REPUBLIC OF KENYA

MINISTRY OF LOCAL GOVERNMENT

LOCAL AUTHORITY DEVELOPMENT PROGRAMME

GUIDELINES: MANUAL TWO

Feasibility Studies

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How to be Successful

We all make mistakes from time to time, but consider these:

- An expensively-built market stands half used.
- A slaughterhouse is hardly ever used.
- A bus park costing four million shillings has never been used.

These are actual examples of projects that have gone wrong. Mistakes have been made which are very expensive for everyone. We all say "that wouldn't happen here", but it does. And when it does, we are all blamed for the mistake.

But sometimes, the opposite happens. A project is developed that is so successful everyone says "why didn't we do it before?". It helps the council, it helps the public and it helps the users.

This manual has been prepared to help all of us prepare projects that succeed - by preparing feasibility studies. You will find that by preparing a project carefully you can find out in advance what the real problems can be, and solve them before it is too late. It will help you and all your colleagues to succeed at your job, and will make it more enjoyable.

Some of the procedures used in the manual may not be familiar to you. If you find any difficulty using them, please contact the Ministry of Local Government for assistance.

HOW TO USE THIS MANUAL

The manual is written to help you:

- o First, to explain the concept of a feasibility study.
- o Secondly, to give you check lists and guidelines that will help you when you are doing feasibility studies.

The manual is organised along these lines.

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We are producing other manuals in support of this one, which give guidance on specific projects - e.g. bus parks and markets. As the need arises we shall be producing more.

A SPECIAL NOTE ABOUT HOUSING

As the procedures to be used in preparing housing projects are different in several ways from non-housing projects, this manual should not be used for housing projects. A separate manual is being prepared for that purpose.

Case Studies

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PART 1:
Case Studies

The Market that Died

It was a hot December day. The Town Clerk had just finished preparing the agenda for the next Finance and General Purposes Committee. He was feeling exhausted and was preparing to go home, when Councillor Kitui burst into his office.

"I want you to put up a proposal to the next Council Meeting . . ."

"Sorry to disturb you, Mr Town Clerk, but I wanted to ask you to put up a proposal to the next Council Meeting. You know how many times I have asked for development in my Ward, but I have been a Councillor for three years and have done nothing. Yesterday I had a deputation from the hawkers who complain that they have been harassed by the askaris, but have nowhere else to go. Let us build a market for them. I have got to show that I can do something for them."

The Town Clerk sighed. He had so many requests like this, but he had to show that he was willing to help the Councillors. He picked up the telephone, and summoned the Treasurer.

"Treasurer, can we find any money for a new market in Shauri Yako Ward?", he said.

"As it happens", said the Treasurer, "we had a large surplus on our main market last year, and I understand that we might be able to get some extra funds from the Local Government Loans Authority. I think we can do it."

The Town Clerk was amazed. He hid his suspicions that the Councillor had already set this matter up with the Treasurer, and said "I will add the matter onto the Agenda for the F & G P committee, and we will see what it decides."

The proposal went through the committee and the Council without any objections. The Town Clerk the instructed the Town Engineer to look for sites and design the building.

The Engineer hesitated. "I cannot design a market unless I know how many stalls, what type of stalls, what type of services are required, whether it is to be a covered market, and so on," he said, "the Council

must decide on those matters before I start the design."

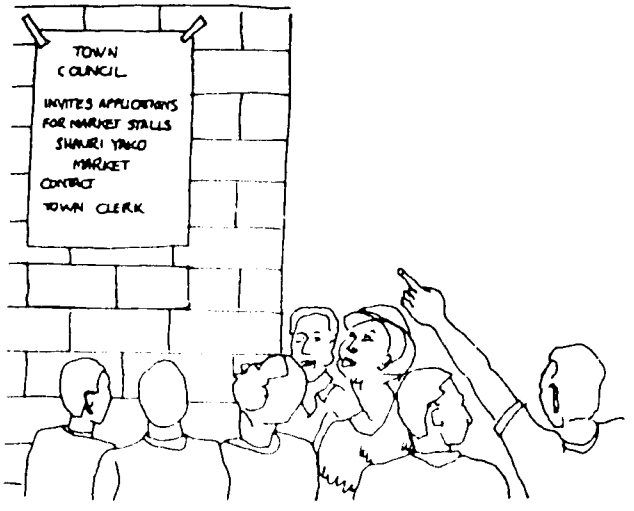
The Town Clerk thought hard. Of course, he thought to himself, we will have to find out how many stalls are needed. I will advertise for applications.

****

In Shauri Yako itself, John Murang'a was going home after work when he noticed a crowd standing around a poster. It read

"The Town Council invites applications for stalls in the proposed Shauri Yako market. Forms are available at the Town Hall."

After the meal was finished, his wife Mary said "Our money is finished: I had to buy school uniforms for the children, and I don't have anything left for food this month. Can you give me more?"



John noticed a crowd standing around a poster

"Of course", said John, "but I have got an idea. Make your own money. They are going to build a new market near here: you can get a stall and keep us going. Why don't you go to the offices tomorrow and get a form?"

Mary did as John suggested, and sent in the form requesting a stall to sell vegetables.

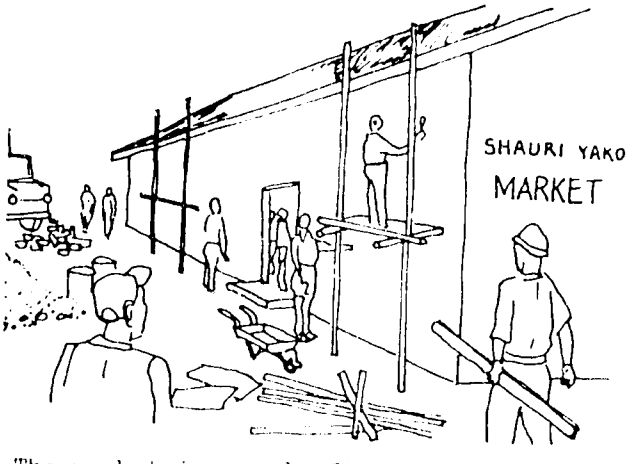
****

The Town Clerk was delighted with the response. There were over 200 applications. "I had no idea," he told the engineer, "that there was such a demand for market stalls. I think this market is going to be a big success."

The Council thought the same. It ordered an immediate start on a market of 200 stalls. The Chairman commented that this would make it the biggest market in northern Kenya.

****

When the market was nearly finished, Mary received a letter from the Treasurer asking her to pay a deposit of shs 500 for her stall, and informing her that the stall fees were ten shillings a day. She was horrified. If she did not make a success of her stall



The market is nearly finished

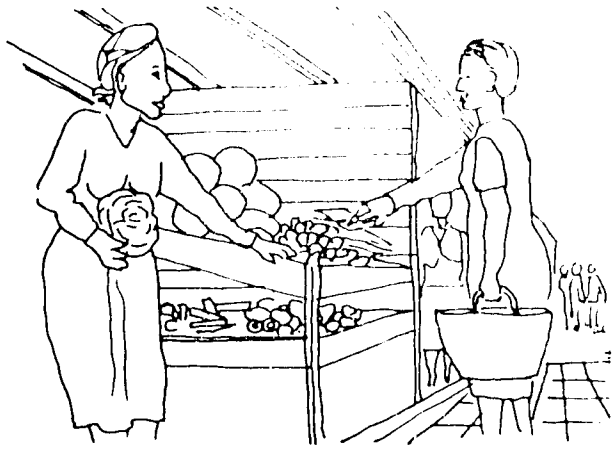
she would loose a lot of money.

She asked John what to do.

"Give it a try" he said, "if you do not take this chance, you may not get another."

She paid her deposit and waited anxiously for the opening day.

When the day came she got up early, and eagerly bought a wide range of vegetables from the wholesalers. Within a few hours the market was full of buyers, and trade was good. When she counted out the money at the end of the day she found she had made shs 20, had about half of her fruit and vegetables left over. Even after paying the rent she had made a little money.



The market opens . . .

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Many buyers came during the first week, but as the novelty of the new market faded, so did the number of customers.

On some days Mary found that she had sold almost nothing. She became very depressed, and told John that she wanted to give up the stall. He would not hear of it.

"Don't you see", he said, "it is early days. Before long people will get used to buying there, and you will make lots of money."

By now Mary was regularly having to throw away fruit and vegetables that had gone bad because she could not sell them. After a while she stopped even buying anything except sukuma wiki cabbages and onions. If a customer asked for anything else, she had to send them to the main market, as none of the stalls were doing well.

Mary told John that she could no longer keep it up. She would have to borrow money to buy from the wholesaler, and did not want to do that. She wanted to give up the whole thing.

John was furious. He accused her of wasting money . . .

At first he was furious. He accused her of wasting the money, of using it to buy drinks, or of selling goods too cheaply, or of being lazy, and not actually being at her stall all day. But she explained that other marketeers were having the same difficulty and he began

to calm down.

"If you give it up you will loose your deposit," he said. "I know," she said, miserably, "but that is better than loosing even more money."

He had to agree, and the next day she went to the Market Master, and told him that she was not going to rent a stall any longer.

****

A few weeks later, in the Town Hall, the Market Master was making his report.

> I have to inform you that we have had many withdrawals from the market. It appears that it is too big, and there is not enough trade for so many stalls. Although the marketeers loose their deposit if they do not rent for a whole year, we shall loose a lot of money if this continues.

****

Meanwhile Mary has had a visit from two other woman who had given up their stall in the market. They discussed why the market had failed.

"You see", said Annie, "when the Council was deciding where to put the market, they chose a place which is too far from the shops and houses. All they looked for was a piece of empty land. No one goes near the market unless they need to buy vegetables, and many people prefer to get them in town."

"I think", said Grace, "that we would have been all right if the fees had been reasonable. We didn't need to have such a beautiful building just to sell vegetables in. To me shs 2 a day would have been all right: then I could have made almost shs 250 more every month. What a difference that would make."

"I have an idea", said Mary, "why don't we sell in the streets? Now we know about how to buy and sell vegetables and fruit, we can sit in the street, near the shops and bus stops, and sell there. We will not have to pay rent, and many people will see our goods and will want to buy."

The market master makes his report . . .

****

John was shocked by the idea of his wife sitting on the ground in the street selling, but she was adamant.

"You were right, John, I need to make some money, otherwise we cannot survive. Leave it to me, and you will see what I can do. Just lend me a few shillings to start me off again"

****

The Town Clerk and the Town Treasurer studied the figures.

"When we had that money in the bank", said the Town Treasurer, "we were getting good money from it. Now we have spent in on a market we are getting nothing. What can we do?"

"We will have to report it to the Council" said the Town Clerk, "and ask them to encourage people to use it more."

****

Mary, Annie and Grace set up as they had planned. Often they were chased away by the askaris, who told them to go and trade in the market. They just laughed: they were making between shs 20 and shs 30 per day each, and every day it got better. Even if occasionally their vegetables were seized by the askaris, they were doing much better now.

****

The Councillors were angry.

"You should have advised us", they shouted at the Town Clerk,"to build a market that is the right size. Just because two hundred people want stalls, does it mean that there is enough trade for two hundred stalls? Of course not. What stupidity."

"You should not have made it so expensive", they shouted at the Town Treasurer, and

"You should have built it in a better position" they shouted at the Town Engineer.

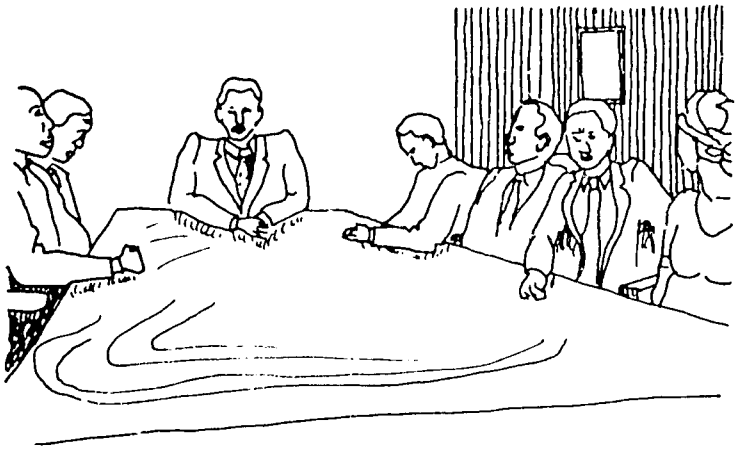
The Town Clerk and the Town Treasurer study the figures . . .

Mary sets up as she had planned . . .

"You should be able to prevent selling vegetables in the street" they said to the Enforcement Officer.

About a year later the Treasurer made the following report to the Council which was accepted.

> You will recall that we spent shs 5,000,000 on the construction of this market. After we have paid interest on the money we borrowed on the project and the salaries, we are making a loss. I recommend that we close the market, and consider putting the structure to an alternative use. Following advertisements in the press, I have had an offer from an industrial co-operative to buy it for shs 4,000,000. Their offer is based on a professional valuation of the property for industrial use, and I think it is unlikely that it will be bettered. The other offers we have received have been much lower. I therefore recommend that we accept the offer, after following all normal procedures. Even though the Council will have lost money on this project we have learnt some useful lessons and the site will be put to a use that is beneficial to the community as a whole.
>
> RECOMMENDED
> That the Shauri Yako market be closed as from the end of this month, and that the site and buildings be sold to the Jua Kali Co-operative Society for the sum of shs 4 million.



Case Study 2: The Bus Park

"And I promise you", said the Minister, "that Government wants to see this place develop, and will help it. As part of the District Focus policy I have been assured that you can have up to shs 7 million in the next financial year."

****

"And I promise you", said the Minister, "that Government wants to see this place develop."

"Look here", said the Mayor to the Town Treasurer, "they are making a profit of one million shillings in Kentowna bus park. We don't even have one. Let us use half the money on that, and the other half on housing. I must have housing put up while I am in office in this town."

Research was begun. How much would a bus park cost? Some said it would be at least shs 5 million, others said 2 million was enough.

There was no Town Engineer to advise. They had tried to recruit one for years but could not attract the right person.

"We shall appoint a consultant", said the Town Clerk. "In fact the same consultant who designed the bus park that the Mayor admires so much."

This was done. The consultants met the Council on several occasions to discuss Council's requests. There were many ideas. A cafeteria, offices for the bus companies, seating sheltered from the wind and rain, etc.

Three months later the design was presented. There was little doubt: it was what the Council wanted. Plenty of room for expansion, good facilities, and beautiful designs. It was magnificent.

The consultants pointed out that the design was almost maintenance free, so that even in twenty years it would be as good as new.

Without further debate, the Council instructed the consultants to proceed with the working drawings and get the job out to tender.

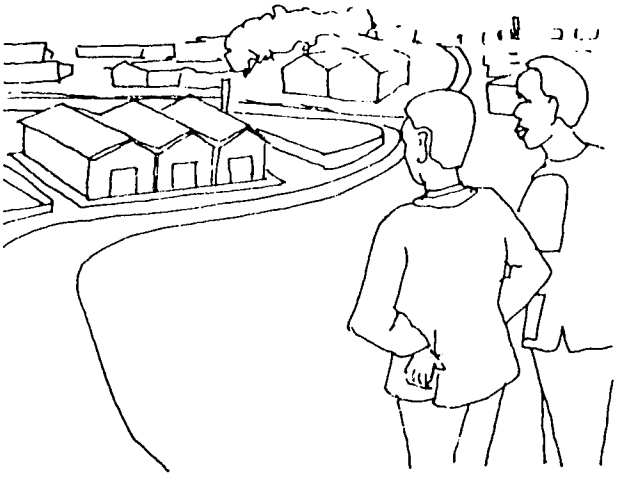
The consultants present their design

By coincidence, the Public Service Commission notified the Council that they had succeeded in recruiting a Town Engineer, who would be starting within one month.

When the new Town Engineer arrived his first request was to be informed about all the on-going projects. He was immediately shown the drawings for the new bus park, and the consultants' report.

He asked to be shown the site.

When he saw it, he was appalled. It was more than one kilometre from the road that buses and matatus were using into and out of the town, and even further from the market and shopping centre. He went to the Town Clerk.



When he saw it he was appalled . . .

"I have been shown the site for the bus park. I hope that this is not the final selection, as it seems to me unsuitable. You will never get buses to stop there. We had a similar problem in the last town I worked in, and, believe me, if a bus park is in the wrong place it will be a failure."

"We asked the consultants", replied the Town Clerk, "to select a site. They told us that we should find a site big enough for future needs and there was nothing suitable nearer the centre. What choice have we?"

The Town Engineer said nothing. He spent the whole of the next day checking the consultants' work. Were their costs reasonable? What other sites were there? He went to see the Town Treasurer.

"What", he said "would be the monthly repayment on a loan of shs 5,000,000?"

"And what", he said, "would be the entry charge, and the operating costs etc for the Bus Park?"

Together they worked it out. To find out possible charges they telephoned colleagues in other Local Authorities. They worked it out that unless the bus park was fully utilised it would not pay its way.
"So much depends" said the engineer "on the number of vehicles using the Park. Let us do a traffic count."

Together they worked it out . . .

This was done. For the next week officers in the Treasurer's Department and the Engineer's Department counted all the buses and matatus coming into and leaving the town. They worked out how many were in the town at any time.

"This" said the Town Engineer, "is the important part. It shows that the bus park that the consultants had designed was about twice as big as the demand. It is lucky we checked."

He spent the next day worrying about what to do. The Mayor and the Council were determined to go ahead with the project. The Town Clerk also had a personal interest in seeing it go ahead. If he delayed it, they might loose the money they had been promised.

Then he added the factors together:

In favour of going ahead

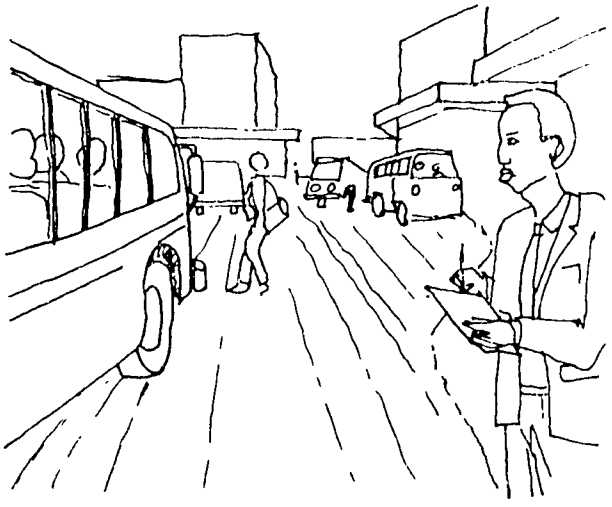
1. The consultants had already almost completed the design. To stop them now would be a waste of their fees.
2. The Minister, Council, and Town Clerk all favoured the consultants proposals, which were very impressive, and wanted to see work start without delay.
3. If the project was delayed there was a risk that it would not be started during the financial year and they would loose the money.

In favour of changing the design

1. It was much too large, and there was an immediate risk that it would loose money, a situation that would probably prevail for the first ten years.
2. It was on the wrong site, and it was going to be very difficult to force the buses and matatus currently going through the town to use it.

He discussed it with the Treasurer. They agreed. They would have to ask the Town Clerk to convene an emergency meeting of the Finance and General Purposes Committee, at which they would report their doubts about the project.

The Town Clerk objected. The design had been prepared by experienced consultants, he said.



A bus and matatu count is conducted

He and the Town Treasurer had personally supervised their work. He would not agree to convene a meeting unless the Town Engineer had prepared a proper report proposing a workable alternative.

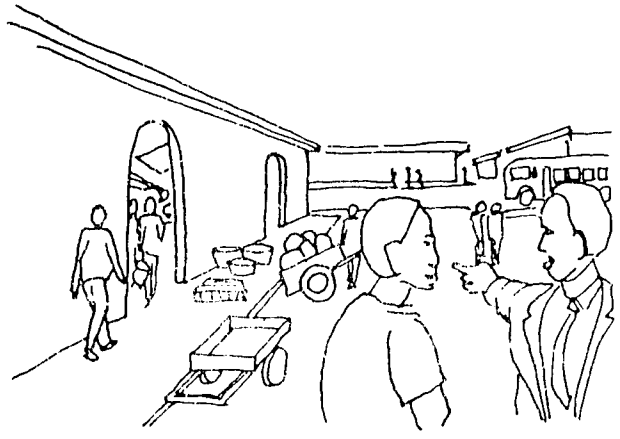
"And" he said, "you had better get it finished within three weeks or it will be too late. I have just had a telephone call from the consultants to say they are going to tender in one month."

During the next three weeks the Town Engineer did nothing else. He started by walking around the town centre looking desperately for a site for the bus park. Eventually he found it: the Council's own workshop and godown, now about thirty years old. Although it only occupied about half a hectare, the whole site was almost two hectares. The vacant land was not visible from the street as it was masked by buildings all round. The godown would have to be demolished and rebuilt elsewhere, obviously, but why not on the site proposed by the consultants for the bus park?

He worked out the costs. Rebuilding the godown and workshop would add about shs 1,000,000 to the project cost, but designing a bus park to accommodate today's demand, and enough for the next five years resulted in a saving of over shs 2 million. With the Treasurer he looked at the rents for the cafeteria and the bus company offices and compared them with the cost of building the structures, and found that they would make a loss. He looked at the type of materials proposed by the consultants, and examined the possibility of using cheaper ones.

He made a decision. The strategy was to be this:

1. Build a bus park that was tailored to the present-day demand, so as to maximise the surplus.
2. Build it in the centre of the town, where it would serve the needs of bus companies and public alike.
3. Retain the consultant's proposals for low maintenance finishes.
4. Reduce the total capital tied up by not building offices for bus stations or cafeterias, but renting ground on which these



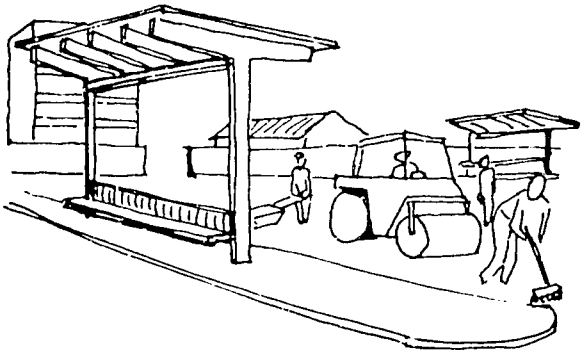
The Town Engineer finds a site

could be built at the expense of the operator.

He worked out that income for the other bus park was likely to have been only about half the expenditure, due to the huge loan costs and the bad location. The surplus for the revised proposal was enough to expand the bus park by 10% per year without any borrowing.

When the Town Clerk read this report he was convinced. He realised that in their excitement to get the project through they had overlooked some important aspects. He recommended to the Committee that they immediately implement the report, and instruct the consultants to redesign the project.

The Town Clerk's recommendation was accepted, and matters moved sufficiently quickly for the project to be started within the financial year. There was enough money to pay for 15 additional houses, much to the delight of the Mayor.



HOW TO DO FEASIBILITY STUDIES FOR

Revenue Generating

PROJECTS

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PART 2: HOW TO DO FEASIBILITY STUDIES: REVENUE-GENERATING PROJECTS

2.1 WHAT ARE THEY?

A feasibility study is simply a way of checking, as far as we can, whether a project is likely to succeed before money is spent. The words "feasibility study" are shorthand for a process that is, in most ways, common sense.

For example, if we are preparing a project such as a market, we must work out, in advance,

- how many marketeers will want stalls in the market
- where the market should be built
- how much the marketeers will pay for their stalls
- how much it will cost the Council to
    - build it
    - run it

Although this list is simplified, it gives you an idea of what you must find out before anyone can say "this project will succeed", or "this project will not succeed". That is the point of a feasibility study.

This manual is here to help you do your job better. It is not, for example, just another procedure you have to go through for the benefit of only Central Government. But, having done a feasibility study it will help you in all approvals which a project must receive - from Council, DDC, MLG and Loan Sanction.

Do not forget that you are preparing the study for your own use, to check that a project will succeed. Only later, when you are satisfied that you have worked out the best possible project, will you have to use the feasibility study to convince other people.

> REMEMBER
>
> When you are doing a feasibility study you should try to arrive at the best combination of ingredients to make it successful. To achieve this it is better to try many different possibilities quickly than to examine only one or two in detail.
>
> Be prepared to abandon your first idea and try another

2.2 WHAT MAKES A PROJECT SUCCESSFUL?

There are many different sorts of project, and we cannot use the same approach for every project. Obviously a school is affected by different factors than a market. A school is a social facility, and a market is a trading facility. But whatever the nature of the project it is well worth while doing a feasibility study.

What should we take into account in a feasibility study?

In a school, for example, we must consider:
Where are the children who will use the school living?
How will they get to school?
How many children will use it?
Is there enough land to provide playing fields?
If not, is there an alternative site for playing fields?
How will the construction of the school be paid for?
How will the teachers, books and materials be paid for?

Many of us have been involved in this process of planning and implementing a harambee school. We may not have sat down and prepared a feasibility study as such, but these have all been discussed in the committees that take charge of the project.

There are many different sorts of project, but they all have some things in common. These are:

- they have a purpose
- they have a size
- they have a site
- they have construction (capital) costs
- they have running costs
- they have benefits, e.g. income, social benefits etc

These are the components of a project. This manual is divided into sections which analyse each of the above components one by one to help you achieve a successful result.

2.3 WHAT IS THE PURPOSE OF THE PROJECT?

We all know what a market is for, what a slaughterhouse is for, what a school is for. So what question are we really asking?

We must go a little deeper. Are we trying to improve existing facilities, or to add new ones? Are we trying to generate income for the Council, or provide a social service? Are we responding to a demand from the public, or, say, to perform a statutory function?

We find that the answers to these questions can differ depending on whether the facility is a new one, or in addition to similar ones already provided by the Council. So we have to take different approaches for each of two situations.

2.3.1. IF IT IS A COMPLETELY NEW FACILITY

If you are planning a completely new facility you have to be very careful. How do you know that people want it, or want it enough to pay for it? For example, if there is no stadium in your town, and you think it is very important that you should have one, how do you decide what sort of stadium to build?

These are the most important things you have to consider:

1. What needs will it meet? What services will it supply? For example, will a market be designed as a daily vegetable market, to operate only on set market days, or to act as a sort of shopping centre for all goods?
2. What is the "demand"? For example, how many seats (if any) should a stadium have, how many football matches will be played in it? etc.
3. Remembering that this decision affects the feasibility, what standard of construction and finishes should be used? For example, should a bus park be tarmacked, should market stalls be covered? etc.

To answer these questions you will have to go through a mini-feasibility study. Then, when you think you have got the answers to those questions, you can double check to make sure that all your costs, etc. are right.

2.3.2 IF IT IS AN EXTENSION OR REPLACEMENT OF AN EXISTING FACILITY

You can easily find out what you should do by talking to the users of the existing facility. For example, if it is a bus park, you can find out:

- how many buses and matatus use it,
- what standard of bus park is required
- what facilities are required

The answers to these questions help you to think more fully about what should be provided. But remember, when you are having discussions with users, or possible users, it is very important to discuss the matter with as many facts as possible. We show you ways of getting these facts in the pages that follow.

Summary Check

1. Before committing yourself to a project, try to define what you want it to do.
2. Consult the users to see what they want.
3. Think about the standards and costs. If standards are high, so will costs be.
4. Consider the resources available to construct and run the project.

2.4 WHAT IS THE DEMAND FOR THE PROJECT?

In this part we examine ways of finding out how big a facility should be. We all know cases of facilities that are too small, and we probably know of ones that are too big. It is important to get this right.

In the case of a market, for example, you will have to find out how many marketeers will want to have a stall in the market. (You will also want to know whether there are hawkers trading elsewhere whose activities may compete with the Council's market and affect the demand for stalls). In the case of a school, you will need to find out how many children need school places.

This is not an easy thing to do, but it is one of the most important. If you get the answer to this question wrong, the whole project can be a disaster.

Here are tips to help you find out the demand:

- advertise in the newspaper, or by posters around the town inviting applications, indicating the expected monthly cost to the user (this is very suitable for housing, markets, etc).
- undertake a survey, for example of the number of buses and matatus going into and out of the town.
- look at the experience of other towns of the same size: do they have such facilities, and if so are they successful? How big are they?
- hold a meeting with everyone who might want to use the facility. For example, if it is a slaughterhouse, the butchers should be invited to discuss it with you. If it is a stadium, the football clubs, schools, etc. should be invited.

This is a very important stage. It does not need to take long, but is must be done carefully.

A WARNING

1. When you are asking people about whether they will use a facility, you must give them some idea of the cost. This is difficult at the early stages, but:

either
find out from other Local Authorities what they charge, but remember, the cost of building rises every year, so even if another Local Authority may charge only shs 5 for a market stall, you might have to charge shs 10 due to high building costs.

or
run through the feasibility study quickly to get an idea of the costs in your own case.

If you do not tell them roughly how much it will cost you will not get the right answer. People will naturally want development, and will be very willing to say that they will use it. You will get much higher figures than you will if you tell them the cost.

ANOTHER WARNING
In trading facilities, particularly markets, the number of applications will not guide you as to the number of stalls that can prosper. If you provide too many, some of the marketeers will go out of business, as there will not be enough trade for them. How many can be supported by a town varies. This problem is dealt with in more detail in our special manual on markets.

When you have arrived at what you consider to be the likely demand for the facility, you should consider whether to allow for future demand in the project to be built. In doing so, consider:

- if your estimates of future demand are not met, you will have over-designed the facility, which is a waste of resources that could have been used elsewhere.

- if it is the type of facility that is easy to expand, it might be better to add onto it when the need arises.

- if it is not the type of facility that is easy to expand, you must decide carefully what demand should be planned for. For example, the demand in five years? ten years?

These issues, together with methods of arriving at proper comparisons between the cost of developing now and at some later date, are discussed at greater length in section 4.1.

Summary Check
1. Assess demand by advertising and asking the users or by doing surveys.
2. Check your answers with towns of a similar size.
3. Remember to include approximate charges in discussions with users.
4. Consider the question of future demand very carefully.

2.5 WHERE SHOULD THE PROJECT BE BUILT?

In looking for a site two matters have to be considered:

- whether it is in the right place?
- whether it is large enough?

2.5.1 The right place?

Much too often projects are built in the wrong place. When we ask why a site was chosen, the answer is often that that was the only piece of land available. Or else we hear that because the facility is a noisy, messy or otherwise undesirable one, it had to be separated from other parts of the town. Many reasons seem good ones at the time. But when, later, the project fails, we realise how important it is to choose the right site.

Here are a few tips on how to find the right site.

Many activities are already taking place informally. Where this is happening may well be the best place to build a permanent facility. For example, where you find hawkers and pavement sellers is going to be a good place for a market. Where you find most matatus dropping off and taking on passengers will be a good place for a bus park.

Once again, ask the people who will use the facility. The users include both the "operators" (for example marketeers, the staff of a school) and the "customers" (for example the customers of a market, and the school children and their parents).

Try to choose the place which is most convenient. For example a school should be built in the middle of the area it is serving.

If so, then you must think very carefully before going ahead with the project. More disasters are caused by bad siting than any other factor. You may be throwing the money away if you do not have the facility in the right place. This is particularly important in facilities that depend on the public, such as markets and bus parks.

Costs are affected by the site. For example one site may be very cheap to service: electricity, water and sewers may all be close, while another may be expensive. Do not rush into a decision about which site is better: even though a site is expensive to service it may also be better in other ways. In a feasibility study we look at everything together.

As you are checking for a site you must remember two important matters:

- Is the land in the ownership of the council?
  If not, is it Government owned?
  If so, will the Commissioner of Lands consent to its use for the purpose?
- Is the site zoned for the purpose?

If not, what is the opinion of the District or Provincial Physical Planning Officer as to the proposed use?

An Important Note

PHYSICAL PLANNING

Most Local Authorities will have a physical development plan prepared for them by the Physical Planning Department. This is a very useful document, and you should never decide on a site without consulting the Plan, and the District Physical Planning Officer.

But be careful. Sometimes the sites selected when the Development Plan was prepared are potential disaster sites. This happens because the plan is out of date (and other facilities have not developed according to plan) or it looks too far into the future, and for many years - even tens of years - the facility may be very isolated and therefore fail.

If you think the Development Plan site or sites are not appropriate consult the District Physical Planning Officer to have an amendment made.

2.5.2 Is the Site Large Enough?

To find out how large the site should be will require some estimates prepared by an engineer, architect or planner. The site should normally be large enough to accommodate today's needs plus room for expansion if at all possible, whether or not the actual development is supposed to be for today's or future demand.

In section 4.2 you will find a check list on site selection matters which helps to ensure that nothing is forgotten.

Summary Check

1. Is there any informal activity that shows us where present users prefer to operate?
2. What do present users ("operators" and "customers") want?
3. Have you chosen a site because it is cheap and easy-to-service? If so, double check that it serves the other needs of the project.
4. Check that the site is in council ownership or can be easily acquired.
5. Check that it will get approval from the Physical Planning Department.
6. Check that it is big enough for future demand if at all possible.

2.6 THE DESIGN

At this stage you have to decide what features will be included in your design. You might find it useful to start by asking yourself what is the basic minimum that must be included.

For example, consider all the different activities you have seen taking place in or around a market. Consider also the different types of building which are used in Kenya for markets. Now decide which ones are essential, and which ones are, perhaps, just desirable.

Obviously, unless you decide on these matters, you cannot work out the cost of the development.

In section 4.4 there is a check list to help you think about the features and standards in the more common projects, namely markets, bus parks, nursery schools and stadiums.

So at this stage:
1. Make a list of the features of the facility, as far as you can. Until you have done this you cannot prepare a cost estimate (see next page).

2. You do not have to commit yourself on the standards to use. What you are doing now is a first try. If, after this stage the costs appear to be too high, for example, you should try again.

It is better to have several approximate tries, each of which can be done quickly, than to take weeks to do just one.

Summary Check
1. List the features you think are required.
2. List the features that can be omitted if costs come out too high.
3. Have them costed (see next page).
4. If necessary repeat until a "feasible" result is achieved (see Page 27)

2.7 COST OF BUILDING

There are three parts of a building design that have to be settled, if we are to find out the rough cost. These are:

- the size
- the standards
- the site

How do we work out the cost? Your engineer or architect will have to prepare outline drawings, and work out the cost from those. Make sure the engineer or architect knows of any capital budget ceiling he has to work within.

If you do not have your own engineers, you may have to commission a firm to prepare the outline drawings and costs for you. But before doing to try to get some idea of costs here are sources of information to help you:

- nearby Local Authorities
- the Ministry of Local Government
- the District or Provincial Works Officer
- a local contractor (if he is reliable).

It is best to go to two or more sources, to check one against the other.

If they cannot help, then you must commission a firm. For advice on how to do this see section 4.5.

Make sure that your costs include:

- the cost, if any, of the land
- the cost of any service connections that are necessary
- the construction cost (including materials, labour, contractor's profit and overheads etc)
- contingencies for bad site conditions
- contingencies for price increases
- professional fees (if any)
- interest during construction (if applicable)

At this stage you should also check to compare the cost with any capital budget you have been given. If it is lower DO NOT ASSUME that you should make it more expensive. This decision can only be taken when you have worked out other costs and income. If it exceeds the budget, consider whether you should apply for the budget to be increased, or redesign to a lower cost level.

Summary Check

1. If your own staff have the skills to prepare an estimate, they should do it.
2. Check your findings with other agencies.
3. Do not forget to include all the "extras" in your estimates.
4. Check that the cost of building is within the capital budget figure you have been given.

2.8 RUNNING COSTS AND INCOME

2.8.1 Running Costs

It is surprising how often mistakes are made when calculating running costs. Here is a list of things that must be included in the running costs:

- repayment of the money which was borrowed to build it
- paying staff to run it
- utilities
- maintenance costs (not just cleaning etc, but painting, repairing roofs, floors, plumbing etc etc)
- insurance
- administrative overheads

Here is how to calculate the costs:

Loan Repayment

Find out the interest rate of the loan.
Find out the repayment period.
Use the tables given at the back of this manual to calculate the annual repayment of the loan.

Staffing

Find out what skills the staff who will run it should have.
(If you do not know, ask neighbouring Local Authorities who have such a facility).
Find out the annual salary levels for the staff.

Utilities

If the facility has water, sewerage and/or electricity the estimated charges for these must be included.

Maintenance

It is almost impossible to predict maintenance costs. They will vary according to the type of building. If you do not have any better figures, use a figure of 3% of the capital cost per year.

Insurance

This is insurance against fire etc. You will normally be able to get this insurance for about .35% of the capital cost per year.

Administrative Overheads

These include:

The supervisors who may not be working on the facility full time, but whose job is to supervise those who do. For example if a market supervisor has to supervise three markets, one third of his monthly salary should be charged to each market.

Staff overheads, for example housing allowances, pensions etc.

The cost of collecting the money - cashiers salary etc.

The cost of collecting or writing off bad debts.

Now add all these figures together. (Make sure that they are all per year).

2.8.2 Income

Income is not so easy to calculate. You must first:

- check that the people who will use the facility are prepared to pay what you intend to charge.
- compare these charges with those paid in facilities like yours elsewhere. Yours will probably have to be higher, because your building costs will be higher, but be careful: if your are much higher, the users will complain.

Multiply the proposed charge by an estimate of the number of payers, and you will get a rate of income per day, per week or whatever is used as your collection period.

Work out how much this will mean per year. BUT

- use only a percentage of the figure, say 90%, to allow for the fact that the facility may not be as fully used as you planned. If, for example, you calculate that with full use a market should generate an income of shs 1,000,000 per year, use only a figure of 90% of that, namely 900,000 as your income in the feasibility calculations.

Compare the annual income with the annual expenditure.

Summary Check

1. Include all costs in you estimate of expenditure.
2. Be cautious in your estimate of income.
3. If possible check with other Local Authorities (if their figures are very different from your find out why. Maybe they have not included all their costs, or have based their charges on a much lower capital cost).
4. Compare income and expenditure.

2.9 FEASIBILITY CHECK

Now you will know: if your calculations show that the income is bigger than the expenditure your standards are about right (but check to make sure you have not overlooked anything in your calculations); and if the income is less than expenditure you have to re-think the project.

You can increase income, by charging more
- but be careful, you may frighten people away if you charge too much).
- the political will to charge more is also essential: discuss it with Councillors to get their reaction before putting it to Council formally

You can reduce expenditure, by:
- reducing the standard of the development
- reducing the size of the development
- reducing the staffing (be careful not to be unrealistic)

A tip: reducing the cost of the development is often the most effective way. Remember that if you start off with very high standards, and the project is not a success, you can never reduce them later. Once the money is spent it must be repaid. On the other hand, if the project is a success you will be able to improve the standards later.

What can you do if after every effort to reduce standards etc it appears that the income will still not match the expenditure?

Consider the following possibilities:
- raise some of the capital by harambee (this is very suitable for social projects such as a social hall, clinic etc)
- investigate whether some of the capital or running costs or both can be met from private sources:
  - o for example, if you are planning a nursery school someone might be willing to provide one privately.
  - o or if you are building a market, the marketeers might be willing to build the individual stalls

As a last resort, you can run it at a loss, but if it will be a loss-maker you will have difficulty obtaining a loan for it. Be very careful: even though under present circumstances you may be able to afford a loss-maker, these circumstances can change very quickly.

If, after all your efforts to match income and expenditure, the project appears not to be feasible, then you have a duty to report that fact to the Council. The reason that the project is not feasible should be carefully explained, together with a report showing the facts and figures.

Summary Check

1. If the project will not pay for itself, try to increase the income or reduce the construction costs.
2. If there is a big surplus of income over expenditure, check your workings once again, in case you have overlooked anything.
3. If after all attempts income is less than expenditure, consider use of harambee or operating it by private enterprise.
4. Be very careful before going ahead with a loss-maker

2.10 PREPARING AND PRESENTING THE FEASIBILITY REPORT

2.10.1 Preparing the report

Now you have done the background work, and you are satisfied that the project is a good one, and that you have found the right site for it, you will present your work to the Council, the DDC, and the Ministry of Local Government.

This section proposes a format that is easy to reproduce, but contains all the important information.

There are two ways of presenting the material: either by using the form discussed below, or preparing a more detailed report. An example of the report approach is given in Section 4.10., but normally the form will be sufficient to give all essential details.

The form has four parts to it, that follow the format of this manual:

- the demand
- the site
- the design (standards and size)
- the costs

There is no point in explaining all the different alternatives that you examined before you arrived at a project that was satisfactory: you only need to present the best project that you can identify.

If you find that the form does not suit your needs, you can present the information in another way. But try to keep your report short and to the point. In that way you can be sure that it will be read, and used, by the people you are presenting it to.

In most cases you will present some drawings with your report. You will not need to prepare a copy of the drawings for all readers of the report. All you need will be one set that you can present verbally to the Council and the DDC, and one set that you can send to the Ministry of Local Government.

REMEMBER: FILLING IN THE FORM IS NOT THE OBJECTIVE OF THE FEASIBILITY STUDY: THE STUDY IS TO SATISFY YOUR AND YOUR COUNCIL THAT IT IS A VIABLE PROJECT.

2.10.2 Presenting the Feasibility Report

To Council

The most important body to which the report must be presented is the Council. In your explanation to the Council you should stress that it is important for the project to be on the right site, built at the right cost, and of the right size if it is to be a success. Outline the alternatives that have been considered but not covered in the written report. Make sure that they understand the issues involved. When Council approves the Report

draft a resolution that includes references to the charges involved, for example:

> The Feasibility Study for the proposed bus park was adopted and
> IT WAS RESOLVED to forward the feasibility study to the DDC and the Ministry of Local Government with a request for approval.
> IT WAS ALSO RESOLVED THAT the charges to come into effect when the bus park is completed will be shs 20/- per bus, 15/- per mini-bus and 10/- per matatu.

In this was Council will have made a prior commitment to the charges, which otherwise could take them by surprise.

<u>To the DDC and Ministry of Local Government</u>
Once approval has been received from the Council it should be submitted formally by the DDC, which should also be requested to make a resolution in similar terms to that of the Council. At the same time a copy of the Study can be forwarded to the Ministry for approval subject to DDC approval.

Summary Check
1. The report should be brief and precise: the form contains almost all important information.
2. One set of drawings should be available for each submission for approval.
3. When submitting the project to Council take the opportunity to explain the project to them, including all the possibilities that had to be considered and the problems that have to be faced.
4. Make sure that when Council approves the Study they also approve the necessary charges on which the study is based.

FEASIBILITY REPORT

PROJECT . . . . . LOCAL AUTHORITY . . . . . .

INTRODUCTION
(Need for Project, and other background facts)

DEMAND
1. Method for finding out the demand

2. Results

THE SITE
1. Description of Location

2. Reasons for choosing this site

THE DESIGN

1. Site size
2. Building size
3. Area of paved external space (if any)
4. Description of facilities offered

5. Other matters of interest

COSTS

CAPITAL COSTS

1. Land (if any)
2. Off-site infrastructure costs
3. On-site construction costs
4. Physical Contingencies
5. Price contingencies
6. Professional fees

Total

RUNNING COSTS

1. Annual Loan Repayment (Interest Rate. . .Period. . .)
2. Staffing

Designation	Annual Pay	Number	Total

3. Water, Sewerage, Electricity
4. Maintenance
5. Insurance
6. Overheads

Total

EXPECTED INCOME (showing workings)

ANNUAL OPERATING SURPLUS (DEFICIT)

RECOMMENDATIONS

NEXT STEPS

SUPPORTING INFORMATION
List all supporting information annexed to this report.

FEASIBILITY STUDIES FOR

Non-Revenue Generating

PROJECTS

		Page
3.1	Income in non-revenue generating projects	35
3.2	Feasibility check	36

PART 3: Feasibility Studies for non-revenue generating projects

What are non-revenue generating projects?

- projects such as clinics and schools which are provided by the State or Harambee.

- other projects such as Nursery schools and Stadiums will generate some revenue, but possibly not enough. Town Halls may be partly self financing if office space is rented out, but overall will impose a drain on the Local Authority's finances.
- Some may generate enough revenue to be self financing in the long run, such as water and sewerage projects, but in the early days (and using the method given in the first part of this manual) will make a loss.
- Some projects generate no money at all, such as roads, but contributions can sometimes be obtained towards their construction.

Thus there is a wide range of projects. By each being non-revenue generating to some degree they impose a financial burden on the Local Authority. The purpose of this section of the manual is to present a system by which the Local Authority can examine the impact of such expenditure on their finances, and if necessary take measures to increase their income.

Procedures in identifiying non-revenue generating projects are the same as for revenue generating projects in these steps:

1. What is the Purpose of the Project? page 16
2. What is the demand? 17
3. Where should the project be built? 20
4. The design 22
5. The cost of building 23
6. Running costs 24

Two sections must be treated differently:

7. Income
8. Feasibility Check

These are discussed in the following pages.

3.1 INCOME IN NON-REVENUE GENERATING PROJECTS

There are potentially two types of inputs in such projects, which constitute income which reduces the Local Authority's outlays. These are:

3.1.1 Capital Inputs

Capital inputs are obtained from interested parties, and are applied to the capital expenditure in order to reduce the amount of capital borrowed. There are two mechanisms for this:

- the Local Authority uses its statutory powers, for example under the Street Apportionment Act
- harambee contributions
- contributions from potential users: for example a football club might give a contribution to the cost of a stadium.

3.1.2 Revenue Inputs

Many of the examples mentioned on the previous page will generate some revenue, but not enough to make them self financing. A stadium, social hall or nursery school for example will charge fees to the user, but these fees may not cover the operating costs, loan repayments etc. The inputs will therefore have the effect of reducing the deficit, but not eliminating it. Sometimes, if the charges are raised to make the facility self financing, they will be so high that no one will use them.

(Another type of project, and one that is potentially self supporting, is water and sewerage. These are subject to special treatment as given in section 4.11).

In a feasibility study for projects such as these, it is therefore necessary to treat them initially as if they are self financing.

3.1.3 Work out the gross capital cost as on page 23, and deduct capital inputs you can obtain.

3.1.4 Work out gross income required to repay the capital borrowed.

3.1.5 Work out the highest user charges, if any, you can reasonably charge.

3.1.6 Using the number of users on which your demand calculations have been based, work out the income based on those charges.

3.1.7 Calculate the annual difference between the cost of running and maintenance (including all overheads etc as before).

3.1.8 This will tell you the deficit that must be met from other sources.

3.1.9 Now examine your sources for additional revenue to cover the deficit. (next page).

3.2 FEASIBILITY CHECK

3.2.1 Increase revenue sources to cover deficit

It is useful at this juncture to examine all sources of revenue to determine which, if any, can be increased to meet the deficit of the project.

> NOTE:
> - If the "deficit" project is being developed at the same time as other project(s) and
> - if you can positively show that the other project(s) will yield a surplus and
> - if that surplus is greater than the deficit of the "loss-maker"
>
> then it is not necessary to demonstrate further sources of revenue: the feasibility study can be conducted as a "package". However, you may find it useful to go through the following exercise in any case.

In order to determine the sources of revenue which you have available, and the potential for increasing them:

- list all sources of revenue,
  e.g. rates, house rents, plot rents, licences, cess, charges for council-provided utilities, e.g. water, sewerage, refuse removal, charges for use of council property (markets, bus parks, social halls), charges for council services (septic tank emptying, slaughterhouse) etc.
- list the amount each source of revenue yields per year
- list the year when each source of revenue was last increased
- for every year that has gone by since the charges were increased, add a factor equivalent to the amount of inflation in that year. (A rough figure of 10% may be a sufficiently accurate).
- show what extra income could be obtained if the charges were increased by that amount.

With this information you have the basis for discussions with all parties concerned. They are
- the Chief Officers
- the Mayor/Chairman and Chairmen of relevant committees
- the PLGO
- the Ministry of Local Government

In your discussions with these parties you will find out their reactions to the possible increases you need. There is no reason why, of course, you should not request an all-round increase.

Once consultations have been completed the issue must be reported to Council. It is ESSENTIAL to obtain the Council's commitment to increases before the feasibility study is completed, as

decisions that are politically so difficult as increasing charges must be taken well in advance. A "conditional" feasibility study, for example one that shows that a project can only be afforded if the Council increases certain charges, is not complete until Council has taken that decision in principle.

When this stage is reached it is possible to complete the Feasibility Report Form shown overleaf. It will be noted that this is not exactly the same as the form for revenue generating projects.

FEASIBILITY REPORT: NON-REVENUE GENERATING PROJECTS

PROJECT . . . . . LOCAL AUTHORITY . . . . . .

INTRODUCTION
(Need for Project, and other background facts)

DEMAND
1. Method for finding out the demand

2. Results

THE SITE (Note: in the case of infrastructure projects this section may be used to describe the area to be served)
1. Description of Location

2. Reasons for choosing this site

THE DESIGN

1. Site size
2. Building size
3. Area of paved external space
4. Description of facilities offered

5. Other matters of interest

COSTS

CAPITAL COSTS (In the case of infrastructure projects lines 2 and 3 will not apply)

1. Land (if any)
2. Off-site infrastructure costs
3. On-site construction costs
4. Physical Contingencies
5. Price contingencies
6. Professional fees

Total

RUNNING COSTS

1. Annual Loan Repayment (Interest Rate. . .Period. . .)
2. Staffing

. Designation	Annual Pay	Number	Total

3. Water, Sewerage, Electricity
   (This item will generally not apply in infrastructure projects)
4. Maintenance
5. Insurance
6. Overheads

   Total

EXPECTED INCOME (showing workings)

ANNUAL OPERATING DEFICIT

METHOD OF MEETING COST OF DEFICIT

Revenue	Source	Current Yield	% to be increased	Resulting annual increase

RECOMMENDATIONS

NEXT STEPS

SUPPORTING INFORMATION

List all supporting information annexed to this report.

Reference Material

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PART 4: REFERENCE MATERIAL

4.1 FUTURE DEMAND

Whether to plan for future demand, and if so for how far in the future?

Consider:
1. Is it practicable to enlarge the facility or service should it be necessary?
2. Is there any uncertainty about the demand figures?
3. If the project is designed to meet present-day demand, does it only just break even, or make a deficit?

If the answer to these three is YES then it is probably inappropriate to size the facility or service for future demand.

If it is NO, particularly to the first question, a more detailed analysis is necessary.

The following issues have to be considered:

1. By how much will demand increase in future?
One basis for this figure is the rate of population increase. A maximum figure applicable to most urban areas is 7% per year, but this should be checked carefully. In many smaller places a figure of 5% is more appropriate. Section 4.13, page 70, gives tables to estimate size and demand given based on rate of growth and period.

2. Will demand be affected by other factors?
For example demand can be affected by income (higher income families use more water than low income families, etc). the price of inputs such as fuel, etc.

3. Over what period should we plan?
A common working period for demand projections is five years. This coincides with the national Development Plan period, and roughly with the project planning cycle (from identification to completion).

A method by which it is possible to compare irvestment made at the present with investment made at some future date is explained in Section 4.7, Discounted Cash Flows. In the rare cases where other factors do not determine whether present or future demand should be allowed for, this method should be used.

4.2 SITE SELECTION: A CHECK LIST

In identifying sites it is most important to check every aspect fully. You should satisfy yourself that you can overcome any problems that the following check list might reveal, and the financial calculations in the feasibility report must include expenditure to meet any problem condition (such as lack of infrastructure connections) revealed by the check list.

The check list also enables an objective method of making the comparison between two or more sites.

Size
- is it big enough?
- is there room for future expansion?

Location
- is it in the "right" location, (as discussed on page 20)?

Access
- does the site have easy access to all who will use it?

Topography
- has a topographical survey been undertaken?
  - if so, does it reveal any problem, e.g. with site drainage, steep slopes, too flat for drainage, etc?
- are there any natural features, e.g. trees, water-courses etc that will affect the design?
- is there any risk of flooding?

Infrastructure
- does it have connections, (as necessary) for
  - water
    - if so, is there sufficient pressure?
  - sewers
    - if so, can all the site be drained into the sewer without pumping?
    - is there sufficient capacity?
  - electricity?
    - if so, is there sufficient capacity?
  - if not, how much will it cost to make them available?

Soils
- have soil surveys been undertaken?
- are the soils suitable for the economic foundations and construction?
  - if not, e.g. rocky or black cotton soils, what extra cost will be involved?

Ownership
- does the Council own the land?
  - if not, is it Government land?
    - if so, will Government make it available to the Council?
      - if not, what is the value of the land?
      - can it be acquired by compulsory purchase?

- or is the owner willing to sell?
- how long will it take to acquire the land?

Planning

- is the land included in the existing Development Plan?
  - if so, is it zoned for the proposed use?
    - if not, can the use be changed?
  - if the land is not included in existing Development Plan, is the Physical Planning Department willing to prepare a Part Development Plan to feature the site and its use?
- is there any existing land use that is incompatible with proposed use?
  - what problems will this cause?

4.3 FINDING OUT FROM OTHER LOCAL AUTHORITIES

Check list of questions to ask

1. Size of facility in relation to population
2. Cost of building
3. Date of building
4. Whether it was designed by own staff: if by consultants, find out their name.
5. Whether it is too big/ too small/ just right.
6. Any public reactions to the design
7. Any maintenance problems
8. Cost of staffing
9. Cost of maintenance
10. Charges and income
11. Would they do the same again, or something different?
12. Any reactions from users to the charges

4.4 CHECK LIST OF STANDARDS AND FACILITIES FOR COMMON PROJECTS

Market

External wall, if any: height, material
Surface: murram, tarmac
Roofed or not roofed?
Stalls: unroofed slabs, roofed slabs, storage space beneath, lockable storage space,
Shop type stalls: tea rooms, grocery/clothing stores, butcheries; electrical and plumbing connections for each. Security arrangements. Windows? Open front?
Small Workshops: Size, storage space, electrical supply
Toilet Facilities
Market Office
Control points for collections
Security Arrangements at night, including lighting

Bus Park

Controls at entrances and exits
Surface: murram, tarmac, concrete, concrete paving
Perimeter Boundary: height, material
Bus shelters: number, type and placing
Seating
Offices for bus park staff, for bus companies
Toilet Facilities
Security Lighting

Nursery School

Materials for walling, roofing
Classroom size
Toilet facilities
Outside playing facilities

Stadium

Football pitch: full size?
Athletics track?
Outside walling: materials, height, gates etc
Seating, if any: materials, height, capacity, roofing?
Changing rooms
Toilet facilities
Refreshment facilities, if any

Slaughterhouse

(This is specialised. The Ministry of Local Government will advise on this)

4.5 COMMISSIONING AN ENGINEER OR ARCHITECT TO UNDERTAKE THE DESIGN WORK REQUIRED FOR A FEASIBILITY STUDY

If you have no staff with suitable skills and if the Ministry of Local Government has stated that it cannot help you, you may have to commission a firm of engineers or architects to prepare preliminary designs sufficient to arrive at approximate costs. Be careful: if you do not do this properly your Council may be forced to pay fees for a bad design, or for services they do not need. Follow this procedure:

1. Before doing anything, decide what you want the firm to do. Do not commit yourself to a commission for anything more than the minimum you require to help you complete the feasibility study at this stage.

2. Check with the Ministry of Local Government the level of fees you might have to pay for this type of commission. Check whether you can pay these from internal funds. If not, apply to the LGLA for Loan Sanction.

3. Find out from neighbouring local authorities, or business men, and any other reliable source, the names of suitable firms.

4. Write to all the firms (not just to one that seems to be the best), telling them what you want them to do, in words such as this:

   "You are required to prepare preliminary designs for . . ., in sufficient detail to arrive at approximate costs. You will be required to illustrate the effect of alternative standards, that we shall specify, on the total costs. The budget allocated for this project is shs . . . It is hoped that the actual costs will be below this figure, but if, for any reason, the estimated cost is greater than this, you should report on the reasons, and give recommendations for reducing the cost.

You will then tell them, when replying, to list:

4.1 Their staff, with qualifications (make sure that they are properly registered)

4.2 The projects they have completed, and the names and addresses of the clients for those projects

4.3 The fees that they will charge for the work.

5. Select the most likely two or three, and telephone the clients of jobs like yours. Ask those clients whether they were satisfied with the performance of that firm.

6. Report your findings to Council, and make your recommendations.

7. When you are sure that the funds for the preliminary design work are available you write to the firm in words such as this:

"Council has resolved to award you the commission for conducting a feasibility study of the . . . . . The fees you will be paid are as laid out in your letter of . . . . .

The work you are to undertake consists of the following: Preparing a preliminary designs sufficient to arrive at an approximate costs for the following alternative standards (here specify what you think might be required).

The work should be submitted to the council by not later than . . ."

At the same time you should write to the other firms, thanking them for their assistance, and advising them that they have not been awarded the commission.

8. When the work is received make sure that it is satisfactorily done before making any payment. We recommend that you request the Ministry of Local Government to help you assess the quality of their work.

4.6 FEE SCALES FOR ENGINEERING, ARCHITECTURAL AND QUANTITY SURVEYING SERVICES

4.6.1 Notes

The fees listed here should be used as guidelines only. They will be affected by the nature of the project, and guidelines issued by Government from time to time.
The fees listed for the different professions below are the basic fees. In addition to these there are:
Travelling time
Out-of-Pocket Expenses (printing, postage, subsistence costs, advertising, etc)
Site Supervision (payment of salary of Resident Engineer or Clerk of Works)

The work covered by the standard fee scales does not include the preparation of feasibility studies. Consultants are entitled to ask additional payment for this. The amount should be negotiated between the client and the consultant on the basis of the nature of the work.

The "cost" of the works is the accepted tender figure or the final cost of the whole of the works, whichever is greater. Where no tender is accepted the lowest bona fide tender is used. Where no tenders are received the fees are based on a reasonable valuation of the works.

Different types of works are charged at different rates. The scales given below are for the common type of works, of which examples are given.

Fees are never payable in advance: they are paid in instalments as the work proceeds. For details of when they may be claimed you should study the official fee scales from which the figures below are taken.

Always ask to see the official fee scales and conditions of engagement before commissioning a consultant. Make sure you understand them. If in doubt consult the Ministry of Local Government.

4.6.2 Civil Engineering

(For example, roads, water and sewerage projects).

Cost of the Works	Fee
On the first shs 200,000	11%
On the next shs 300,000	9%
On the next shs 500,000	7.5%
On the next shs 1,000,000	6.5%
On the next shs 2,000,000	6%
On the next shs 6,000,000	5.5%
On the next shs 10,000,000	5%

(Source: Association of Consulting Engineers, December 1970)

4.6.3 Architecture

Non-repetitive works
(For example offices, markets, social halls)

Cost of the Works	Fee
Up to shs 20,000	shs 600 + 12%
Shs 20,000 - shs 40,000	shs 1000 + 10%
Shs 40,000 - shs 80,000	shs 1400 + 9%
Shs 80,000 - shs 160,000	shs 2200 + 8%
Shs 160,000 - shs 320,000	shs 3800 + 7%
Shs 320,000 - shs 400,000	shs 5400 + 6.5%

The above fees assume that no quantity surveyor is employed. If one is employed a reduced fee should be paid. For all works costing greater that shs 400,000 it is recommended that a quantity surveyor is employed, and the fee scales assume that this is done.

Shs 400,000 - shs 640,000	shs 6400 + 6%
Shs 640,000 - shs 1,280,000	shs 8000 + 5.75%
Shs 1,280,000 - shs 2,500,000	shs 11120 + 5.5%
Shs 2,500,000 - shs 5,000,000	shs 17360 + 5.25%
Shs 5,000,000 - shs 10,000,000	shs 29840 + 5%
Shs 10,000,000 - shs 20,000,000	shs 54889 + 4.75%

Repetitive Works
(housing estates of more than four of the same type of house or more than one of the same block of flats)

Fees as above multiplied by 0.70

(Source: Republic of Kenya: Conditions of Engagement and scales of fees for Professional Services for Building Works, 1974)

4.6.4 Quantity Surveying

Non-Repetitive Works

(For example offices, markets, social halls)

Costs of the Works	
Up to shs 400,000	shs 2800 + 5%
Shs 400,000 - shs 640,000	shs 4400 + 4.6%
Shs 640,000 - shs 1,280,000	shs 7600 + 4.1%
Shs 1,280,000 - shs 2,500,000	shs 15280 + 3.5%
Shs 2,500,000 - shs 5,000,000	shs 25280 + 3.1%
Shs 5,000,000 - shs 10,000,000	shs 35280 + 2.9%
Shs 10,000,000 - shs 20,000,000	shs 55280 + 2.7%

Repetitive Works

(Housing)

	Pre-Contract Services	Post Contract Services
First Housing unit	As fees listed above less 1.25%	1.25%
Next 4 identical units	.5%	1.25%
Next 5 identical units	.3%	1.25%
Next 15 identical units	.2%	1.25%
Remaining identical units	1%	1.25%
External Works	1.25%	1.75%

Source: Republic of Kenya: Conditions of Engagement and scales of fees for Professional Services for Building Works, 1974.

4.7 DISCOUNTED CASH FLOWS

(How to compare investment today, with investment at a future date)

4.7.1 Introduction

This section presents a very simplified approach to comparing expenditure at the present with expenditure at some future date. This is useful if we are trying to assess the merit of building a cheaper or smaller facility today, and upgrading it later, with the alternative of developing it to the ultimate standard today. Alternatively it can be used to compare a high maintenance, low cost solution with a low maintenance high cost solution.

The technique is not complicated. It is necessary only to work out the costs of the alternatives on an annual basis and compare them. The easiest approach is to start with two alternatives, to find out which is yielding the best results.

For each alternative it is best to project each of the costs - as would be presented in the feasibility study - and all the income, year by year, either for the length of the loan, or the economic life of the project.

4.7.2 Examples

Two examples are given, in order to illustrate the approach.

Example 1.

In this example we consider whether it is more economic to develop a sewerage scheme for what we expect the population to be in ten years time, or whether it is more economic to design the scheme for the population in five years' time, and extend it at that time. Thus we compare a single contract with a phased contract.

In doing so there are three basic elements to be compared: the income, which since it is based on the number of consumers, remains the same for both models, and is assumed to be the net income after collection costs have been deducted; the loan repayments, which are a product of the contract cost; and the maintenance which is set at ten percent of the contract cost. The sum of these elements gives an annual surplus, which is then cumulated to the end of a ten year period.

It will be seen from the Table overleaf that, given the assumptions as they are, there is a net difference of shs 1,529,000 between the two cases: the phased example being more economic.

Example 1: A Sewerage Scheme
Cost of alternative solutions

All costs are in constant prices

Base Data	
Population	17000
Rate of Growth/year (%)	7
Persons/Plot	8
Loan Period (years)	25
Interest Rate (%)	12
Annuity Rate/1000	127
Payment/Plot/Month	55

Alternative "A"		Alternative "B"		Alternative "C"	
Planning Period	Yrs 1-10	Planning Period	Yrs 1-5	Planning Period	Yrs 6-10
Number of Plots	4460	Number of Plots	3200	Number of Plots	1260
Gross Cost	14495000	Gross Cost	11200000	Gross Cost	4410000

Alternative "A": costs in shs '000

Year	1	2	3	4	5	6	7	8	9	10
Income	1403	1501	1606	1718	1838	1967	2105	2252	2410	2578
Loan Repayment	1848	1848	1848	1848	1848	1848	1848	1848	1848	1848
Maintenance	185	185	185	185	185	185	185	185	185	185
Sub-Total	2033	2033	2033	2033	2033	2033	2033	2033	2033	2033
Annual Surplus	-630	-532	-427	-315	-195	-66	72	219	377	546
Cumulative Surplus		-1163	-1590	-1905	-2099	-2165	-2093	-1874	-1497	-952

Alternative "B" and "C": costs in shs '000

Year	1	2	3	4	5	6	7	8	9	10
Income	1403	1501	1606	1718	1838	1967	2105	2252	2410	2578
Loan Repayment "B"	1428	1428	1428	1428	1428	1428	1428	1428	1428	1428
Maintenance	143	143	143	143	143	143	143	143	143	143
Sub-Total	1571	1571	1571	1571	1571	1571	1571	1571	1571	1571
Loan Repayment "C"						562	562	562	562	562
Maintenance						56	56	56	56	56
Sub-Total						619	619	619	619	619
Annual Surplus	-168	-70	35	147	268	-222	-85	63	220	389
Cumulative Surplus		-238	-204	-56	211	-11	-95	-33	188	577

Example 2

The second example compares the cost of laying a "high maintenance/low cost" surface, and upgrading it at a later stage with laying a "low maintenance/high cost" surface from the start. The alternatives used in this example are murram, which is upgraded after five years by adding interlocking concrete paving blocks, and laying the concrete blocks from the beginning. The cost of laying the blocks after five years is over and above the cost of the murram surface, whereas if they are laid during the initial construction period, the murram wearing coat is not necessary.

In this example no income data are considered, the exercise is to determine the lower cost solution in the ten year period.

It will be seen from the Table overleaf that by deferring the investment five years there is a saving of shs 120,000.

Example 2: Alternative Finishes for a Bus Park

Alternative Finishes

Bus Park Data	
Size (sq.m)	2000
Cost of Murram/sq.m	80
Gross cost, murram	160000
Cost of Conc. Paving/sq.m	300
Gross Cost, conc paving	600000
Annual Maintenance, murram	16000
Annual Maintenance, conc.	4000
Loan Period in years	25
Interest Rate (%)	12

Alternative "A", costs in shs '000

Year	1	2	3	4	5	6	7	8	9	10
Murram										
Loan Repayment	20	20	20	20	20	20	20	20	20	20
Maintenance	16	16	16	16	16					
Sub Total	36	36	36	36	36	20	20	20	20	20
Conc. Paving										
Loan Repayment						76	76	76	76	76
Maintenance						4	4	4	4	4
Sub Total						80	80	80	80	80
Total	36	36	36	36	36	100	100	100	100	100
Cumulative		72	108	144	180	280	380	480	580	680

Alternative "B", costs in shs '000

Year	1	2	3	4	5	6	7	8	9	10
Conc Paving										
Loan Repayment	76	76	76	76	76	76	76	76	76	76
Maintenance	4	4	4	4	4	4	4	4	4	4
Total	80	80	80	80	80	80	80	80	80	80
Cumulative		160	240	320	400	480	560	640	720	800

4.7.3 Further Refinements

Such calculations may be refined in very many ways. For example, interest may be calculated from end of year deficits and surpluses, and added to the calculation; inflation may be taken into account, and assumptions may be made about interest rates

In these examples prices are assumed to rise exactly in line with inflation. If it is considered likely that prices will rise faster than inflation, then future contract sums may be increased by the difference between inflation and construction costs. For example if inflation is rising by 10% per year, and construction costs by 14% per year, then construction costs at today's prices must be increased by 4% per year compound to project them into a future date. For example in the sewerage project, the cost of the second stage would be (by reference to the compound interest table on page 71) 21.7% higher.

Further sophistications are possible if it is considered necessary. For example incomes and maintenance costs in Example 1 could have been increased by the factor of inflation for each year, while the loan (being a fixed annuity) remains constant. This would result in a higher net surplus in the end.

4.8 ESTIMATION OF RUNNING COSTS

This section gives three examples of facilities that are often developed by Local Authorities, as an aid to the approximate estimation of running costs. For any final feasibility study you should try to develop your own costs.

The examples should be used with caution. You should first compare the size of your facility with that of the example. The Town Clerk or Town Treasurer of the Local Authority responsible will be happy to give you information in that respect. Secondly you should update the salaries etc for inflation. The figures were prepared in June 1987.

4.8.1 Example 1: Meru Slaughterhouse

Staff	Grade	No.	Salary/year		
	S/H Manager	1	26,640		
	S/H Supervisors	3	63,540		
	Cleaners	3	27,360		
	Slaughtermen	18	101,520	Total	219,060

Overheads — Direct costs relating to salaries

Grade	No.	House Allow. per m.	NSSF per month	Total per year
S/H Manager	1	800	80	10,560
S/H Supervisors	3	450	80	19,080
Cleaners	3	180	45.50	8,118
Slaughtermen	18	180	40	47,520
			Sub-Tot.	85,278
Accountancy and Administration				20,000
Uniforms, tools and materials				46,000
			Total	151,278

Overheads as a percentage of salaries 69%

Utilities	Water	7,780
Total Annual Cost	Kshs	378,118

4.8.2 Example 2: Naivasha Bus Park

Staff	Grade	No.	Salary/year	
	Clerical	2		
	Askari	4	(for all)	65,600

Overheads	Direct Costs relating to salaries		
	House allowances	7,200 p.a.	
	Leave allowance	400	
	Overtime allowance	6,000	
	Supervisor's time	3,960	
	Admin. amd Accountancy	5,940	
	Uniforms	3,860	
	Tools	2,320	
	Total		29,680
Overheads as a percentage of salaries			36%
Total Annual Cost			Kshs 95,280

4.8.3 Example 3: Kisii Market

Staff	Grade	No.
	Assistants	10
	Askari	1
	Labourers	9

4.9 DOING A FEASIBILITY STUDY:
A week-by-week account of one example.

Week 1
Council resolves to go ahead with bus park and new market.

Town Clerk convenes meeting of officers. Assigns duties:

Engineer: Look for sites.
Find out likely costs of typical bus park and markets.

Treasurer: Find out charges made by other Local Authorities.

Town Clerk himself: Propose staffing, based on discussions with other Local Authorities.

Week 2
Officers report back to Town Clerk

Engineer reports that two sites have been identified, and he is looking into the land ownership, services and similar matters. He considers that both facilities are best located where a temporary bus park and market are already functioning.

He has also found that bus parks cost anything between shs 1 million and shs 7 million. There is also a wide range for markets. He advises that the most important thing is to find out the demand first, and then calculate the cost.

The Treasurer reports the charges for new bus parks and markets in neighbouring town. He says they are almost double what the Council is presently charging in the temporary market and bus park. He has also found out the typical level of staff in the facilities.

It was agreed that the most important thing was to find out the level of demand. The Engineer agrees to mount surveys, helped by staff from the Town Clerk's Department.

Week 3
The Engineer mounts a bus count. Based on this he decides that a bus park for 6 buses, 4 minibuses and 25 matatus is required. He informs the Town Clerk who will check with other Local Authorities on the staff required to run this

Week 4
The Engineer mounts a survey of all hawkers and kiosks in the town that might be put into the new market. He also surveys that market on market day to see how many stalls will be required and how big they should be to serve the existing marketeers. He reports that an open-air market will be required occupying about 50m x 50m, together with 80 lock-up stalls, 20 shops, a tea room, an office and a public toilet.

The Town Clerk convenes a meeting. He requests the Engineer to

find out the cost of building facilities of this size.

Week 5

Town Clerk has a meeting with all Chief Officers.

The engineer reports on costs. He has worked out the cost of access to the site, and proposes two different standards of design. One bus park comes to shs 1,650,000 and shs 2,500,000. The alternative designs for the market come to about 3,000,000 and 2,500,000.

The Treasurer has worked out the staffing costs and from the capital costs and charges can now do the basic feasibility check. It is found that the bus park is viable at both levels of expenditure. The Engineer argues strongly for the more expensive type of bus park, which will require much less maintenance as it has concrete block paving and not murram: the Treasurer argues strongly for maximising the returns. He points out that the condition of the surface of the bus park will not affect its ability to attract revenue.

At this point the Town Clerk suggests that since the revenue for the bus park are much higher than the costs, they should also consider including the loop road from the main road which leads to both facilities. The present bad state of that road reduces the attractiveness of the present bus park and makes enforcement difficult. This idea is accepted by the Treasurer, and it is agreed that he and the Engineer will prepare a feasibility study on that basis.

Week 6

The Treasurer and Engineer agree that the higher standard bus park and a tarmacked access road would be the best solution in the long term. They prepare a draft report and discuss it with the Town Clerk.

The recommendations are agreed by all, and a final report is now prepared by the Town Treasurer and the Town Engineer.

Week 7

The Feasibility Report is presented to the Council.

4.10 FEASIBILITY REPORT: AN EXAMPLE

An example of a completed Feasibility Report based on the above example.

4.10.1 Market

Demand

The demand was determined by counting the kiosks surrounding the existing site and those scattered all over the township, which totalled 217. Of these some are too far from the project site, and are not therefore accommodated in the proposed market, and others are sufficiently substantial to require a shop in the proposed market. Therefore 20 shops and eighty lock-up stalls are required. There are two market days and the open air market is full on those two days.

Site

The site is between the stadium, the Pyrethrum Board stores, the existing bus park on Hospital Road and opposite transport house, a restaurant and boarding establishment.

Several factors have been taken into account when choosing this site.

1. The market is accessible to farmers and members of the public who will come by public transport, as it is next to the proposed bus park.
2. The bus park can be used as a parking area for the off-loading of farm produce.
3. The existing site is near the essential service connections of electricity, water and telephone.
4. It is in the central are of Molo town and is convenient for the residents.

Design

The site covers one acre. The proposed market would accommodate 80 lock-up stalls, 20 shops, a market master's office, a tea room with kitchen, five toilets with septic tanks and six wash basins.

Costs

Capital Costs

Estimated Construction cost	shs 2,500,000
Land (Council Owned)	0
Price Contingency (5% of construction cost)	125,000
Consultancy Fees	300,000
Total	shs 2,925,000

Annual Running Costs

Loan Charge: Repayment of shs 2,925,000 over 23 years at 11.25%	353,925
Staff	
1 Clerk at shs 20,280 per year	20,380
2 askaris at shs 7,920 per year each	15,840
3 cleaners at shs 6,540	19,620
Printing	20,000
Insurance at .15% construction cost	4,388
Maintenance at 2% construction cost	58,500
Total Running Costs per year	512,653

Income

(Note: these charges are based on existing charges in the temporary market, but increased in accordance with a Council resolution)

80 lock-up stalls at shs 250 per month	240,000
20 shops at shs 400 per month	96,000
1 tea room at shs 400 per month	4,800
Open air market at shs 32,000 per month	384,000
Possible income per year	724,800
Less 10% risk factor	72,480
Net income per year	652,320

Annual operating surplus is 652,320-512,653 = 139,667

4.10.2 Bus Park

Demand

The method used to find the demand was to station four people at four locations currently in use in the township.

Olegrueni: there were 67 matatus making 77 trips, nine minibuses making 12 trips and 1 bus making two trips.

Post Office: there were 97 matatus making 150 trips, 14 minibuses making 20 trips, and 20 buses making 21 trips daily.

Kibunja: there were 13 matatus making 16 trips, 2 minibuses making two trips and no buses.

Existing bus park: there were 13 matatus making 16 trips, 2 minibuses making 2 trips and no buses.

From the survey it was possible to work out the number of public transport vehicles in the town at any one time. The results are as follows:

Time	Matatus	Minibuses	Buses
7 - 8 am	28	0	0
8 - 9 am	19	1	1
9 - 10 am	38	2	2
10 - 11 am	34	4	4
11 - 12 noon	18	2	3
12 - 1 pm	29	4	4
1 - 2 pm	14	4	4
2 - 3 pm	16	1	0
3 - 4 pm	18	1	1
4 - 5 pm	13	1	1
5 - 6 pm	-	3	2

Site

The proposed bus park is on the site of the existing bus park. It is next to the existing market and diagonally opposite Transport House (a restaurant and lodging establishment). There is a 1.3km long murram road leading to the existing bus park, which is in bad condition, and requires upgrading if it is to handle the traffic.

The site has been chosen because:

1. The site has been approved in the town's development plan.
2. It is centrally located to serve the town's residential areas, the hospital, school and stadium and the commercial area.
3. The land belongs to the Council, and there is sufficient for future expansion.
4. The site is adjacent to the proposed market,

Design

From the table given under "demand" above it can be seen that the maximum number of matatus in the town within any one hour was 38. Since matatus do not wait long for passengers, especially at peak hours, it is considered that a figure of twenty five matatu parking spaces should be included in the bus park. Based on the survey it is considered appropriate to allow for 4 minibus parking bays and four bus bays.

The proposed design incorporates shelters for waiting passengers, collection and checking booths at entrance and exit.

The access road, which runs in a loop from the main road, should be rebuilt to full standard and tarmacked.

Capital Costs

Construction cost	shs 2,500,000
Road tarmacking	2,000,000
Land (Council Owned)	0
Price Contingencies (7.5% construction cost)	337,500
Consultancy fees (12% construction cost)	540,000
Total	5,377,500

Running Costs

Loan Charges: Repayment of shs 5,377,500 over 23 years at 11.25%	661,978
Personnel	
2 collectors at shs 7920 each per year	15,840
2 sweepers at shs 6540 each per year	13,080
Maintenance	
2% of construction cost (bus park only)	50,000
Utilities	10,000
Printing	10,000
Insurance at .15% of construction cost	3,750
Total running cost	764,648

Revenues

(Based on rates charged at present bus park, increased by Council resolution)

Matatus: 286 entries per day, at shs 10/- per entry, 365 days per year	1,043,900
Minibuses: 34 entries per day, at shs 15/- per entry, 365 days per year	186,150
Buses: 23 entries per day, at shs 20/- per entry, 365 days per year	176,900
Frontage fees for 22 plot owners on inproved road at shs 400 per year	8,800
Total	1,406,750
Less 10% risk factor	140,675
Expected annual revenue	1,266,075

Project Surplus
(Revenue less running costs) shs 501,427

Thus provided Council raises the charges to the levels used in the study, revenues from the bus park will finance the cost of construction of the bus park and the road, together with running expenses.

4.10.3 Conclusions

It is therefore recommended that this project can proceed to the stage of preparing a design brief and that a suitable consultant be commissioned to finalise the designs of both the market and the bus park.

4.11 WATER AND SEWERAGE PROJECTS: A SPECIAL CASE

In preparing a feasibility study for water and feasibility projects the basic criteria will be the same as for other revenue generating projects, as they should be handled by the Local Authority as separate, self financing funds.

However, these projects are a special case because in many cases there is likely to be a deficit in the years immediately after construction has been completed, due to low consumer demand. The duty of the LA in these circumstances is to demonstrate to the Ministry of Local Government and the Local Government Loans Authority that:

1. The system as designed is the most economic possible, given the present and future demand patterns.
2. The deficit, if any, can be met from General Rate Fund or other sources, or, if not, that the Council is willing to raise revenues to such a level as to cover the deficit.

Presentation of the Report

Local Authorities, in presenting their material for approval by the Ministry should ensure that the following matters are covered:

1. The accounts relating to the existing system.
This should include
COSTS
- annual loan repayments
- annual maintenance costs
- annual staffing costs (in addition to maintenance staff, such as meter readers, accounts clerks, cashiers etc)
- overheads such as postage, printing, etc.

INCOME
- number of consumers
- tariffs
- actual consumption per month
- receipts per month
- if tariffs are proposed to be increased, the result of proposed increases

2. The proposed accounts relating to the proposed system.
This should include
COSTS
- as for existing system

INCOME
- projection of number of consumers
- proposed tariff
- projected income

3. A consolidation of the data in (1) and (2) above.
4. If these projections reveal a shortfall, then the Council must show how the shortfall will be financed. The following possibilities should be considered:
- raising the tariffs further

- using the surplus (if any) from other sources to cover the deficit.
- raising the Rates, licence fees, user charges for housing, bus parks, markets etc

If it appears that the deficit is too large to be covered in this way, then the design of the scheme should be re-examined to determine:

- whether it can be implemented in phases
- whether lower cost solutions can be used
- etc

4.12 LOAN REPAYMENT CALCULATION

Nearly every project uses borrowed money, and it is very useful to know how much the loan repayments will be. The table helps you to calculate this.

It does not calculate it for small fractions of a percent, or for individual years, so if you think it is very important to get the right figure you can use two figures and average them. But in most cases, for a feasibility report, the nearest figure will be accurate enough.

On page 68 you will find a Loan Repayment Tables. This is a clean copy for you to use. On page 69 is an annotated copy that will help you if you have difficulty doing the exercises.

HOW TO USE THE TABLE

Look at the Table. You will find the interest rate in the first column, down the left hand side. You will see that the lowest interest rate is 4% and the highest is 18.5%. The interest rates are presented in groups of five to help you read the Table.

Across the top of the Table is the Loan Repayment Period. You will see that the shortest repayment period in the Table is 5 years, and the longest is 40 years.

You will also see that the figures are in shillings, for every 1000 shillings borrowed, and they are per year. So, if your project is for shs 30,000, you must multiply the figure in the table by 30. If it is for shs 3,000,000 you multiply the figure by 3,000. (If you want to use K£ instead of shillings, the Table is equally valid, as long as you stick to one unit throughout).

****

EXAMPLE 1

Now try this example.

What is the repayment per year of a loan of shs 55,000 if the interest is 6.5% and the repayment period is 30 years?

Answer:

Look at the page 69. You will see a line below the figure 6.5, and to the right of the figure 30. Where these two lines meet is the figure 77.

This means that the repayment figure is shs 77 per thousand.
So if we have borrowed shs 55,000, the answer is

$$\frac{55{,}000 \times 77}{1000} = \text{shs } 4235$$

Now try another.

EXAMPLE 2
What would the annual repayment be for a loan of shs 2,750,000, borrowed over a period of 25 years, with an interest rate of 12.5%?

Answer:
Look at page 69. You will see a line down beside the 25 year column, and one under the 12.5% interest rate. Where they meet is the figure 132. This means that the repayment is shs 132 per thousand.

Our answer is therefore $\frac{2,750,000}{1,000} \times 132$ = shs 363,000

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Tips:

- o If you want to find out the amount to be paid per month, divide the answer by 12.
- o If you want to find out the interest rate for one quarter or three quarters, use the figure half way between the whole number and the half. For example 14 1/4% over 15 years is the average of 14% and 14.5%, namely 163 and 167, which is shs 165 per thousand (See EXAMPLE 3 on the sheet)
- o If you want to find out the repayment rate for intermediate years, you can use the same technique. For example to find the loan repayment for a loan with an interest rate of 16% over 23 years, you will see that the figure for 20 years is 169 and that for 25 years is 164. If we subtract one from the other we get the amount of 169 - 164 = 5. Therefore there is an decrease of five shillings over the period of five years. Therefore if the loan period is 23 years, to cost will be 169 - 3 = shs 166 per thousand (see EXAMPLE 4 on the sheet).

NOTE: THESE FIGURES ARE APPROXIMATE, BUT SUFFICIENTLY ACCURATE FOR ALL NORMAL WORKING.

LOAN REPAYMENT TABLE

The amount to be repaid ANNUALLY
for every shs 1000 borrowed

		Loan Repayment Period (Years)							
		5	10	15	20	25	30	35	40
Interest Rate (%)	4	225	123	90	74	64	58	54	51
	4.5	228	126	93	77	67	61	57	54
	5	231	130	96	80	71	65	61	58
	5.5	234	133	100	84	75	69	65	62
	6	237	136	103	87	78	73	69	66
	6.5	241	139	106	91	82	77	73	71
	7	244	142	110	94	86	81	77	75
	7.5	247	146	113	98	90	85	81	79
	8	250	149	117	102	94	89	86	84
	8.5	254	152	120	106	98	93	90	88
	9	257	156	124	110	102	97	95	93
	9.5	260	159	128	113	106	102	99	98
	10	264	163	131	117	110	106	104	102
	10.5	267	166	135	121	114	111	108	107
	11	271	170	139	126	119	115	113	112
	11.5	274	173	143	130	123	120	118	116
	12	277	177	147	134	127	124	122	121
	12.5	281	181	151	138	132	129	127	126
	13	284	184	155	142	136	133	132	131
	13.5	288	188	159	147	141	138	137	136
	14	291	192	163	151	145	143	141	141
	14.5	295	195	167	155	150	148	146	146
	15	298	199	171	160	155	152	151	151
	15.5	302	203	175	164	159	157	156	155
	16	305	207	179	169	164	162	161	160
	16.5	309	211	184	173	169	167	166	165
	17	313	215	188	178	173	172	171	170
	17.5	316	219	192	182	178	176	176	175
	18	320	223	196	187	183	181	181	180
	18.5	323	226	201	191	188	186	185	185

LOAN REPAYMENT TABLE

The amount to be repaid ANNUALLY
for every shs 1000 borrowed

Interest Rate (%)	Loan Repayment Period (Years) 5	10	15	20	25	30	35	40
4	225	123	90	74	64	58	54	51
4.5	228	126	93	77	67	61	57	54
5	231	130	96	80	71	65	61	58
5.5	234	133	100	84	75	69	65	62
6	237	136	103	87	78	73	69	66
Example 1 6.5	241	139	106	91	82	77	73	71
7	244	142	110	94	86	81	77	75
7.5	247	146	113	98	90	85	81	79
8	250	149	117	102	94	89	86	84
8.5	254	152	120	106	98	93	90	88
9	257	156	124	110	102	97	95	93
9.5	260	159	128	113	106	102	99	98
10	264	163	131	117	110	106	104	102
10.5	267	166	135	121	114	111	108	107
11	271	170	139	126	119	115	113	112
11.5	274	173	143	130	123	120	118	116
12	277	177	147	134	127	124	122	121
Example 2 12.5	281	181	151	138	132	129	127	126
13	284	184	155	142	136	133	132	131
13.5	288	188	159	147	141	138	137	136
14	Example 3 291	192	163	151	145	143	141	141
14.5	295	195	167	155	150	148	146	146
15	298	199	171	160	155	152	151	151
15.5	302	203	175	164	159	157	156	155
16	305	207	179	169	164	162	161	160
16.5	309	211	Example 4 184	173	169	167	166	165
17	313	215	188	178	173	172	171	170
17.5	316	219	192	182	178	176	176	175
18	320	223	196	187	183	181	181	180
18.5	323	226	201	191	188	186	185	185

4.13 HOW TO USE THE COMPOUND GROWTH/INTEREST TABLE

On page 71 you will find a Table that enables you to work out quickly how much demand, for example, will increase over a period, given any assumed annual rate of growth. On page 72 you will find a similar sheet that has been annotated to help you understand the two exercises we have prepared on the subject.

****

Exercise 1

If we know that traffic in a bus park is increasing by 7% per year, and there are at present 13 buses and 40 matatus using the bus park, how many vehicles will be using it is five years' time?

Looking at the table we first select the column headed "Growth rate" 7%. Next we run down the column to "year 5". The figure here is 1.40. This is our multiplication factor.

Thus the traffic in five years can be expected to be:

Vehicle	Present	Multiplication factor	In five years
Bus	13	1.40	13 x 1.40 = 18.2, say 18
Matatus	40	1.40	40 x 1.40 = 56

Example 2
If inflation is running at 9% per year, and a house rents of shs 285 were last increased six years ago, and it has been decided to raise them by the same amount as inflation, what is the new level of house rents?

To find the multiplication factor, we first find the column headed "Growth/Interest Rate (%)" and look for 9%. Going down this column to "year 6" we find the figure 1.68.

The calculation will therefore be:

Number of years	Amount	Multiplication Factor	New Amount
6	shs 285	1.68	285 x 1.68 = shs 478.80

COMPOUND GROWTH/INTEREST TABLE

The amount to which a unit (1) will grow
within the periods stated
and at the rates stated

	Growth/Interest Rate (%)																			
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1:01	1.02	1.03	1.04	1.05	1.06	1.07	1.03	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20
2	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.17	1.19	1.21	1.23	1.25	1.28	1.30	1.32	1.35	1.37	1.39	1.42	1.44
3	1.03	1.06	1.09	1.12	1.16	1.19	1.23	1.26	1.30	1.33	1.37	1.40	1.44	1.48	1.52	1.56	1.60	1.64	1.69	1.73
4	1.04	1.08	1.13	1.17	1.22	1.26	1.31	1.36	1.41	1.46	1.52	1.57	1.63	1.69	1.75	1.81	1.87	1.94	2.01	2.07
5	1.05	1.10	1.16	1.22	1.28	1.34	1.40	1.47	1.54	1.61	1.69	1.76	1.84	1.93	2.01	2.10	2.19	2.29	2.39	2.49
6	1.06	1.13	1.19	1.27	1.34	1.42	1.50	1.59	1.68	1.77	1.87	1.97	2.08	2.19	2.31	2.44	2.57	2.70	2.84	2.99
7	1.07	1.15	1.23	1.32	1.41	1.50	1.61	1.71	1.83	1.95	2.08	2.21	2.35	2.50	2.66	2.83	3.00	3.19	3.38	3.58
8	1.08	1.17	1.27	1.37	1.48	1.59	1.72	1.85	1.99	2.14	2.30	2.48	2.66	2.85	3.06	3.28	3.51	3.76	4.02	4.30
9	1.09	1.20	1.30	1.42	1.55	1.69	1.84	2.00	2.17	2.36	2.56	2.77	3.00	3.25	3.52	3.80	4.11	4.44	4.79	5.16
10	1.10	1.22	1.34	1.48	1.63	1.79	1.97	2.16	2.37	2.59	2.84	3.11	3.39	3.71	4.05	4.41	4.81	5.23	5.69	6.19
11	1.12	1.24	1.38	1.54	1.71	1.90	2.10	2.33	2.58	2.85	3.15	3.48	3.84	4.23	4.65	5.12	5.62	6.18	6.78	7.43
12	1.13	1.27	1.43	1.60	1.80	2.01	2.25	2.52	2.81	3.14	3.50	3.90	4.33	4.82	5.35	5.94	6.58	7.29	8.06	8.92
13	1.14	1.29	1.47	1.67	1.89	2.13	2.41	2.72	3.07	3.45	3.88	4.36	4.90	5.49	6.15	6.89	7.70	8.60	9.60	10.70
14	1.15	1.32	1.51	1.73	1.98	2.26	2.58	2.94	3.34	3.80	4.31	4.89	5.53	6.26	7.08	7.99	9.01	10.15	11.42	12.84
15	1.16	1.35	1.56	1.80	2.08	2.40	2.76	3.17	3.64	4.18	4.78	5.47	6.25	7.14	8.14	9.27	10.54	11.97	13.59	15.41
16	1.17	1.37	1.60	1.87	2.18	2.54	2.95	3.43	3.97	4.59	5.31	6.13	7.07	8.14	9.36	10.75	12.33	14.13	16.17	18.49
17	1.18	1.40	1.65	1.95	2.29	2.69	3.16	3.70	4.33	5.05	5.90	6.87	7.99	9.28	10.76	12.47	14.43	16.67	19.24	22.19
18	1.20	1.43	1.70	2.03	2.41	2.85	3.38	4.00	4.72	5.56	6.54	7.69	9.02	10.58	12.38	14.46	16.88	19.67	22.90	26.62
19	1.21	1.46	1.75	2.11	2.53	3.03	3.62	4.32	5.14	6.12	7.26	8.61	10.20	12.06	14.23	16.78	19.75	23.21	27.25	31.95
20	1.22	1.49	1.81	2.19	2.65	3.21	3.87	4.66	5.60	6.73	8.06	9.65	11.52	13.74	16.37	19.46	23.11	27.39	32.43	38.34

COMPOUND GROWTH/INTEREST TABLE

The amount to which a unit (1) will grow
within the periods stated
and at the rates stated

Example 1

Example 2

Year	Growth/Interest Rate (%) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20
2	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.17	1.19	1.21	1.23	1.25	1.28	1.30	1.32	1.35	1.37	1.39	1.42	1.44
3	1.03	1.06	1.09	1.12	1.16	1.19	1.23	1.26	1.30	1.33	1.37	1.40	1.44	1.48	1.52	1.56	1.60	1.64	1.69	1.73
4	1.04	1.08	1.13	1.17	1.22	1.26	1.31	1.36	1.41	1.46	1.52	1.57	1.63	1.69	1.75	1.81	1.87	1.94	2.01	2.07
5	1.05	1.10	1.16	1.22	1.28	1.34	1.40	1.47	1.54	1.61	1.69	1.76	1.84	1.93	2.01	2.10	2.19	2.29	2.39	2.49
6	1.06	1.13	1.19	1.27	1.34	1.42	1.50	1.59	1.68	1.77	1.87	1.97	2.08	2.19	2.31	2.44	2.57	2.70	2.84	2.99
7	1.07	1.15	1.23	1.32	1.41	1.50	1.61	1.71	1.83	1.95	2.08	2.21	2.35	2.50	2.66	2.83	3.00	3.19	3.38	3.58
8	1.08	1.17	1.27	1.37	1.48	1.59	1.72	1.85	1.99	2.14	2.30	2.48	2.66	2.85	3.06	3.28	3.51	3.76	4.02	4.30
9	1.09	1.20	1.30	1.42	1.55	1.69	1.84	2.00	2.17	2.36	2.56	2.77	3.00	3.25	3.52	3.80	4.11	4.44	4.79	5.16
10	1.10	1.22	1.34	1.48	1.63	1.79	1.97	2.16	2.37	2.59	2.84	3.11	3.39	3.71	4.05	4.41	4.81	5.23	5.69	6.19
11	1.12	1.24	1.38	1.54	1.71	1.90	2.10	2.33	2.58	2.85	3.15	3.48	3.84	4.23	4.65	5.12	5.62	6.18	6.78	7.43
12	1.13	1.27	1.43	1.60	1.80	2.01	2.25	2.52	2.81	3.14	3.50	3.90	4.33	4.82	5.35	5.94	6.58	7.29	8.06	8.92
13	1.14	1.29	1.47	1.67	1.89	2.13	2.41	2.72	3.07	3.45	3.88	4.36	4.90	5.49	6.15	6.89	7.70	8.60	9.60	10.70
14	1.15	1.32	1.51	1.73	1.98	2.26	2.58	2.94	3.34	3.80	4.31	4.89	5.53	6.26	7.08	7.99	9.01	10.15	11.42	12.84
15	1.16	1.35	1.56	1.80	2.08	2.40	2.76	3.17	3.64	4.18	4.78	5.47	6.25	7.14	8.14	9.27	10.54	11.97	13.59	15.41
16	1.17	1.37	1.60	1.87	2.18	2.54	2.95	3.43	3.97	4.59	5.31	6.13	7.07	8.14	9.36	10.75	12.33	14.13	16.17	18.49
17	1.18	1.40	1.65	1.95	2.29	2.69	3.16	3.70	4.33	5.05	5.90	6.87	7.99	9.28	10.76	12.47	14.43	16.67	19.24	22.19
18	1.20	1.43	1.70	2.03	2.41	2.85	3.38	4.00	4.72	5.56	6.54	7.69	9.02	10.53	12.33	14.46	16.88	19.67	22.90	26.62
19	1.21	1.46	1.75	2.11	2.53	3.03	3.62	4.32	5.14	6.12	7.26	8.61	10.20	12.06	14.23	16.78	19.75	23.21	27.25	31.95
20	1.22	1.49	1.81	2.19	2.65	3.21	3.87	4.66	5.60	6.73	8.06	9.65	11.52	13.74	16.37	19.46	23.11	27.39	32.43	38.34