train builders and VIDCO maintenance units	10
70	Health Asstnts site wells and toilets with cmty	15
100	Supervise construction of walls and toilets	80
130	Final inspections and handovers to community	7
20	Hold community liason meetings (D Council, etc)	5
80	Random site inspections of siting done by HAs	5
90	Health education on well and toilet usage	15
110	Random checks on quality of facilities	10
120	Refresher course for H.A.s.	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

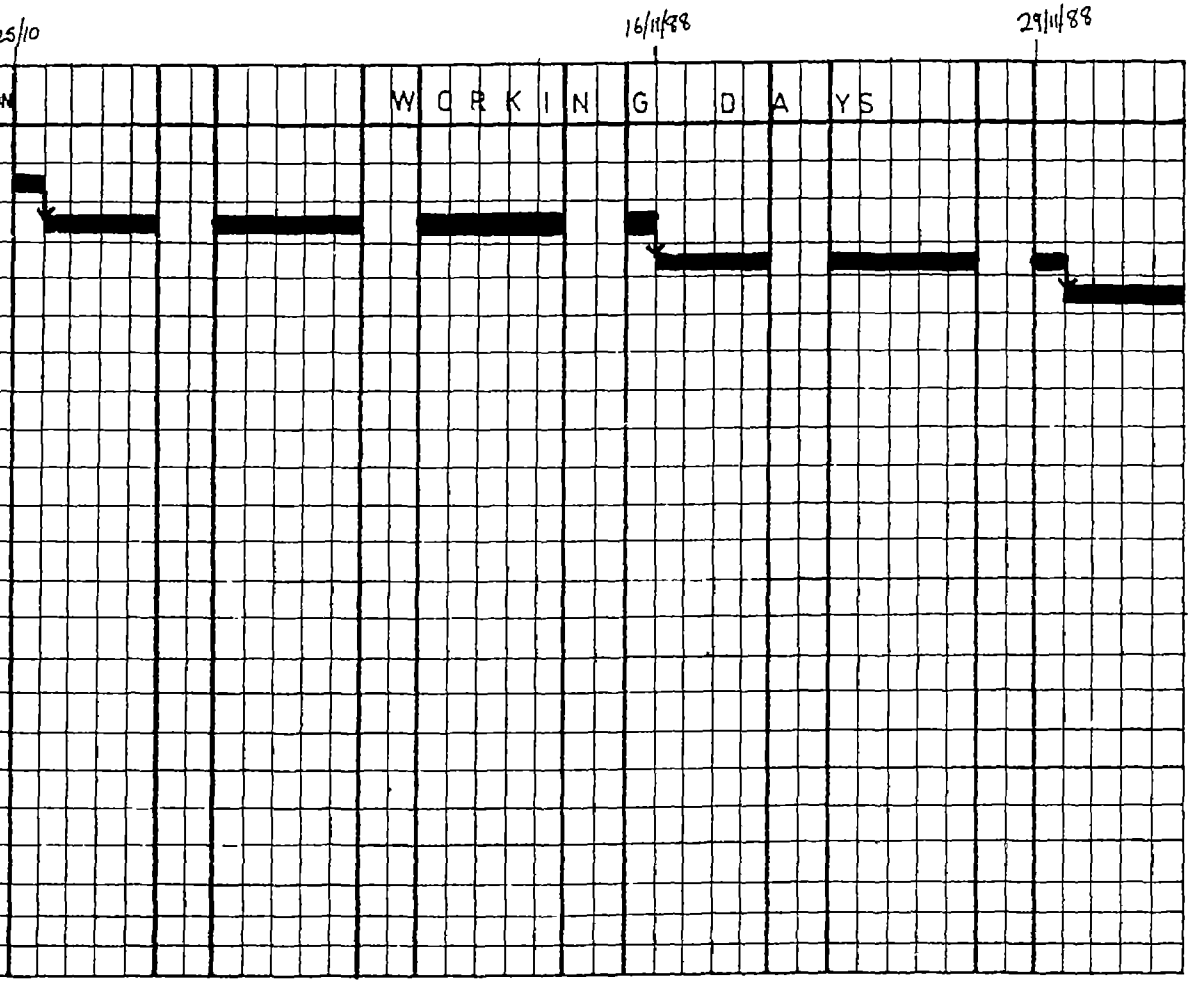


FIGURE 5.2 (part ii): GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date _____

DISTRICT: "TYPICAL" PROVINCE: _____ PROJECT: WATER SUPPLY & SANITATION

MONTH: NOV. – JAN. YEAR: 1988 – 1989

MILESTONES: 29/11/88 14/12/88 21/12/88 3/1/89

NO.	ACTIVITIES	DURATION
10	Draw up project plan (CPA, GC, organisation chart, etc)	20
30	Hold refresher course/training w'shop with HA	6
40	Hold community mobilisation meetings, VIDCO w'shops	15
50	Receive materials and distribute, check further	10
60	Train builders and VIDCO maintenance units	10
70	Health Asstnts site wells and toilets with cmty	15
100	Supervise construction of wells and toilets	80
130	Final inspections and handovers to community	7
20	Hold community liason meetings (D Council, etc)	5
80	Random site inspections of siting done by HAs	5
90	Health education on well and toilet usage	15
110	Random checks on quality of facilities	10
120	Refresher course for H.A.s.	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

WORKING DAYS

FIGURE 5.2 (part iii): GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date: _____

DISTRICT: "TYPICAL" PROVINCE: _____ PROJECT: WATER SUPPLY & SANITATION

MONTH: JAN/FEB. YEAR: 1989

MILESTONES:

NO.	ACTIVITIES	DURATION
10	Draw up project plan (CPA, GC, organisation chart, etc)	20
30	Hold refresher course/training w'shop with HA	6
40	Hold community mobilisation meetings, VIDCO w'shops	15
50	Receive materials and distribute, check further	10
60	Train builders and VIDCO maintenance units	10
70	Health Asstnts site wells and toilets with cmty.	15
100	Supervise construction of walls and toilets	80
130	Final inspections and handovers to community	7
20	Hold community liason meetings (D Council, etc)	5
80	Random site inspections of siting done by HAs	5
90	Health education on well and toilet usage	15
110	Random checks on quality of facilities	10
120	Refresher course for H.A.s.	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

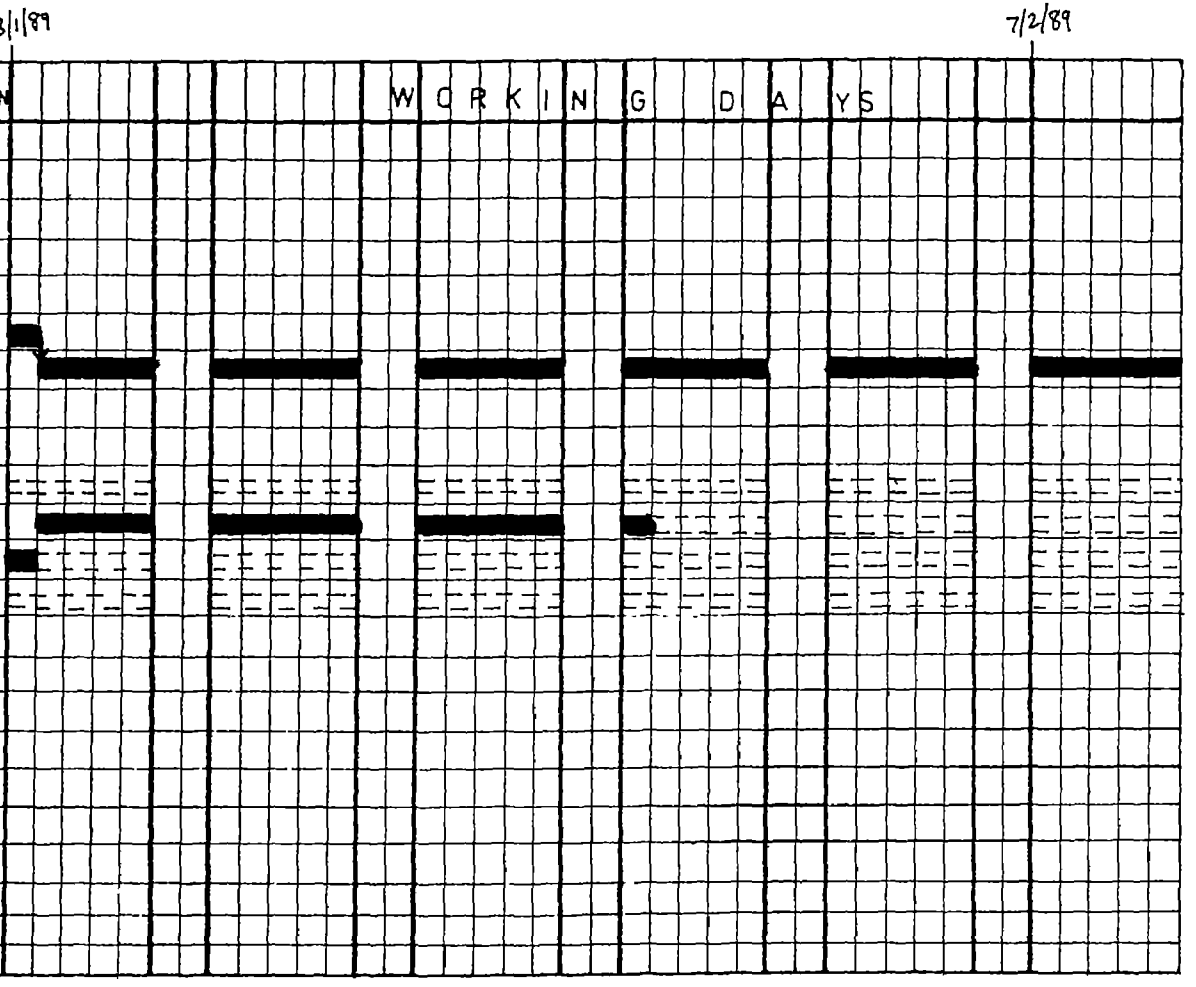


FIGURE 5 2 (part iv): GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date _____

DISTRICT "TYPICAL" PROVINCE: _____ PROJECT: WATER SUPPLY AND SANITATION

MONTH: Feb/March YEAR: 1989

MILESTONES: 7/2/89 14/3/89

NO.	ACTIVITIES	DURATION	WORKING DAYS
10	Draw up project plan (CPA, GC, organisation chart, etc)	20	
30	Hold refresher course/training w'shop with HA	6	
40	Hold community mobilisation meetings, VIDCO w'shops	15	
50	Receive materials and distribute; check further	10	
60	Train builders and VIDCO maintenance units	10	
70	Health Asstnts site wells and toilets with cmty.	15	
100	Supervise construction of wells and toilets	80	
130	Final inspections and handovers to community	7	
20	Hold community liason meetings (D Council, etc)	5	
80	Random site inspections of siting done by HAs	5	
90	Health education on well and toilet usage	15	
110	Random checks on quality of facilities	10	
120	Refresher course for H.A.s	5	
	RESOURCE REQUIRED		
	RESOURCE AVAILABLE		
	DIFFERENCE		

FIGURE 5.2 (part v): GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Dat · _____

DISTRICT: "TYPICAL" PROVINCE: _____ PROJECT: WATER SUPPLY & SANITATION

MONTH: MARCH/APR. YEAR: 1989

MILESTONES:

NO.	ACTIVITIES	DURATION
10	Draw up project plan (CPA, GC, organisation chart, etc)	20
30	Hold refresher course/training w'shop with HA	6
40	Hold community mobilisation meetings, VIDCO w'shops	15
50	Receive materials and distribute; check further	10
60	Train builders and VIDCO maintenance units	10
70	Health Asstnts. site wells and toilets with cmty.	15
100	Supervise construction of wells and toilets	80
130	Final inspections and handovers to community	7
20	Hold community liason meetings (D.Council, etc)	5
80	Random site inspections of siting done by HAs	5
90	Health education on well and toilet usage	15
110	Random checks on quality of facilities	10
120	Refresher course for H.A.s.	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

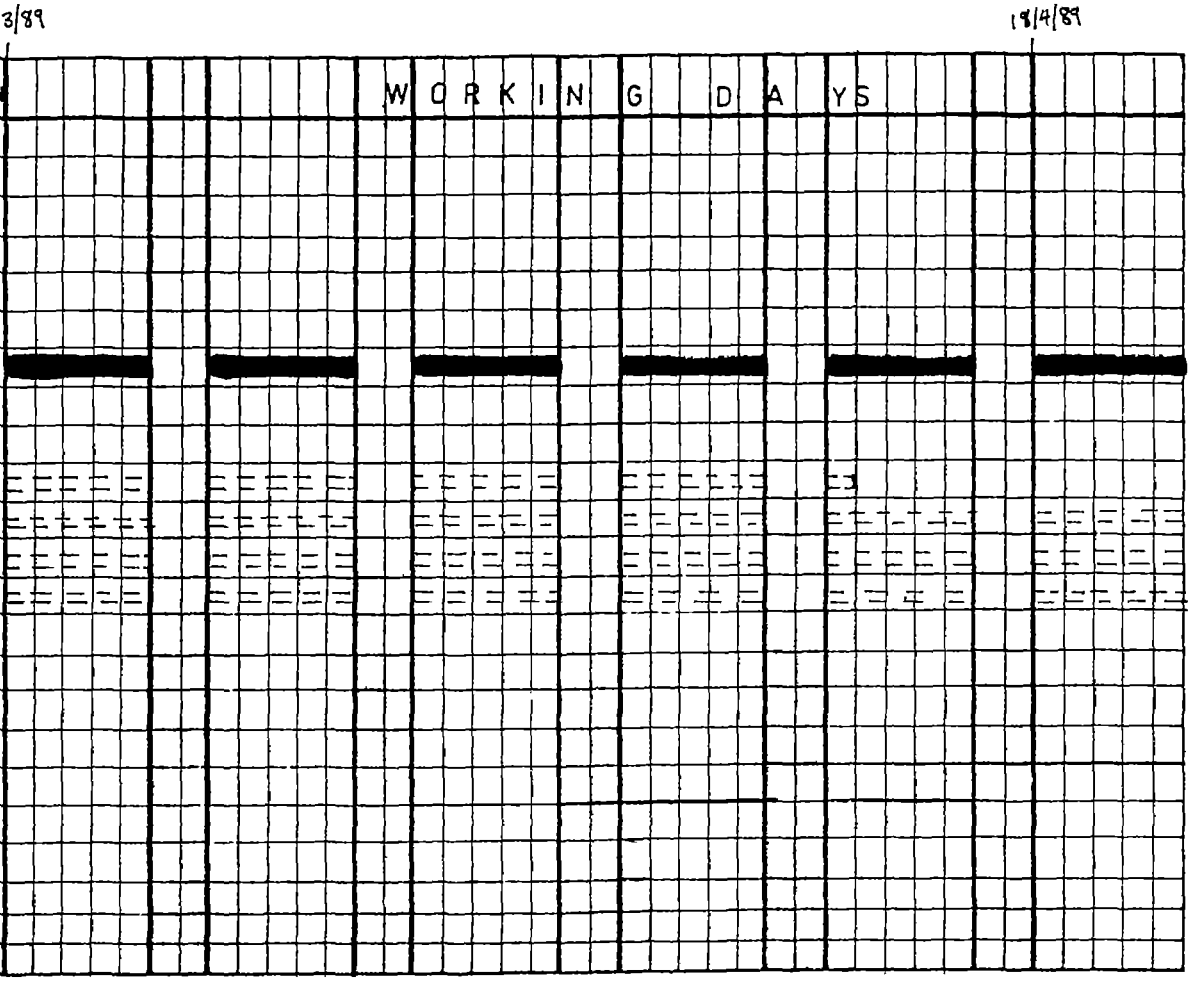


FIGURE 5.2 (part vi): GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date: _____

DISTRICT: "TYPICAL" PROVINCE: _____ PROJECT: WATER SUPPLY & SANITATION

MONTH: APR/MAY YEAR: 1989

MILESTONES: 18/4/89 5/5/89

NO.	ACTIVITIES	DURATION
10	Draw up project plan (CPA, GC, organisation chart, etc)	20
30	Hold refresher course/training w'shop with HA.	6
40	Hold community mobilisation meetings, VIDCO w'shops	15
50	Receive materials and distribute, check further	10
60	Train builders and VIDCO maintenance units	10
70	Health Asstnts site wells and toilets with comty	15
100	Supervise construction of wells and toilets	80
130	Final inspections and handovers to community	7
20	Hold community liason meetings (D.Council, etc)	5
80	Random site inspections of siting done by HAs	5
90	Health education on well and toilet usage	15
110	Random checks on quality of facilities	10
120	Refresher course for HAs.	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

WORKING DAYS

FIGURE 5 2 (part vii): GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date: _____

CHAPTER 6: PROVINCIAL IMPLEMENTATION PLAN

What is the purpose of a provincial implementation plan? Provincial CPAs and GCs are the aggregate of all the district project implementation plans; The need for effective communication; Informal communications establish good personal relationships; Formal communications confirm decisions made informally; Monthly progress reporting; Establishing a clear organisational structure; Recap on Chapter 6.

What is the purpose of a provincial project implementation plan?
The provincial project implementation plan is used to keep track of what is happening across the province as a whole and to compare progress by different districts or projects within the province. The project manager can then concentrate his/her efforts on any districts lagging behind or experiencing difficulties.

Provincial CPAs and GCs are the aggregate of all the District project implementation plans
Once each of the District network diagrams and Gantt Charts have been drawn up, the same methods can then be used to draw up the project plan for the Province as a whole. Obviously it would be too bulky and cumbersome to tag each District Plan onto each other. Therefore at Provincial level the activities in each District are aggregated and a new network diagram and Gantt Chart are drawn up.

An example of a "typical" provincial CPA and GC
Following exactly the same steps 1 - 11 for the critical path network and 1 - 4 for the Gantt Chart as were used in the previous Chapter 5, it is possible to derive a CPA and GC suitable for use at provincial level.

An example of each, based on a "typical" provinces's experiences is found in Figures 6.1 and 6.2(parts i-iv). The plans are intended to provide a strategic overview of each districts' progress i.e. the project manager should be able to see at a glance as to whether every district is progressing according to schedule at the specified milestones.

NOTES:

1. It must be remembered that the earliest start times of many activities at provincial level are dependent upon those same or related activities having been finished or at least started at district level. For example checking that communities in each district have been fully informed of the project and mobilised in support of it.

   It is therefore imperative to cross check that earliest provincial activities coincide with the equivalent activities at district level..

   Another way of approaching this problem is to write in milestones on the provincial CPA as one is building it up, deriving the milestones from the districts' GCs. For example, the day that the district CPA begins (Activity no.10 on 20 September 1988) must coincide with the day that the province begins its meetings with the

districts to assist them with drawing up detailed project plans (Activity no.20 at the provincial level). Similarly, the provincial random attendance at training workshops (Activity no.50 on 29 November 1988) can only begin once these workshops have begun at district level (district Activity no.6). To ensure this coincidence of timing the duration of preceding activities must be lengthened or shortened.

2. Where two or more districts have different project plans and time schedules (not shown on our example due to lack of space,) the provincial network diagram should be based on the district with the longest (slowest) critical path.

The need for effective communication

Project management is concerned with translating objectives into reality. This can only be done through people and the success of a project therefore depends, to a great extent, on the ability of the project manager's communications with others.

Good communication between the project manager, staff and user community helps to create enthusiasm and support for a project and is therefore to be nutured.

Bad or inadequate communication produces indifference and apathy.

On smaller projects informal, oral communications are probably sufficient to get everyone working together. However, on larger projects, particularly where there are substantial financial commitments involved more formal, written communications are called for so that everyone can be kept in touch with decisions that have been made.

Informal communications establish good personal relationships

Informal communications (verbal, either face-to-face or over the telephone) are useful for establishing good personal relationships and for fast and efficient immediate resolution of problems and deciding upon a course of action.

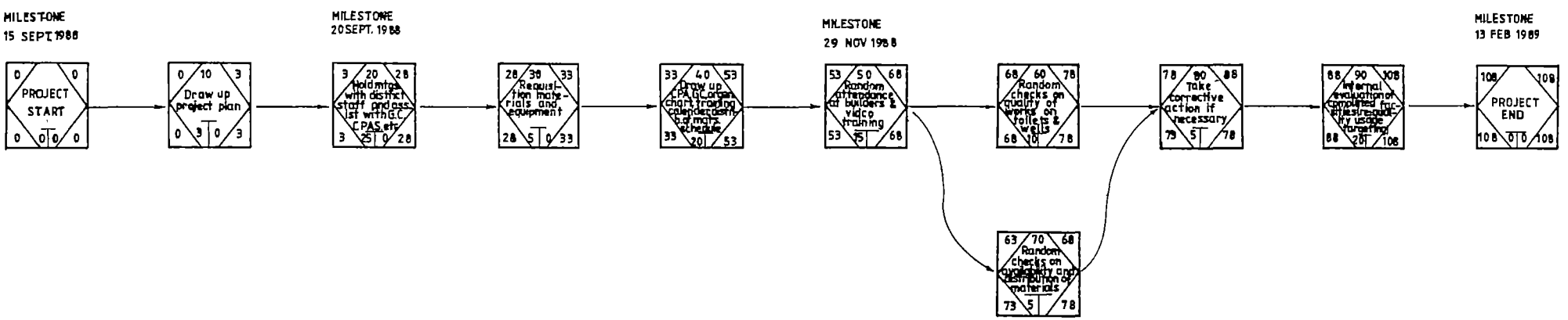
Formal communications confirm decisions made informally

On the other hand, formal communiucations (usually site visits and meetings, and/or written minutes) are necessary to confirm any decisions that have been made informally, to briefly record the main reasons for a decision and to serve as a record to communicate these decisions to people who were not present at the meeting.

Formal communications are generally necessary for the smooth running of a project and they are indispensable when it comes to dealing with matters such as:-

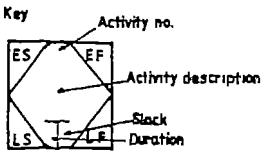
- applying for funds;
- requisitioning and paying for equipment and materials;
- periodic progress reports and financial accounts for Head Office and/or the donor agency.

FIGURE 6.1: CRITICAL PATH ANALYSIS FOR PROVINCIAL COORDINATION OF TYPICAL DISTRICT WATER SUPPLY AND SANITATION PROJECTS



NOTES:

1) Key



2) When calculating the earliest start, take the latest time on the forward pass if there are more than one preceeding activities.

3) When calculating the Latest Finish, take the earliest time on the backward pass if there are more than one

DISTRICT: _____ PROVINCE: "TYPICAL" PROJECT: WATER SUPPLY & SANITATION

MONTH: Sept/Oct. YEAR: 1988

MILESTONES:

NO.	ACTIVITIES	DURATION
10	Draw up project plan	3
20	Hold meetings with District staff, assist with CPA	25
30	Requisition materials and equipment	5
40	Draw up CPA, GC, training calendar, orgn chart	20
50	Random attendance at VIDCOs & builders training	15
60	Random checks on quality of works	10
80	Take corrective action where necessary	5
90	Internal evaluation of project	20
70	Random checks on availability/distribution materials	5
	. RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

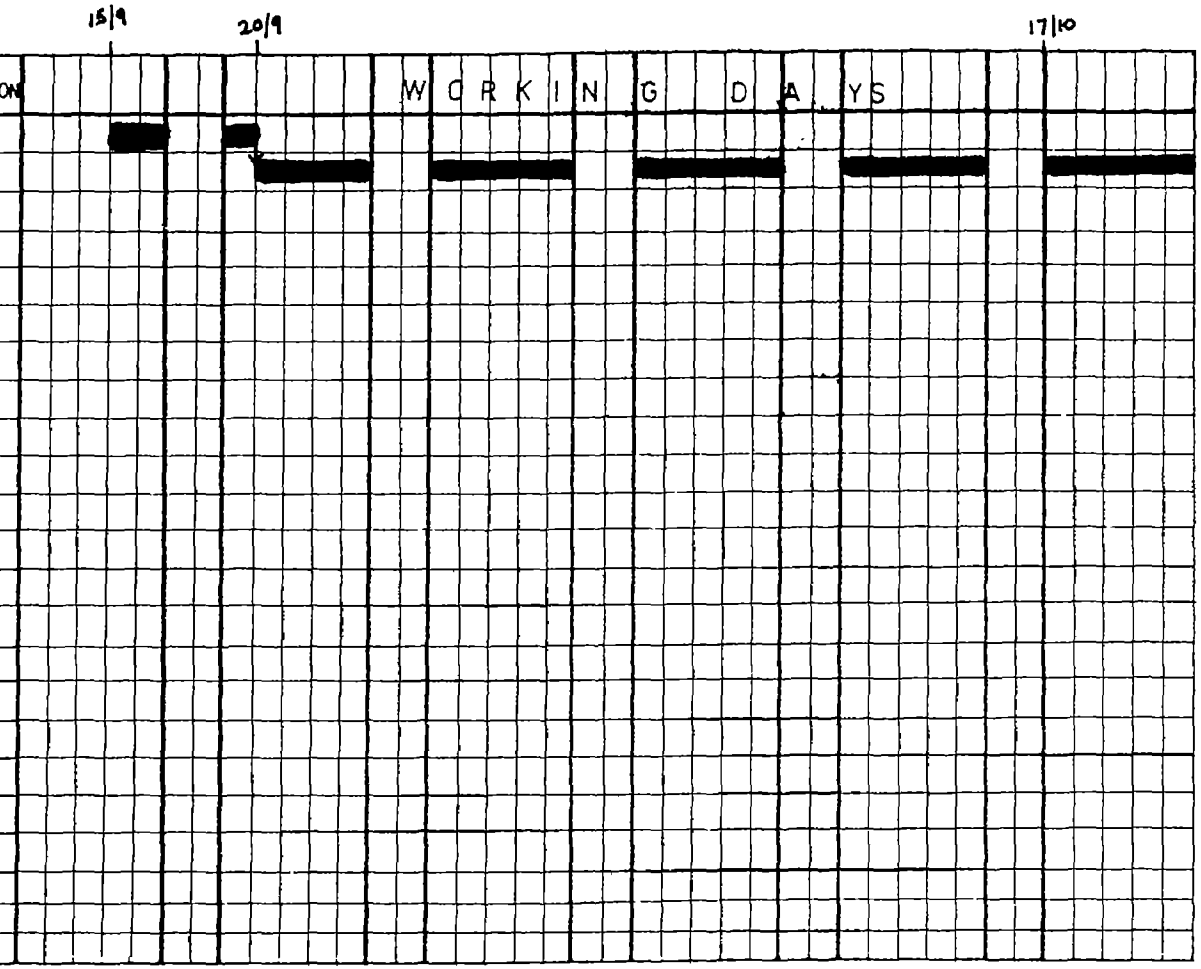


FIGURE 6 2 (part i) : PROVINCIAL GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date _____

DISTRICT _____ PROVINCE: "TYPICAL" PROJECT: WATER SUPPLY & SANITATION

MONTH: Oct/Nov. YEAR: 1988

MILESTONES: 17/10 25/10 1/11 21/11

NO.	ACTIVITIES	DURATION
10	Draw up project plan	3
20	Hold meetings with District staff, assist with CPA	25
30	Requisition materials and equipment	5
40	Draw up CPA, GC, training calendar, orgn chart	20
50	Random attendance at VIDCOs & builders training	15
60	Random checks on quality of works	10
80	Take corrective action where necessary	5
90	Internal evaluation of project	20
70	Random checks on availability/distribution materials	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

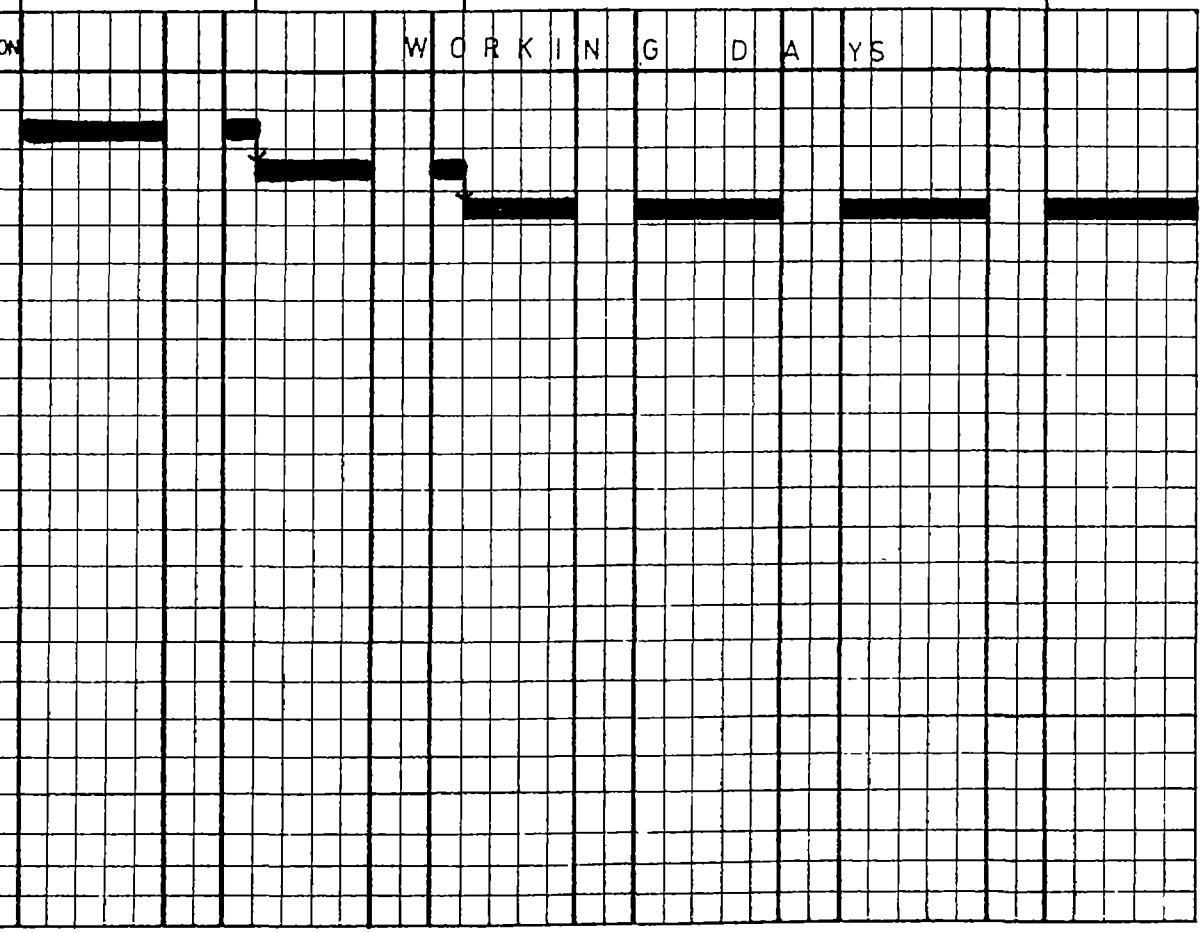


FIGURE 6.2 (part ii) : ~~PROVINCIAL GANTT CHART FOR WATER~~ SUPPLY AND SANITATION PROJECT

Compiled by _____

Date _____

DISTRICT: _____ PROVINCE: "TYPICAL" PROJECT: WATER SUPPLY & SANITATION

MONTH: Nov | Dec. YEAR: 1988

MILESTONES: 21/11 29/11 20/12 26/12

NO.	ACTIVITIES	DURATION
10	Draw up project plan	3
20	Hold meetings with District staff, assist with CPA	25
30	Requisition materials and equipment	5
40	Draw up CPA, GC, training calendar, orgn. chart	20
50	Random attendance at VIDCOs & builders training	15
60	Random checks on quality of works	10
80	Take corrective action where necessary	5
90	Internal evaluation of project	20
70	Random checks on availability/distribution materials	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

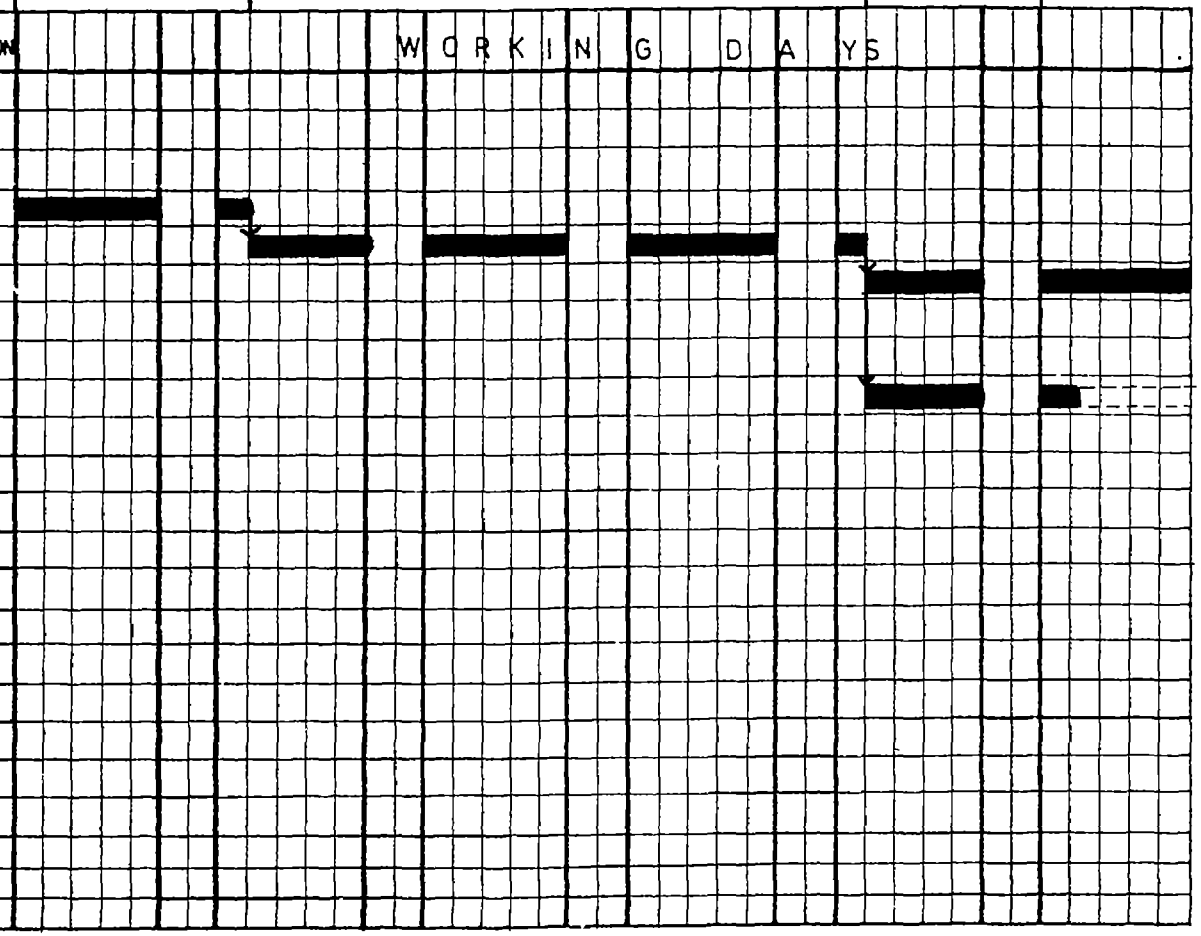


FIGURE 6.2 (part iii) : PROVINCIAL GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date _____

DISTRICT _____ PROVINCE. "TYPICAL" PROJECT WATER SUPPLY & SANITATION

MONTH: Dec / Jan. YEAR: 1988/89

MILESTONES:

NO.	ACTIVITIES	DURATION
10	Draw up project plan	3
20	Hold meetings with District staff, assist with CPA	25
30	Requisition materials and equipment	5
40	Draw up CPA, GC, training calendar, orgn chart	20
50	Random attendance at VIDCOs & builders training	15
60	Random checks on quality of works	10
80	Take corrective action where necessary	5
90	Internal evaluation of project	20
70	Random checks on availability/distribution materials	5
	RESOURCE REQUIRED	
	RESOURCE AVAILABLE	
	DIFFERENCE	

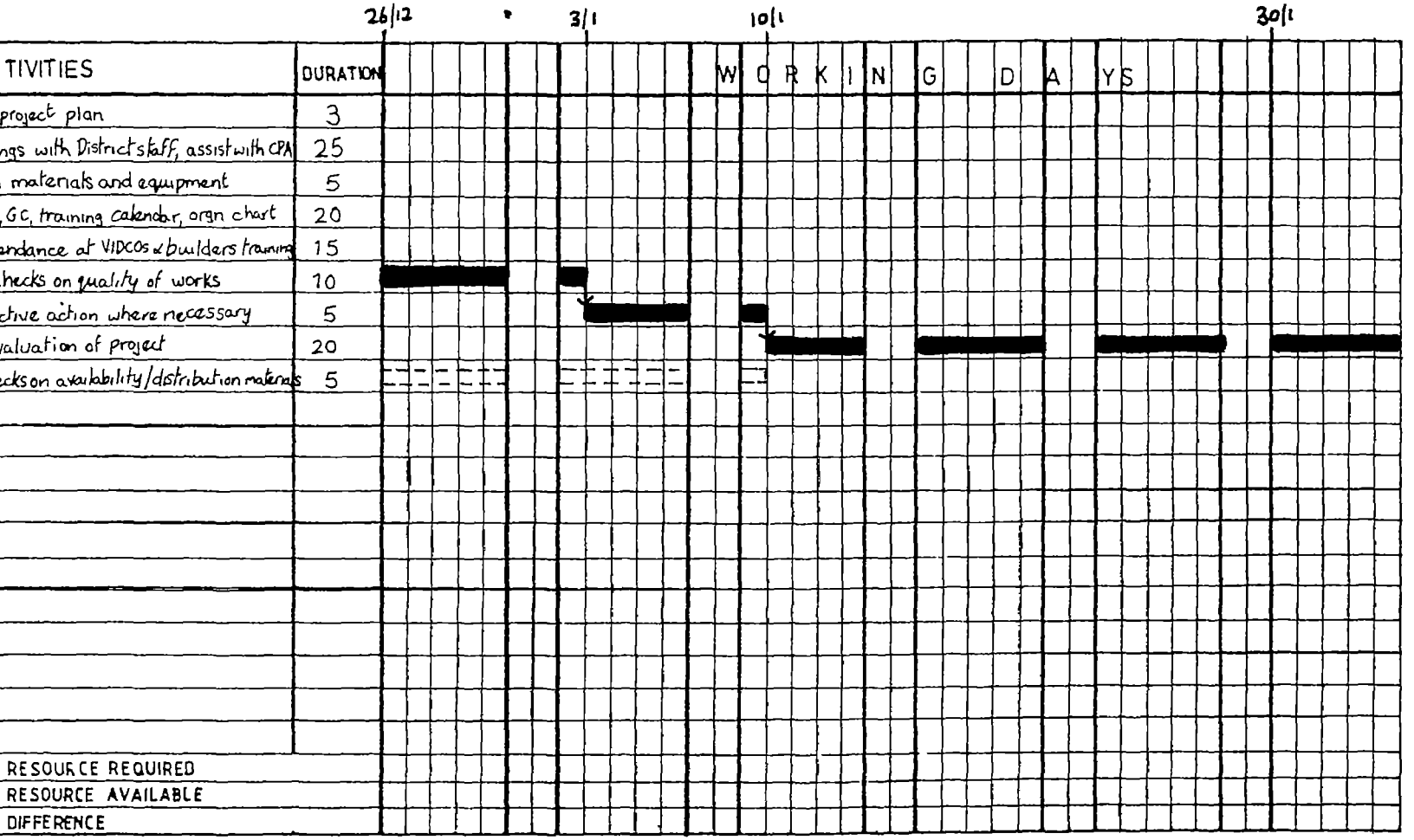


FIGURE 6.2 (part iv) : PROVINCIAL GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date: _____

DISTRICT: _____ PROVINCE: "TYPICAL" PROJECT: WATER SUPPLY & SANITATION

MONTH: Jan/Feb. YEAR: 1989

MILESTONES: 30/1 7/2

NO.	ACTIVITIES	DURATION	WORKING DAYS
10	Draw up project plan	3	
20	Hold meetings with District staff, assist with CPA	25	
30	Requisition materials and equipment	5	
40	Draw up CPA, GC, training calendar, orgn chart	20	
50	Random attendance at VIDCOs & builders training	15	
60	Random checks on quality of works	10	
80	Take corrective action where necessary	5	
90	Internal evaluation of project	20	
70	Random checks on availability/distribution materials	5	
	RESOURCE REQUIRED		
	RESOURCE AVAILABLE		
	DIFFERENCE		

FIGURE 6.2 (part v) : PROVINCIAL GANTT CHART FOR WATER SUPPLY AND SANITATION PROJECT

Compiled by _____

Date _____

Monthly progress reporting

Although not detailed in the district and provincial project implementation plans (i.e. the network diagrams and Gantt Charts), an extremely important activity at every month end is making a monthly progress report on the project.

The format and procedures for making monthly reports are laid down in the Ministry of Health's "National Monitoring System for Wells and Springs" and "National Monitoring System for Sanitation" Training Notes of September 1988. In summary:-

(i) Every month each Environmental Health Technician collects information on all new wells and springs and newly completed latrines in his/her ward/s. This information is filled in (in triplicate) on the two standard reporting sheets (see Figures 6.3 and 6.4.)

(ii) At the end of every month the Environmental Health Technician files one copy of each form for his/her own records and forwards two completed copies to the District Environmental Health Officer.

(iii) The District Environmental Health Officer checks that all the forms from the district have been properly filled in. S/he files one copy of each of the forms for record purposes and forwards the remaining copy together with a collated District Summary Form of sanitation data to the Provincial Environmental Health Officer.

(iv) The Provincial Environmental Health Officer is responsible for checking that all district information is correctly filled in and for ensuring that the monitoring system is running smoothly throughout the province. S/he then reports on water supply and sanitation progress to the Provincial water supply and sanitation Sub-committee of the Provincial Development Committee and sends on the districts' information to the Chief Environmental Health Officer.

(v) The Chief Environmental Health Officer is ultimately responsible for the computerisation of data from all provinces and for reporting the collated information to the Ministry of Health's National Health Information System, to the Ministry of Energy, Water Resources and Development's Water Master Plan office and to the Ministry of Local Government, Rural and Urban Development's National Co-ordination Committee for Rural Water Supply and Sanitation where national policies are formulated for the whole sector.

Figure 6.3: D I S T R I C T D E V E L O P M E N T F U N D / M I N I S T R Y O F H E A L T H

W E L L A N D S P R I N G D A T A S H E E T

GENERAL INFORMATION **REPORTING MONTH AND YEAR:** _____

Province: _____ Adm. district: _____ Council: _____ Division: _____ Code Index: . . . .

WELL AND SPRING INFORMATION

Ward name (1)	Ward code (2)	Location (2b)	Well number (3)	Grid ref. (4)	Map number (5)	Water source type (6)	Lifting device (7)	Yield (8)	Total depth (9)	Lining depth (10)	Depth to water (11)	Main users (12)	Number of users (13)	Ownership (14)	Headworks (15)	Implementing agency (16)	Funding agency (17)
		This column can be used to identify different wells within the same ward (state local name of place where well is located)				Wells: 1=Upgraded hand dug 2=Upgraded blasted 3=New hand dug 4=New blasted 5=Hand augered Springs: 6=Spring 7=Other	1=Bucket pump 2=Bush pump 3=Blair pump 4=Nsimbi pump 5=Bucket & windlass 6=Other 7=Not applicable	1=High 2=Medium 3=Low 4=Minimal 5=Dry 6=Not applicable				1=Household 2=School 3=Business 4=Health institution 5=Other		1=Communal 2=Private 3=Institution	1=Wash-slab 2=Cattle trough 3=Fence 4=Soak-away 5=Garden 6=Other 7=No headworks	1=MOH 2=DDF 3=NGO 4=Community 5=Private 6=Other	State the code of Ministry, Donor, NGO or state Private or Community (Refer to code List in the manual)

Reported By (Ward):.....**Date:**..... **Checked By (District):**..... **Date:**.....

Figure 6.4:

MINISTRY OF HEALTH

NEW/UPGRADED COMPLETED SANITATION FACILITIES

GENERAL INFORMATION

REPORTING MONTH & YEAR : _____

Province _____ Adm. district: _____ Council: _____ Division:_____ Code Index : . . .

LATRINE INFORMATION

NAME OF WARD	WARD CODE NUMBER	NO.OF H. HOLDS WITH NEW COMPLETED LATRINES	NO. OF MULTI COMPART MENT STRUC-TURES COMPLETED	NO. OF SQUAT HOLES/ SEATS BY TYPE OF STRUCTURES				NO. OF SQUAT HOLES/SEATS BY USER					NO. OF SQUAT HOLES/ SEATS BY IMPLEMENTING AGENCY						TOTAL NO OF SQUAT HOLES/ SEATS	NO.OF VENT PIPES WITHOUT FLY SCREENS
				Single Blair	Double Blair	Multi Comp-partment-	Other flush toilet etc.)	House Hold	Schools	Health Inst.	Busi-ness Centre	Other	MOH with GOZ funds	MOH + donor fund	Donor Code	NGO	Major NGO Code	Other		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	17)	(1	(19)	(20)	(21)
TOTAL																				

Reported by (Ward):_____

Date:_____

Checked by (District):_____

Date:_____

Establishing a clear organisational structure

In order to achieve good communication on the project, whether it be informal or formal, it is necessary to identify or create an appropriate, workable administrative orgsisation. This is to ensure that:-

1. The project manager is clear as to who is responsible (and therefore accountable) for what tasks;

2. Staff/project personnel are clear as to each of their own responsibilities and authority as well as that of their colleagues and the line of accountability/chain of command;

3. The user community and general members of the public can be directed with their queries directly to the individual who can assist them, rather than being shuffled around from office to office.

A typical organisational chart for all Provinces is detailed in Figure 6.5. It is suggested that the chart be amended to reflect the conditions of each particular Province and then displayed prominently for all Project staff and members of the community to refer to it. The Chart would be of further benefit if the names of individuals in different positions were also written in and kept up to date!

Recap on Chapter 6

The successful implementation and control of water supply and sanitation projects at both provincial and district levels are carried out by means of:-

1. A Critical Path Analysis (using a network diagram) which details all the projects' main activities, the relationship between activities, the duration of activities and the shortest possible time (the critical path) in which the project can be fully completed.

2. A Gantt Chart (also known as a Bar Chart) which clearly communicates to project staff the main activities of the project, when each activity should begin and end and any slack time for an activity.

   The project manager uses the Gantt Chart to calculate how much of a scarce resource (eg. manpower) is required each day of the project and where it is found that resources needed exceed the resources available, s/he reschedules non-critical activities so as to better match the resources available (this exercise is known as "resource levelling").

3. An Organisational Chart which identifies lines of accountability and different responsibilities of all people involved in the implementation of the project - be they members of the community (VIDCO Chairmen, builders) or members of the project staff (from Village Community Workers in the Ministry of Community and Co-operative Development to the Provincial Government Health Inspector in the Ministry of Health).

Figure 6.5 ORGANISATIONAL AND RESPONSIBILITY CHART
PROVINCIAL AND DISTRICT WATER SUPPLY AND SANITATION PROGRAMME

RESPONSIBILITIES OF A TECHNICAL STRUCTURE

RESPONSIBILITIES OF A TECHNICAL STRUCTURE

1 i) Overall co-ordination of the national water supply and sanitation programme together with complementary primary health education and achievement of stated national goals.

ii) Accountable for all public funds spent at district and provincial levels on water supply and sanitation programme.

iii) Recruiting staff for national provincial and district offices to ensure the achievement of national goals.

2 i) Co-ordination of water supply and sanitation programme at provincial level

ii) Accountable (to Head Office) for all public monies spent at provincial and district levels.

iii) Responsible for day-to-day duties of provincial and district staff

iv) Supervision of progress on projects and monitoring quality of structures built

v) Procuring of materials and equipment.

vi) Drawing up and provincial water supply and sanitation development plans.

vii) Keeping of commitment register and control over vehicles and equipment.

3. i) Drawing up district water supply and sanitation development plan.

ii) Drawing up materials and equipment list.

iii) Mobilisation of and liaison with community

iv) Siting of wells and toilets.

v) Educational health care programme.

vi) Training of builders.

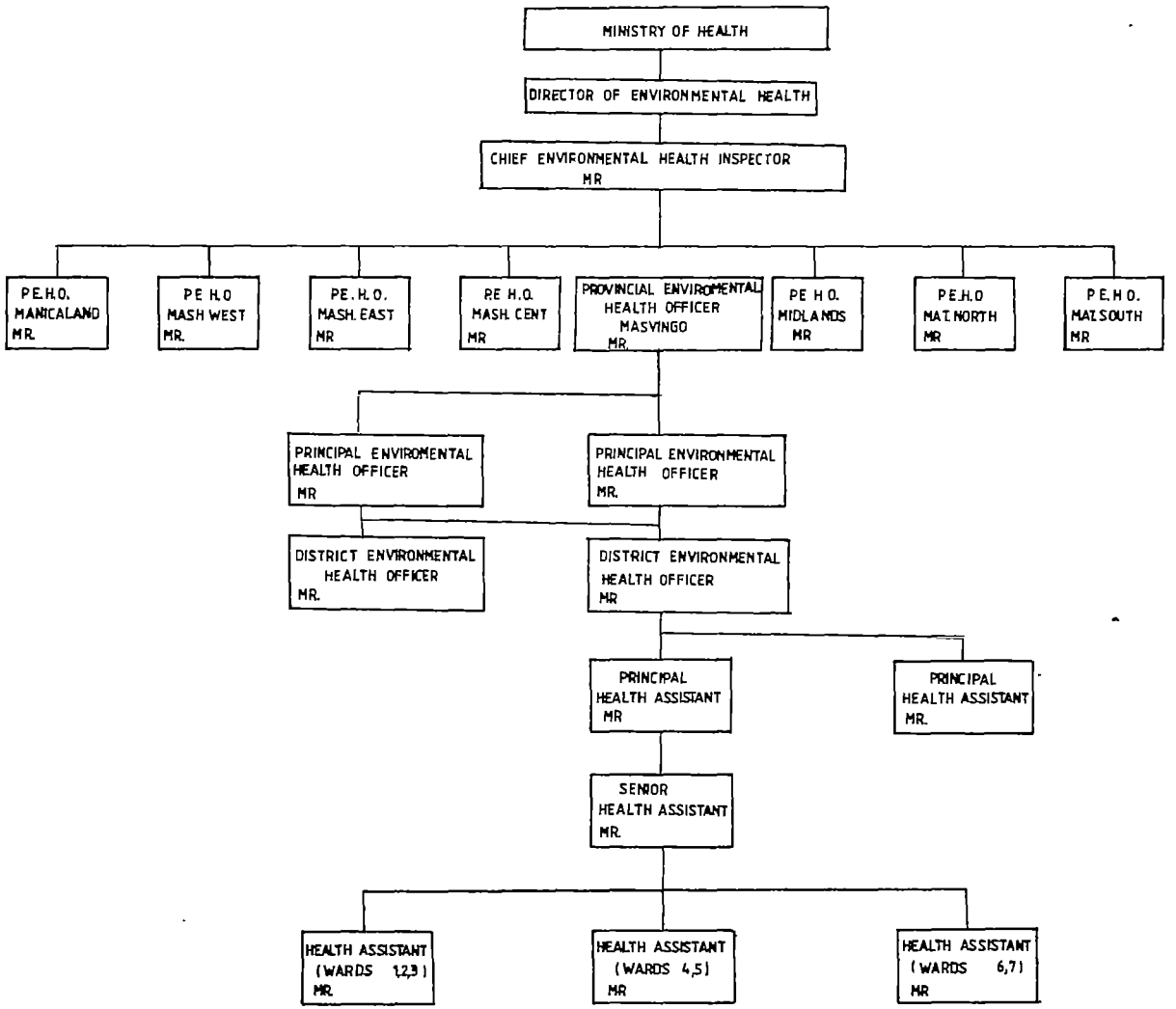
vii) Distribution of materials and tools.

viii) Inspection and supervision of well and toilet construction

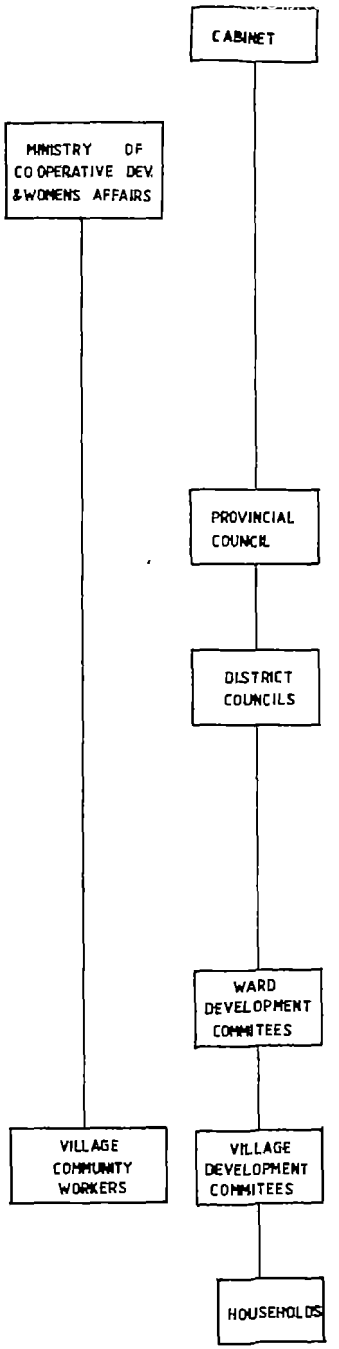
4 i) Mobilisation of the target community

ii) Liaison link between target community and project staff.

TECHNICAL STRUCTURE



POLITICAL STRUCTURE



CHAPTER 7 : FINANCIAL MANAGEMENT AND PROCUREMENT

Why is sound financial management and control necessary? What are the roles of the PHSA vs project manager? What the Commitment Register can tell you about the project; What the Commitment Register can't tell you about the project; Ideally what should the Commitment Register consist of? Control over stocks by Health Assistants; Monthly financial reporting; What are the responsibilities of the project manager with respect to procuring materials, tools and equipment? Government Tender Board procedures (Competitive Quotations, Informal Tenders, Formal Tenders, Participation in contracts held by other Ministries); Entering into Contracts with local builders.

Why is sound financial management and control necessary?

Unlike the management of projects in the private sector (where projects are expected to operate at a profit,) in the public sector, projects, by their very nature, are often implemented so as to achieve social objectives rather than economic ones. Often it is not possible to quantify these social benefits in monetary terms and a project might even be run at a loss and be subsidised so as to achieve social aims.

Nonetheless, financial control in the public sector is as important, if not more so, as in the case of the private sector. Public funds are being used and there is therefore a social as well as political responsibility encumbent upon the project manager to ensure that those funds are spent as designated and are spent in the most cost effective way with minimal losses. Sound financial management and control are therefore a necessary part of sound project management.

What are the roles of the Provincial Health Services Administrator vs. the Project Manager?

The Provincial Health Services Administrator is responsible for the actual procurement of materials and equipment, i.e. for issuing requisitions to suppliers and recording the requisitions and payments in the Commitment Register. S/he must draw the balances on the vote to the attention of the project manager.

The project manager is responsible for all procurement decisions that affect the project, for example for what is to be ordered, when and from which supplier; which votes are to be frozen; to where materials are to be distributed; and similar.

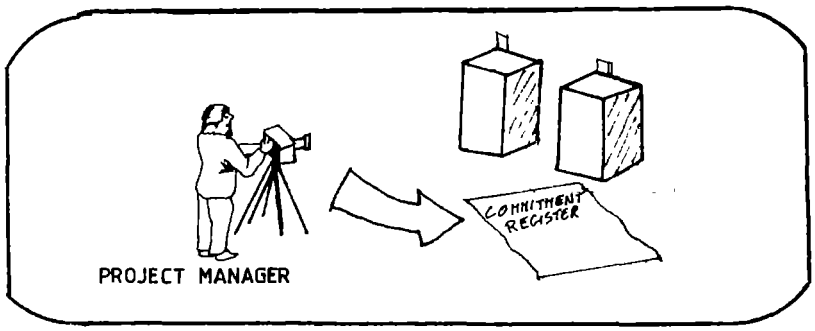
The Commitment Register

The Commitment Register is used as a daily budgeting and monitoring tool used by the Provincial Health Services Administrator.

What the Commitment Register can tell you about the project

A Commitment Register is therefore there to be <u>used</u> in an active way for active control by the relevant officials, rather than for a passive monthly check that payments/requisitions are being registered.

The Commitment Register provides an instant picture of the project at any given time.



If carefully used, the Commitment Register can reveal the overall budget size of the project in the current financial year and the daily balance on the budget vote or item lines.

It also indicates if more is being spent on certain items than was originally budgeted for. If so, the question to be asked is "Why?" If there have been legitimate price increases, how are these to be catered for? By scaling back on the project; by re-scheduling the project and carrying forward some works to the next financial year? (assuming more funds will then be available); by actively seeking additional funding in the current financial year.

The project manager should provide the PHSA with a detailed breakdown of the budget so that s/he can create the necessary budget lines in the Commitment Register.

What the Commitment Register <u>can't</u> tell you about the project
Obviously the Commitment Register is <u>not</u> able to tell you a number of non-quantifiable factors about the project, for example:-

(i) The degree of mobilisation of the community and enthusiasm for the project, other than as can be measured by moulding of bricks, collecting sand and stones, etc.

(ii) On building projects, in particular, spending tends to be periodic rather than consistent, as materials are usually ordered and delivered in bulk (to cut costs). Therefore the commitment register cannot accurately tell whether or not the project is going according to the project timetable. (The Critical Path Analysis or Gantt Chart must be used for this).

Sound financial management is called for if future projects are to be justified on the example of an existing project; or if the existing project is to be extended or replicated in another district.

Ideally what should the Commitment Register consist of?
Ideally, a seperate commitment register should be kept for each water supply and sanitation project which is funded by a source different from any other water supply and sanitation project. This is so particularly in the case of donor-funded projects, so that progressive financial expenditures can easily be extracted if the donor wishes to see this information.

However, it is recommended that the item headings kept in the commitment register be the same, or as nearly the same as possible, whether the project is being funded by a donor or by the Ministry's own Disease Prevention Control vote. This will have the advantage of a standardised system being used by staff (ease of keeping different registers). Also expenditures on different projects can be easily compared and a cumulative total can be kept of expenditures on the water supply and sanitation sector in the province as a whole.

Unfortunately, government accounting procedures have been standardised throughout the service and therefore are not as informative, comprehensive or flexible as might be desirable for comprehensive project control.

For example the payment of staff salaries is controlled through the SSB and is held against a staffing vote in each of the Ministry's divisions/sections; - they are not borne directly by the project. Equally, the costs of moulding bricks, supplying sand and stone and volunteering labour are borne by the user community and there is therefore no direct cost reflected on the projects' budget in the provincial office

In such circumstances, the best that the project manager (through the PHSA) can do is to set up a commitment register for those items over which he can exercise some control, which usually amounts to:-

(a) materials supplied by Government (cement, reinforcing gauze and mesh wires, tube well casing, pumps and spares);

(b) building equipment and building tools;

(c) vehicle hire and mileage;

(d) printing and stationery;

(e) posts and telecommunications;

(f) office equipment and maintenance;

(g) office cleaning materials.

Some of these items (eg. c - g) may be shared by the project with the office as a whole. It is therefore up to the project manager based on what items are covered in the project budget approved by the donor, to direct the Provincial Health Systems Administrator as to which of these items are to be committed against the project votes and which against the votes of the office as a whole.

Control over stocks by Environmental Health Technicians
In some provinces, materials and tools are delivered through the DHEO by the supplier directly to the project Ward. Once there, the stocks may be temporarily stored at a Rural Health Centre or a school and then are issued to individual households.

The onus for receiving the stocks from the supplier and distributing them to the households falls to the Health Assistants. Formal but simple controls on stocks are needed at this level and can be effected by two simple procedures:

(i) Keeping a stock control book or "bin cards" for recording stocks received and disbursed. For example:

a) Stock Control (Materials)

Item Name	Quantity	Date Received	Date Given Out	Name and Signature of Householder and EHT

b) Stock Control (Tools)

Item Name	Quantity	Date Taken Out	Date Returned	Name and Signature of Householder and EHT

(ii) The District Health Inspector should take an inventory of Ward stocks (materials and tools) at least twice per annum. Random checks on stores should also be carried out by the Provincial Government Health Inspector on visits to Wards.

Monthly financial reporting:
When drawing up the monthly progress reports on wells/springs and toilets (see Chapter 6), the Provincial Environmental Health Officer must include an analysis of financial expenditures on the project. Figure 7.1 below illustrates a format for such a report:

Figure 7.1: Mashonaland Central: Provincial Water Supply and Sanitation Project Ministry of Health

Month Ending _____ Year _____

ITEM	VOTE NO.	TOTAL VOTE	EXPENDITURE OVER MONTH UNDER REPORT	CUMULATIVE EXPENDITURE TO DATE	CUMULATIVE EXPENDITURE AS % OF TOTAL
1. Materials - Building		$ 2500 000	568 000	1968 051	79[1]
2. Equipment/Tools - Building		$ 100 000	6 525	16 623	17
3. Vehicle Hire (CMED)		$ 20 000	5 208	19 398	97[2]
4. Official Travel		$ 10 000	156	1 629	16
5. Printing and Stationery		$ 5000	329	2308	46
6. PTC		$ 5000	176	2693	54
7. Equipment and Maintenance - Office		$ 2000	229	1630	82
8. Cleaning materials - Office		$ 1000	38	732	73

Notes to project manager:

1. These items are often bought in bulk, periodically. Check that only about 20% is still required to complete the project. If more funds will be required than were initially voted for, write up report to Head Office explaining the reason for cost over-runs (eg. price escalations; original estimate too low, etc) and get Head Office's response. If a virement is agreed/or donor pays variation, the project may continue to completion this financial year. If not, the project must be re-scheduled and some works carried over to next financial year.

2. Staff to be advised of freeze on all further travel in CMED/Ministry vehicles until further notice (hard as this may be). Unauthorised over-expenditures render the head of office personally responsible for the over-expenditure). Immediately write to Head Office justifying why this vote is almost depeleted and requesting a virement (or additional funds from a donor if these are available).

Note that a virement (i.e. transferring savings from one vote to another) may only be approved by the Permanent Secretary of the Ministry. They may not be done internally in the Provincial Offices. Applications for virements should therefore be made well in advance so that the necessary authorisations may be received in time to keep the project to its timetable.

What are the responsibilities of the Project Manager with respect to procuring materials and tools and equipment?
Under the water supply and sanitation programme the present Government policy is to supply (on a grant basis) to the community, all non-locally available materials (viz. cement, gauze, reinforced and mesh wires, tube-well casings and pumps) as well as building tools and well-drilling equipment (where necessary).

Government Procurement Procedures

When public funds are being used to purchase such materials, there are extremely strict and rigid procedures laid down by Treasury, that must be followed.
It is therefore important for all provincial project managers (and some of their delegated staff) to be well versed in these procedures so as to carry them out correctly and in good time to avoid delays in the project. The rest of this Chapter is devoted to detailing the more important procedures that are used on a regular basis. Figure 7.2 shows these procedures by way of an organogram (i.e. start at Step 1 and work your way logically through the chart).

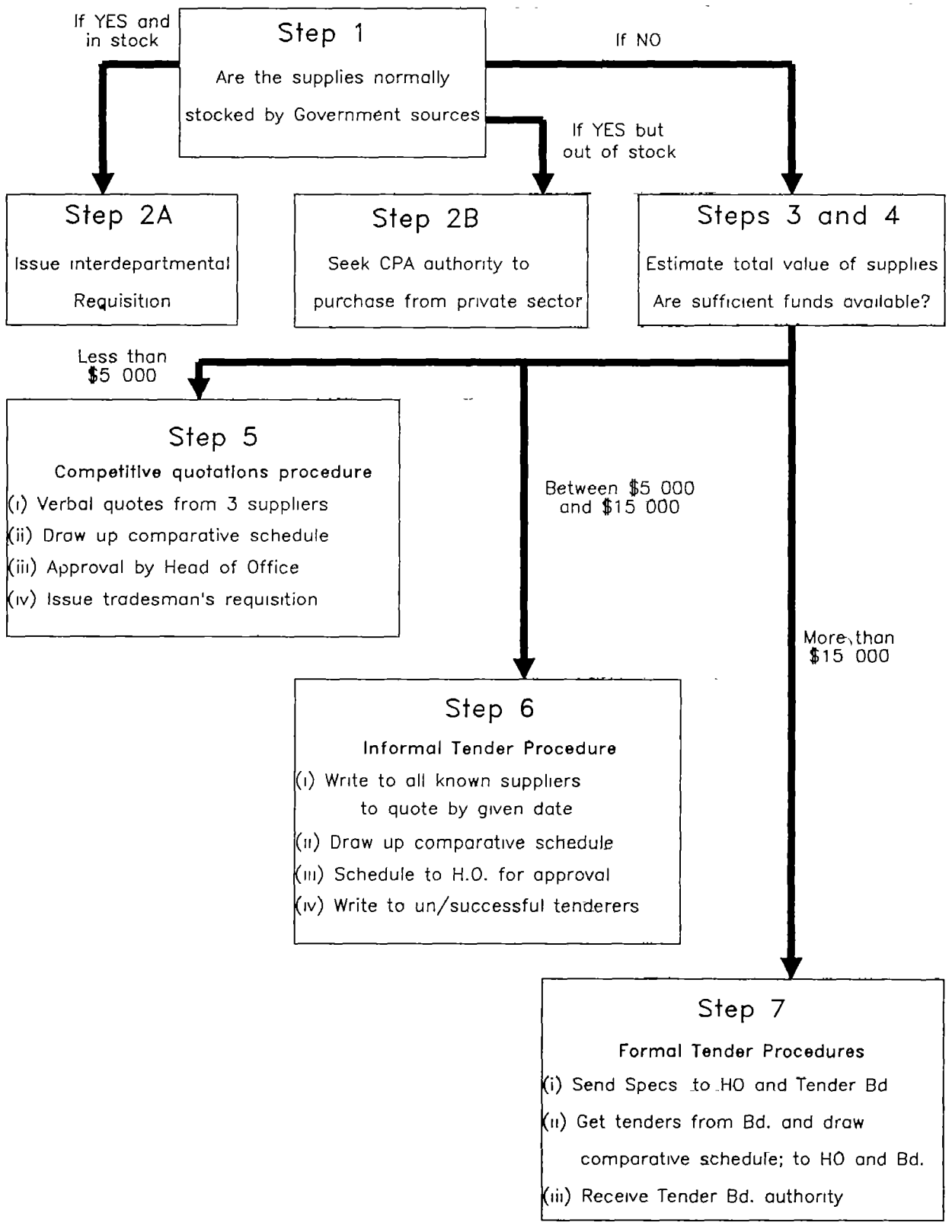
Step 1. Check whether or not the supplies (or services) you require are available from Government sources
In terms of Treasury Instructions 1030 to 1035, supplies and services which are obtainable from Government sources must be obtained from these sources - no matter the delay or cost - unless authority in writing is received from the Central Purchasing Authority to obtain the materials from the private sector. Make full use of this proviso by contacting the CPA telephonically and establishing whether or not they have stocks. If not, immediately request written authority (on their standard form) to purchase from the private sector.

What are the supplies and services available from Government sources?
Treasury Circulars are issued periodically listing the supplies and services available from Government sources. These Circulars are sometimes out of date but amongst the services available, of use to the water supply and sanitation programme are:-

(i) CMED:

All government's vehicle and heavy equipment requirements,
Transport and recovery facilities for non-CMED vehicles and equipment,
Provision of urgently needed spares for non-CMED vehicles.

Figure 7.2 Procedures for Procuring Materials



(ii) Government Central Stores:

All Government common user items such as furniture, uniforms, crockery, cutlery, bedding and camping equipment, common tools (eg. picks, hoes, shovels, spades, wheelbarrows).

(iii) Ministry of Public Construction and National Housing:

All requirements in connection with the erection of new public buildings and staff housing.

(iv) Ministry of Local Government, Rural and Urban Development:

The acquisition, disposal or leasing of State owned land (including in communal areas) by members of the public and user Ministries.

(v) Department of Printing and Stationery:

All government printing and office stationery requirements, including the provision, repair and maintenance of plan printing, copying and duplicating machines.

Step 2. Issue Inter-Departmental requisition
If you suspect that the supplies you require may be offered by one of the above government sources you should requisition by means of an Inter-Departmental requisition.

Once the I.D. requisition is returned to you, endorsed "Not available" (together with specific written authority from the Central Purchasing Authority), you may begin procedures to procure the supplies from the private sector.

Step 3. Estimate the value of the supplies
The value[1] of the required supplies determines the procedures to be followed:

(i) Not exceeding $5 000 - follow Competitive Quotations procedures.

(ii) Exceeding $5 000 but not exceeding $15 000 - follow Informal Tender procedures.

(iii) Exceeding $15 000 follow:-

---

1 It must be noted that the value of the supplies as estimated above are for the total order to be placed that year (the Tender Board Authority's are valid, generally speaking, for 1 year from their approval date). Thus should you require 11 bushpumps for the financial year and they cost $1 000 each, it is absolutely against Treasury Instructions to requisition the pumps four at a time following Competitive Quotations procedures (i.e. not exceeding $5 000 with each requisition). As 11 pumps are required in total at $1 000 each, the total value is $11 000 and Informal Tender procedures must be followed. An order may not be divided or reduced for the purpose of introducing different tender procedures.

(a) Formal Tender Procedures, or

(b) Special Formal Tender Procedures; or

(c) Approved List Tender procedures.

Step 4. Check that sufficient funds are available to purchase the supplies
Before proceeding further, check against the commitment register that sufficient funds are available to cover expenditure on the required supplies in the current financial year.

Step 5. Competitive Quotations procedure
If the total value of supplies required is estimated as less than $5 000 (excluding sales tax), then formal tender procedures are dispensed with and competitive quotations may be used.

Competitive quotations procedure is carried out by:-

(i) Telephoning all known suppliers, (a minimum of 3 if there are 3) and asking their price to supply (and deliver if necessary) the specified materials.

(ii) Draw up a comparative table of the quotes offered by each of the suppliers.

(iii) Seek approval of one of the suppliers (the one who quotes the lowest price unless there is very good reason why the order should not go to him) by the Head of the Provincial Office (or the officer designated in terms of the Accounting Officer's Instructions).

(iv) Make out a "Tradesmen's requisition" (Form 67211-7), including on it the supplier's quote for the supplies so that it can later be checked that the quotation given correspond with the supplier's invoice.

Step 6. Informal Tenders procedure
If the total value of supplies required is estimated as more than $5 000 but less than $15 000 (excluding sales tax), then informal tender procedures are followed.

An "informal tender" means a tender which need not be advertised in the Government Gazette and which may be approved by the Head of Department (i.e. at Head Office level) without reference to the Tender Board. However, a minute is sent to the Tender Board for its record purposes).

(i) Find out who all the potential suppliers are (ask other officers in your office or in other Departments, consult the Yellow Pages, consult the Standards Association of Zimbabwe or the Tender Board, etc).

(ii) A written letter is then sent to all known suppliers inviting their quotations. Your letter should contain the following:-

a) give adequate details of the supplies required quoting full specifications where necessary;

b) state when and where the supplies are required;

c) state the closing date for receiving the quotations;

d) request the suppliers to state the country of origin of the supplies (wherever possible Zimbabwean produced supplies are to be used);

e) explain that their tender price is to include the cost of delivering the materials to a specified site.

(iii) Once the closing date of the informal tender has passed, draw up a comparative schedule of the details of each tender received. (See Figure 7.3 for a standard format).

The comparative schedule must show:-

a) the name of each tenderer,

b) the country of origin of the supplies tendered;

c) the quantity tendered;

d) the rate per unit;

e) the total tender price; and

f) a subtraction of 1% from the total tender price for supplies bearing the mark of approval of the Zimbabwe Standards Association;

g) Any other charges (e.g. for delivery) or any discounts offered (be wary of discounts offered for payments within 30 days of delivery - Government is usually not able to pay within 30 days);

h) A statement recommending to whom the tender should be awarded (on lowest cost unless there is a very good reason not to do so).

(iv) Also record on the Comparative Schedule, a space for the recommendation of the Head of Department as to the tender to be accepted.

(v) Send at least two copies of the Comparative Schedule to the Head of Department (at Head Office) for his or her approval. One of the copies will be sent on to the Tender Board showing which tender was accepted and why. One of the copies of the schedule is retained by the Department for audit purposes.

(vi) On receiving notification from Head Office as to the successful tenderer:-

Figure 7.3: Format of a Comparative Schedule

Tender No. _____ Date _____

COMPARATIVE SCHEDULE FOR THE SUPPLY OF _____

Tenderer	Country of Origin of Supplies	Rate/ Unit	Total Price	Less 1% Standards Association Preference	Delivery Period	Remarks

RECOMMENDATION: That the tender of _____ Company be accepted and that the price is fair and reasonable.

_____

(Signature of Head of Department/Ministry)

a) enter into a written contract with the successful tenderer (on Printing and Stationery Form Z349(T));

b) advise the unsuccessful tenderers of the name of the successful tenderer and his total tender price;

c) Systematically inspect, sample and test the quality of supplies as they are delivered. Do not accept them if they do not conform to the specifications or standards indicated in the invitation to tender or the contract. Where no specified standard was indicated, the supplies should still conform to a standard acceptable to the general public.

Step 7. Formal Tender procedures
If the total value of the supplies required is estimated as more than $15 000 (excluding sales tax) then formal tender procedures are to be followed.

A "formal tender" means a tender which is to be advertised in the Government Gazette and the local press and submitted to the Tender Board for consideration.

(i) The following information and papers must be prepared by you and sent to the Head Office for onward transmission to the Secretary of the Tender Board who is then responsible for preparing the advertisement inviting tenders. (Note that tenders are always advertised on a Friday and advertising copies must be with the Board at least one week in advance):

a) a concise description of the supplies required;

b) the designation and full postal address of the officer from whom tender documents, detailed specifications and further particulars are obtainable;

c) whether or not any deposit is payable for the tender documents (usually only applied in the case of large-scale, complex projects);

d) the suggested closing date for receipt of tenders by the Tender Board. This date must be not less than 27 days after the date of publication of the advertisement. A longer period should be allowed if practicable. Tenders are generally opened on Thursdays at 2.45 pm;

e) a copy of relative tender documents specifications or other particulars issued by your office;

f) the following statements must be included in the tender documents:-

- the lowest of any tender will not necessarily be accepted and the Board reserves the right to accept the whole or any part of a tender;
- unless special circumstances require a longer period to be fixed, offers must hold good for 30 days from the closing date for the receipt of tenders;

- tenders will not be considered unless they fully comply with specifications;
- tenderers are at liberty to tender for one or more items;
- tenders invited by the Secretary to the Board shall be addressed to the Secretary and shall be transmitted under sealed cover with the advertised tender number and name written on the outside of the envelope;
- the country of origin and/or manufacture must be stated;
- tendered prices are not to include sales tax (or include it as a separate item).

(ii) Once opened, the tenders will be sent to you, or Head Office, with a covering list by the Secretary of the Board.

(iii) Enter all tenders received on a comparative schedule (for format see Figure 7.3). Depending on the goods required some columns may be unnecessary and may be ommitted.

(iv) Leave space for the Head of Office's recommendation as to which tender should be accepted (usually the lowest price unless there is a very good reason not to do so).

(v) Within 14 days of having received the list of tenders from the Secretary to the Board,return the Comparative Schedule to him, together with all the tenders. The reasons for recommending the acceptance of a specific tender must be clearly stated and include a statement as to whether or not the prices are fair and reasonable.

(vi) Thereafter six copies of the Tender Board's resolution will be sent to you (or your Head Office) naming the successful tenderer.

(vii) Notify the successful tenderer in writing and enter into a written contract with the supplier (on Department of Printing and Stationery's Form Z349T).

(viii) Notify the unsuccessful tenderers in writing, advising them of the name of the successful tenderer and his total tender price.

(ix) Systematically inspect, sample and test the quality of supplies as they are delivered. [See step 6(vi)(c) above.]

Step 8. Special Formal Tenders or Approved List procedures

A "special formal tender" means a tender which is not required to be advertised in the Government Gazette but which is submitted to the Tender Board for consideration. It is used in cases where the total value of supplies required is estimated as more than $15 000 (excluding sales tax) but:-

- where the Department considers that tendering should be limited to a list of approved tenderers;

- for urgent requirements where time does not permit the invitation of tenders by advertisement in the Gazette;
- where there has been no response to an advertisement for formal tenders and where it is necessary to reinvite tenders.

(i) Apply to the Board (through your Head Office) for permission to follow special formal tender procedures, including a list of the firms from which it is proposed to invite tenders.

(ii) Receive the Board's approval to follow special formal procedures.

(iii) Invite special formal tenders in writing. Your letter of invitation should include all requirements as listed in step 7 (Formal Tender procedures) above.

(iv) Receive the tenders.

(v) Follow step 7 (Formal Tender procedures) above.

Participation in contracts held by other Ministries
In order to expedite the procurement of materials, the Tender Board does permit different Ministries or Departments to participate in contracts already authorised for other Ministries or Departments.

This is particularly useful when procuring items for the water supply and sanitation projects which are common to many other Ministries. For example cement and different types of wire are also used by the Ministries of Public Construction and National Housing and Transport and the Prisons Department.

The procedure for participating in another Ministry's tender authority is as follows:

(i) Send the Participation Form (see Figure 7.4) in triplicate for completion to the supplier (to complete Part A) and then to the contracting Ministry (to complete Part B).

(ii) Submit the duly completed forms to the Tender Board for endorsement.

(iii) On receiving the Tender Board's endorsement, issue requisitions in the usual way, quoting the other Ministry's TBR number.

Entering into Contracts with local builders.
The bulk of contractual agreements with local builders in the water supply and sanitation programme will be directly between the builders and the user households themselves. The project manager and his/her staff are merely active in training the builders in the required skills and in supervising the quality of works on behalf of the households.

Figure 7.4: Contract Participation Form

Reference.....
Date.....

The Ministry/Department of
.....

A. Contract.....

We,..... hereby confirm that we agree to the participation of the Ministry/Department of ..... in the purchase of goods in terms of .....
Contract No.....

Yours faithfully

Signature .....
for :

Reference.....
Date.....

The Ministry/Department of
.....

B. Contract.....

Permission is hereby granted for the Ministry/Department of ..... to participate in this Ministry's/ Department's Contract No. .....

Signature .....
for :

Part A to be completed by Contractor.
Part B to be completed by Contracting Ministry/Department.

However it may be necessary and possible on occassion, for the project manager to directly engage the services of a local builder/s for particular piece-work if funds are available for this in a donor-funded project.

Assuming that the extent of this contract would be less than $5 000, then a builder would be selected on the basis of competitive quotations. Thereafter it is strongly recommended that a formal contract be drawn up and signed with the builder. To pre-empt any future misunderstandings or problems between the two parties a written contract is recommended. A copy of a typical contract which may be amended according to specific circumstances is given overleaf.

Particular attention is drawn to clause 2 of the contract where it is stated that payments to the contractor shall be made in instalments.

Instalments are used so that:-

a) the Contractor will have some money in advance to pay wages to his assistants, purchase tools and cover similar running costs; and

b) to protect the project against an unscrupulous Contractor who may be paid in advance and leave the site before finishing the job or before completing it to an approved standard.

A useful payments schedule which may be followed is as follows:

Payment Certificate No.	Level of Works	Percentage for Payment
1	Advance payment	15%
2	Foundations	10%
3	Superstructure	25%
4	Roofing	25%
5	Finishes	15%
6	Upon completion	10%
		100%

FORM OF AGREEMENT AND BUILDING CONTRACT

(Where materials are not to be supplied by the Contractor)

between PROVINCIAL ENVIRONMENTAL HEALTH OFFICER acting on behalf of THE MINISTRY OF HEALTH (. . . . . .PROVINCE) (hereinafter called "the Employer,")

and . . . . . .

of . . . . . .

(hereinafter called "the Contractor").

to carry out the following works: . . . . . .

. . . . . .

(hereinafter called "the Works")

as described on Drawing Nos. . . . . .

prepared by The Ministry of Health.

1. It is hereby agreed that the Contractor will complete the Works in accordance with the drawings to the satisfaction of the Ministry of Health.

2. The Employer will pay the Contractor the Contract Sum of . . . . . .

. . . . . .

($. . . . . .) which shall be paid in instalments as agreed between the two parties.

3. The Contractor will comply with any written instruction given by the Provincial Government Health Inspector to him during the course of the carrying out of the Works.

4. Any claim for increased costs incurred either in Clause 3 above or for any other justifiable reason shall be submitted to the Provincial Government Health Inspector in writing at the time such an increase is incurred. Any variation of the Contract Sum will be made only by the Provincial Environmental Health Officer who will obtain the agreement of the Provincial Medical Director and Contractor to such variation, which agreement shall not unreasonably be withheld.

5. The Employer shall be responsible for the measuring and ordering of all materials and plant required in the works and for the delivery of same to the Site.

6. The Employer shall be responsible for insuring the Works against fire, loss or damage to the full value of labour and materials to be used in the Works.

7. The Contractor shall be responsible for insuring against any claim in respect of personal injury or death of any person arising out of the carrying out of the Works.

8. The Provincial Environmental Health Officer shall be responsible for checking that the Contractor's setting-out is in accordance with the drawings.

9. The Provincial Environmental Health Officer shall be allowed access to the Works at all times, or to any place where components for the Works are being assembled.

10. The date of commencement of the Works will be . . . . . .

. . . . . .

11. The date of completion of the Works will be . . . . . .

. . . . . .

12. If the Contractor fails to complete the Works within a reasonable time or to the satisfaction of the Provincial Environmental Health Officer, then this Contract may be terminated upon such terms as will be specified by the Provincial Government Health Inspector, in order that another Contractor can be employed to complete the Works.

13. Any Sub-Contractor employed on the Works by the Contractor to be approved by the Provincial Environmental Health Officer.

14. The Contractor is solely responsible for the employment and termination of employment of his own work force.

15. The Employer shall not give any direct instruction to the Contractor except in writing.

As witness our hand the . . . . . day of . . . . . .19 . . . . .

at . . . . . Province, Zimbabwe.

Employer . . . . . .

Witness . . . . . Address . . . . . .

Contractor . . . . . .

Witness . . . . . Address . . . . . .

CHAPTER 8: OFFICE ORGANISATION

Paperwork, a necessary evil; Why spend time on paperwork?; Written records guide and control the project; Written records are the key to financial control; Records should be readable and accessible; Accessibility calls for a logical filing system; File notes, memoranda, letters and reports; Copying correspondence.

Paperwork, a necessary evil

Paperwork and letter writing is not the most exciting part of managing a project. Many project managers see themselves as people busy in the field without sufficient time to spend on report writing. However written records are not only an element of effecti project management but are essential to it.

Why spend time on paperwork?

(i) As a civil servant, every PEHO or member of staff on a project team, may find him/herself transferred to another province, promoted to Head Office, sent on a training course outside the country, or similar. Thus, although that person might know every last detail of the project in her/his head, it would be extremely difficult for the next encumbent in the post to pick up the project smoothly and keep it running if there is no information on the files.

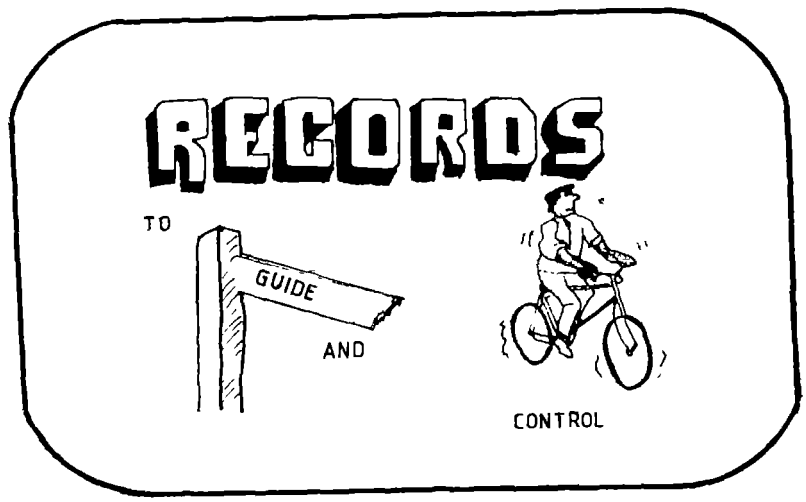
(ii) The more people there are involved in the project (and an overriding aim is to have maximum community participation and representation,) the more the written word is relied upon to get the message - the same message - across to everyone.

(iii) The water supply and sanitation projects make use of substantial public funds (be these from Treasury or from a donor). Therefore accurate and up to date records are needed when making disbursements and keeping financial control.

Written records guide and control the project

The project manager should be able to make use of accurate, written information to both guide and control the project, rather than just following after the flow of project activities.

From the project manager's office comes such information as instructions to Health Assistants on site; decisions concerning which vehicles and equipment are be deployed to which areas; which suppliers have been awarded tenders for materials and when these are to be delivered; what progress is being made by different districts and what corrective actions are necessary; and so on.



The success of a project is judged on its adherence to quality, time and cost constraints. Good management decisions are only possible if the project manager has adequate information available at appropriate times. Even the best manager forgets items now and again, and written records help to overcome this problem. Equally if all project staff are presenting reports of progress (however brief), the manager can be kept up to date with particular problems in a district, quantities of materials delivered and shortfalls, etc.

Written records are the key to financial control
As already discussed in Chapter 7, strong financial control relies on the keeping of records:

- preparation of tender documents and comparative schedules for procurement of materials;
- keeping a commitment register of supplies requisitioned and funds actually disbursed;
- organisational charts showing lines of accountability and responsibility for different project activities (see for example Fig 6.5);
- monthly reporting to Head Office and keeping a check on cost overruns.

Records should be readable and accessible
If one goes to the trouble and time of keeping written records, then it is worthwhile keeping them easy to read and understood by others as well as being accessible.

Accessibility calls for a logical filing system
All offices already have their own filing systems in place. It is therefore not the intention here to recommend a complete overhaul of these systems. However a few pointers might be considered:

(i) The files should be named and numbered according to a logical system, for example by district, by ward within a district, by topic, etc.:

Health Education Training Materials	HE1
Health Education, Meetings Ward	2HE2a
Health Education, Meetings Ward	3HE2b

(ii) Whatever the nomenclature used, keep an up to date index in the Registry for quick reference.

(iii) All confidential files - notably personal staff files, must be kept locked at all times, either in the PMD's office or the PHSA'S office. These files must only be passed (for actioning, information, etc) from one person to another by hand. Avoid causing staff members embarassment and never leave these files in someone's pigeon-hole or on top of an empty desk.

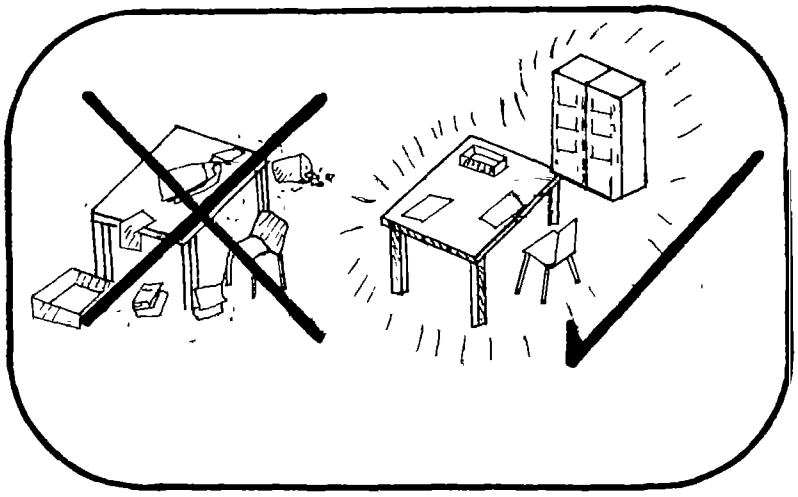
(iv) When full, files should be endorsed on the front cover "CLOSED" together with the closing date and either kept in a special Closed Files cabinet or sent to Government Archives for safekeeping.

(v) Make sure that there is a duplicate key to the Registry kept by the Head of Office - there is nothing more annoying or time-wasting than being unable to use a file when it is needed.

(vi) All government files are confidential. Their contents may not be disclosed to members of the public (including Councillors and other community leaders) without the prior approval of the Head of Office.

File notes, memoranda, letters and reports
Keep office correspondence brief and to the point. Different formats are used for different types of correspondence:

(i) File Notes
Whenever a staff member goes on site, attends an important meeting, or similar, s/he should make a brief file note of the activity. Too often site visit records are scribbled on the backs of old envelopes and these end up lost in a heap of papers in a drawer back in the office.



More time can be wasted looking for odd bits of paper or arguing over what was actually agreed at a site visit than if a brief file note had been made at the end of the day.

The typical format for a file note is:

File Ref:

FILE NOTE

a) Date, time and place of meeting.

b) Those present (names and representing which Ministry/organisation).

c) Purpose of meeting/site visit.

d) Main points covered and agreed to.

e) Main points not agreed to.

f) Follow up action required and by whom.

Signature of officer: . . . . . Date: . . . . . .

(ii) Memoranda

Office memoranda are letters which are written within the office or to any other official in another Ministry/Department. No matter the grade of official to whom the memo is marked for the attention of (even if it is to the Permanent Secretary), one dispenses with "Dear Sir" and "Yours faithfully".

Memoranda are always addressed to the Head of the Office, not to an individual, but may be marked for the attention of an individual. When writing to another provincial office or writing to another Ministry on an issue which is likely to cause future debate or conflict the memo should be copied to Head Office.

The typical format of a memorandum is:

File Ref :
Secretary for.....
Address of Receiving Office
Address of Sending Office
Date

(Attention : Cde.F.Moyo)

Topic Headline ; e.g. Shortage of Training Materials for Village Community Workers Mudzi District

Your letter referenced..... of ...../...../1988 on the above topic refers
OR
The telecon between Cde ..... of your office and the undersigned on the above topic on .../.../1988 refers.

.....
.....
.....

C.Mudzinga
For: Provincial Medical Director
(Mashonaland East)

c.c. Chief Environmental Health Officer, Ministry of Health (Attention Dr Osuo) - Please action last paragraph

Memoranda are correspondences within Government offices; therefore care should be taken not to copy them directly to members of the public (including local authorities). It may be necessary to write a seperate letter to the local authority where necessary.

(iii) Letters

Letters are correspondences sent to members of the public, including local authorities, parastatals and missions. When writing to Rural District Councils it is a matter of protocol to copy the letter to the District Administrator (and if necessary to the District Environmental Health Officer)of the area so that s/he is kept abreast of developments. If the letter is likely to cause future debate or conflict, a copy is sent to Head Office for their records.

The typical format of a letter is similar to that of a memo with a few additions:

File Ref :
Address of
Sending Office
Date.....

The Senior Executive Officer,
Chiweshe District Council,
P/Bag 2010,
GLENDALE

Dear Sir,

TOPIC OF LETTER AS A HEADLINE

Reference is made to our joint site meeting a Kawanzarurwa consolidated village on .../.../1988 to inspect progress of the primary water supply programme.
It was agreed at the meeting that:

.....

.....

.....

If you have any further queries on this issue, please do not hesitate to contact this office.
Yours faithfully,

C. Mudzinga
For: Provincial Medical Director
(Mashonaland Central)
c.c. District Administrator, Concession - For your information.
c.c. DEHO - For your information.

(iv) Reports

Reports are a formal means of communicating progress of a project; problems being faced; requesting support assistance; or similar. Their contents and format obviously vary considerably but may include the following items:

File Ref:

NAME OF REPORT

a) Executive Summary - one to two pages summarising the main points and recommendations of the report. (It is placed at the beginning of the report but is written up last.)

b) Background - to the topic of the report.

c) Introduction and Purpose of Report.

d) Method Used (where applicable).

e) Main Findings.

f) Recommendations.

g) Office in which the report was produced, date of report and circulation list.

(v) Miscellaneous Office Forms

Standard, roneoed forms are often suitable for correspondence which is undertaken routinely, such as for checklists for inspecting toilets under construction; certificate of competence of builders who have undergone a training course; contracts with local builders; etc.

Check that forms are properly designed so that they are easy to use and do not require staff to fill in a lot of superfluous information.

Copying correspondence

Mention was made above to copying some memos and letters to Head Office or to other officials for their record purposes or for their action. In addition, all correspondence should have at least one extra copy for the office file (or more copies of cross-referencing to related files) and at least one other copy for a running file so that all project staff may be kept abreast of work being done by the office as a whole. (Remember that no confidential staff minutes should be copied to the running file.)

Some offices also make use of a "tickler file". A copy of all correspondence is put into this file in date order and every day one month after the correspondence was written it is put to the Head of Office to "tickle" his/her memory as to whether or not a reply has been received or further action is needed.

CHAPTER 9 : MANPOWER

Areas of responsibility with respect to staffing positions; Operating within a "steady state" organisational environment; Assessing manpower requirements; How to cope with staff shortages; A further word on the use of consultants; Mobilising staff and creating a project team spirit.

Areas of responsibility with respect to staffing positions

The staffing position in most provincial and district offices is established by the Ministry at Head Office level with concurrence of the Public Service Commission. Therefore, the recruitment of new staff is not generally within the responsibilities of the provincial project manager. Nonetheless s/he should be aware of the procedures that are followed elsewhere in the Public Service and do whatever s/he can to make a case for more staff where this is needed and to build up staff morale in the office.

Operating within a "steady state" organisational environment

Under project operational conditions, there is a difference between the situation of a project manager who may have to assess the manpower requirements to implement the project and be able to go out and recruit the necessary staff, and the situation of a project manager operating within a "steady-state" organisational environment. The latter has a set complement of staff and must deploy them as best as possible over any number of projects or activities. The provincial project manager of the Ministry of Health's water supply and sanitation projects, of course falls into this latter category. Nonetheless, there is some leeway for such a project manager by:

(i) resource levelling (rescheduling some activities in a project to optimise available manpower);

(ii) making a strong case to the Head Office for further staff, either by transfer or new recruitment;

(iii) making use of the personnel assistance available from NGOs or consultants and funding agencies.

Assessing manpower requirements

The first task to be addressed in manpower planning is that of assessing what the manpower requirements are in order to complete the project in the required time and to a required level or standard of performance.

When calculating manpower requirements, there are two factors to consider:-

a) quantity - i.e. manhours required to complete a given activity given a certain level of skill; and

b) skill level of the person identified to carry out a specified task.

Assessing the quantity of manpower needed

Most project managers, particularly experienced ones, are able to make "guestimates" as to the amount of manpower needed to complete a project, and therefore, roughly how long the project will take. In Chapters 4, 5 and 6, the concept of project management was rationalised and the use of Critical Path Analysis and Gantt Charts were recommended.

One of the first steps in drawing up a Critical Path Network diagram is to list all the possible activities that will have to be undertaken in order to complete the whole project. Once the project has been broken down into these activities, the duration time of each activity is then calculated. (Estimates should include extra time for unforseen circumstances.) This duration time is, in effect, a calculation of manpower required. Assuming a normal (or typical) level of resources available to the project manager, and assuming the standard to which the activity must be performed, the duration time = the amount of manhours /mandays /manweeks needed to carry out the activity.

Often a project manager will be able to calculate this duration time on the basis of past experience. Alternatively, if s/he has no experience of having worked on such an activity before, the project manager might then consult and discuss with other staff members, local builders in the community, colleagues in other provincial offices, and so on. At the end of the day (unless work study methods are used, which are not recommended for the water supply and sanitation projects under discussion), this duration time calculation is derived somewhat intuitively and subjectively.

After drawing up the Critical Path Analysis, all the activities, together with their duration times and possible slack, are shown graphically on a Gantt Chart. The manpower requirements each day can then be added up vertically and totalled in the bottom column. This is then compared with the amount of manpower actually available to work on the project.

(ii) Assessing the quality or type of manpower required

In calculating duration times, the type of person required - in terms of education, skills, experience and personal qualities - needs to be specified. If a new member of staff is to be recruited the project manager can assist procedurally by providing as much information as possible to the Head Office. Typically, this is done by means of drawing up a Job Description which should include:-

- job title and grade (make use of existing already approved Public Service structures, where possible);
- necessary minimum education and technical qualifications and further qualifications that would be an advantage;
- descriptions of all the duties and responsibilities that the staff member would be expected to perform;

- to whom that post is responsible and for whom that person will be responsible;
- minimum past experience on similar work required;
- any personal qualities that may be an advantage.

How to cope with staff shortages

Where the amount of manpower required exceeds that available, the project manager has at least three options open:

(i) Resource levelling - this was discussed in detail on page 49 and consists of rescheduling non-critical activities to different days so as to reduce the staff overload on other days. Care should be exercised here, however, that staff are not being expected to work at fever-pitch on critical activities day after day. This effort will be difficult to sustain and may result in long term project delays and staff discontent. It is as well in the planning to allow for some slowing up/slack periods.

(ii) If resource levelling is not possible and if the project cannot be delayed, then the project manager could also consider making a case to his Head Office for an increase in the staff complement. However, the filling of vacant posts can take many months to accomplish, particularly for more senior posts. Furthermore the creation of new posts on the establishment requires the approval of both the Public Service Commission and Treasury and can therefore take a number of years to achieve.

This option then, with good reason, is not a realistic one for the stressed project manager who has to get money spent in the current financial year and who must be seen by the user community to be getting the job done.

(iii) A further alternative, which is being used more and more in the water supply and sanitation projects, given the large amounts of donor funding supporting this sector, is to make a case for the temporary secondment of NGO other donor agency staff for either a set period of time and/or to carry out specific duties, usually making use of skills which are not locally available.

It should be noted however, that Provinces do not have the authority to unilaterally take on such staff. A case must, in the first instance, be made to Head Office and before an agreement can be finalised the Ministry of Finance, Economic Planning and Development must ratify the agreement. Again therefore, some time delay must be expected and planned for.

A further word on the use of consultants

Having a consultant/member of an NGO on a project team, can be very beneficial:-

- experiences from elsewhere will be introduced which may have lessons for a local problem;

- s/he is likely to have skills not easily available locally;.
- s/he is likely to come to the office together with a certain amount of "support equipment" - engines and measuring tapes, photocopier, vehicle, overhead projector, etc.
- s/he is likely to be a dedicated professional with a strong personal commitment to doing a job well and to assisting development in communities. This attitude may in turn "rub-off" on other staff and be very encouraging.

However, there are also some potential points of conflict in having a consultant on the project team:-

- s/he will usually be drawing a salary from the donor and therefore find her/himself with split alliegances - answerable both to the objectives of the employing donor as well as to those of the project manager and user Ministry;
- s/he may be better qualified and/or more experienced than the project manager and this may cause some leadership conflicts, particularly in the eyes of other project staff and the community;
- s/he may be in a hurry to see the project completed within her/his contract period and therefore be impatient with local discussions and decision making processes;
- s/he may come from a different cultural background and may not take into account local traditions and protocols.

However the astute project manager can minimise these difficulties by being aware before hand that they might exist and by clearly defining the duties, responsibilities and lines of accountability of the consultant are early on in the project. Expatriate consultants should be required to train a local counterpart to succeed him/her in his/her duties.

Mobilising staff and creating a project team spirit

The primary goal of the project manager with respect to the project team is to promote harmonious working relationships and build up team spirit and commitment to the project. In Chapter 2, some of the personnel management skills that mark a good project manager were identified. The following should also be considered where appropriate:-

(i) **Leadership styles**

The project manager should provide a clear leadership image and have a clear vision of what is expected of each of her/his project staff. This vision should be seen by the staff themselves, that is, each staff member should know what is expected of her/him and on whom s/he may call with problems (of either a job-related or personal nature).

The best way of achieving this is to involve staff early on in formulating the project plan, in discussing problems and issues related to the project and to allow

them some degree of personal initiative. The extent to which this is tempered with a more authoritarian style depends very much on the project or work environment. There is no "right" or "wrong" style of leadership - there are only "appropriate" styles. When there is room for leeway, allow leeway. When disciplinary measures are called for, enforce them.

(ii) **Pay policy**

This is unfortunately one area that is very weak in the Public Service - it is not possible to directly reward a good worker by increasing her/his salary or paying bonuses. However, the project manager can and should accept responsibility for ensuring that staff members (particularly new ones) receive their salary cheques promptly on Government pay day; that Subsistence and Travel allowances and advances are processed and paid expeditiously; that applications for leave (and cash in lieu of leave) are processed expeditiously, in close consultation with the PHSA (i.e. the officer in charge of recording expenditure).

(iii) **Stabilising the project team**

If there is a high turnover of staff on the project team, the project manager should attempt to establish why this is so. Sometimes it may even be necessary to interview the resigning staff member to ascertain why s/he does not fit the job or the job does not fit her/him. Staff often resign for more than one reason (i.e. it may not only be because of dissatisfaction with salary scales). It may be that they are upset by what they feel are unfair promotion procedures; by problems with a work colleague; by boredom with the job or alternatively by overwork with no recognition; and so on. Many of these factors can be rectified by a sensitive project manager if s/he judges it necessary.

(iv) **Training and career development**

One of the "carrots" offered by employment in the Public Sector is the opportunity of furthering one's educational qualifications and career by being selected to go on a training course. The project manager should acquaint her/himself and keep up to date with all the possible sponsorship that are offered on various courses that may be of benefit to his/her staff. (It is useful to look out for suitable courses which might be offered in other Ministries besides the Ministry of Health.)

It is necessary to establish a clear staff training policy with the staff so that it is not seen as an arbitrary award given to some and not others - eg. those longest on the job get priority or those who show maximum effort. It is also necessary to ensure that the appropriate staff member's name is put forward for the appropriate course - with regards to level of existing qualification and experience and what skills will be brought back to the project.

The staff member undergoing training should be made aware of why they are being trained on that particular course. Furthermore they should officially report back and be given an opportunity to make use of their newly acquired skills on their return to their home station.

Finally the project manager should make a strong case to Head Office in support of the candidate. This should include:-

- The name and duration of the course and institution where it is offered;
- Possible sponsorship (if known);
- Letter of acceptance of candidate to the course from the institution (if possible);
- A clear statemenmt as to how the course will benefit the candidate in her/his duties on return home and how the candidate will use the knowledge gained on the course on the return home;
- A completed Public Service Training form PST1 in triplicate for onward transmission through the Head Office for approval by the Ministry, Public Service Commisssion and and Cabinet (in cases where the training is outside the country.)

Approval to attend a training course outside the country takes a minimum of 6 months to process and therefore early applications should be made. The project manager , with assistance from the PHSA, should follow up the application. Personal perseverence may help to speed up the process.

(v) **Attitudes to try and foster in the project team**

- the satisfaction which comes from pride in the completion of a good job;
- the satisfaction which comes from being a member of a well-respected team;
- the feeling of pleasure arising from physical and mental effort;
- pride in the leadership of the team.

CHAPTER 10 : TRAINING

Role of training in relation to project management; How to assess training needs; Approach to assessing training needs based on the planning cycle; Developing a project training plan; Training approaches; Developing a training calendar; Evaluation of the training programme; Inventory of training needs and training resources.

Role of training in relation to project management

Training imparts skills, knowledge and appropriate attributes needed by individuals or groups to improve their abilities to perform in their present and any future jobs/tasks. It fundamentally equips project staff and the target community to see a project through to completion.

Training is a continuous process which can take place either:

- before a project starts; or
- during the project to take account of unexpected new developments;

Therefore it should be seen as a continuous process which can be either off the job or on the job; within or outside of the organisation; formal or informal.

For training to be effective it should be realistic in its consideration of the trainee, the trainer and the project environment. All three depend on positive feedbacks within and between each other.

How to assess training needs

A training needs assessment should seek to identify those skills relevant for the successful planning, implementation and monitoring stages of the project.It must take account of the:

- objectives of the project;
- characteristics of the project milieu and the problem being addressed; and
- available manpower and existing skills.

In order to assess training needs:

(i) split the project into stages;

(ii) assess what activities need to be performed in each stage of the project;

(iii) assess who has to carry out each activity;

(iv) identify the extra skills needed by those people to carry out the activities effectively;

(v) assess their current skills level.

The difference between the current skills level and the desired skills level is the gap which must be filled by training.

Figure 10.1: Assessing Training Needs Based On The Planning Cycle

Variables Stage	Activities to be done	Skills needed	Who	How: Resources
Planning/design Community liason Technical issues Financial/materials procurement Implementation Monitoring/review Maintenance/use				

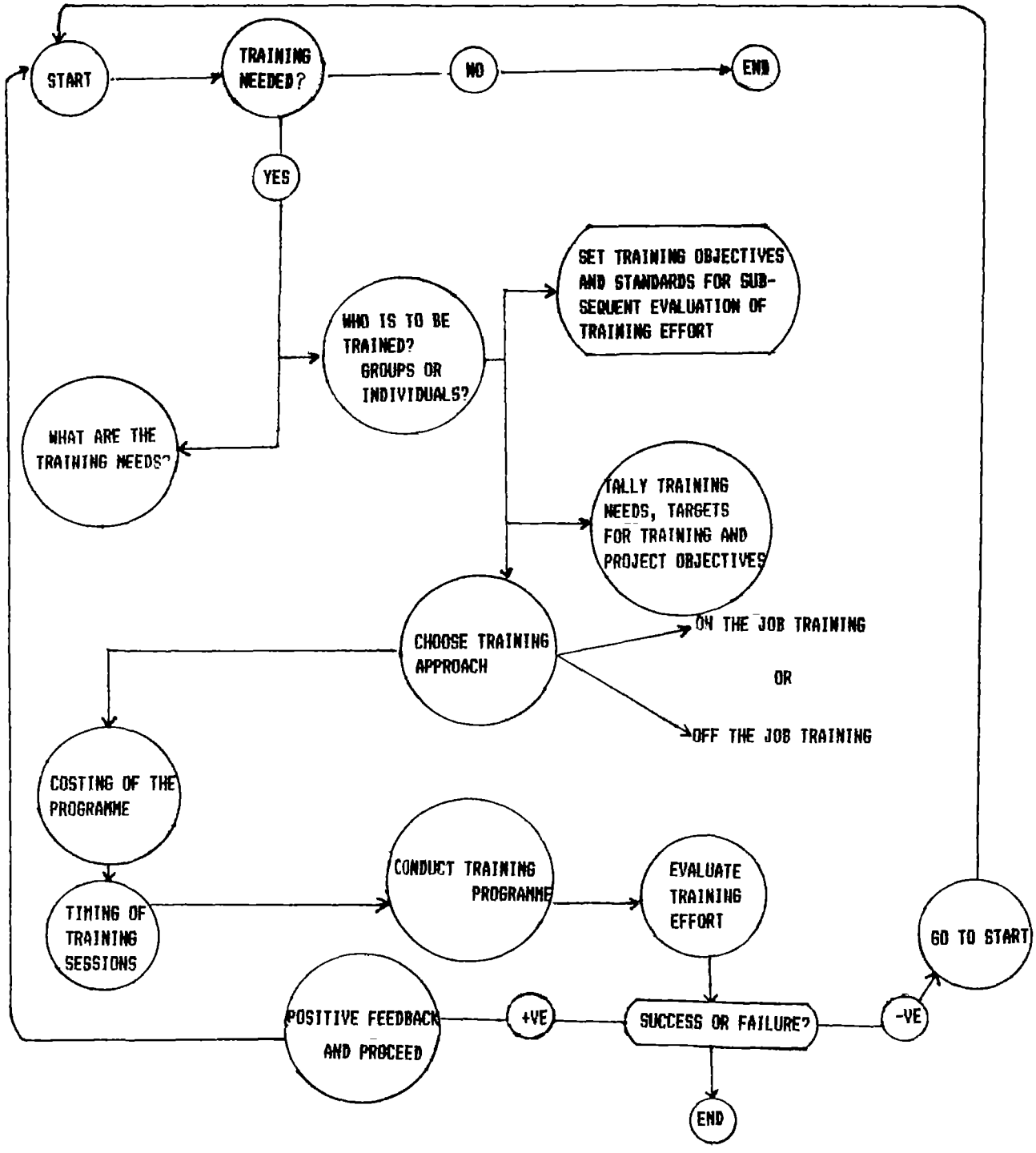
Developing a project training plan

Training plans are directed toward maintaining and improving current job/activity performance. The basic steps involved in this process are outlined in the flow chart Figure 10.2 following. Fundamental to the whole process is the needs identification which determines who is to be trained, how, where and when, and the standard expected of the training process.

In order to estimate the cost of the training programme realistically, specify:

- the place where the training is to be carried out;
- equipment needed (for example paper, overhead projectors);
- transport needed;
- manpower needed;
- food and accommodation;
- any special requirements.

Figure 10.2: Developing a Training Plan



Training Approaches
Training approaches can be a mixture of both on the job and off the job sessions, depending on the specific tasks being taught, the calibre of the trainees, the interests of the trainers, time, facilities and resources available, and so on.

ON THE JOB TRAINING METHODS

- Job rotation
- Coaching, initiation
- Mock runs of activities
- Supervision by seniors
- In field service training

OFF THE JOB TRAINING METHODS

- Role playing
- Practical exercises
- Classroom training, films
- Seminars
- Workshops with colleagues
- Mock runs of activities
- Field visits to other provinces/projects

Obviously, as one designs different forms of training for different groups, the training content varies from overall policy and strategic issues to specific technical skills.

Developing a training calendar
There are four categories of target groups to be trained for the successful implementation of the water supply and sanitation projects, namely:

(i) Beneficiaries; consisting of -

a) direct users (i.e. households),

b) builders, well sinkers pump minders (i.e. local skilled personnel).

(ii) Local Level Implementors; consisting of -

a) Community Village Workers,

b) Health Assistants and Senior Health Assistants.

(iii) Community Leaders; consisting of -

a) District level leadership (District Councillors and staff),

b) Ward and Village leadership (WADCO AND VIDCO councillors and chairpersons),

c) Party leaders and local MPs,

d) School and religious leaders,

e) Chiefs, headmen, etc.

(iv) District and Provincial Project Staff; consisting of -

a) Health Services Administrators,

b) District, Principal and Provincial Environmental Health Officers;

c) District Administrator's staff (e.g. LGPOs);

d) Staff of NGOs involved in the project.

A comprehensive training calendar should include the following details:

- the target group to be trained,
- the methods of training (building facilities in the field, classroom sessions, etc),
- the number of participants in each session,
- the topic/s to be covered,
- time required for the training,
- dates for the training to take place,
- costs per capita,
- total costs,
- evaluation method.

Training courses for each group should be assessed prior to implementation to avoid duplication, waste time or resources and to be appropriate to the training gap. In the case of training sessions for community leaders and households, training for the water supply and sanitation projects might be incorporated with training being conducted by other Ministries to avoid duplication.

Figure 10.3: Format for a Training Calendar

PROJECT: WATER SUPPLY AND SANITATION

IMPLEMENTING AGENCY: MINISTRY OF HEALTH IN CONJUNCTION WITH MINISTRY OF COMMUNITY AND CO-OPERATIVE DEVELOPMENT

TRAINING SCHEDULE FOR TARGET HOUSEHOLDS: CHIGWIKI WARD, MOUNT DARWIN

ACTIVITIES	TIME J F M A M J J A S O N D	TEAM LEADERS	VENUE	NUMBERS	DURATION	COST
1. Health and Hygiene Education						
2. Demonstrations, films on hygiene						
3. Introduction to Project						
4. Meetings/discussions on Project						
5. Selection of Pilot Sites etc.						

Evaluation of the training programme

Evaluation or performance appraisal is a formal, structured system designed to measure a trainee's actual performance against designated performance standards. The evaluation therefore is done on the basis of performance on an activity after training. Evaluation should attempt to be:

- objective,
- bias free, and
- progressive i.e. provide positive inputs to future training sessions.

Evaluation should be an ongoing process. The training co-ordinator requires the following inputs for evaluating the effectiveness of a particular training course:

- records of performance by the trainee on the job before and after the training,
- objectives of the training against which to assess what was actually achieved,
- objectives of the organisation and project as a whole;
- well-defined standards of evaluation.

As a result of the evaluation, the training co-ordinator should be able to identify the specific target groups and topics of training which need improvement and those which are to be discontinued.

It is recommended that a typical training programme be evaluated by means of the **"objective card"** system. Figure 10.4 below shows how the system might be used for evaluating the impact of training on a protected wells project.

Figure 10.4: Objective Card Rating Of Training For The Protected Well Project, Chigwiki Ward, Mt Darwin

		Village							Total
		1	2	3	4	5	6	7	7
Wells dug per month	Before training	2	8	5	6	10	4	4	39
	After training	4	6	6	8	7	9	8	48
	Change	+2	−2	+1	+2	−3	+5	+4	+

As a result of this very simple method, questions that are immediately apparent to the training co-ordinator are:

- Why is the project so successful in most villages? Can this be attributed only to the training, or to other factors as well?
- Why is the project not doing well in villages 2 and 5? Are the reasons outside of the scope of the training programme? What can be done to rectify the situation?

An alternative method of evaluation is the **"subjective card"** system. Figure 10.5 below shows how the subjective card system might be used for evaluating the impact of training on a protected wells project.

Figure 10.5: Subjective Card Rating Of Training For The Protected Well Project Chigwiki Ward, Mt Darwin

Variable	Rating			
	Execellent	Good	Fair	Bad
Community participation	✓			
Builders' motivation		✓		
Materials procurement			✓	
etc.				

As a result of this subjective assessment (which might be carried out by all project staff in a workshop setting to get a balance of opinions,) it is apparent for example, that further training or another form of intervention in the procurement of materials is needed.

Whichever evaluation system is used (preferably the two are used in conjunction with each other,) the evaluation of the training programme should be aimed at:

(i) identifying deviations from the expected standards of performance;

(ii) pointing to why these deviations are happening;

(iii) recommending corrective action so as to better the future performance of the trainees, the trainers, the user community and the project organisation as a whole.

Inventory of training needs and training resources

Figure 10.6 below identifies trainees, their training needs, suggested methods and duration of training and easily available resources which can be incorporated into a provincial water supply and sanitation project training programme. As in the case of examples presented in other Chapters, the matrix is for a "typical" province. Ideally it should be adapted by the project manager to suit his/her own particular project environment.

Figure 10.6: Training Needs and Training Resources

TARGET GROUP	TRAINING REQUIRED	DURATION AND TRAINING METHODS	LITERATURE AND RESOURCES	TYPE	SOURCE
COMMUNITY LEADERS Councillors, VIDCO/WADCO Chairmen, Traditional Leaders	Familiarisation with project Expected inputs from all parties Community mobilisation Management of Pumpminders Community use and management of facilities	One day VIDCO workshops, demonstrations, meetings, before and during project implementation	VIDCO Water and Sanitation Subcommittee Handbook Manual on Community Participation/DANIDA project Fencing a Borehole or Well Building a Washing Stand VIDCO Module Development for Environmental Health Training	Handbook Manual Booklet Booklet Booklet	MCCD DDF/MOH MOH Blair/MOH MOH
LOCAL LEVEL IMPLEMENTORS Environmental Health Technicians Village Community Workers	Familiarisation with project, roles and responsibilities Expected inputs from all groups Reporting Distribution and control of materials and tools Training of builders Supervision of builders Liasing with communities	Detailed courses on all project aspects, minimum of two weeks each	A D Austen and R H Neale: Managing Construction Projects; a guide to processes and procedures, ILO, 1982 Manual on Community Participation/DANIDA project Water, Sanitation and Health Blair Research Laboratory Bulletins for Rural Water Supply and Sanitation Health Education kit	Book Manual Booklet Book Pamphlets	UZ Library DDF/MOH MEWRD DDF/MOH Blair/MOH Blair/MOH MOH
BUILDERS	Installation, use and maintenance of bucket pump, Blair pump, hand auger drilling rig Construction and protection of hand-dug wells Construction and maintenance of Blair toilets	Intensive training courses followed by 1 day refresher courses during project implementation	R S Hed: Project Control Manual, Geneva 1979 Single Blair Latrine Builders, Manual Double Blair Latrine Builders, Manual Fencing a Borehole or Well Building a Washing Stand	Book Booklet Booklet Booklet Booklet	UZ Library Blair/MOH Blair/MOH MOH Blair/MOH
TARGET HOUSEHOLDS	Hygiene reated to water and sanitation Use and maintenance of pumps, headworks and Blair toilets	1 day meetings, seminars, demonstrations before, during and after project implementation	Sanitation T-shirts Blair Latrine Flipchart Health Education Kit VIDCO Module Development for Environmental Health Training Film on Rural Sanitation Blair Research Laboratory Bulletins for Rural Water Supply and Sanitation	T-Shirts Chart Pamphlets Booklet Film Book	MOH Blair/MOH MOH MOH Blair/MOH Blair/MOH
PUMPMINDERS	Maintenance Repairs Community Mobilisation Reporting	2 week intensive course followed by 1 day meetings, workshops and demonstrations during implementation	Pump Minder's Handbook, UNICEF Water, Sanitation and Health Water Committees Manual on Community Participation/DANIDA project Building a Washing Stand Maintenance Manual for Bush Pump Caretakers	Handbook Booklet Booklet Manual Booklet Manual	DDF/MOH Blair/MOH MOH/MEWRD DDF/MOH Blair/MOH MOH/MEWRD
RELATED STAFF/VISITORS From Head Office, Provincial Offices, researchers,	What is development? The health, water and sanitation component in rural development	Extended courses 1 day workshops, briefings etc before, during and after project	R Chambers: Rural Development, Putting the Last First S Paul: Strategic Management of Development Programmes, ILO 1983	Book Book	UZ Library UZ Library

CHAPTER 11 : TRANSPORT

A major limiting factor; Transport costs and the project budget; Estimating requirements as limited resource; Pool vs. project vehicles; Slack periods and maintenance; CMED; Motorcycle revolving fund.

Transport - a major limiting factor

There can be no single more limiting factor to all provincial water supply and sanitation projects than that of transport - more specifically, the lack of vehicles to move staff and materials. Where vehicles are available there are invariably insufficient funds to permit anything but a restricted monthly mileage allowance.

Unfortunately it is beyond the scope of this Handbook to attempt to solve this problem. However in this Chapter an attempt is made to briefly highlight areas of concern with respect to transportation in project management. This might assist the project manager in pre-empting or circumventing some problems before they arise rather than having to face them on site once they have reached crisis proportions.

Transport costs and the project budget

Transport costs can typically amount to up to 30% of the total costs on construction projects. This large cost must be fully recognised by both the project manager and the funding source (be it Government or donor funds).

When first drawing up the general project plan (see Chapter 3: "General Project Strategy") it is essential to realistically estimate:

- the proposed mode of transport and source of vehicles (e.g. 1 X 5 tonner from DDF; 1 X 4X4 from donor);
- estimated mileages (monthly and per annum).

Also, when attempting to justify being allocated another vehicle, a strong case can be made by knowing the annual mileages to be covered to implement a project. It is generally acceptable to add on an additional 10% for contingencies on this estimate.

Estimating transport requirements as a limited resource

The project manager can make an accurate calculation of transport requirements and how to schedule the use of limited vehicles to maximum effect when drawing up of the project's Gantt Charts,

This is done by appending lines at the bottom of the Chart (either in place of or underneath the Manpower requirements) and estimating on a daily basis the kilometres that would have to be travelled to carry out different activities. When required kilometres exceed available kilometres (also taking into account the type of vehicle required,) then resource levelling can be undertaken; i.e. certain activities (particularly non-critical ones) are rescheduled to obtain a better spread of vehicle useage.

Pool vs. project vehicles
The three common sources of vehicles for use on any project are:

(i) Private vehicles - either of the suppliers or of staff - mileage is paid for out of the project budget or an office vote;

(ii) Pool vehicles - either on permanent or temporary issue to the user Ministry from C.M.E.D.;

(iii) Project vehicles - paid for specifically out of a project budget by the donor.

In the case of project vehicles, there is usually a specific clause in the original funding agreement document stating what duties the vehicle must be used for. This clause invariably limits the use of the vehicle for direct project related activities.

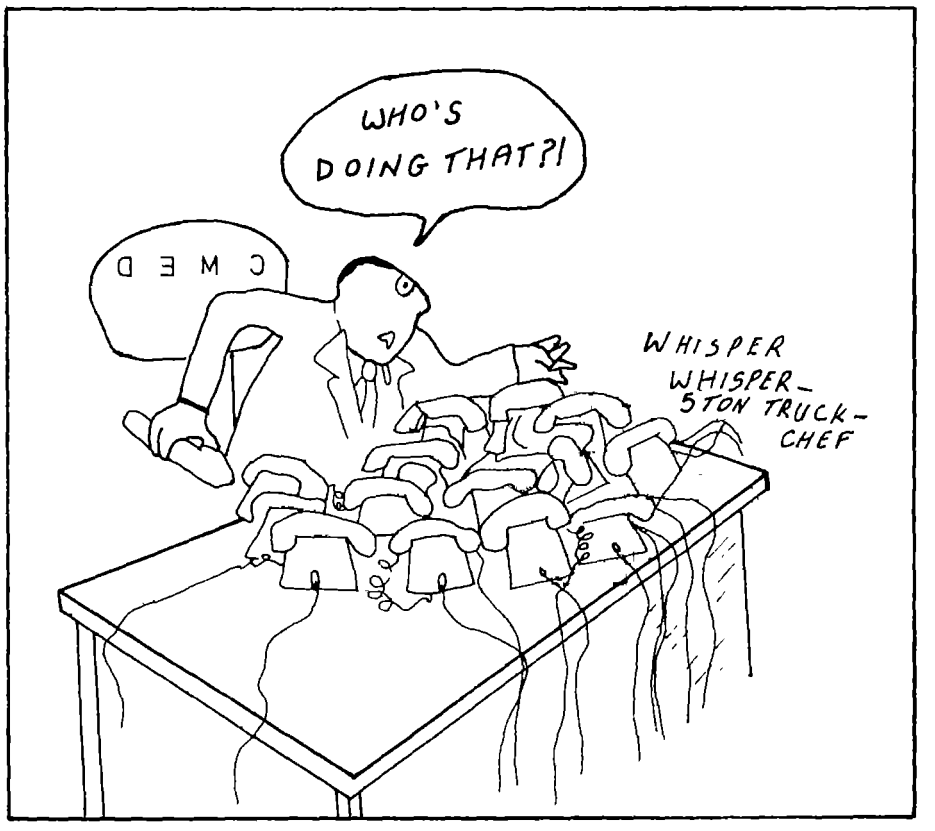
This can often be the cause of conflict in the provincial office. It may be that a vehicle is needed to urgently deliver drugs to a rural health centre or to ferry a patient to a clinic and the project vehicle is the only one available.

In many cases the project manager uses his/her discretion in the matter. The project manager is advised to appraise him/herself of the conditions and covenants governing the use of project vehicles (and other equipment) and to carefully weigh up the long term needs of the project vs. the short term needs for the use of a vehicle on non-project related duties. It sometimes helps in the identification and control of project vehicles if the name of the project is clearly painted on the vehicle's sides.

Slack periods and maintenance
The key to keeping a fleet of vehicles in running care is continual preventative maintenance - a concept that should be familiar to all primary health care officials!

All vehicles require servicing after the first 1 000 km and thereafter every 5 000 km or three months whichever is the sooner. It will definitely pay off in the long term to have the vehicle off the road for 2 -3 days every three months than to have to send it to C.M.E.D. for 2 -3 months because the engine block has seized, brakes failed, or similar. Again, the Gantt Chart is useful in identifying slack periods for vehicle maintenance.

Requisitioning vehicles through C.M.E.D.
In instances when there are no pool vehicles on issue to your office or when your vehicle is in C.M.E.D. for repairs, in principle you may be allocated a temporary issue vehicle. Of course your requisition will be in competition with requests from all other Ministries including the Z.R.P. and may well be unsuccessful. There appears to be no fool-proof way of obtaining a temporary issue vehicle; your requisition will have to be accompanied by a great deal of personal lobbying and determination.



The motorcycle revolving fund

The Ministry of Health's motorcycle revolving fund has recently been accepted by C.M.E.D. The fund will work in the following way:

> Identified donors will contribute "seed" funds into a central pool fund to be used by C.M.E.D. to purchase a fleet of motorcycles. Ministry of Health staff may then apply for a C.M.E.D. vehicle loan to purchase a motorcycle. If approved, the applicant is issued with a motorcycle which must be paid back for over a period of between 3 - 5 years. The applicant makes use of the motorcycle on Government duties and will be paid at the usual rates for mileage covered.

CHAPTER 12 : SUPPORT FACILITIES

What is meant by support facilities?; Approval procedures; Generating political support for needed facilities; Preparing a Report of Justification.

What is meant by support facilities?
Every project may have some extra facilities that are needed which may not have been part of the originally approved project proposal. As a water supply and sanitation programme increases, involving more and more of the community and requiring a larger project staff team, the list of support facilities will also expand. Facilities which are commonly required include:

- storage yards and covered areas;
- project offices and equipment depots;
- staff housing.

There is need for facilities for use by project staff at district, ward or village level but their provision is possible only through assistance from the donor agency or from central government (in the latter, by means of the public sector investment programme.) The onus is on the project manager, with assistance from project staff at ward level, to identify the facilities needed and then to mobilise as much support as possible for securing funding for the facility.

Approval procedures
Once the need for the facility has been identified and that need has been adopted by the local community, then the next task is political and technical lobbying, based on a Report of Justification.

The district and provincial platforms, through the District Councils and Provincial Council (assisted by the technical District and Provincial Development Committees), must approve the priority of the proposed facilities. These Councils/Committees may wish to upgrade the Report of Justification and may even be in a position to pressure the implementing/funding Ministries at Cabinet level (through the Provincial Governor) to provide the necessary funds, resources or personnel.

Thus the procedure to be followed is:

(i) The PEHO (through district staff) identifies the needed facilities and prepares a Report of Justification.

(ii) The Rural District Council, as the local authority evaluates the Report and considers it together with other needs in the district.

(iii) All projects or needs which stand out significantly will then be put forward through the District Development Committee.

(iv) If found to be technically feasible, the proposal is put up to the Provincial Development Committee for further technical assessment in the light of provincial resources and needs.

(v) If recommended, it is put to the Provincial Council for approval.

(vi) Thereafter it is included in the next financial year's Annual Development Plan which is considered by MFEPD when sectoral Ministries make their annual bids.

(vii) In parallel to this provincial approval process, the PEHO also makes a case for the facilities through the province's annual PSIP submissions to the Ministry of Health, Head Office.

At every stage it is important to emphasise that the facilities are not needed in isolation but for the success of the water supply and sanitation programme in that district and province as a whole.

Generating political support for the needed facilities

Consider the following example where two F14 stock-type houses are needed for Health Assistants working in a particular ward. The following groups of people need to be mobilised in support of the request if it is to be successively approved through the above Council and Committe structures:

(i) The local community and VIDCO/WADCO leadership - through meetings and discussions emphasising the necessity of these houses for use by their Health Assistants.

(ii) The District Council - The DEHO must raise the issue at meetings and present a Report of Justification which should emphasise the need for the houses in terms of the successful implementation of the water supply and sanitation programme.

(iii) The District and Provincial Development Committees - The Report of Justification is presented by the Subcommittee on Water Supplies and Sanitation to the District Development Committee, noting the importance of the support facilities to the ongoing implementation of the water supply and sanitation project and emphasising technical considerations (land availability, costs, possible funding sources, methods of construction).

Once approved or amended by the D.D.C., the Report is taken by the PEHO to the P.D.C. for circulation and recommendation to the Provincial Council.

The Provincial Council must be persuaded of the importance of the proposed facilities in relation to the rest of the province's needs. It must be borne in mind that all sectoral Ministries in all districts are lobbying for approval of their own projects. The Report must therefore emphasise why this project should be a priority in the district and the role it plays in supporting the greater water supply and sanitation programme.

As the Report of Justification is taken up the administrative hierarchy, the people reading it are more and more removed from the actual problem. If these people are to be persuaded to identify with the need it is crucial that a comprehensive Report be prepared from the beginning and used as the communicating tool.

Preparing a Report of Justification

Precision and clarity are the qualities of a good Report. The Report should be brief (so as to be read) but comprehensive, covering :

- current housing conditions of Health Assistants;
- purpose and specifications of the proposed facilities;
- name and location of proposed facilities;
- land and material requirements of proposed facilities including long term maintenance responsibilities;
- estimated cost and possible source of financing for the proposed facilities including any voluntary contributions by the local community to show their support of the proposals;
- list of Council and Committee resolutions supporting the proposed facilities (added on successively);
- possible harmful effects on the running of the overall water supply and sanitation project if the facilities are not constructed.

The following is an example of how the Report of Justification might be set out:

REPORT OF JUSTIFICATION

PROPOSED HOUSES FOR HEALTH ASSISTANTS, MINISTRY OF HEALTH, MASHONALAND CENTRAL PROVINCE

PROJECT ITEM	INFORMATION AND DESCRIPTION
1. Location:	Chigwiki Ward, Mt Darwin
2. Proposed Facility:	2 X F14 stock type houses : To house the two ward Health Assistants based at Katsuro business centre. The Health Assistants are currently accommodated in two pole and dagha huts at the centre. They are forced to make use of the public toilets at the general dealer's store for personal sanitation, thus setting a poor example to the community who are being urged to build their own Blair latrines. Furthermore the existing shelters are not large enough to accommodate the families of the Health Assistants; in the longterm this is likely to negatively affect staff morale.
3. Date needed:	Immediate; 1989/90 financial year.
4. Ministries involved:	To be paid for and occupied by Ministry of Health staff; To be constructed and maintained by Ministry of Public Construction and National Housing.
5. Expected Benefits:	Boost staff morale on the Ministry of Health's national water supply and sanitation programme and decrease staff turnover in Chigwiki Ward thus leading to greater continuity and effort on the project and better working relations between the staff and target/user community.
6. Available Resources:	Land - 2 X 300m^2 pegged stands have been allocated by the District Council at Katsuro.

	Community contributions - all necessary bricks, sand, stone aggregate and water (approximately 30% of total building costs). Contribution from CADEC - $5 000 pledged.
7. Further Materials Required:	Non-locally available building materials, local builders wages. Total outstanding cost: $25 000.
8. Financing:	Ministry of Health's PSIP 1989/90.
9. Proposal supported by:	Darwin District Council (25/9/1988) Darwin District Development Committee (1/10/1988) Joint Mash. Central Provincial Development Committee/Provincial Council (31/10/1988)
10. Effects if facilities not built:	Ministry of Health's water supply and sanitation staff are currently living in a very poor standard of shelter which is also overcrowded. In the long term this may lead to an increase in ill health of staff with resultant absenteeism from work. Staff dissatisfaction is increasing and a number of staff have requested transfer to alternative wards. This will lead to a lack of continuity and delays on the water supply and sanitation project and deteriorating relations with the target community.

CHAPTER 13 : MONITORING

What is the purpose of monitoring?; What if monitoring procedures are ignored?; What are the advantages of an effective monitoring system in a project?; What is the difference bewteen monitoring and evaluation?; Project monitoring is both performance and operational oriented; What is performance monitoring?; What are key indicators in performance monitoring?; What is operational monitoring?; What are key indicators in operational monitoring?; How is the project to be monitored in a systematic and comprehensive way?; Take corrective action where necessary.

What is monitoring?
Monitoring is the day-to-day keeping track of project activities. It is part and parcel of all other project activities.

What is the purpose of monitoring and review?
Monitoring is a practical tool to achieve effective project management. The purpose of monitoring is to assess:

(i) whether a project's inputs (i.e. funds, materials, staff, community participation, etc) are being delivered and used in accordance with the detailed project plan (i.e. the project budget and the project timetable);

(ii) whether the project's outputs (i.e. number of toilets and wells constructed, training courses given, health education activities) are being produced in a timely and cost-effective way; and

What if monitoring procedures are ignored?
By not carrying out monitoring as part and parcel of the implementation process, the project faces the risk of:

(i) running into delays and/or cost overruns;

(ii) under-representing or even completing excluding certain sectors of the target population;

(iii) problems of quality control with respect to the facilities being built; and

(iv) delay in identifying problems/conflicts between project staff and the user community.

What are the advantages of an effective monitoring system in a project?
Ongoing, systematic monitoring of a project can:

(i) provide constant feedback as to the extent to which the project is achieving its goals;

(ii) identify potential problems at an early stage and propose solutions;

(iii) monitor the degree to which the project reaches its target group;

(iv) safeguard the project budget and minimise cost overruns;

(v) provide guidelines for the planning and implementation of future projects.

What is the difference between "monitoring" and "evaluation"
Sometimes in project management the terms "monitoring" and "evaluation" are used interchangeably. However the purpose of evaluation is slightly different from that of monitoring and therefore the differences should be kept in mind.

Monitoring is an internal, day-to-day project activity aimed at assessing whether the inputs and outputs on a project are being used or produced in the most effective way (with respect to a number of indicators, for example: cost- effectiveness, time-effectiveness, target-group-effectiveness, goals achievement, or similar.)

On the other hand, evaluation is undertaken to determine the success of the project in relation to the original objectives set and the costs involved. It attempts to identify why or why not the objectives and costs have been met and within budget. As such, it is an iterative or learning process. Evaluation is usually concerned with whether or not funding for the current project should be continued or whether similar projects should be undertaken in the future.

Ideally, both evaluation and monitoring are undertaken by both staff who are inside and outside of the project. However, for the purposes of this Handbook, only monitoring methods are considered in detail. This is not to say that evaluation should not be carried out, but that it is not one of the daily activities of the project (which has been the focus of this Handbook).

Project monitoring is both performance and operational oriented
Project monitoring can be a straightforward fairly simple exercise. Monitoring procedures can be considered in two categories:

(i) performance monitoring; and

(ii) operational monitoring.

(However in practice the project manager may wish to ignore these differences and approach monitoring in a unified way.)

What is performance monitoring?
Performance monitoring is used to assess:

(i) the extent to which the project's resources are being used within the approved budget and timetable:

(ii) whether the intended outputs are being produced in a timely and cost-effective manner; and

whether the project benefits are reaching the intended target population.

Performance monitoring makes use of key indicators so that the project manager receives constant feedback on problems and improves the results/outputs of the project

What are the key indicators in performance monitoring?
The key indicators to be used are left to the discretion of the project manager, but typical indicators and methods made use of are:

(i) Periodic, random site visits to districts and holding conversational (informal) interviews with the District Health Inspectors.

(ii) Periodic, random site visits to villages and holding informal meetings, discussions, observation of behaviour, use of simple community questionnaires, etc with Health Assistants, local builders, community leaders and households to assess :

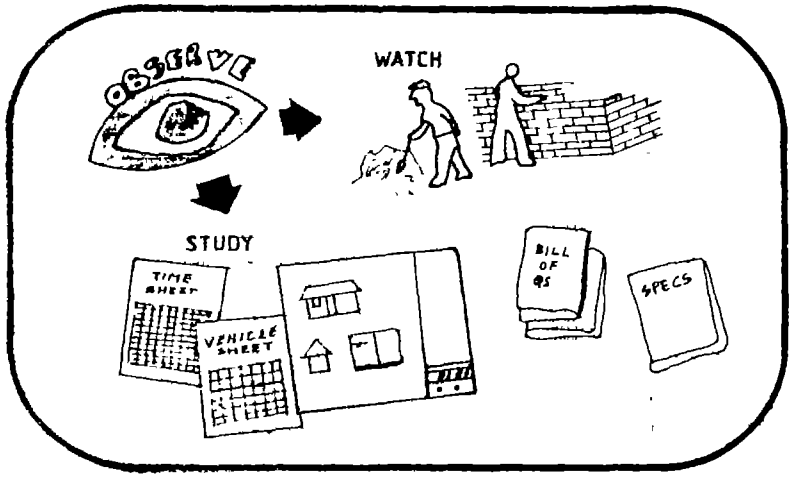
a) the extent of community support for the project;

b) whether all households are benefitting from the project (particularly with respect to the siting of wells);

c) whether the health hygiene programme is reaching all households and whether households are using the facilities as intended.

(iii) Compare monthly progress forms with the overall project objectives (in terms of numbers of facilities, are sufficient wells and toilets being built every month to achieve the annual target?)

(iv) Attend some of the Health Assistants' training workshops to assess their awareness of the overall project goals and ability to transmit these to the target community.



What is operational monitoring?
Operational monitoring is used to measure the speed and costs of the project delivery system and the quality of the outputs (wells, toilets and health education.) If possible, alternative methods of project implementation could be used for comparison, to judge the efficiency and effectiveness of the chosen method of project implementation.

> **Operational monitoring makes use of key indicators so that the project manager receives constant feedback and improves the way in which the project is carried out.**

What are the key indicators in operational monitoring?
Amongst the key indicators available to the project manager for use are:

(i) Monthly checks on the commitment register to ensure that the project budget is not being exceeded.

(ii) Periodic, random site visits to wards where the project is being implemented and by direct observation ascertain whether:

a) materials are being delivered on time;

b) the quality of works meets minimum specifications (check strength of bricks, look for cracking in walls and crumbling of floor slab and roofs);

c) community liason and training is being constantly undertaken.

(iii) Comparison with other projects either in the province or elsewhere, for example:

a) builders are hired permanently by donor agency in comparison to community voluntary labour;

b) materials are procured directly through donor in comparison with through the Government Tender Board.

(iv) Hold workshops/staff meetings to identify implementation problems and consider solutions to them.

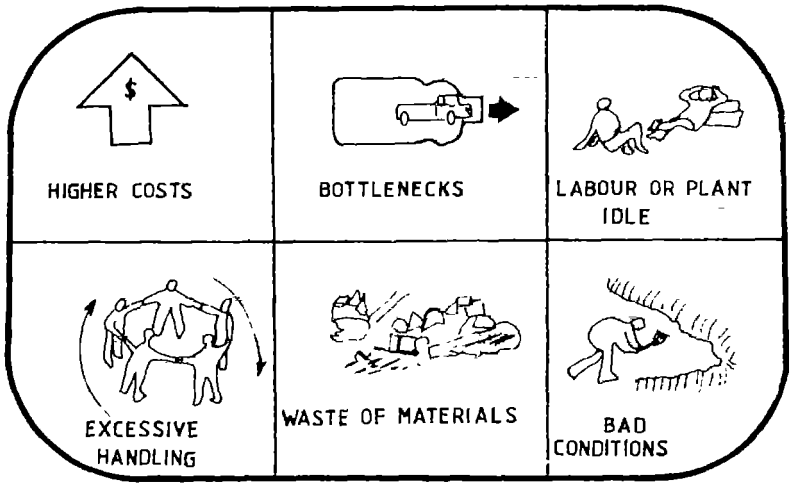


Figure 13.1 is a checklist example of questions to be monitored by District and Provincial Government Health Inspectors in their meetings with field staff and the user community. The checklist monitors both performance and operational criteria.

Figure 13.1: **CHECKLIST FOR MONITORING OPERATIONAL AND PERFORMANCE INDICATORS OF A SANITATION PROJECT**

A. Physical Changes:

(i) What is the total number of latrines built under the district programme to date?

(ii) Are all the latrines completed?

(iii) Are all the latrines in good repair? If not what are the reasons/problems behind this?

(iv) Are the user households pleased with their latrines?

(v) What effect have the toilets had on the village water supply? (Test water quality in wells/boreholes).

(vi) Have all substructures been lined within the proper distance from the wells?

(vii) How many latrines have been built by households with no assistance since the completion of the formal programme in the village?

B. Economic Changes:

(i) Have all households involved in the programme paid the builder and contributed in the construction? If not why?

(ii) What is the current cost to Government and to individuals of a latrine?

(iii) Are the Health Assistants still active? How many local builders are working on the programme?

C. Social changes:

(i) Do all household members actually use the latrines? If not, who does? Why do the others not?

(ii) Why have people without a latrine not built one yet?

(iii) Has the incidence of diarrhoeal disease declined in the community?

(iv) Can this be attributed to the water supply and sanitation project?

How is the project to be monitored in a comprehensive, systematic way?

To be effective a monitoring exercise must be comprehensive (rather than *ad hoc*) and systematic (rather than intuitive).

(i) Define the key issues to be assessed (e.g. cost control, quality of works, reaching the target community) and the relative importance of each.

(ii) Define the organisation of the monitoring process (e.g. who of the project staff will be responsible for monitoring; who do they report to; is any outside assistance required [from Head Office Accounting Section, from consultants to carry out community surveys,etc.])

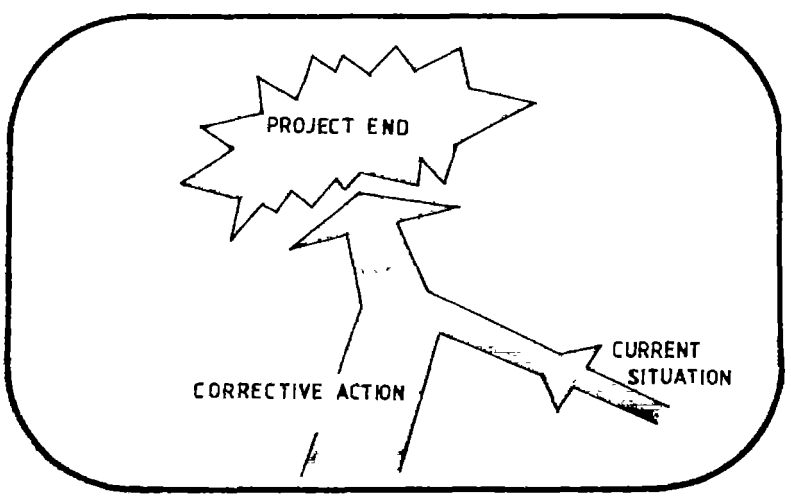
(iii) Define the scope and intensity of the monitoring (e.g. will all villages in the project be monitored or only some; if only some, how will the sample be selected?)

(iv) Ensure that the monitoring is result oriented. Ask clear questions to which there can be clear answers. Unless the project manager is in the happy (and unlikely) position of having time on his hands, do not go in for a large-scale monitoring exercise. To identify the scale necessary, ask for what purpose the monitoring is being done - to justify a new project?; for the monthly reporting system?; at the project completion phase?; etc. and scale the monitoring exercise appropriately.

(v) Identify the resources that will be needed to carry out the monitoring- which staff, for how long, how will they travel, what special equipment or materials will they need, etc?

TAKE CORRECTIVE ACTION WHERE NECESSARY

There is little point in going to the time and trouble of monitoring the project if the results or findings are merely filed away. If the findings point to a situation which is not satisfactory then the effective project manager must have the courage to take corrective action.



Corrective action can take many forms:

(i) If there are cost overruns, then

a) ascertain if there has been any misappropriation of funds or materials and equipment if so, then take immediate disciplinary action;

b) discuss the extent of the problem with Head Office;

c) seek a virement if justifiable.

(ii) If materials are in short supply and this is delaying the project, then

a) seek to share in the Tender Board Authority of a sister Ministry (see Chapter 7);

b) seek alternative sources of supply;

c) seek a temporary loan from an NGO working in the area which could be paid back once your supplies have arrived;

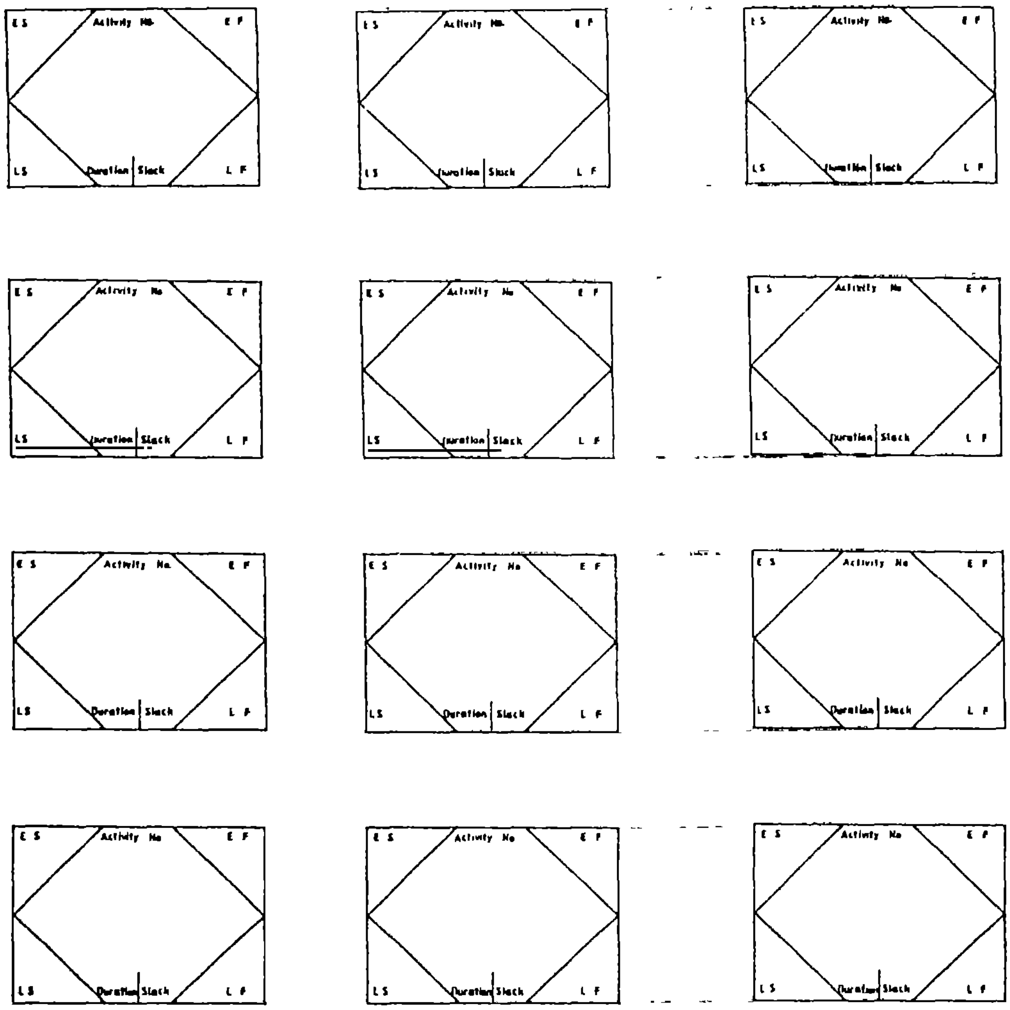
d) scale forward the expected completion date of the project and discuss reasons for this with project staff, community leaders and at district and Provincial Development Committee meetings.

(iii) If the target community is not benefitting from the project, then

a) actively seek reasons for this;

b) concentrate more and experienced staff in that village and emphasise their work on community liason/mobilisation and on the health eduaction programme;

c) discuss the issue further with the District Council and Head Office with a view to amending next year's proposed projects.


E S
Activity No.
E F
L S
Duration
Slack
L F

DISTRICT:_____ PROVINCE:_____ PROJECT:_____

MONTH:_____ YEAR:_____

MILESTONES:

NO.	ACTIVITIES	DURATION	WORKING DAYS
	RESOURCE REQUIRED		
	RESOURCE AVAILABLE		
	DIFFERENCE		