8

Preparation of a Project for Subsequent Funding

Projects must meet many requirements and expectations. However, in accordance with the overall purpose of the present document, the focus of Chapter 8 will be on the expectation that the project will be able to attract funding from an ODA. Thus, in the preparation of the project attention should be given to:

- Full information about the project's basic characteristics, taking into account the implications arising from the different possible sources of funding.
- The measures needed to support the project and make it successful.
- A funding and implementation proposal.
- An assessment of the project's expected impact and of its risks.

In Chapter 8.3, the project's preparation is discussed in the light this strategy. Japanese and other experience is summarized in Chapters 8.1 and 8.2, respectively.

8.1 Japanese Experience

8.1.1 Master Plans and Feasibility Studies

> The centerpieces in the preparation of a project are the master plans and feasibility studies undertaken by Consultants in the context of a Development Study.

Master plans and feasibility studies are normally carried out in the context of JICA's Development Studies. The objective is to assist the recipient in the adaptation of long-term plans and in making investment decisions for a specific project. The objectives and the types of JICA's Development Studies are referred to in Chapter 3 and fully explained in Annex 3.

Master Plans

As already referred to in Chapter 5.1, master plans comprise a considerable body of information on the sector and on the developmental aspects of projects. They may be country-wide, regional or for a specific area. They are basic studies, often requiring extensive investigation and research, and contain proposals for a step-wise implementation.

The preparation of master plans for environmental sanitation will normally involve:

- The collection and review of existing data and information, i.e.:
  - The physical features of the area, e.g. climate, topography, geology, communications, *etc.*
  - Social and economic conditions and statistics; the social circumstances in the sector of environmental sanitation.
  - Policies and development plans in the sector, present conditions, on-going projects, legislation on sanitation.
  - Institutional and managerial aspects, the financial condition of existing implementation agencies or organizations.
- Field surveys, e.g.:
  - Present conditions and the quantity and quality of waste to be discharged.
  - Geology, topography, water quality and land use in the vicinity of existing or future disposal sites.
  - Public awareness concerning environmental sanitation.
- Forecast of socio-economic change and future demand for sanitation.
- Identification and evaluation of issues.
- Formulation of the actual master plan, e.g.:
  - Confirmation of the planning framework, including time horizon, demand forecast, definition of the programme or project area.
  - Setting goals and strategies, including the analysis of alternatives.
  - Selection of priority projects for step-wise implementation. Consideration of the economics of alternative programmes for phased implementation.

- Analysis of technical features and aspects.
- Cost estimates and financial plan.
- Institutional, organizational and managerial aspects, and needs for capacity building.
- Operation and maintenance.
- Plans for public information.
- Overall evaluation of the technical, environmental, financial and socio-economic features of the plan.
- Implementation plan.

Feasibility Studies

Feasibility studies, as already discussed in Chapter 5.1, are undertaken to prepare specific projects for implementation. The studies also identify needs for additional studies and Technical Cooperation.

Normally, a feasibility study involves:

- Confirmation and/or updating of the master plan in terms of time horizon, project areas, service levels, major project components, and environmental impact.
- Supplementary studies and investigation, as required, including social studies, in accordance with JICA's guidelines.
- Preliminary engineering design of the proposed facilities and equipment.
- Cost estimates and a financial plan in accordance with the criteria of the prospective funding agency or agencies (not necessarily Japanese).
- Operation and maintenance.
- Plans for institutional development.
- Public relations, and plans for public education.
- Evaluation of the project's features in terms of its technical, environmental, financial and socio-economic features.

The results of the feasibility study are normally made the subject of a seminar involving the recipient, Japanese, and eventually other ODAs, Consultants, and the prospective implementation agency or organization.

8.1.2 The Approval Schemes of Japanese ODA

The approval of requests for an ODA loan or Grant Aid involves the appraisal of the project's technical, financial and economic, and supplementary features.

The Approval of Japanese Official Loans

When providing official loans, the ODA takes account of the economic circumstances of the recipient country, e.g. LLDC to NIE. The terms of the loans are based on the economic situation and the capacity of the country to service debts.

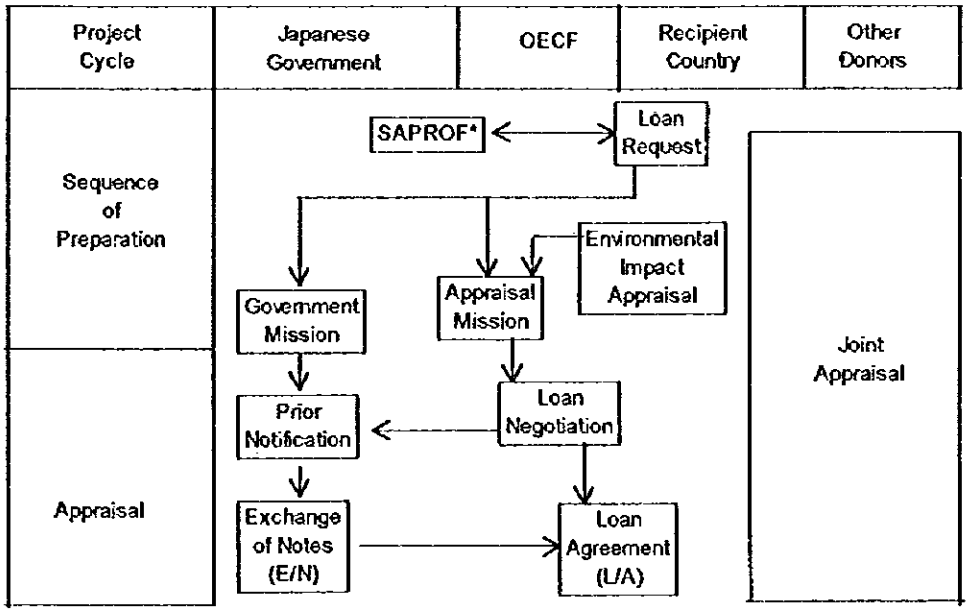
The approval scheme is exhibited on Figure 8.1. Its main steps include:

- Preparation of the project with financial, economic and environmental evaluation, and submission of a loan request by the recipient.
- Appraisal by the Government of Japan and OECF.
- Prior notification, loan negotiation and agreement.

In order to be appraisable in the light of Japanese and, as appropriate, other ODAs' criteria, the feasibility study must exhibit the following (see also Annex 7.1):

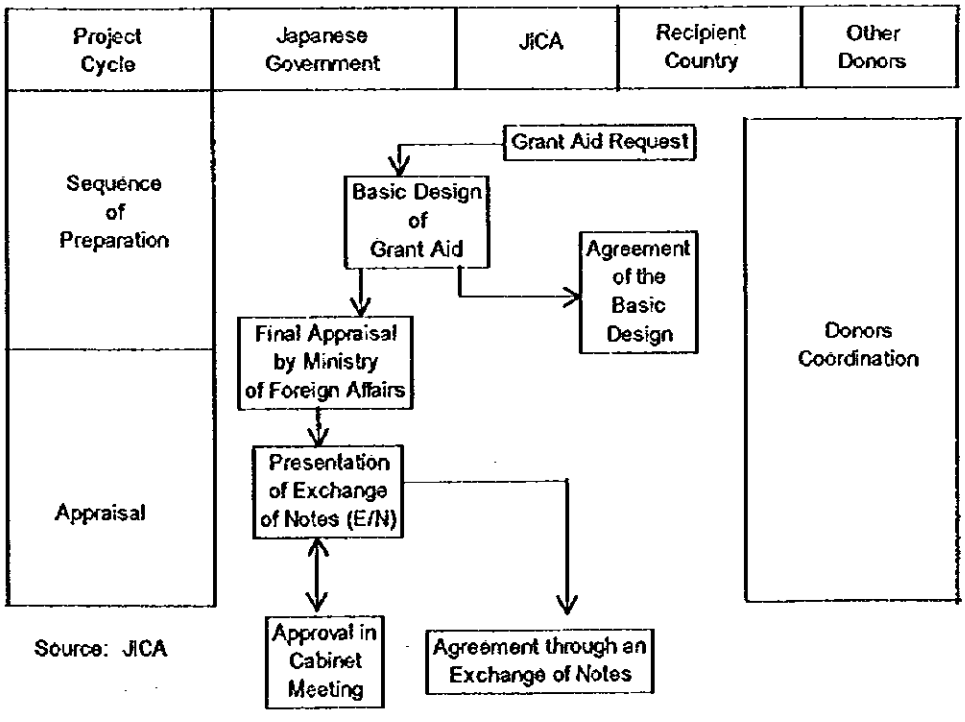
- The technology of engineering works and the supply of materials at shadow and market prices.
- The legal aspects, management (on a self-paying basis), and the capacity of the implementing agency or organization.
- Financial features, e.g. the FIRR, debt service, coverage ratio and the repayment schedule.
- An evaluation of risks and uncertainties.

Figure 8.1 — Appraisal of a Request for a Japanese Official Loan



* SAPROF = Special Assistance for Project Formation
Source: JICA

Figure 8.2 — Appraisal of a Request for Japanese Grant Aid



Source: JICA

The Approval of Grant Aid

The scheme for the approval of Grant Aid is shown in Figure 8.2. The main features of the process of approval include:

- A request for Grant Aid from the recipient.
- Studies and the basic design.
- Appraisal and approval.
- Detailed design and implementation.

8.1.3 Linking Development Studies with Project-type Technical Cooperation

Linkage between the Development Studies and project-type Technical Cooperation offers many advantages.

Project-type Technical Cooperation may extend over a long period of time, beginning often before the Development Study and possibly continuing beyond the implementation of the investment project itself. This offers opportunities for research and development as regards local conditions and preferences, socio-cultural factors, the most appropriate technology, institutional development, and general capacity building. In some cases, project-type Technical Cooperation may be a start-up phase of a subsequent Development Study, or it may involve a pilot study between the preparation of a master plan and the subsequent feasibility study, or vice-versa. Combining the two types of Japanese ODA will often be advantageous, especially as regards the consideration of software, as described in Chapter 8.

Linking Development Studies with other types of Technical Cooperation is very effective. Among other things:

- Package contracts combining Project-type Technical Cooperation with a Development Study may be made for Consultants.
- Technical Cooperation may start small with the intention of following up with a full-scale Development Study.
- A pilot project may be undertaken during the preparation of a master plan or feasibility study in cases requiring capacity building or institutional development.

- A mini-Development Study may be undertaken as a startup for project-type Technical Cooperation in projects with relatively small-scale funding cooperation.

8.1.4 Manuals for the Planning of Projects for Environmental Sanitation

Some manuals are available for the planning of projects for environmental sanitation.

A considerable amount of experience has accumulated, and research been undertaken, during the vast build-up of environmental sanitation in Japan since World War II. An important aspect of this experience relates to the transition from traditional systems for the disposal of nightsoil and graywater, through modern on-site facilities (*Jokaso*) and/or small-scale sewerage systems, and, ultimately, to the large-scale sewerage and sewage purification systems serving all the large cities of Japan today.

In the course of this transition, many socio-cultural and socio-economic, and institutional and organizational problems, had to be dealt with — and they are still challenging the implementation agencies as the programme for universal coverage moves into some of the country's semi-urban and rural areas. Many lessons for application in the developing countries have been learned in coping with these problems.

Japanese technical and other literature covering the experience abounds, although often it is in Japanese. Two volumes have recently been published in English by the International Environmental Planning Center of the University of Tokyo, entitled, "Nightsoil and Gray Water Treatment in Japan" (see Notes). Another publication in English is the "Manual for the Introduction of *Jokaso* System in Developing Countries" by the Overseas Survey Committee on Night Soil Treatment Technology Transfer. Other publications are listed in the Notes.

The above-mentioned publications contain basic technical information for the planner and designer. For use in Japan's domestic programmes for environmental sanitation, they are supplemented by a number of manuals issued by the governmental bodies responsible for the programmes, i.e. the Ministry of Construction and the Ministry of Health, and are intended to guide the preparation of projects for subsequent funding from a variety of sources available.

Further, JICA has issued a "Case Study for Development Studies for Water Supply, Sewerage and Drainage, Flood Control, Water Resources and Groundwater" (in Japanese). The latter emphasizes the social background of projects, the selection of treatment methods, costs, construction, and evaluation. The former sums up five cases, i.e. Egypt, South Yemen, Indonesia, Thailand and Peru. Both JICA and OECF have published guidelines for environmental impact assessment of development projects, and, specifically, for projects for water supply and environmental sanitation. The Ministry of Construction, in cooperation

with other ministries and concerned professional organizations, has issued a Manual on Master Planning for Sewerage and Sanitation in Developing Countries. A guideline for operation and maintenance is under preparation. The Ministry has also published a Guideline in 1993 on "The Application of Technologies for the Treatment of Urban Sewage in Developing Countries" (in Japanese), which addresses integrated technologies for sewage and drainage, both on-site and off-site. The Ministry of Health is issuing a manual dealing with *Jokaso*.

8.2 Experience of the Donor Community

8.2.1 Background

> After the International Decade, a wealth of information for planning projects for environmental sanitation is available and is used by the other organizations, both as regards investment projects and Technical Cooperation.

Most of the aid organizations have supported projects for environmental sanitation in the past. All have had experience with water supply projects which are similar in nature and require a similar approach. Considering that 748 million people were newly provided with sanitation during the International Drinking Water Supply and Sanitation Decade — 1981 through 1990 — it is obvious that a wealth of experience is available in all the organizations as regards the preparation of projects for subsequent funding.

The experience of the Decade derives from projects of all types and sizes but, fortunately, it covered both urban and rural areas, water supply and sanitation, and both hardware and software. It involved lending institutions such as the World Bank and the regional development banks, the organizations of the United Nations system, and multi- and bilateral Technical Cooperation and funding organizations. Of the total US$134 billion that was invested during the Decade, 53 billion went for urban sanitation and almost 7 billion for rural sanitation. Of the total amount, 34% came from external sources of funding, the remaining 66% from the national and/or local government and from the people who themselves benefitted from the projects.

During the early days of the Decade, the goal often was — simply — to increase the number or percentage of people having access to water supply and sanitation. In itself this was a good objective, but it disregarded the many factors which were discussed in Chapters 5 to 7. Accordingly, many projects did not perform well, and, gradually, during the Decade, the emphasis shifted away from just pipes and pumps. Among other things, more operational research was undertaken and both the lending institutions and the Technical Cooperation agencies increased their coordination so as to make the best use of new knowledge during the preparation of projects for subsequent funding. Some of the lending institutions added Grant Aid to projects under certain conditions and also began to provide Technical Cooperation if the projects so warranted. By the same token, the Technical Cooperation

agencies added Grant Aid for construction in cases when pilot or demonstration projects were an essential part of their cooperation. The experience of the Decade suggests that many benefits can accrue if close cooperation takes place between Technical Cooperation, Grant Aid and actual lending.

In a nutshell, the Decade provided a huge amount of experience and information — more like what had already become available in many other development sectors. Mechanisms have been established jointly by the Donor community and the developing countries to keep this experience up-to-date and to undertake needed research, and, also, to translate it into actual project design. These tasks have been undertaken, respectively, by bodies such as the Water and Sanitation Collaborative Council and the UNDP/World Bank Water and Sanitation Programme.

8.2.2 Are There Any Guidelines?

No guidelines have been written for using this information for the preparation of projects for subsequent funding. The other organizations rely on the expertise of their technical staff and the experience of the recipients.

However, most of the other organizations have issued guidelines or instructions setting out the scope and depth of the appraisal reports that they require prior to the approval of a loan or of Grant Aid. The best sources of guidance for project development are these instructions for appraisal.

Has all this experience been written up for use in the preparation of projects for subsequent funding? Usually not.

The other aid organizations will insist that the quality of a project prepared for subsequent funding depends, in the first place, on the quality of the prior negotiations between the external support organization and the recipient, on the one hand; and, on the other hand, on the experience of the recipient and the quality of the Consultants. No written document, so the other organizations assert, can be a substitute for this — because no project resembles another with respect to its technical needs and its socio-economic and cultural circumstances. The other organizations prefer to rely on the competence and experience of their own technical staff for the formation — in cooperation with the recipients — of tailor-made projects.

It is not surprising therefore that the other aid organizations have not published guidelines or manuals for project preparation. The notable exception is the Project Preparation Handbook published by the World Bank in 1983 as part of the UNDP/World Bank Water and Sanitation Project. It consists of three volumes published in the World Bank Technical Papers Nos. 12, 13, and 14. Another, though more limited, example is the "Design

Guidelines for Simplified Sewerage", also Published by UNDP and the World Bank, in 1994, as part of their joint programme. The publication mainly covers the technical features of the design, and only a few of the other aspects of project preparation.

The other organizations have published the results of their research on many of the specific subjects encompassed by environmental sanitation, and the most pertinent of these publications are listed in the Notes at the end of each sub-chapter. The other organizations have also published project experience and case studies, although neither these case studies nor the research findings constitute formal guidelines for project preparation. Projects must be tailor-made on the basis of field investigations and studies carried out by the Consultants under contract for the preparation of a project, and the Consultants are selected on the basis of their experience and professional record, and are given detailed TOR rather than manuals to be the basis of their work.

However, most of the other organizations have issued guidelines or instructions setting out the scope and depth of the appraisal reports that they require prior to the approval of a loan or of Grant Aid. Some of these instructions have been summarized in Annex 6. They indicate clearly how the staff of these organizations will appraise the projects prepared by the recipients and the Consultants. Naturally therefore, the best sources of guidance for project development are these instructions for appraisal. Most of the instructions are made widely available and are used as reference points when the TOR for the Consultants are prepared, and when Consultants are briefed prior to the commencement of their work.

8.2.3 Projects Must Be Appraisable

> Feasibility studies required by other organizations have expanded in scope and have become more complex and diversified for all investment projects. In the case of Grant Aid, however, the requirements for appraisal are scaled down to save time and money. Software factors, technology, sustainable management and finance remain predominant criteria in any appraisal.

In the requirements for appraisal reports, the other aid organizations use a fairly uniform approach to projects for environmental sanitation (and water supply).

Feasibility Studies for Investment Projects

For projects requiring investment in terms of either a loan or Grant Aid, feasibility studies are required. In the past, the studies mainly served the purposes of estimating the costs, establishing the basis for subsequent implementation and the preparation of tender documents, financial forecasting, and institutional strengthening. This has changed considerably; the studies have become more complex and diversified.

In accordance with the experience described in Chapters 5 through 7, today many additional investigations must be carried out in the course of the feasibility studies, e.g.:

- proof that the scheme fulfills overall development goals;
- proof that sector-specific objectives can be attained;
- establishment of realistic time horizons of — often — not more than five to ten years hence;
- cross-linkages with water resources development and other relevant sectors, i.e. health, housing, infrastructure and regional development;
- assessment of users' benefits;
- measures to ensure sustainability of the project, e.g.:
  - good management;
  - financial sustainability, including cost recovery and users' participation;
  - operation and maintenance; and
  - technological acceptance and appropriateness;
- full financial planning;
- institutional proposals, empowerment and participation;
- potential for private sector participation, and
- protection of the environment.

From the foregoing, it can be seen that there is a need for a whole gamut of special studies to be undertaken in order to address existing gaps. The other organizations do not, therefore, impose planning models or checklists upon the Consultants. They all insist that professional qualifications and experience cannot be replaced by models or manuals.

The Case of Grant Aid

In the case of Grant Aid for investment, the requirements may be relaxed for several reasons, such as (i) the amount of funds involved is comparatively small and may not warrant a very expensive feasibility study, and (ii) the time available for planning is normally much shorter than in the case of a loan and this will call for shortcuts. Nevertheless, the information

required for the appraisal of Grant Aid for investment projects is the same as that shown above, although the depth and detail of the information may be less.

Software Factors

Increasing attention to "software" is apparent in the programmes of all of the other aid organizations. Neglect of human considerations has been shown to have seriously compromised too many projects in the past. First, last and in the middle — every single aspect of water and sanitation has to do with people. Their needs and attitudes and abilities cannot be omitted from any calculation. In many cases, therefore, supplementary studies and proposals now are required before the project can be approved. Participatory planning is emphasized as a good way of "getting it right".

Sustainable Management and Finance

Sustainability has become a concern of all other organizations, although they may use different terminology. An interactive mesh of activities, many of them closely concerned with software once more, are now considered necessary in the planning process. Factors addressed in the process include institutional and managerial measures, the costs and financing, and the choice of technology — all treated as a closely interrelated system — as has been described already in Chapter 7.

There is wide agreement among the other aid organizations with regard to the need for good management, and also on the following specific requirements that must be addressed by the planner during the preparation of the project:

- Devolution, accompanied by support to the local level from higher levels of government, if needed.
- Involvement of the beneficiaries.
- Sound fiscal policies at government level, matched by cost recovery based on an assessment of the willingness and ability of the beneficiaries to pay.
- Sound managerial procedures accompanied by human resources development emphasizing operation and maintenance, and monitoring and surveillance.
- Participation of the private sector, as appropriate.

8.2.4 Choice of Technology and Its Funding Implications

On-site sanitation and low-cost sewerage are accepted as valid alternatives for semi- and peri-urban and rural areas; however, a general strategy for the funding of on-site disposal is not available yet.

Choice of technology has become a major pre-occupation of all of the other organizations. They share the view that when making this choice, consideration of the present level of information and future educational capacity of the user is a must, and that a careful balance of the costs *versus* the willingness and ability of the consumer to pay must be achieved. By the same token, local O&M of systems is greatly favored. There is wide agreement that the capital-intensive high-tech technology applied in the industrial countries for off-site environmental sanitation is not the preferred option for most situations in the developing countries. Increasingly, low-cost and appropriate technologies are used in the programmes of the other organizations — such as:

- Low-cost sewer systems for the collection and treatment of household wastewater,
- On-site technologies for nightsoil and graywater collection and treatment, and
- Recovery and re-cycling.

While these technologies are substantially different from each other, the distinctions between them do not imply that only one or the other would be the "prescribed" solution for a specific situation at all times. As in the industrial world, quantum changes in technology are also expected in the developing world, in tune with the progress of development.

So far, no clear-cut policy has yet emerged with regard to two basic questions posed by these technologies:

(1) Models

What is the best model for making low-cost and on-site environmental sanitation fundable, especially in the case of on-site disposal in peri-urban and rural areas and when it involves a large degree of private ownership of the latrines or other on-site equipment? Several models have been researched: e.g. (i) combining sanitation with drinking water supply and taking advantage of the institutional setting normally available or proposed for the water supply component, and (ii) creating a credit bank or union or similar mechanism which can act as the recipient and fund manager, and which lends funds to the private owner, based on an application which may be scrutinized by a local governmental or nongovernmental institution. These models are described in the Case Studies of Annex 8, especially those dealing with projects in India and Lesotho. They require careful analysis, and they may

involve long-term preparatory activities and support measures which need to be undertaken before a funding decision can be taken. By a large measure, at this stage Grant Aid is the most suitable option for funding; funding by ODA loans under suitable conditions is still an open question. The experience available so far points to the following:

- A research or pilot project may be undertaken with a view to investigating technological options promoting the programme and explaining it during informational and educational campaigns.

- During the pilot project, the buildup of a community structure is desirable to advocate, supervise and monitor both the pilot project and the full-scale project or programme.. This may involve local government or nongovernmental structures.

- As part of the foregoing, the project should provide training to local government staff, who will then train and provide technical advice to the community's responsible officials, e.g. sanitary staff of the local health infrastructure, and extension workers.

- Promote, support and license, as appropriate, private sector participation, e.g. local production and construction of the facilities.

- Provide ODA funding during several years of operation.

- Assure the full support of the project by regional and/or central government in terms of policy, legal requirements, financial backup and guaranties, participation in the promotion, supervision and monitoring of the project, technical backup and advice, and financial input during the initial phase.

- Following the pilot operation, it is important to create a critical mass for the full-scale project, i.e. aim at an area-wide district, regional or even national coverage by the project.

(2) **Mixes**

In choosing the technology, not just one option might be considered for a specific project area, but rather the best "mix" — so as to address the needs and potentials of the different areas and/or population groups within the project area. On the one hand, infrastructural requirements, land use, building codes and public health needs will (or may) vary greatly from section to section of the project area. On the other hand, the population may be mixed, including wealthy people, demanding and paying for a traditional sewerage system, the fringe populations depending on on-site and on-plot systems, and the people living in between who are able to afford a simple system of sewers (these might be connected to the central system or otherwise discharge into an open water or groundwater with or without prior treatment). Further, the situation is very fluid in many of the developing countries, and the "right" and affordable technology may change quickly; this will pose a special challenge to the planner (see also "Time Horizons" in Chapter 8.3.4).

8.3 Discussion

A primary goal in the preparation of a project is its eventual approval by the funding agency or agencies — not easy, because of the many requirements which these agencies do need to have fulfilled. The present chapter describes how a project should be specifically designed to fulfill just such needs.

A comparison of the information summarized in Chapters 8.1 and 8.2 demonstrates that the experience accumulated in Japanese overseas cooperation for environmental sanitation tallies with that of the other aid organizations in many respects. However, there are also differences as regards, on the one hand, details and depth and, on the other hand, principles and emphasis. This is not the place to assess the differences. Still, it may be concluded that lessons can be learned both ways. It is deemed appropriate to capitalize on the experience of all ODAs, and to undertake to keep the following Discussion as broad as possible.

8.3.1 Implications of the Source of Funding

> Not all sources of funding can be tapped for all types of systems for environmental sanitation. A realistic appraisal of the constraints posed by the funding sources is an important step in the preparation of a project. The sources may be ODA loans, Grant Aid or Technical Cooperation Funds, or a combination. The projects discussed here are principally investment projects and those supporting measures needed to make them successful.

Considerable differences will exist with respect to the funding of investment projects, i.e. funding through loans, Grant Aid, or a mix of the two. The potential for cost recovery varies, according to the ability and willingness of the target group(s) to pay for the service, and will be a major factor in designing the most feasible funding scheme. This also has important technological implications, according to the following rules of thumb:

- For central urban areas, a relatively high-tech sewerage system with high-degree sewage treatment prior to the discharge of the effluent into the sea or a river, or its re-use, may be feasible. Thus, projects for such areas are likely to be off-site systems with a strong operating agency and a favorable economy of scale. Therefore, even though they are capital-intensive, they are more easily financed because people are able and willing to pay for the service, and banks are basically ready to make loans.

- In contrast, projects for rural and many peri-urban areas are likely to be low-cost sewerage or on-site facilities and must be designed taking into account (i) the ability of the beneficiaries to pay very little, and (ii) the paramount problem of making a

sustainable arrangement for operation and management at reasonable cost to the owner of an on-site facility. Such projects are not usually attractive to banks because they often involve a very large number of individual latrines or septic or other tanks which can be funded more easily through Grant Aid. If this is not available, their funding will depend on innovative managerial and financial schemes in order to make them sustainable and "bankable".

- An intermediate situation may exist in some semi-urban areas where low-cost sewerage systems may be feasible. In such cases, funding agencies will not need to deal with a large number of individual hardware components but will, nevertheless, need to adapt to beneficiaries who can pay only limited amounts of money. Accordingly, funding by banks or Grant Aid is more feasible than in the case of on-site sanitation.

- In considering the above rules of thumb, ALL costs must be considered, i.e. the cost of capital investment, costs of operation and maintenance, and the replacement and improvement costs. The sum of all costs should be measured up to the ability of the beneficiaries to pay, and also to the policy regarding "who pays" and "who not", especially if there is a policy regarding the distribution of the costs among the different segments of population. Consideration of all these factors may or may not favour a technology which ordinarily would be "ruled out" on the basis of its capital costs alone. A further case in point is the reduction of the costs to low-income people if foreign Grant Aid is available to render the costs of construction nonrepayable. In this case, the costs of off-site sanitation may indeed be lower than would those of an on-site system which the owner would have to install and maintain totally at his own expense.

- In either loans or Grant Aid, the principles of effectiveness and sustainability are the same, and the preparation of projects must involve consideration of all relevant factors. This is particularly important in the case of projects for environmental sanitation, which, more than many other types of projects, are affected by social, economic and cultural factors, by the degree of participation, by the problems associated with operation and maintenance, and by the choice of technology.

Technical Cooperation funds are different, and are intended to finance preparatory and/or supporting measures, or "software". In most cases, they are funded through grant money, and include the dispatch of experts, training, the provision of equipment, investigations, public relations, health education, *etc.* Thus, Technical Cooperation funds may be an important component in the total funding of a project, and their availability and best use should be carefully explored during the negotiation of the SOW and during the Project Study itself. Unlike ODA loans and Grant Aid for investment projects, Technical Cooperation Funds can be approved and allocated within a relatively short time. They are also more flexible in response to changing conditions in the project.

Projects for environmental sanitation always harbor risk of delays and unforeseen events caused primarily by their social dimension. When a Project Study is undertaken and when

the project is implemented, flexibility and contingency allocations are important and should always be agreed upon during the negotiation of the SOW. Consideration should also be given to the following:

- All projects for environmental sanitation will need Technical Cooperation funds for dealing with software matters. For on-site sanitation, Technical Cooperation will differ in both quantity and quality from that in the case of off-site projects. As a rule of thumb, projects for on-site sanitation will in most cases not only require more funds for Technical Cooperation, but also for a longer time and involving a more interdisciplinary approach than off-site projects.

- Many projects for environmental sanitation involve a research and/or pilot component for which Technical Cooperation funds should be the best source of funding.

- Because of their early availability, Technical Cooperation funds should always be used to involve the potential funding agency or agencies, with the view of shaping the project itself and its environment, and for creating conditions which will ensure subsequent funding of the project.

- Technical Cooperation, and the Project Study itself, offers opportunities for joint activities with other Technical Cooperation agencies. Such opportunities should be exploited with a view to capturing the widest possible gamut of experience in the donor community and to promote funding through ODA loans or Grant Aid.

Figure 8.3 outlines an algorithm relating systems technology to the potential sources of funding. If a traditional sewage system is feasible, at least the hardware component of the project has the potential of qualifying for an ODA loan. Some of the software components may involve Technical Cooperation, and some may become part of the loan, depending on the circumstances of the project.

If a traditional sewerage system is not possible, an on-site or low-cost sewerage solution must be sought. Even then, at least some part of the hardware may qualify for a loan, whereas the rest (hardware and software) may require Grant Aid and/or Technical Cooperation. If an ODA loan is not feasible for the project in its entirety, a combination of Grant Aid and Technical Cooperation would be sought for the project — probably focusing hardware on Grant Aid and software on Technical Cooperation.

A special case would be when some of the hardware could qualify for an ODA loan if it were combined with either a traditional sewerage project or with some other type of project, such as for water supply. A case in point might be the hardware component of a low-cost sewerage system and/or an on-site system for a semi-urban area which might be combined with the sewerage system for the central area of the town. Another case could be a system for on-site sanitation for a rural area if combined with a water-supply project that is funded through a loan.

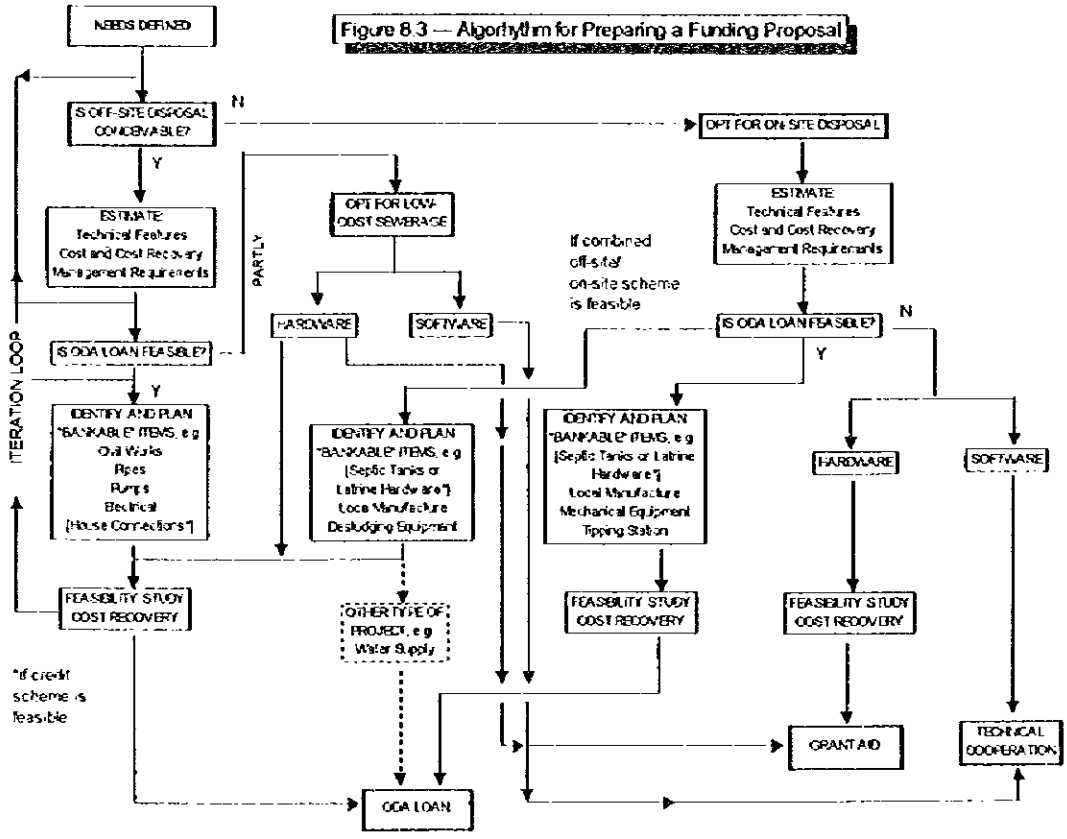


Figure 8.3 — Algorithm for Preparing a Funding Proposal

8.3.2 General Approach to the Preparation of a Project

Preparation of a project involves studies and investigations, engineering design, the actual project proposal, a logframe analysis, and project-support measures.

The actual project proposal will in most cases be based on preliminary engineering studies and design. When Grant Aid is involved, implementation design may be substituted so as to save time and money. But many other studies and investigations are also needed.

As discussed in Chapters 8.3.4 through 9, the actual project proposal will include information on — at least — basic project features, project-support measures, the costs and financial aspect of the project, implementation, expected impact and risks involved, and the implementation agency or organization. It will also analyze the project in light of the general conditions in the country and the sector.

The Principle

It should now be clear that all projects must be **tailor-made**; i.e., for each project, a different set of conditions must be met. All parties involved must be fully aware of the implications thereof: i.e. the recipient, the beneficiaries, the international or bilateral ODA, the Consultants, and the public whose taxes fuel the whole process.

It goes without saying that the studies and investigations which will be undertaken to prepare the project must also be **tailor-made**. Each study will be different, involve different investigations and arrive at different conclusions. The scheme presented in Figure 8.2 is only a generalized presentation of the preparation of the project, and should not therefore be followed blindly. The figure is intended (i) to exhibit the interrelated and interactive elements which will bring the project to fruition and (ii) to provide guidance for the planning and design of the investigations and supporting measures which are required to make the project appraisable and successful.

Figure 8.4 — The Preparation of a Project for Subsequent Funding

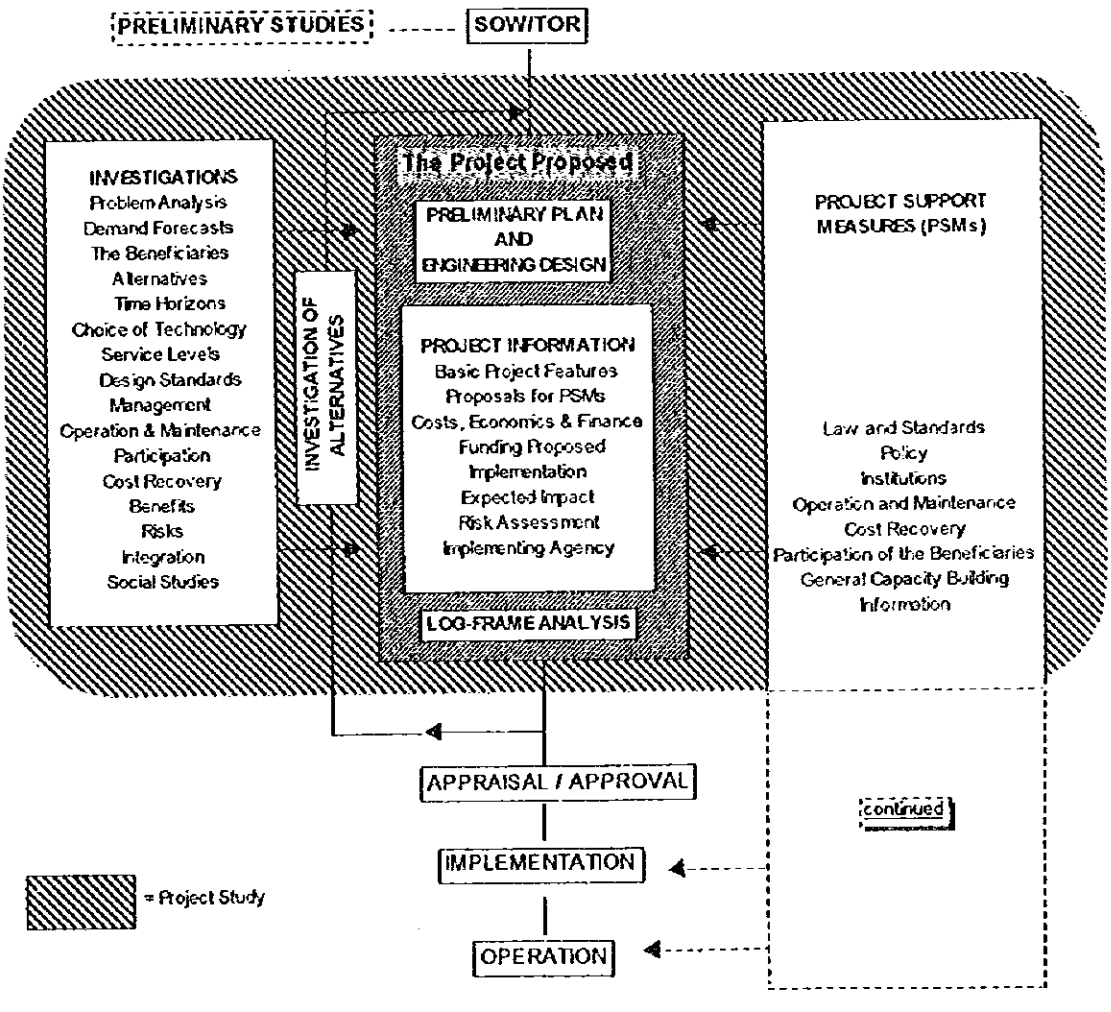


Figure 8.4 exhibits the following:

The project proposed (center)	this will be the actual project proposal.
Investigations (left)	the investigations undertaken during the preparation of the project. They may be technical, socio-economic and socio-cultural, managerial, and institutional. The listing in Figure 8.4 is not a prescription for any specific project, since each Project Study must be tailor-made, as pointed out before. But it indicates the wide range of subjects which the Consultants may need to study.
Project Support Measures (right)	The project-support measures will normally be planned during the preparation of the project. However, implementation may take place prior to or during the appraisal/implementation of the project, as will be discussed in Chapter 8.3.5.

Studies and Investigation

(1) Engineering

Engineering studies are the backbone of every project for environmental sanitation. If an ODA loan is involved, preliminary engineering studies and design are undertaken as part of the Project Study. The scope and depth of such studies and design are well known and need not be repeated here in detail. Suffice it to say that they involve a wide gamut of field studies and investigations, as well as office studies and analyses which must be clearly described in the TOR.

In contrast, time and money is often limited when projects receiving Grant Aid are planned and designed. In such cases, the stage of preliminary engineering may be severely compressed, even eliminated, and instead implementation (final) engineering will be undertaken and tender documents prepared. The Consultants responsible for the engineering must nevertheless address and investigate the same variables listed below for preliminary engineering, although in considerably less detail. The TOR must make this clear.

The scope and depth of the engineering studies will vary with the technology applied. For high-tech water-borne sewerage systems and treatment works, fully fledged engineering studies are required. On the other end of the spectrum, the engineering of latrines is rudimentary but, nevertheless, investigations into several aspects should be carried out, e.g. the choice of the type of latrine, soil characteristics, the problem of groundwater protection, the standardization of parts, and construction methods. If septic or other tanks are required, engineering will focus on the same problems and in addition deal with prefabrication of tanks and other parts, operation and maintenance, including desludging and the disposal of sludge.

For low-cost or small-bore sewerage, engineering must deal with many of the aspects covered in the case of off-site systems, but pay particular attention to their special hydraulic characteristics, accessibility in crowded and narrow settlements during construction, maintenance requirements, house connections, and the protection of the sewers against vandalism.

The following presentation intends to summarize the points made above as regards engineering studies. Annex 4 provides further information on the choice of technology.

	Type of Engineering Design
Loan for:	
- Traditional sewerage system	Fully fledged preliminary engineering
- Low-cost sewerage system	Fully fledged preliminary engineering
- On-site systems	Implementation design with standardized technologies, if appropriate
Grant Aid for:	
- Low-cost sewerage system	Reduced preliminary engineering and/or implementation design
- On-site systems	Implementation design with standardized technologies, if appropriate

(2) **Other**

In Chapters 8.3.5 to 8.3.9, many subjects are discussed requiring studies and investigation. Many of these will be non-engineering, i.e. socio-economic, sociocultural, financial and fiscal, managerial, institutional, *etc.* All parties in a project are challenged to identify the specific studies and investigations required, and to plan and implement them — always with the active participation of the recipients and often including the beneficiaries. No general guideline can be established as to the subjects to be dealt with, nor as to the depth or methods of investigation. Each case must be tailor-made, as was pointed out before. Chapters 8.3.5 through 8.3.9 are intended to provide some overall information, and the Notes at the end of each chapter (and Annexes 5 and 6) include the most important publications of the extensive literature covering these matters.

Project Information

In Chapters 8.3.4 through 9, the range of information that the actual project proposal should cover is discussed, i.e. the basic features of the project, project-support measures, costs and

the economic and financial aspects — including a proposal for the project's funding — implementation, the expected impact of the project, and the risks involved. The information should also demonstrate the compatibility of the project with the situation of the country and sector.

8.3.3 Compatibility with Situation of the Country and Sector

During the preparation of projects for environmental sanitation, the compatibility of the project with the overall situation and development trends in the country should be analyzed.

Every project should be based on information regarding the existing sector development policy.

Avoid planning and designing a project on the basis of expatriate criteria and perceptions.

Compatibility with the Situation in the Country

Chapter 4 stipulates that the project must be compatible with the country's economy, problems, policies and priorities. This may relate to financial and economic policy, governance, participation and community management, women and the role of the private sector — all of which bear heavily on projects for environmental sanitation. It must further be compatible with current development plans and their priorities and with the constraints encountered in their achievement, as well as with priorities for ODA cooperation.

The primary purpose in this respect is to set out clear objectives and operational approaches, and to enable an assessment of how and to what degree the proposed project relates to and contributes to the items listed. Thus, not all of the information needs to be in great detail, but it must be assembled early in the planning process. For Grant Aid projects, the information may be brief indeed but is nevertheless important. Whenever quantitative information is not available, this should so be stated, and qualitative statements presented.

Compatibility with the Situation in the Sector

Many countries and most of the donor agencies recognize environmental sanitation as a field for priority action and, accordingly, have undertaken sector studies and established sector policy, both for national action and ODA cooperation. Most of the studies and policy deal with both water supply and sanitation and often also relate to other sectors, e.g. water resources, health, housing, urban and/or rural development.

Sector policy and development, and local conditions and needs, are among the parameters that must guide project planning and design. They must be studied carefully so as to avoid the project being planned and designed on the basis of expatriate criteria and perceptions. The parameters may include but are not limited to:

- Actual conditions and shortfalls in the sector:
  - Coverage by environmental sanitation on a per capita or area-wide basis;
  - Unserved and/or underserved population, its characteristics and distribution;
  - Type and physical conditions of existing systems and their operation and maintenance; and
  - Management and institutions.
- Related conditions and problems:
  - Public health;
  - Environmental conditions or standards to be met;
  - Water resources; and
  - Geology and hydrogeology.
- Existing sector priorities and programmes, and timeframes for action:
  - Projects already identified or under way in the area, and their timeframes;
  - Target groups; and
  - Other ODA activities in the area.
- Potentials and capacity in the sector:
  - The potential ability to pay, to assume functions in operation and maintenance, and for participation;
  - Resources available at the household, community and governmental levels; and
  - Local management capacity and management support from higher levels.
- Common constraints in the sector:

- Funds available for capital investment and for operation and maintenance;
- Institutions and management;
- Cost recovery; and
- Participation, management at the community and/or household levels.

- Sector principles:
  - Use of the most "appropriate" technology;
  - Integration with water supply, hygiene education and environmental protection; and
  - Coordination with other sectors.
- Policies:
  - Government *versus* community funding;
  - Government *versus* community management; and
  - Cost recovery.

8.3.4 The Basic Project Features

The basic project features will cover 11 items, at least; i.e. problems analysis, demand forecast, the beneficiaries, alternatives, time horizon, choice of technology, service levels, design standards, management, operation and maintenance, and participation.

Problem Analysis

The problem analysis will give answers to a wide gamut of questions regarding the technical, socio-economic and socio-cultural conditions which the project will specifically address.

The current status of environmental sanitation in the project area should be analyzed, together with the consequences arising therefrom, e.g. the impact on individual and public health, convenience, the environment, water-resources development, pollution of surface and

groundwater, the potential for social and economic development, infrastructure in the area, and — specifically — the impact on women and children.

The analysis should further cover the factors which may constrain the project, such as lack of awareness on the part of the beneficiaries of the benefits of the project, their ability and willingness to pay for it and to undertake operation and maintenance of facilities, the suitability of different technologies, community institutional aspects and organizational shortcomings, the existing legal framework regarding water resources and the environment, the availability of land, geology and hydrogeology, the capacity of surface, groundwater or ocean for the disposal of effluent or nightsoil, and potentials for the re-use of treated effluent.

Other problems to be analyzed include the availability of resources of all kinds, the role of the private sector in the area, and government and community structures and their interactions in the planning, implementation and maintenance of public works systems.

Demand Forecasts

The demand forecasts should be undertaken in terms of both the number of people in need of services and the amount of wastewater and residues to be expected. Consideration should be given to the actual availability of water supply in the area, the costs of sanitation and other local factors. Estimates should not be made by using standard figures, as is often done by expatriate Consultants. Forecasts for water-supply demand in the area should be taken into account or, if not available, approximated as part of the demand analysis.

The forecasts should also consider the influence on future sanitation demands of potential socio-economic developments in the area, technology, alternative service levels, project costs, the recurrent costs for operation and maintenance, and local traditions and perceptions.

The Beneficiaries

The target group or groups should be described in a historical, current and future perspective. Why was this population selected? How can demography be interpreted? What are the socio-economic and sociocultural characteristics? Are there any commercial, industrial and/or agricultural users who will benefit from the project (and might their needs pose any problems)? Which public utilities exist or may be built in the future? Which particular aspects relating to women and children must be taken into account? What is the income level and distribution? How much can people pay for sanitation within their own budgets? Are they ready to assume ownership? What are their perceptions with regard to environmental sanitation and how would different service levels and their respective costs affect their willingness to pay? What is the best arrangement for ensuring their participation in the planning, implementation, funding and operation and maintenance of services such as environmental sanitation, and what can be predicted in that respect?

Many of these questions cannot be answered without a thorough knowledge and deep understanding of the people in the community. Thus, expatriate Consultants will definitely need the cooperation of local Consultants.

Alternatives

In the investigation of alternative project designs, it is not sufficient to consider physical, topographic and financial parameters alone, as is customary in the planning of projects in many other sectors. Considerable weight must be given to the variables which impact on the performance of the project, its operation and maintenance and, ultimately, sustainability. These variables have been discussed in Chapters 5 through 7.

Technology will be of primary importance in investigating alternatives because of the fundamental differences between a traditional sewerage system (off-site disposal), the on-site disposal of graywater and nightsoil, and low-cost sewerage systems — or, perhaps, a combination. As pointed out in Chapter 4, on-site disposal is a valid alternative for environmental sanitation in many situations and is now considered a valid approach for Japanese ODA, provided that suitable financial and operational arrangements can be made — especially in rural and semi-and peri-urban areas. It is less costly on a per-capita basis than off-site systems. Off-site sanitation will continue to be a valid alternative, but it requires more capital investment per capita and is suitable mainly for central urban areas serving an economically better-off population. A combination of the two may be practical under certain conditions, especially for peri-urban areas, as exemplified in Annex 4. Whenever population density allows, especially in semi-urban low-income areas, the introduction of small-bore sewerage may be feasible, especially if combined with a traditional sewerage system and/or genuine on-site disposal.

In presenting alternative solutions, not only their technical and financial characteristics must be analyzed. Consider also the options regarding their management, with its socio-economic and socio-cultural implications, and the problems to be expected in operation and maintenance, and, ultimately, in sustainability.

Time Horizons

Unless this matter has already been decided in the context of preliminary negotiations between the recipient and the external support agency, the time horizons for projects in environmental sanitation should be analyzed on the basis of water supply development plans, demand forecasts, the likely urban or rural development, infrastructure requirements and other related factors. Important considerations are (i) the rapid changes in urban and town planning, and in the demography of developing countries, and (ii) the likelihood of transitions from one technology to another as these changes occur, i.e. from on-site disposal to low-cost sewerage and from there onwards to a fully fledged sewerage system.

Time horizons are also important considerations in the design of facilities for treatment of sewage prior to its discharge — into a body of water, into the surface, groundwater or sea — or, alternatively, prior to the re-use of treated effluent. In few cases should it be expected that a very high degree of sewage treatment must be attained in one step. Rather, the step-wise achievement of advance treatment will be the rule rather than the exception — in keeping with the step-wise implementation of the sewerage system itself, and in line with the gradual development of the institutional capacity for the operation of the sewage works. In other words, both the capacity and the degree of treatment of the sewage should be carefully phased.

Special study is needed as to how soon the circumstances of the projects might undergo changes such as those referred to above. Accordingly, the timing of investment and/or the economics of deferring investment to a later stage should be studied and assessed on that basis.

The time horizon of sanitation projects may be relatively short, and interim solutions may be fully acceptable. The traditional approach in the industrial countries of planning sewerage systems for 20 and more years is clearly not recommended, especially in semi- and peri-urban situations.

The Choice of Technology

The choice of technology is presented as a perennial challenge throughout most chapters of the present publication, and will not be reviewed in detail in the current Chapter. It suffices to recall that the actual project proposal should contain convincing information that the technology or technologies proposed are suitable after a careful study.

The implications of funding should not be considered the dominating factor in the planning of a project for environmental sanitation. However, when a project is prepared for subsequent funding by an ODA, the information of Chapter 8.3.1 needs to be paid very special attention with regard to the choice of technology, as do the following considerations:

- Loans must be repaid, and the lending institutions insist on dealing with a borrower who can ensure good technical and fiscal management as well as the project's sustainability. Systems using off-site technology can meet these requirements more easily than on-site systems, for which it may be difficult to identify a suitable borrower.

- House connections to off-site systems have been funded by ODA loans although ultimately they are the responsibility of the beneficiaries. Since off-site systems always have an identifiable borrower, the funding of house connections can be arranged through that borrower to the satisfaction of the lending institution. In contrast, in the case of on-site systems, the funding of the individual latrine or septic tank should always be considered the responsibility of the beneficiaries; yet

experience has shown that, often, the beneficiaries are unable to raise the capital, considering that this may equal the family's income of one month or even more; consequently, a number of models have been explored recently for providing capital loans to such families as well (see 8.3.1).

- In the case of Grant Aid, the funding of house connections and on-site systems is less difficult. However, the Consultants must present a technology which is nevertheless financially sound and sustainable.

Service Levels and Design Standards

The differences between the quality of the service of off-site *versus* on-site systems are obvious. Yet, within each of these two alternatives there is latitude for choosing service levels, and the flexibility is still greater in the case of transitional systems. The range of available service levels should be investigated and assessed in each case in terms of their cost, operation and maintenance requirements, the actual and future water supply, environmental protection and social acceptability.

Once the decision on service levels has been taken, design standards should be established and justified in the project proposal. The inflexible adoption of standards such as are published in many texts is not to be recommended. Many local factors need to be considered, e.g. the cost, location, depth and hydraulic characteristics of sewers and their minimum diameter and gradient under the conditions and expected changes in the project area, the type, local availability and/or production of materials and appurtenances, local methods of construction, the likelihood and consequences of inadequate operation and maintenance, the frequency and intensity of storms and floods, the likelihood of garbage and refuse being thrown into sewers, access of people, access of animals, the breeding of disease vectors and the propagation of other agents of disease.

A special case is the standard for the disposal of effluent from both on-site and off-site systems:

- On-site systems can meet only relatively low standards reliably unless high-tech design is applied, and operation and maintenance are of a high standard and monitored regularly (as is the case with some high-tech Japanese *Jokaso*). The potential pollution of underground water and nearby wells for water supply are genuine problems in all developing countries and must be studied carefully.

- Off-site sewage treatment can meet almost any effluent standard, theoretically, but in order to operate reliably and at reasonable costs the standards must be adapted to environmental requirements and the ability of the operator to ensure the proper functioning of the treatment plant. High-tech treatment processes are not normally recommended for developing countries because of their cost in foreign currency, frequent breakdowns, difficulties encountered in replacing malfunctioning equipment and purchasing spare parts. Alternative technologies are available, and should be investigated, e.g. oxidation ponds and lagooning (see Annex 4).

- If the re-use of treated effluent is proposed, strict adherence to the standards recommended by WHO for the safeguarding of public health and/or the environment should be considered obligatory.

Management: the Implementation Agency or Organization

The management of the proposed project is inextricably linked with governmental and community structures and capacity and managerial expertise should be carefully researched and fostered. In few cases will it be possible merely to base the project's management on what exists. Therefore, management will also be among the project-support measures discussed in Chapter 8.3.5. What follows are selected items requiring information and assessment when a project for environmental sanitation is presented for subsequent funding; other items should be added as appropriate:

- The distribution of functions and capacity between the agency or organization, on the one hand, and the different levels of government, the community, nongovernmental organizations, and the beneficiaries, on the other hand; and a strategy for their further development and interaction, including measures to fill existing gaps, with special attention to:
  - the mobilization of financial resources;
  - fiscal management;
  - operation and maintenance; and
  - participation of the beneficiaries.
- The resources available, including human resources, and an assessment of the way they are managed.
- The legislative and/or legal preconditions to make the management structure effective and the project as independent of subsidies as possible.
- The options for linking or merging the management of on-site and off-site sanitation.
- By the same token, the options and the pros and cons for linking or combining management with water supply and/or programmes or projects in other sectors, e.g. health, infrastructure, and/or regional development.
- Potential participation and the roles of NGOs and the private sector.
- The implications of the policies and other requirements of the cooperating ODAs and the best strategy to address them.

Operation and Maintenance (O&M)

O&M is part of management and is implicit in the discussion in the preceding paragraphs. Special matters to address include:

- Procedures for O&M, and the adequacy of managerial capacity and human resources and skills to implement them.
- Capacity building and human resources development for O&M.
- Users' participation, e.g. cost sharing or the maintenance of on-site units and off-site house connections, in keeping with health and environmental requirements.
- The funding of the recurrent costs of O&M, including replacements, spare parts, *etc.*

Participation

Every Project Study should include investigation into the roles to be played by the community and the beneficiaries, and how this participation can be brought about. The investigation itself should involve a multi-disciplinary team and may best be carried out in association with local Consultants, governmental and/or nongovernmental institutions. Based on the investigation, suitable project-support measures may be recommended to promote and ensure participation. Factors to be investigated and/or addressed include:

- Awareness by the community and the beneficiaries of the roles they should play.
- Contribution to the financing of the cost of the project in both money and kind.
- Participation in operation and maintenance.

More details are contained in Annex 5.

Logframe Presentation of the Project Proposal

In Chapter 6, the logframe methodology was reviewed. It analyses the overall goals of the project, its purpose, the activities undertaken and the results achieved. The methodology also calls for an analysis of the assumptions made by the planner, the indicators for measuring achievements, and for an assessment of the risks inherent in the project.

A logframe presentation should be a part of every project proposal. The presentation should cover all components of the project, both hardware and software. The presentation will demonstrate that the Consultants have studied and addressed all local factors that make a

project successful rather than having merely applied rule-of-thumb figures and variables found in textbooks, or solely relied on their experience within their own countries.

8.3.5 Project Support Measures to Ensure Performance and Sustainability

All projects must include software components which will support the projects' performance and sustainability. They should be planned as part of the project Development Study.

The supporting measures will address critical issues such as legal matters, policy, institutional development, operation and maintenance, cost recovery, the promotion of participation, general capacity building and information, as the case may require.

The Planning and Implementation of Project Support Measures (PSMs)

In Chapter 7, the case was presented that a project consisting of "hardware" alone will not be successful. It was pointed out that the hardware normally includes sewer pipes, tanks and ponds for the treatment of wastewater, septic tanks and latrines — depending on the technology chosen. The software — as the project-support measures are often called — addresses matters without which a project will fail to perform, such as the enabling laws and standards, policy, institutional development, operation and maintenance, financial planning and cost recovery, participation and capacity building.

The planning of the PSMs is just as serious a business as the planning of the hardware and must be given adequate time and money! In most cases, Consultants are contracted to elaborate the plans, and, in some cases, assist in their implementation

Only in few cases will the PSMs be funded as part of an ODA loan, although exceptionally this has happened. Most often, however, ODA grant money is made available either as part of a Grant Aid allocation or from Technical Cooperation funds (see Chapter 8.3.1). Each case will be different because the planning and implementation of the software is a project-specific matter, *par excellence*, and always requires special skills and a very country-specific approach.

The timing of the planning and implementation of project-support measures will require special attention as early as possible during the negotiations of the SOW. A choice must be made from among at least three scenarios:

- Some PSMs may be planned and implemented before the actual project-support study if the results are essential for the study itself. For instance, the participation of the beneficiaries in the planning process may need to be promoted quite some time before the study commences, as may other PSMs to provide health education to the beneficiaries, or to prepare them to participate in the choice of technology during the actual project Development Study. In such cases, the planning of the PSM may be the subject of a startup phase of the actual study or a preparatory activity, or even a separate project by itself.

- Many PSMs will be planned right at the beginning of the project Development Study and implemented as the study gets under way, e.g. PSMs for establishing financial accounting or for promoting and deciding on cost recovery. Such PSMs must be completed before the project is appraised, so that the potential funding agency can take their outcome into account when making the appraisal.

- Other PSMs may be planned in conjunction with the actual project Development Study but be implemented only after the project has been approved, e.g. a two-year programme for the strengthening of an existing institution or for the establishment of a new one, or a programme for the training of staff and building general capacity for subsequent O&M.

In this context, each project-support measure may be looked at as a small project itself — with an objective or objectives, activities, methods of implementation and a budget.

As pointed out before, the Consultants may not only be responsible for the planning of PSMs but also for their implementation. This will vary from case to case. The Consultants should always be responsible for identifying the PSMs prior to or during the Project Study unless this was already done during the negotiations of the TOR. The TOR must be very clear about this particular aspect.

The Consultants' role in the implementation of PSMs may be selective. But the Consultants should always be responsible whenever the outcome of a PSM is a precursor for some part or all of their work. It is incumbent on the sponsoring ODA, therefore, to include adequate funds in the budget for the preparation of the project, either as part of a loan or Grant Aid or from Technical Cooperation funds. Ample funds should be allocated to undertake the PSMs professionally. Further on in this publication, more will be said about the need for an association between the Consultants and local Consultants or institutions, with the aim of enhancing their capabilities to deal with the sociocultural aspects involved in many of the PSMs.

Under the following nine headings, different types of support measures are discussed. Overlaps with other sub-Chapters of Chapter 8 cannot be avoided because of the complex nature of the factors involved and the measures by which they may be addressed.

The Content of Project Support Measures

The following is intended to serve as examples rather than specific guidelines.

(1) Law and standards

The legal prerequisites for projects for environmental sanitation may include some or all, but are not necessarily limited to, the following; and, where they are lacking, they may be developed through a PSM in order to address:

- The rights and obligations of the owner of the dwelling regarding the on-site or off-site disposal of wastewater and nightsoil.
- The rights and obligations of the municipality and, as appropriate, private contractors for handling waste disposal.
- The establishment of rates and tariffs for environmental sanitation, and of other means for the recovery of costs by the municipality or a nongovernmental organization and/or private contractor.
- The discharge of wastewater and nightsoil into the environment.

Legal requirements may either be embodied in general public law or may be contained in enabling legislation, municipal codes, law or regulations pertaining to public, private or semi-private organizations for environmental sanitation, or they may be added to public health law or regulations — whatever suits the situation best.

Other types of standards may also be needed regarding technology and operation and maintenance, e.g. standards and/or standard designs for on-site facilities and their location, technical standards for sewerage systems and treatment works, and environmental standards for the discharge and re-use of effluent and/or graywater and sludge from on-site systems. Standards may be needed for charges for environmental sanitation and their equitable structuring — taking into account the problems of low-income populations in paying for sanitation. (See Annex 2)

(2) Policy

At the policy level, each country will choose a different approach and, depending on its administrative structure, will allocate responsibilities for sanitation to the central, regional or local levels, or to a combination thereof. Policy for environmental sanitation may be part of the country's overall policy, or it may be sector policy related to water supply and sanitation, or to water resources, health, public works, environment, infrastructure, housing or a combination among them. Policy may address a variety of subjects, and if one or several are still open to question, a PSM should develop suitable proposals, e.g. for:

- The funding and funding mechanisms (including subsidization, tax breaks, *etc.*) of environmental sanitation both off-site and on-site, including such fundamental matters as the funding of privately owned on-site units, or of house connections to a public or private sewerage system.

- The distribution of responsibilities for construction and operation and maintenance among the participants, i.e. the beneficiaries, the municipality, and/or various levels of government.

- The empowerment of communities to manage systems, with backup from higher levels of government.

- Cost recovery and, as appropriate, charges and tariffs to be levied on the beneficiaries, taking into account their income levels.

- Private sector roles.

(3) Institutions, especially the implementing agency or organization

Institutional development is high on the list of PSMs for projects for environmental sanitation in most developing countries. Existing institutions are often inadequate or responsibilities are not clearly defined, or there may be a multiplicity of overlapping responsibilities. Without effective institutions, projects cannot be promoted, planned, implemented and managed.

Consideration may be given to PSMs for:

- Making proposals for the tasks to be faced, the functions to be carried out, and the resources needed by the institution, in the context of the project proposed, with particular emphasis on the implementation agency or organization.

- An assessment of existing institutional and managerial capacity for handling the project proposed, and on this basis the elaboration of proposals for establishing new institutions and/or mechanisms at the most suitable level, as appropriate.

- Assisting in the implementation of such proposals, including the drafting of by-laws, designing procedures, and assisting in the buildup of capacity to implement them.

- Making proposals for and undertaking training with respect to the supervision of and/or technical support to the beneficiaries in the discharge of their functions within the project.

- Making proposals and developing procedures for the licensing and supervision of private contractors, e.g. for local production and construction, and for the servicing of on-site systems and the disposal and re-use of effluent and/or treated nightsoil.

- Elaborating procedures and providing training with respect to the planning of extensions.

(4) Operation and maintenance

O&M is one of the most critical aspects of the management of sanitation projects both off-site and on-site. All parties must be involved, i.e. the beneficiaries, the implementing agency or organization, the municipality, and the appropriate government institutions at the local, regional or national levels.

The distribution of tasks between the parties is of particular interest in the design of a PSM. Naturally, off-site systems, with their more sophisticated technology, lend themselves to primary action by the implementing agencies, without precluding any action by the beneficiaries. On-site systems will normally be more suited to action performed by the beneficiaries themselves, since they will be the owners of the systems in many cases. Thus, in the design of PSMs for O&M, the following may be used as general guidelines (see also the discussion of participation under (6)):

- For the beneficiaries and/or owners, overall:
  - Information must be provided related to O&M requirements and to their own functions, with training supplied,
  - Supervisors from local and governmental organizations should supply technical support , including visits, and
  - Eventually, financial incentives need to be arranged;

  In the case of on-site systems:
  - Beneficiaries must be informed and trained in the specific requirements of operation and maintenance of on-site systems; and
  - Technical support must be provided.

  In the case of off-site systems:
  - beneficiaries must be informed, and training provided on the specific characteristics of off-site systems and their implications for O&M;
  - Technical support, supervision and monitoring should be supplied relative to the performance of the tasks the beneficiaries must perform.

  In both cases:

- Dumping of garbage and other unsuitable materials into the system must be prevented.

- For the operating agency of off-site systems: information and training of agency personnel; building capacity for system inspection, O&M and replacement, laboratory analysis; establishing technical and management procedures and systems for record keeping; and establishing stores and the procedures to use and manage them — all with the aim of:

  - Establishing and keeping up-to-date inventories of all physical facilities.
  - Monitoring the conditions of house connections.
  - Monitoring the physical conditions of sewer pipes and appurtenances, and keeping them in good operating condition.
  - Keeping sewage treatment works in good operating condition.
  - Monitoring the performance of sewage treatment works and the disposal of residues, in keeping with health and environmental standards.
  - Timely replacement and/or renewal of parts and components of the system, and keeping stocks in adequate quantities.
  - Planning of repairs and rehabilitation of defective components.

- The strengthening or creation, as appropriate, of services for operation and maintenance, either as part of governmental or community structures, or as a private-sector service establishment.

- The strengthening or creation, as appropriate, of technical support capacity and structures to assist the community and/or the beneficiaries in the tasks they will assume for operation and maintenance.

(5) Cost recovery

A scheme for cost recovery is needed for all projects if only to recover the costs of operation and maintenance, irrespective of whether they are initially funded or partially funded by ODA loans or Grant Aid.

PSMs are needed in most cases, early during project planning and design, to:

- Study the willingness to pay.

- Elaborate proposals for equitable rates and tariffs covering the costs of operation and maintenance, at least.

- Promote the acceptance of rates and tariffs by the beneficiaries.

- Build capacity in the operating agency to apply and collect the charges in accordance with the rates and tariffs proposed.

- As applicable, develop proposals for funding and recovery of costs of on-site units for graywater and nightsoil disposal, and of house connections to off-site systems which may have been funded from project loans or Grant Aid.

(6) Participation of the beneficiaries

The experience gained during the International Drinking Water Supply and Sanitation Decade has demonstrated sufficiently that (i) all projects for environmental sanitation must involve the participation of the beneficiaries, and (ii) most projects must include a software component to promote, facilitate and bring about that participation. No uniform approach for the planning and implementation of this software component has been evolved, nor is the matter as yet fully researched. Indeed, the promotion and facilitation of participation is one of the thorniest subjects in the planning of all projects of environmental sanitation — for, basically, four reasons:

- The beneficiaries are not aware of the negative impact of environmental sanitation on individual and/or public health, and thus are reluctant to participate.

- They give environmental sanitation a lower priority in their family budgets than other basic services, including drinking water supply.

- The high cost of off-site disposal.

- In the case of on-site systems, the reluctance of the beneficiaries to invest money themselves for the construction and maintenance of the required facility.

There is a general agreement that participation is a "must" in rural areas where on-site systems are the "appropriate technology", because experience abounds that in such cases local or governmental organizations are unable to successfully cope with either construction or with maintenance of the hardware.

This is less clear, however, in the case of urban areas and off-site systems; these, it is generally believed, should be the responsibility of the local or governmental organizations because of their technical complexity and managerial and financial requirements. This view is not correct, however; the successful construction and O&M of off-site systems also depend on the participation of the beneficiaries, although of a different kind. The parameters

of this kind of participation are still to be worked out through study, research and experimentation.

Thus, for the promotion of participation, all projects for environmental sanitation should include PSMs. The content of the PSMs must fit the specific target groups. On the one hand, there are no general suggestions as regards their content, but there are guidelines for undertaking the social studies which will provide the basic information for designing the PSMs (see also Annex 5). On the other hand, there is agreement that the PSMs should help to achieve the following objectives:

- They must raise the level of understanding of environmental health and of the prevention of communicable diseases through health education. In this context, health education should not be looked upon as an end in itself. On the contrary, health education should, ultimately, raise the level of motivation of the beneficiaries, especially of the women, who have the key role within the family in matters of health and of environment generally. Thus, health education should first promote hygienic behaviour at the level of the individual and the family, then in the environmental care of the neighborhood; eventually, it must facilitate participation — along with other members of the community — in the planning and implementation of a programme or project for sanitation.

  It must be borne in mind that it is women who are responsible for the upbringing of children, including their hygienic habits. However, women also do all of the cooking, cleaning and laundry; and, as well, in many countries they do much of the farming and other manual labour — all this in addition to their reproductive role. Their workload is crushing, their health strained or failing, and so finding the time and energy for hygienic training of each of many children is not at all an easy matter. Any provision of amenities that will lighten their workloads rather than increase them, or improve the state of their health, will increase their willingness or even ability to provide improved hygienic training. Motivation by itself only goes so far and no further; time and energy are essential requirements.

- In particular, PSMs must provide information on the health problems associated with inadequate sanitation, and on the benefits that can be derived from improved sanitation.

- Information on technological options available for the programme or project should be made available. The objective would be to assure acceptance of the technological option chosen for the project, thus encouraging participation.

- The PSMs must identify the roles of the beneficiaries. Often, participation in kind is proposed as the best form of participation. For instance, participation in the construction of latrines and small sewer lines qualifies as such, and is often

considered essential in the case of village on-site systems. However, this is not enough for either on-site or off-site systems.

In the case of on-site systems, participation may indeed involve contributions in kind during construction. But to keep the system in good operation condition, the beneficiaries — often the owners — must also accept responsibility for the regular servicing and eventual replacement of the system, at their own expense.

For off-site systems, participation may also involve contributions in kind, e.g. during construction and in keeping house connections in good order. Normally, however, the beneficiaries accept having to pay their share in funding the cost of the system both as regards the initial costs of construction and of O&M.

- The PSMs must provide information on the initial and recurrent cost of the facilities and how they are to be funded. Here, the objective is to raise the level of understanding of the cost of environmental sanitation, with a view to promoting acceptance of the principles of cost recovery and cost sharing by the beneficiaries. This should be done in accordance with one of the methods exhibited in Annex 6.

- Participation must be organized. Most forms of it need support from a community and/or nongovernmental support structure, or perhaps from a governmental structure. The PSMs should indicate and promote the most suitable participation design in accordance with the local conditions.

(7) Local production of equipment and material

The local production of sewer pipes and appurtenances, septic tanks, latrines and soak-away components is highly desirable in the context of projects for environmental sanitation — if feasible — and also pumps, electrical and construction equipment. Possibilities should be explored during the Project Study and, if appropriate, suitable PSMs should be planned and/or carried out to facilitate local production, e.g.:

- Feasibility studies.

- Technical advice, planning of production, and preparation of funding proposals.

- Marketing assistance.

(8) General capacity building

In connection with all of the seven items presented above, the following may be suitable PSMs at both the institutional and the community levels:

- The training of technicians at all levels, focusing on operation and maintenance, general and fiscal management, supervision and technical support from local, regional or national governmental organizations, public information and health education.

- Capacity building at the levels of the community and governmental institutions, with special attention to:

  - Information.

  - The general lack of human resources.

- Proposals and assistance in their implementation, with a view to enhancing empowerment and devolution to the lowest possible level; and for accompanying policy and technical advice from the relevant government organizations.

(9) Information

Information is needed to support the planning and design of the project as well as its operation and maintenance, future extensions and evaluation. Most of the information bases are inadequate or nonexisting. The buildup of information and/or the creation of essential information bases are highly relevant subjects for PSMs, covering, e.g:

- Basic information on the status of environmental sanitation (and of water supply) in the project area.

- Demographic information, including the composition of individual households.

- Health related information, especially on infant morbidity and mortality, housing, hygiene, food hygiene and vectors and vector-borne diseases.

- Behavioral information, especially on personal hygiene, individual environmental care, health and environmental priorities, perceptions regarding ownership, and the willingness to pay.

- Information on locally available materials and on private sector potentials.

8.3.6 Costs, Economic and Financial Aspects, and Proposal for Funding

Good financial planning begins with the estimation of the capital and recurrent costs, and the costs of PSMs.

Other factors to be considered are the requirements of the ODAs and the quality of fiscal management by the implementation agency or organization.

The next step will always be a financial analysis and the elaboration of a proposal for cost recovery.

Finally, a proposal for the funding of the project can be prepared.

Capital Costs

There is no need to stress that every project proposal must be accompanied by an estimation of its costs. This is accepted engineering practice in all fields, not just environmental sanitation. To make a reasonably precise estimate, Consultants develop the project to the stage of preliminary engineering design. The estimate will take into account:

- Local unit costs of construction,
- The cost of materials and equipment locally available, and
- The foreign exchange needed to purchase materials and equipment not locally available.

The estimate is always broken down into labor and capital requirements, and the latter into local and foreign currency, and in accordance with the potential sources of funding.

Recurrent Costs

It is also standard engineering practice to estimate recurrent costs for all projects, including:

- Capital charges and amortization, depending on the funding scheme proposed.
- Costs of operation and maintenance broken down into:
  - Labor;

- Energy, chemicals, etc;
- Costs of "normal" replacements; and
- Reserve, for extending services within the time horizon of the project.

Costs of Project Support Measures

Contrary to the practice in many industrialized countries (for valid reasons which do not need to be discussed here), the estimation of costs of the project should include the cost of the PSMs discussed in Chapter 8.3.5.

ODA Requirements

Projects proposed for ODA assistance should be accompanied by information which the potential funding agency or agencies need for their appraisal (see Annex 6). Especially for projects proposed for ODA loans, the Consultants must produce data as discussed below. Grant Aid projects should also meet sound economic and financial requirements, although the depth of the analysis of the projects may be relaxed by the funding agency for the sake of expediency. Whenever Technical Cooperation Funds are sought, the need for analysis will be further relaxed, although the proposal will always be accompanied by the rationale, and by an analysis of the expected outcome and impact of the proposed activities, especially if PSMs are proposed.

The information assembled by the Consultants in the case of ODA loans will normally include:

- Is the project the least cost (total costs) alternative to attain the objectives?
- Income and expenditure; the financial plan and its reliability; sources and application of funds.
- The internal rate of return.
- The cost/benefit and cost/effectiveness ratios in terms of social opportunity costs.
- The discounted present value of benefits.

All of the above should be dealt with on a quantitative basis. This is certainly so with respect to the capital and the recurrent costs of the project itself. If some of the other information cannot be presented in fully quantitative terms for lack of information, qualitative analysis may be accepted as a substitute; however, it must be presented in the depth and detail needed for the appraisal of the project by the funding agency.

The funding of individual on-site units or house connections needs special attention if an ODA loan or Grant Aid may be involved. ODA policy may stipulate that all or most of the cost be borne by the beneficiaries. Yet, some ODAs now accept the financing of such items through short-term credits to the beneficiaries, funded by ODA loans or Grant Aid. In such cases, a governmental or a local nongovernmental institution or some sort of credit union may be established and given the responsibility for the re-lending and recovery of the funds. In the case of Grant Aid, a successful model channeled the recovered funds into a revolving fund. This fund may then be used to finance project extensions by essentially the same method or to put the project or programme on a continuing long-term basis.

Fiscal Management

The fiscal management of a project is always a critical issue, and projects receiving ODA funds will be scrutinized with a view to assessing the capacity of the implementation agency or organization to ensure the handling, application and recovery, and, as appropriate, repayment of the funds. Table 1 of Annex 6 exhibits some of the common errors in fiscal management which may be considered in the assessment, in addition to the following questions:

- Is the legal status of the implementation agency or organization compatible with the task to be fulfilled?
- Is it, especially, authorized to take and manage a loan and/or Grant Aid, make decisions regarding cost recovery, and on-lend money, as appropriate?
- Are the management structure and its capacity (including human resources) and the management procedures adequate?
- How is the implementation agency or organization and its fiscal management supervised?

Fiscal management by the potential implementation agency or organization will not be found satisfactory in many cases. In such instances, a suitable PSM may be identified and proposed (see also item (8) in Chapter 8.3.5).

Financial Analysis and Cost Recovery

All projects funded by an ODA loan and/or Grant Aid will undergo financial analysis. There are many procedures for this analysis, and the method used for a specific project will ultimately depend on the requirements of the potential funding agency or agencies. Some examples are summarized in Annex 7. General information regarding the financial analysis of projects for environmental sanitation (and water supply) is exhibited in Annex 6.

Cost recovery is partly a matter of governmental and/or ODA policy, and partly a financial and social issue. Many governments and most ODAs have opted for full cost recovery as a principle in the long run, but have also stipulated that partial recovery may be acceptable as a temporary approach, in which case the costs of operation and maintenance should always be recovered, even if Grant Aid is involved. If individual households receive credits for on-site sanitation or house connections (see previous item), they obviously must amortize the funds over a rather limited number of years (perhaps five).

Cost recovery can be achieved through a variety of techniques, foremost user charges, rates and tariffs. Social cross-subsidization maybe a matter of policy. In any case, the Consultants should propose the most appropriate scheme, taking into account, e.g.:

- The ability of the beneficiaries to pay, and the appropriateness of the charges.
- Impact and feasibility with respect to low-income groups.
- Compatibility with the financial plan for the project and the forecasts of income and expenditure.
- Compatibility with perceptions.
- Institutional capacity to manage cost recovery.

Funding Proposal

In the financial analysis of the project, the sources and the application of funds must be clearly exhibited (see Annex 7, Table 6). At this stage, a funding proposal should be developed concurrently with the analysis. It is important that this task is not deferred until the end of the Project Study. Consultations about the possible sources of funding should start as early as possible between the recipient and the ODA sponsoring the study. During the course of the study, potential funding agencies should already be approached, so that the Consultants and the recipient can investigate alternative funding proposals. In any case, a funding proposal should be part of every project proposed, and should be presented and rationalized as part of the information in the Consultants' Project Study report.

8.3.7 Implementation

In the implementation of projects for environmental sanitation, delays — originating in site factors, software activities, participation and interagency cooperation — are likely to be encountered and should be anticipated.

Consulting engineers are very familiar with the planning of project implementation, although, in the case of environmental sanitation, several special aspects must be considered. The implementation plan should include a set of organizational and implementation procedures covering the interaction and interrelationships with, and the responsibilities of, respectively, the external Consultants, local Consultants, the governmental and nongovernmental organizations involved, the contractor(s) and suppliers and importers of material and equipment. Some of the specific factors which may impinge on the implementation of projects for environmental sanitation involve:

- The interaction and procedures involving the beneficiaries, especially if they need to consent to access to their premises (when house connections are laid), if they are party to activities concerning them (e.g. information programmes), or if they are party to the implementation of hardware components of the project.

- Along the same lines, interaction and procedures with local leaders, and the local representative(s) of the recipients.

- Interaction and procedures involving other governmental organizations, e.g. environment agencies or those responsible for water supply, water resources, health, housing, infrastructure.

Hardware Components

Quite generally, the implementation plans for the hardware components of a project will cover but are not limited to:

- Construction plans and work schedules for each project component and for the project as a whole.

- The timely manufacture of equipment and materials which can be produced locally, e.g. pipes, septic tanks and other equipment for on-site disposal, pumps, and electrical equipment.

- The timely supply of imported material and equipment.

Consideration of Site Factors

For the implementation of hardware components, a number of site factors come into play, e.g.:

- Allowances for the construction of on-site and off-site systems in densely settled areas (e.g. in semi- and peri-urban areas) where access may be difficult for mechanized construction equipment and for the transport of larger diameter pipes, septic tanks, *etc.*

- Allowance for the timing of local production of new types of larger diameter pipes and on-site disposal units, including the supervision of production and the certification of the products.

- Sewage treatment works and facilities for the deposition of sludge from on-site systems may not be well known to local contractors; they may involve unknown construction technologies.

- In some cases, ocean disposal of effluent may be proposed, and the construction technology may be quite new.

Software

The implementation of software components may be rather complex. Delays may occur in the implementation of each individual component itself, but also the timing *vis-à-vis* other software components, and the hardware components themselves. Special allowances may be made in the TOR, though it would always be incumbent on the Consultants, in consultation with the recipient, to monitor the implementation of the software and to adjust timetables. The delays may be due to:

- Time-consuming procedures whenever policy matters are being touched upon, e.g. in the case of institutional development, law and standards, cost recovery *etc.* There may be long delays during project implementation in obtaining agreement to proceed further.

- Along the same lines, allowance may need to be made whenever implementation depends on the participation of the beneficiaries, e.g. in laying house connections or building on-site facilities; and also whenever the education and motivation of the beneficiaries are involved. The time needed to implement this type of software component, and the impact on the implementation schedule of the project, may be large.

- Along the same lines, the training of operating staff during the construction of the facilities may be more time consuming than expected.

- The implementation of many software components will require the participation of local Consultants, especially when policy matters are involved and when the implementation depends on the participation of local and community organizations. The foreign Consultants may not be able to control the resulting delays.

8.3.8 Expected Impact of Projects for Environmental Sanitation

> The Consultants will be responsible for assessing the expected impact of the projects in terms of, at a minimum, (i) health, (ii) the socio-economic and (iii) sociocultural conditions, (iv) future development in the sector, and (v) the environment.

The Consultants should prepare impact assessments with respect to each of the five items listed in the Box, in quantitative terms. However, under the real-life conditions of many projects, qualitative analysis may be substituted due to a lack of quantitative information. The Consultants should endeavor to make valid judgements of the impact, and also make suggestions as to the kind of data that should be assembled during the project's operation, for subsequent review of the project's performance and for post-evaluation.

Health Impact

- Of primary interest is the reduction in infant mortality and morbidity due to diarrhoeal diseases, as will be seen from Annex 1. Other positive health impacts may also be expected.

- Attention should be given to the synergistic effects resulting from conditions and/or improvements with respect to drinking water supply, general cleanliness, the removal of solid waste, stopping the breeding and propagation of flies and disease vectors, and enhancing food safety and general conditions of housing.

Socio-economic Impact

- A specific estimate should be made of the cost/benefit distribution among the target groups within the project area. Of particular interest are the cost-and-benefit implications for low-income groups and how these groups fare in comparison with other groups.

- A more general assessment should be presented of the impact on poverty, and also on the productive capacity of the target groups served by the project. The logframe analysis proposed in Chapter 6.3.4 should be taken into account.

- What is the impact on the private sector?

Sociocultural Impact

Under this heading, four assessments should be made:

- What changes in perceptions have taken place during the preparation of the project and what can be expected during implementation and subsequent operation?
- How has participation evolved and how may it evolve further during the operation of the project?
- What will be the potential impact on empowerment, good governance, and women in development?
- What impact is expected regarding vulnerable groups, especially women and children?

Expected Impact on Future Developments in the Sector

- A first assessment would address the lessons learned during the planning and design of the project and how they may be used in planning sector programmes in the future, including those for the improvement of water supply, solid wastes management, and other measures to improve general environmental hygiene.
- How is the project expected to promote replicability?
- What is the impact on the financial situation of the sector and the sector organization?
- What has been learned regarding the beneficiaries' willingness to pay for sanitation and how will this influence cost recovery in the sector as a whole?
- What is the impact on participation in the sector, including the planning for water supply and wastes management?
- How will the project contribute to private sector involvement in the sector?

Environmental Impact

Environmental assessment is normally a mechanism for avoiding a negative environmental impact due to development projects. However, all projects for environmental sanitation should make a positive environmental impact as well — be proactive. Thus, the assessment of the environmental impact should cover:

- The positive impacts on the immediate environment in which people live, and also on the general environment — by virtue of retaining pollution which hitherto has been discharged into the environment.

- The avoidance of negative impacts such as the pollution of groundwater, drinking water sources, rivers and costal areas, and the other environmental impacts covered in the ODA guidelines for environmental impact assessment.

8.3.9 Risks

> No project is without risk even if careful attention is paid to the possible risk factors during its planning and design. The risks should be identified and assessed and the options to reduce and/or prevent them studied and proposed by the Consultants. Risks may pertain to the objectives of the project, design criteria and standards, financial forecasts, implementation, O&M, and side effects. Besides the assessment of such specific risks, an overall assessment should address the severity and preventability of the risks and suggest means of coping with them.

Projects may fail for many reasons. Most frequently, projects aimed too high, operation and maintenance was insufficient, or the finances and their management were inadequate. Often, the lack of authority of the implementing agency or organization is at the root of the problem. Under the following seven headings, the most essential factors are listed that have frequently contributed to the failure of projects in the past.

Achieving the Objectives of the Project

Objectives of the project may not be achieved for many reasons, e.g.:

- Assumptions have been overly optimistic.
- Planning and design errors.
- Inadequacy of software components.
- Inadequacy of basic data.

Design Criteria and Standards

Many risks may be associated with design criteria and standards. The following can only be indicative:

- The amounts of graywater or sewage forecasted were too high. Water consumption did not grow as fast as expected.

- The number of house connections laid-on increased at a slower rate than expected.
- Technical design criteria may prove less than optimal under the conditions in the project area in terms of cost, operation and maintenance, and/or acceptability.

Financial

Cost recovery is a main concern and will always involve risks, e.g.:

- The willingness of the beneficiaries to pay for sanitation has been overestimated.
- The operating agency lacks capacity to collect charges.
- Some of the cost recovered may be diverted for other purposes.

Implementation

All of the factors reviewed in sub-Chapter 8.3.7 involve risks which must be assessed. Other factors include:

- Overruns in costs in both local and foreign currency.
- Delays in implementation because of technical, organizational and managerial factors.
- Departures from design during implementation.

Operation and Maintenance

All factors considered in sub-Chapters 8.3.3 and 4 involve risks, either technical in nature, or involving aspects of budget, management, organization, staffing for O&M, breakdowns, lack of spare parts and many others. Examples of critical bottlenecks are the irregular desludging of on-site systems, leaking septic tanks, poor maintenance of house connections to off-site systems, inadequate cleansing of sewers and appurtenances, unsanitary tipping stations for nightsoil, the re-use of effluent and ocean disposal.

Side Effects

Side effects may be environmental, sociocultural and/or organizational, e.g.:

- Negative impacts on the environment due to effluent of on-site and off-site disposal.
- Risks associated with the re-use of nightsoil and treated effluent.

- Sociocultural risks, e.g. nuisances in neighborhoods.
- Disease outbreaks whether or not actually caused by the project, e.g. a suspected connection with tipping stations for nightsoil, the re-use or the ocean disposal of effluent.
- Complaints or interference by other sectors or sector projects.

Overall Assessment

Each risk should be appraised as regards:

- Severity, e.g. low, medium or high.
- Preventability, e.g. high, medium or low (or even none).
- Means to cope with the risks, e.g.:
  - during planning and design of the project;
  - during implementation and/or operation.

9

The Management of Project Studies

There are two objectives in the management of project studies in international cooperation — the management of the whole process by the ODA, and the management of the work undertaken in the recipient country by the recipient and the Consultants themselves. The two management functions are interdependent, must compliment each other, and are no less important than the quality of the study itself. In devising effective management, the following aspects must be addressed, i.e.:

- The ODA and the recipient negotiate the SOW and TOR and agree on the objectives of the project and the study, including its cost, funding and budgeting. The ODA selects and supervises the Consultants in consultation with the recipient, as appropriate.
- The recipient links the study to subsequent investment decisions, with the participation of the ODA, as appropriate.
- The Consultants and the recipient ensure that the study will be a participatory process and involve all parties. They further arrange coordination and cooperation with other studies undertaken in the project area and/or in the environmental sanitation sector.

9.1 Japanese Experience

> Flexible and effective Project Study management is promoted by JICA, mainly by enhancing the authority and management ability of the study team.

Many parties participate in a Project Study, and their respective functions and responsibilities, their interactions during the whole of the process, and their management of each step all need careful attention. Japanese Project Study management, especially in the past, tended to focus on the technical aspects and the coordination of the Japanese team, whereas the coordination of the interactions with any other participating party was usually vested in the recipient. The current management process aims to avoid:

- Possible misunderstandings and misperceptions.
- Expectations on the part of both the recipient and the ODA which cannot be fulfilled.
- Lack of cooperation by the executive organization, local government, and/or the people in the target area.
- Social and cultural misjudgments.
- Inconclusive results, leading to a lack of followup investment.
- Delays, and over-runs in the costs of the study.
- Adverse repercussions within the ODA/recipient relationship resulting from any of the above.

JICA adopted the following approaches principally to avoid these problems:

- Clear and convincing procedures must be established for the study and for the evaluation and implementation of the project, and the agreement of every participant is to be obtained regarding the study, and the project, through the SOW.
- The TOR is to stipulate that the Consultants must coordinate their work with all of the concerned parties, not only the Consultants' Project Manager, but also all staff of the other involved parties.
- In the case of complex and difficult studies, the Consultants' Project Manager concentrates on management tasks, whereas Sub-project Managers are assigned the usual technical tasks, e.g. study coordination, report writing, technical advice to the project staff, *etc.*
- Communication among all concerned parties is promoted through tools such as TV and radio programmes, videos, brochures with graphics and text, and newsletters.
- To avoid cost over-runs, the selection of the Consultants is based on the technical proposal they are requested to submit, on their overall ability, and on the composition of their staff. The total fee requested will be considered only whenever the two best proposals are of the same quality, or if the best proposal is substantially more expensive than the second.

Good management of project studies will anticipate and cope with the risks inherent in every Project Study supported by an ODA in a developing country. Past experience is monitored by JICA and used with the view of adapting procedures to changing conditions.

9.2 Experience of Other Aid Organizations

Before agreement is reached to undertake a Project Study, in-depth and detailed discussions take place with the recipient, and the responsibilities of each of the participating parties are carefully delineated.

The selection of the Consultants is based on the technical quality of their proposals.

Monitoring of the Project Study and linking it with followup investment are of particular concern.

9.2.1 The Preparatory Process

In-depth discussions take place with the recipient before a Project Study is agreed upon. This is often a time-consuming process and may involve several missions to the country to review and discuss, *inter alia*, sector policies and needs, the relationship of the proposed project to other projects, the country's development priorities and programmes, and whether or not preliminary studies are still needed before the Project Study. By the time the SOW is approved, all parties involved will have a good understanding of the objectives, and of the depth of the studies and investigations to be undertaken. They will also have agreed upon the distribution of responsibilities among themselves, coordination with other agencies both national and external, and with the potential funding agency or agencies.

9.2.2 The Selection of the Consultants

Only exceptionally are studies contracted without a call for a limited number of competitive technical and financial proposals from a number of short-listed Consultants. The selection of the best proposal is based on its technical content and the qualifications of the Consultants' staff assigned to the study. The price attached to each proposal is considered if two proposals are of equal quality otherwise.

9.2.3 Responsibilities

A clearly defined role for the recipient is considered to be essential in the management of the study, although the other organizations retain controls to ensure that the studies are still compatible with their own development goals and sectoral policies. The recipient's role may relate to drafting the TOR, short-listing and inviting Consultants to submit proposals, and contracting and supervising the Consultants selected.

The organizations approve the TOR and may *de facto* write them; they analyse or approve the estimation of the cost of the study, and approve the invitation to submit proposals, which the recipient then issues.

The organizations also:

- Review, comment upon (as appropriate) and approve the recipient's analysis of the proposals received and their suggestions for the selection of the winning proposal. In so doing, they may not only express views but may ask for clarification and/or additional information from the recipient, if the case so warrants;

- Approve, where the recipient is involved in the drafting, the contract with the selected Consultants, including the plan of work, the conditions of payments, reporting schedules, and the procedure for the acceptance of the Consultants' final report and project proposals; and

- Receive copies of all reports submitted by the Consultants in draft form — they are normally addressed to the recipients — together with the recipients' comments thereon.

9.2.4 Monitoring

Most of the other organizations independently monitor the study on-site. A senior technical staff member of the organization, often an engineer, is designated as Project Officer by many of the organizations, and given a large degree of authority in the discharge of this function. The Project Officer proposes whether/when to intervene and to what degree other specialized staff of the organization (e.g. economists, financial analysts or social scientists) or outside specialists should be involved in the monitoring of the study.

9.2.5 Followup Investment

Linking project studies with subsequent investment decisions is an important concern of all of the other organizations. Special arrangements are made for the participation of the potential funding agency or agencies in the preparation of the TOR and the short-listing of the Consultants, and in the monitoring of the progress and outcome of the study.

9.3 Discussion

Cooperation between all parties involved in the study is essential.

The SOW and TOR require special attention during the preparatory phase of the study.

The costing of the study is based on the TOR. For the selection of the Consultants, a wide gamut of technical and managerial information is required.

The participation of the potential funding agencies is desirable at important stages during the study.

9.3.1 Cooperation Between the Parties Involved

Close cooperation between the beneficiaries, the recipient, the ODA and their Consultants, and the potential funding agency or agencies will:

- Establish the mutual trust required to study and address the needs for environmental sanitation at the levels of the family, the neighborhood, and the community.
- Facilitate decision-making with respect to the choice of technology and the financial and managerial responsibility of each party during implementation and subsequent operation and maintenance.
- Facilitate "learning by doing" — especially as regards the broad implications of environmental sanitation for the family and the community, but also for the local and national government sectors and institutions involved.

Among the major roles which might be played by each participant, the following cannot be more than a general framework, since each ODA will follow its own procedures:

The beneficiaries: They are consulted during the negotiation of the SOW and participate from the early phases of the study, especially as concerns the basic features of the project, the design criteria and, of course, all studies and investigation involving themselves.

The recipients: Their role in the overall management of the study is important from many points of view, e.g. ensuring compatibility with existing policy and procedures, making the best use of their

experience, providing training and learning experience, laying the groundwork for followup after the completion of the study, and for promoting the sustainability of the project. In this spirit, the recipient will contribute to the SOW and TOR, and be involved during the planning of the work of the Consultants and throughout the implementation of the study. This involvement will also indicate whether or not the management capacity of the recipients is adequate or might be enhanced by the addition of suitable measures for capacity building during the course of the Project Study.

The recipients are also responsible for providing input on the part of the government, the community and the individual in terms of baseline data, local studies, counterpart funding, materials and equipment, and human resources. They are further responsible for arranging coordination and cooperation within the sector and with other sectors, and they take part in monitoring the project, together with the ODA.

The ODA:

The ODA decides on its input into the SOW and TOR. It has the final responsibility for the short-listing, selection and contracting of the Consultants and for their supervision during consultation with the recipient, as appropriate. The ODA monitors the Project Study and arranges coordination and cooperation with other ODAs and the agency or agencies likely to fund the implementation of the project.

The potential funding agencies:

They may be consulted during the process of selecting the Consultants, as appropriate, and may wish to participate in the monitoring of the study.

9.3.2 During the Preparatory Phase

SOW

Each ODA will follow its own policy in formulating the SOW. Since the SOW lays the ground for the Project Study, it should be detailed. A well-formulated SOW will facilitate the drafting of the TOR, help avoid misunderstandings during the course of the study and, accordingly, help avoid subsequent disappointments on the part of either the recipients or the ODA itself. Therefore, special studies and investigations, and subjects requiring research, should be identified in the SOW — as well as, of course, the type of technical, financial and managerial recommendations expected from the Consultants. It is also important that the

SOW lists the contributions to be made by each participant, the distribution of their roles during the study, and the strategies for the study's implementation.

TOR

The TOR will be the basic document for the work of the Consultants. It is advantageous to make it part of their contracts. The TOR are formulated in consultation with the recipient, and in a language which they share. That way there is prior agreement as to the scope and depth of the work of the Consultants, and a well-written TOR will facilitate later implementation. The TOR should include the details needed by the Consultants to prepare proposals, plans of work and staffing charts for study, while leaving them considerable flexibility to exhibit their technical approaches and management procedures. Further, the TOR should set out payment procedures in both local and foreign currency, and list any other requirements on which the ODA will base its selection. Thus, it is a responsibility of the ODA to prepare a tailor-made TOR in accordance with the objectives and scope of each specific Project Study. The use of standard TOR is not recommended, nor is it useful to overload the TOR with administrative matters that might better be placed in the more prosaic sections of the Consultants' contracts. As can be seen, the elaboration of the TOR is a professional task.

9.3.3 Costing, Funding and Budgeting of the Project Study

Each Project Study is costed on its own merits. Basic parameters for the estimation of the costs in both local and foreign currency are:

- The TOR.
- The personnel and time required to complete the study.
- Equipment and supplies.
- Sub-contracts, e.g. for research or supplementary investigations.
- Home office support to field activities.
- General overhead.

Costing may need to be adapted to the method of funding of the study.

On the basis of the estimate, the budget for the study can be established. Normally, it exhibits a balance between the ODA contribution and the contribution of the recipient — covering, as appropriate, cash contributions, equipment and materials, data and information, studies and research, and human-resource inputs.

9.3.4 Information for the Selection of Consultants

With few exceptions, the selection takes place on the basis of proposals from a limited number of short-listed firms. In the short-listing, the following information is taken into account:

- Overseas experience of the Consultants in environmental sanitation.
- Ability of the Consultants to apply the multi-disciplinary approach needed for planning and designing projects for environmental sanitation.
- Ability to deal with the socio-economic and sociocultural aspects of the Project Study.
- Ability to respond to the requirements of the potential funding agency or agencies.
- Ability to cooperate with the beneficiaries in the spirit of participatory planning.
- Ability to associate with local Consultants and institutions.
- Qualifications of the Consultants' senior technical and managerial staff.

Based on the TOR, the short-listed Consultants are invited to submit a technical proposal which would exhibit, e.g.:

- The Consultants' experience with similar studies for similar projects for environmental sanitation.
- A full understanding of the TOR.
- The professional approach required to implement the TOR with thorough attention to all aspects of the project.
- The management plan of the Consultants, including explicit responsibilities of their local and home-office staff and senior officers, arrangements for home-office support, and managerial arrangements *vis-à-vis* local Consultants.
- The plan of work and a timetable, including distribution of work between the field level and the home office.
- Proposals for association with local Consultants or institutions.
- Staffing of each component of the study both at the field level and at the Consultants' home office, with an indication of staff time allocated to each component and the qualifications of each staff member involved.

- The Consultants' internal management of the study, including home office and senior specialist backup to the field.
- Reporting.
- The total fee.

The selection is made on a technical basis rather than on the price of the proposal.

9.3.5 Monitoring, Evaluation and Appraisal

Good management of the project studies and their subsequent appraisal by the potential funding agency call for effective monitoring and evaluation. Plans for this phase should be made when the SOW is negotiated with the recipient.

Monitoring and evaluation of the study will relate to the objectives of the project and will be facilitated by the logframe analysis that has been discussed in Chapter 6.3.4. The logframe matrix should always be the basis for designing the content and process of monitoring and evaluation. By the same token, the criteria for subsequent appraisal of the project by the prospective funding agency or agencies should further guide the design.

A desirable approach might be:

- Monitoring and evaluation should always be undertaken with professional participation as regards the technical aspects of the study and its management.
- A useful model is the appointment of a panel of specialists who will regularly visit the study both in the field and at the consultant's home office, as appropriate, together with staff from the sponsoring aid organization. They will report to both the recipient and the sponsor, especially for larger projects. The participation of international specialists is appropriate whenever the subsequent funding of the project involves international funding institutions.
- Clear TOR for the panel are required for each case, and members must be fully conversant with ODA policy and the criteria used by the potential funding agency or agencies.

9.3.6 Linking the Study with Technical Cooperation and Subsequent Investment Decisions

Possible linkages of the study with Technical Cooperation is important, as discussed in Chapter 8.3.1.

The Project Study should lead to followup investment. As exhibited in Chapters 4 through 8, this calls for innovative approaches. To reduce the risks for misjudgements, it is advantageous to "touch base" with the potential funding agency or agencies at certain critical points, such as during the preparation of the TOR, in the short-listing of Consultants, and in the periodic monitoring and review of the Project Study and the Consultants' final reports.

The ODA and the recipient therefore explore — as early as possible — which agency or agencies are likely to fund the project, and ascertain their willingness to participate during the Project Study in the manner indicated above — without commitment at that time, of course.