FOREIGN FINANCING FOR COASTAL INFRASTRUCTURE IN DEVELOPING COUNTRIES

Master of Science Thesis
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January 2004
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Second edition Printed: 09 January 2004

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'I do nothing but go about persuading you all, old and young alike, not to take thought for your persons or your properties, but and chiefly to care about the greatest improvement of the soul. I tell you that virtue is not given by money, but that from virtue comes money and every other good of man, public as well as private. This is my teaching, and if this is the doctrine which corrupts the youth, I am a mischievous person.'

Socrates (469 BC - 399 BC), quoted by Plato, 'The Death of Socrates'
PREFACE

Where the emphasis in assisting developing countries to manage their problems in the coastal zone has been on sustainable development, this research focuses on the financing required to realise the plans which execution forms an integral part of the coastal policy. It provides an advice for governments of developing countries on how to increase the available sources of financing, especially from abroad.

The idea is that governments of developing countries should be acquainted with the way financiers make investment decisions and be aware of the methods available to influence this. This research aims to provide the just that information.

It is not suggested that ideas presented are a complete novelty, but it does fall outside the scope of the traditional coastal zone. This research aims to be an addition to that point of view.

Royal Boskalis Westminster NV (Boskalis) has generously supported the research, which gave access to an enormous amount of information. It also gave the opportunity to examine the position of the contractor more thoroughly. Contractors are demanded to participate ever more in complicated financing structures. Their participation in financing is analysed. Contractors’ options for participation in financing projects are discussed.

The author has written this report for his Master of Science thesis, for his studies in Civil Engineering at Delft University of Technology. He specialised in Coastal Engineering, at the faculty sub-section of Hydraulic engineering. He has also briefly studied Business Administration at Erasmus University in Rotterdam.

Don Ginsel

Papendrecht, 14 November 2003
ACKNOWLEDGEMENTS

Many thanks go out to all people mentioned below and even more, who I am unable to mention here. A large amount of information and discussion was a necessary component for the understanding of the subject and the production of the research. Especially the friendly and supportive people at Royal Boskalis Westminster’s headquarters composed a helpful, pleasant and informative environment.

Delft University of Technology, Faculty of Civil Engineering and Geosciences

Founded in 1842, Delft University of Technology is the oldest, largest, and most comprehensive technical university in the Netherlands. With over 13,000 students and 2,100 scientists (including 200 professors), it is an establishment of both national importance and significant international standing. Renowned for its high standard of education and research, the University collaborates with other educational establishments and research institutes, both in the Netherlands and overseas.

TU Delft tries to discover problems and challenges in society which, with all its expertise, it can work towards solving. In short, it is society itself that defines our most important assignments. Today, social issues are becoming progressively complex - more and more often, they require a multidisciplinary approach. [www.tudelft.nl]

Committee members:

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prof. drs. ir. J.K. Vrijling, Probabilistic design and hydraulic structures;
ir. T.H.W. Horstmeier, Design and construction management.

Royal Boskalis Westminster NV

Royal Boskalis Westminster NV is an international service company active in the area of maritime infrastructure. Its core activities include the construction and maintenance of harbours and waterways, the creation of land in water, and coastal defences and riverbank protection. In addition, the company operates in numerous home markets in a wide range of related activities such as sand and gravel production, dry earth movement, environmental activities, and underwater rock fragmentation.

Boskalis has a wide spread of operations worldwide. Boskalis has operations in over 50 countries in five continents. The company has a large and varied fleet of some 300 vessels. Boskalis has been listed on the Euronext Amsterdam since 1972. [www.boskalis.com]

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SUMMARY

While foreign investments in developing countries are declining each year, the need for help and funding grows steadily. In the coastal zone the effects of over-population, pollution and changes in climate are becoming ever clearer. This requires a suitable policy to tackle the increasing number of problems and provide the coast with the necessary infrastructure for development. These works call for large sums of money, which the developing countries often do not have at their disposal. An alternative approach is necessary to increase the financial means available for coastal infrastructure and policy.

This research aims to provide a guide for governments of developing countries to assist in attracting foreign investments for coastal infrastructure. This includes ports, waterways, landfill and reclamation, roads and sea-defence. Governments of developing countries should first realise that investors have a different way of judging project value and second, acquire knowledge of it and use it to attract more finance.

Project financing is a suitable way of arranging financing between multiple financiers when the project generates revenues. For project finance a separate company is founded which manages the projects finances. The most important roles for financiers in project financing are lender and sponsor. They invest in the project based on future cash flows with the projects assets as collateral. This type of financing is non-recourse, stating that no recourse from sponsors or government is possible at default. This increases the risks for participants and also the arrangements costs.

The available international financing sources are divided in three categories: Bilateral institutes, multilateral organisations and private investors. The criteria found to be of most importance for the financing decision of the party are development goal realisation and economic feasibility for multilateral and (often with addition of off-take obligation) bilateral institutes. Private financiers determine their investment decision mostly on a return on investment as high as possible compared to the risk of financing, together called the commercial attractiveness. Other criteria researched are: financial feasibility; inter party agreement; environmental sustainability and country risk.

The financiers’ criteria are evaluated with project feasibility methods, with the qualitative economic, financial and commercial feasibility based on the internal rate of return method for comparison with a required rate of return, different for each financier. The required rate of return for commercial feasibility is set at the cost of capital for a company with a risk premium for the country risk, the default risk and (for sponsors) the cash flow volatility risk. The risks are respectively determined by the country risk rating (twice) and the variation coefficient of the GDP in current US$. Public financiers have a comparative rate of zero for economical feasibility.

Because commercial financiers are mainly interested in their own cash flow, the individual cash flows need to be separated, and compared with the predetermined required rate of return. For this a cash flow model has been made in Microsoft Excel, to present cash flows independently and determine individual rates of return.

Taking two examples, the actual arrangements in financing is examined as well as the working of the cash flow model to execute project feasibility studies. For the Cartagena Tidal inlet project in Colombia is found that the FMO grants mostly because of development goals and Dutch export incentive. Environmental protection is also and important issue. For the Maputo Port concession in Mozambique the estimated returns for sponsors are high enough to explain their interest in the project without even considering secondary benefits. The lenders have a much lower rate of return on this project, especially compared to the estimated risk adjusted required return. This poses some questions about the risk modelling. It can be concluded that the involvement of development institutes can bring down perceived risks and thereby limit the cost of financing.

Regarding the policies of financiers and the examples examined, the criteria and how their fulfilment is assessed by financiers, provides a handhold for developing country’s policies. Addressing the criteria of development finance institutes is best done by striving for development goals fulfilment and economic development. Environmental aspects are also very important, while the eligibility for development financing is of hardly any influence for the government. Private financiers can best be
attracted by limiting risks through government involvement in the financing or development finance participation and by improving profitability for financiers by tax incentives or subsidies.

Contractors have the option to advice on financing, arrange financing with other parties or participate in financing. Lately, the latter option is demanded more often requiring the contractors to invest in a project as sponsor. This investment should be compared to the additional benefits of goodwill and surety of work. The financial risks need to be assessed properly and a partnership with a financial party would be beneficial. Optimally, if demands for participations keep growing, a standard financial partnership for multiple projects could be beneficial.

In South Africa development assistance is hardly given anymore because of the average welfare. Some funds are available for small local initiatives or particular environmental issues, other than infrastructure. Within the scope of this research, private financing would have to be addressed if foreign financing is required. South Africa has understood this and promoted foreign investment by tax relief programmes, and investments assistance. What could still be improved is the allocation of needed projects to prosperous development opportunities. Especially tourism and transport seem attractive developments to co-finance coastal infrastructure.

In general the advice to developing countries is:

- To aim at grants for financing first, second soft loans, third commercial loans and fourth commercial investments, because of the costs of capital. Secondary benefits like import of knowledge and efficiency can make the fourth option more attractive.

- Developing countries’ governments can best attract bilateral foreign finance by creating political relations and address development goals.

- Developing countries can best attract multilateral finance by aiming at development goals like spread of welfare and economic development.

- Developing countries can best attract commercial financiers by limiting the perceived risk by financiers and provide tax incentives for higher returns.

- Also demanding sponsorship from contractors or operators or an export credit is a possibility.

- Even though a country may not be entitled to receive development assistance, the involvement of a development financing institution is helpful in reducing perceived risks by investors.

Contractors should assess the total package of benefits that come from participation in financing, regarding direct financial return, surety of work and goodwill for example. When a contractor will choose to participate in financing, a partnership with a financial institution is beneficial for both, concerning their specialist knowledge. Besides participating in finance, contractors might decide only to advice or arrange financing, provided by another party.

South Africa faces many problems in the investment climate, but has a large potential to exploit tourism, mining and transport to generate the financial benefits needed to develop infrastructure, housing, employment and other development which is seriously needed.
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1 INTRODUCTION & PROBLEM DESCRIPTION

What is being researched and how?

Discussing the problems in developing countries, regarding their ability to manage their coast and development adequately, the issue of finance seems to be an important limitation. This chapter extensively discussed the problems and interconnections, enabling the selection of availability of finance as main challenge to be researched in this thesis. This leads to a problem definition and research goal, giving direction to an approach to contribute to a quickened development for developing countries, making use of foreign financing sources for infrastructure. The chapter concludes with a readers' guide of the report.

1.1 INTRODUCTION

Developing countries have a difficult job keeping up with the more prosperous economies in the world. To overcome this inequality, economic development should bring about a more social distribution of welfare. Despite much help of developed countries the disparity in wealth is increasing.

One of the effects of weak economic strength is the insufficient ability to invest in infrastructure, that is needed for economic development and to cope with changing environmental conditions. Another problem, closely related to the economic instability and accompanying a low level of development is political instability and in effect the inability to regulate, monitor and plan resource use and environmental conditions.

While about two thirds (50%-70%) [Hoozemans et al, 1993] of the human population in the world lives at or near the coast, this area is most vulnerable to human activities and is most affected by the late and predicted climate changes. Especially sea-level-rise and increasing river discharges are a growing treat to human livelihoods and economic activities [IPCC, 1993].

The need to assist developing countries with these problems has been identified on the World Coast conference in 1993 in Noordwijk, The Netherlands [IPCC, 1993] and was recently re-issued on the World Summit on Sustainable Development in Johannesburg [WSSD, 2002].

Developing countries are trying to set up a solid coastal management system to develop the needed coastal infrastructure. They unfortunately often lack sufficient creditworthiness and funds for infrastructure projects. This research paper discusses abovementioned problems and suggests solutions for these problems, especially concerning the coastal zone and available finance.

'Until the early 70's, much of the financing of infrastructure development in emerging countries came from government sources, such as the host country government, multilateral institutions and export financing agencies. More recently, however, constraints on public funding have emerged. These constraints include reductions in developing country financial aid funding' [Hoffman, 1998]

Increasingly, the private sector is invited to interfere in project development, construction, operation and financing. First, because of the deteriorating funds from public sources and second because of the insight that the private sector is often better capable of executing these tasks. In developing countries, this changing environment is increasing the need for foreign investments, with a large participation required for private parties [Hoffman, 1998].

1.2 PROBLEMS IN THE COASTAL ZONE IN DEVELOPING COUNTRIES

1.2.1 Discussion of current problems at the coast

Over the world, many people live along the coastal shores. Because of its enormous share of resources, the coastal zone is an attractive environment for people. People live, work and leisure at or near the coast and many natural coastal resources have economic importance. Besides humans,
unique flora and fauna is found along the coastal waters, and the coast is a place where the large number of uses should be carefully balanced.

In Figure 1-1, an overview is given of some sub-problems, which were considered relevant for this research. It helps to clarify the structure of the problem. Not all mentioned problems are occurring simultaneously in all developing countries and not all possible problems are mentioned. This cause and effect analysis describes some common problems, which seem most necessary to analyse the situation in developing countries.

The scope of problems and possible solutions lies within the developing country itself. Trade barriers with developed countries and other external development limitations are not considered.

![Figure 1-1: Some causes and effects of problems in the coastal zone of developing countries](image)

**Lack of education, law and enforcement**

Many developing countries are still on the brink of setting up a solid regulatory framework concerning pollution, environmental protection and a steady business environment. Some countries, which have a more advanced legal system, often lack the political stability to execute and vindicate these laws. Kaufman et al. [2002] researched several indicators of political development, showing that many developing countries meet problems in some area of governance. These problems with the legal system disable regulation of over-use of natural resources, pollution and so deterioration of the environment. Education to create awareness of coastal issues is seen as part of a solution to this problem.

**Over-use of natural resources**

For simplicity, pollution is viewed as over-use of the space and capacity available within the environment to deal with waste. The exploitation of natural resources, is unrestricted by concerning regulation that is non-existent. The main cause remains the growing population, which produces an increasing amount of rubbish and uses an increasing part of the available resources. Examples of these resources are space, fertile soil, drinking water, timber and fish stock.

**Growing population**

Due to growing world population and migration towards the sea, the number of people living in the coastal zone is growing very fast. In many developing countries the population around economical potential, like large cities and ports, is growing at large pass. When the lesser developed parts of a country, often the rural part, is poorer, the larger the stream of migrants becomes. In overcrowded areas poverty, pollution, health problems and over-exploitation of resources are the results. These effects are again causes of problems like environmental degradation and pose a serious threat to human health in these areas.
Climate change
The climate on earth is changing [IPCC, 2003]. The most threatening to the coast are the rise in sea level and the increasing occurrence of natural hazards, like excessive rainfall and tropical storms. For human as well as natural functions, increasing discharge of rivers, flooding and other destructive conditions form a serious threat. Especially human health and economic development are influenced by these changing conditions, although it should be noted that not everywhere on earth these changes in climate are perceptible.

Environmental deterioration
Lack of environmental regulation and the abuse of natural resources cause a deteriorating environment along the coasts. Here, the problems grow faster than elsewhere, because of the large number of people in this region. Worldwide, governments and development associations agree that regulation and its enforcement should be able to maintain the environment at an acceptable level and improve the current situation where necessary and possible [WSSD, 2002].

Increase in poverty
One of the major challenges faced by developing countries is overcoming poverty. Besides a lower income to re-invest in the country, poverty is a threat to health and can only be lifted by equally distributed economical development. To come to an equal distribution also the right regulatory (social) framework is needed [World Bank, 2002].

Health treat
Poverty reduces the environmental and sanitary conditions. This poses threats like lack of food, unsuitable housing and spreading of deceases. Because of this, people are moving to places where the environment poses more risk on the inhabitants, which is increased by the changing climate. Down-grading of infrastructure has the same influence, where sanitary facilities or protecting infrastructure are becoming inappropriate.

Infrastructure down-grading
Infrastructure development is the most appropriate measure against problems caused by economic deterioration, caused by health threats and climate change. Bad maintenance by lack of money often causes infrastructure to degenerate, with its impact on the economy. Examples of infrastructure are roads, ports, coastal defence systems, sewerage and drinking water supply, but also hospitals and urban development.

1.2.2 Need for coastal zone management
An increasing number of problems along the coasts are being identified. As a response, Coastal Zone Management (CZM, see paragraph 2.2), a policy with promising results in western countries, is increasingly used to address the problems of the coastal zone.

Many western countries are trying to help developing countries to identify the problems and provide the knowledge and technology to solve them. There are some analogies between CZM in developed or developing countries. Nevertheless, several problems can be described, which arise in implementation of coastal plans specific for the developing world. These issues require attention from the following developments.

Need for regulation
A very important condition for Coastal zone management and development is regulation. Herein the goals and objectives are set as well as the laws under which the policy shall be carried out. In this regulation, a large part needs to focus on the environment, pollution and the use of resources.

Enforcement of the regulation by the right institutions should also be included, as well as education of policy enforcers. Education is also a tool for creating awareness of problems and management with all users of the coast. Poverty eradication is also an important policy issue, where inequality of income is large. The investment climate, required to be healthy to attract foreign investors, also needs a solid regulatory framework of financial laws.

Need for economic development
The fight against an increase in poverty requires economic development, equitable division of welfare amongst the people, and the general raise in economic standards. With an improved economy, more
funds become available for development in general, so that poverty, health threats and environmental deterioration can be diminished.

Economic development is also required if foreign financing is needed for development. Although foreign financing can be a catalyst for economic development, some development must already have taken place because foreign financiers require monetary and economic stability.

Need for infrastructure

To support an upcoming economy, decent infrastructure is required. Not only to protect the business environment from natural threats, but also to open up areas separated from development, link production with consumption and decrease travel time. To overcome health problems, sewerage, drinking water and suitable housing need to be realised.

The increased risk for monetary instability causes a slow and volatile economic growth and low credit ratings by international finance institutions, disabling the country to obtain necessary financial means that are not available on the domestic finance market.

1.2.3 Need for political stability and investments

All these problems require two major issues to be solved: the need for political stability and the need for investments. These two problems are worked out in this paragraph, after which the goal and approach of the research are set out.

Need for investments

'The lack of capital in developing countries results in a need for foreign investment and lending to satisfy growing infrastructure needs' [Hoffman, 1998]. In developing countries, a shortfall of funds to invest in these projects leaves a gap between needed and realised projects, because of shortfall of domestic savings [Leslie, 1987]. Non-stable political situations tend to keep away foreign investors. The only providers of funds with specific interest in developing countries are multilateral and bilateral development agencies. Still, even these institutes require a decent governmental policy and certain stability.

Need for political stability

Many developing countries still suffer from unstable political climates. Some countries still have not fully recovered from colonialism and western exploitation. In several cases, disputes with neighbouring countries exist, or the country itself is divided by inequality, oppression or rivalry between political leaders, sometimes resulting in war. Political instability poses a serious threat to the ability to attract foreign investments [Kauffmann et al, 2002].

Many developing countries carry the burden of an enormous foreign debt, resulting in large debt service\(^1\) payments or financial isolation. This has its impact on the economy of the developing country, which is also hindered by several international import protection measures.

1.2.4 Research problem definition

Much of the recent work in assisting coastal development in developing countries coped with the stated problems in the field of Coastal zone management, sustainable development and poverty reduction. However, as the flows of public funds to developing countries are drying, the need for private investments becomes lucid.

The focus of this research is the finance required for coastal financing is an important part of project development, but is often over-simplified or even neglected in (theoretic) project development. In developing countries, this is a factor, which has a very negative impact on the number and size of projects which are developed.

\(^1\) Debt Service: amounts payable for interest and pay-off for debt
The problem definition:

An increasing number of problems arise along the coasts of developing countries, needing an appropriate approach like Coastal Zone Management, involving solutions to these problems. The limited domestic financial means and the inadequate access to international finance restrain the capability to apply these solutions and will have to be conquered.

1.3 APPROACH TO THE RESEARCH

1.3.1 Research goal

The problem simply put as the requirement for more foreign investments in developing countries' coastal infrastructure, has several aspects, which are further investigated. First, a comprehensive goal is set for the research, to set the outer boundaries to the research.

Research goal:

Research the possibilities, risks and feasibility of attracting foreign investment for a strategic approach to Coastal Zone Management projects, in developing countries. This should be covered in a model for application, usable for Dutch contractors like Royal Boskalis Westminster NV, in order to assist foreign clients in arranging financing for the development of coastal infrastructure.

1.3.2 Method

The research is approached from the perspective of the initiator of a project in the coastal zone. It is presumed that it is an investigation for a government of a developing country, to identify financing options and ways to influence their interest. It should provide a strategic analysis and advice on how the government should approach available financing sources, manage the coastal zone and finance the subsequent projects.

The strategy for this is first to research the optimal way to allocate coastal resources to infrastructure projects. Second, the initiator must be aware of the motives for investing of several institutions, by which the initiator can adjust his project or select the right financier. The criteria, by which financiers make their financing decisions, should be able to assist the initiator in understanding financiers' incentives and attracting foreign project financing.

Financing is discussed especially because besides enabling project development, it has its own cost and arrangements, which is often forgotten or ignored. The financing needs to be set-up in several alternatives, which is evaluated and selected, to come to the most suitable arrangement, for all parties involved. The government of a developing country will also be given the means to select the most suitable financing structure, depending on their needs and means available.

Infrastructure is the playground of large contractors. Along the coasts, climate change and economic development require and make possible much work to be done by contractors like reclaiming land, building dikes and breakwaters, dredging canals and harbours and other infrastructure. This counts especially for developing countries, where infrastructure is far from complete. Unfortunately, still many projects fail due to financing problems. This is also a reason to improve project financing, and increase the number of successful projects in developing countries. With the findings of this research, contractors are able to assist their clients reach their goals on financial level and eventually increase business activities. The increasing role of contractors as project sponsor or lender is also discussed.

1.3.3 Criteria, assumptions and boundaries for the research

Governments' objectives

Based on the assumption that governments want to create value for their country, in this case, looking at the coastal zone. Value creation can be found in preventing damage from flooding, stop erosion or improve infrastructure in order to create a better economy and thereby improve the welfare of the
people. This viewpoint is assumed for the research. Other value creation can be found in improving the environment or taking measures to improve the health of civilians.

The government makes decisions based on economic and political benefits of a project, whether or not measurable. Another assumption is that governments want the infrastructure projects they initiate to be economically feasible.

Investors' objectives

Investors are mainly interested in making return on their investment. Because of the growing international awareness of business ethics and the need for sustainable development as well as sustainable relations with clients as well as suppliers of resources, other criteria for doing business are becoming more important. For simplicity, it is assumed in this research that the interest of investors lies merely on making return on investments, leading to profitable entrepreneurship.

In addition, the height of investment risk is an essential parameter for investors. It is assumed that investors make their decisions based on return on investment, compared to the risk their bear. Investors want to maximise return / risk ratio.

Contractors' objectives

Traditionally, contractors have not much to do with financing of projects. Project initiatives are tendered in procedures requiring only a thorough execution-plan and calculated construction cost based on a preliminary design from the client.

In recent years, design and construct and other integrated contracts have come in fashion, where the contractor has to bid on basis of a set of boundary conditions, which requires the design to be done by the contractor.

The next step to integration is the involvement of the contractor in project development and financing processes. Lately, taking part besides constructing in the financing, arrangement or supply is requested increasingly.

International financiers

The search for finance is limited to the international finance market. This source, however, comprises many financiers, with many (slightly) different goals and work methods. To come to a comprehensible research and still enable the information to be useful for identifying financiers and their criteria for investment decisions, the scope is limited to three main categories of financiers, assumed to be driven by a single set of investment criteria. It is therefore not expected that this research offers a complete manual for attracting all possible financiers, but way financiers evaluate projects compared to national governments initiating them should become clear.

Financing of projects

Coastal Zone Management demands much more money than only direct project funding. The needed funds, which besides by government finances are also available in the international development assistance market, do often not produce direct benefits. This makes this funding inappropriate for private financing, which is seen as an interesting source for developing countries. To be able to assess their participation in finance, only coastal projects are investigated.

1.3.4 Objectives

The research goal can be split up in several objectives, partitioning the research in smaller pieces. These objectives form the basis of the chapters, which will become clear in the readers guide.

- Determine boundaries of research, type of projects and physical, political and financial environment;
- Identify and select foreign financing sources for developing countries' infrastructure;
- Assess the financiers' criteria for financing;
- Research how to evaluate these criteria;
- Investigate how projects are financed by these financiers;
- Develop a method to assess the criteria, so that a government may select financiers and address their requirements;
• Find and evaluate opportunities for developing countries to remove obstacle for financiers and attract more foreign financing;
• Apply all findings in a case country;
• Identify opportunities for contractors regarding co-financing and assisting clients.

1.4 READERS GUIDE

This report is set up make the subjects of coastal zone management, finance and project appraisal accessible to many readers. Especially concerning the fact that much of the theory falls beside common Civil Engineering lead to a more extensive handling of these subjects. Readers who are already acquainted with these subjects could skip chapters two, three and five.

Chapter two pictures the environment under observation, discussing the coastal zone, coastal infrastructure and Coastal Zone Management.

Chapter three introduces the facts of finance, by reviewing Corporate Finance as well as Project Financing techniques. The chapter also explains various finance structures found with infrastructure projects and different roles parties can play in financing.

Chapter four discusses and selects several financing sources, especially for projects in developing countries, with a foreign origin. Examples of bilateral, multilateral en private financing are discussed.

Chapter five uses the criteria determined in the previous chapter to determine the value of project for each different party. It comes discusses several feasibility studies to assess these criteria.

Chapter six introduces the method used in this research to assess the score of infrastructure projects and the developing countries on the financiers' criteria for financing. It explains the importance of risk analysis and mitigation as well as cash flow prediction and certainty.

Chapter seven shows two examples of financing and uses methods discussed in the previous chapter to evaluate the decision to participate in financing of the parties who did.

Chapter eight concludes all previous chapters by discussing opportunities for developing countries to improve the attractiveness of infrastructure in their countries for financiers.

Chapter nine discusses the findings and impact of the research for contractors.

Chapter ten researches South Africa for its options in attracting finance for its infrastructure projects and evaluates the opportunities suggested in chapter nine.

Chapter eleven concludes the research with a discussion, conclusions and recommendations.

1.5 CONCLUSIONS

This research will investigate the options for governments of developing countries to attract financing from foreign sources. Because coastal problems in developing countries are growing, while financial means are diminishing, this seems the necessary way to be able to resolve these problems.

The problems in the coastal zone include lack of housing, pollution, unemployment and bad infrastructure. This infrastructure is seen as the key to better development. The infrastructure facilities falling under the scope of the research are of a civil engineering nature.

The research will find and assess various foreign sources of finance and see how the developing country can cope with these demands and still fulfil its own needs.
2 COASTAL ZONE INFRASTRUCTURE & MANAGEMENT

Which types of project, in which environment are under investigation?

There are two reasons to provide background information on Coastal Zone Management and infrastructure. The first reason is to give the boundaries and a description of the projects that are being researched. The second is to explain the presence and use of coastal resources that could be used to generate benefits for coastal projects, and make them more profitable, both economically and financially.

A description of the coastal zone, its human functions and infrastructure is discussed. Next, coastal zone management and the therefore required financing are considered, followed by a summary of coastal zone management with a focus on developing countries and some issues that require attention.

2.1 DESCRIPTION OF THE COASTAL ZONE

2.1.1 Definition of the coastal zone and its boundaries

The need for a definition of the coastal zone is eminent. Not so much from the ambiguity of the place of the coastal zone, everyone will point to the interface between the sea and the land. The problem lies in the size of the coastal area. Which parts are included and which are not? This especially becomes an issue when discussing coastal zone management, where an authority must be assigned regulatory rights over a defined area.

In this research, country borders set the system boundaries. The exclusive economic zone exists of 200 nautical miles seawards of the coastline, according to United Nations Convention on the Law of the Sea. Hoozemans et al. [2002] also considers the exclusive economical zone to be the seawards boundary, whereas the landward boundary is considered to be best at 300 meters land inward of the high water mark or where the influence of the sea is present.

As landward boundary of the coastal zone the region under influence of the tides (also some parts of rivers, lagoons and estuaries) is chosen. It is of importance for protection of the land from flooding, saltwater intrusion or erosion. This area also includes the dunes. It should be extended to the nearest administrative boundary. The seaward boundary is chosen on the continental shelf, in practise to a depth not more than 50 meters.

2.1.2 Coastal resources

Physical resources

The coast comprises many physical resources, which have several uses for humans and functions for nature. The most important resource, but perhaps the too common to notice is the resource of space. Especially now the number of people in the coastal zones around the world is growing as well as their required space. This resource it threatened the most by flooding and erosion. Related to space is fertile soil, required for agriculture and for example solid ground for construction of houses. Tidal flats and island are more separated parts of the coast, but actually also make part of the space, albeit with different functions. Other physical resources are mining products like sand, rock and clay. The climate also produces some non-living resources, like wind, waves, currents, sunshine, temperature and rain. The latter is also of great importance of producing sufficient fresh water.

The living resources of the coast are all flora and fauna. For human interest a smaller number of living resources can and must be mentioned. Fishery is in many societies a very important source of nutrition and income. The species of fish that are being caught are numerous. Also at the beaches

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much food is found, for example in the form of shrimps, shellfish and lobsters. Other important living resources are mangroves, dune vegetation and sea grass. These plants protect the coast from erosion and often are a source of food.

Besides water based animals also many land and air based animals choose the coast as their territory. Many animals live in dunes, mangroves and on tidal flats. Especially birds are seen much in the coastal region. In the water, corals must also be considered as a part of the coastal zone, completing the often delicate equilibrium of nature.

2.1.3 Human activities in the coastal zone

The people living in the coastal zone have several reasons for doing so. Besides the natural attraction of human beings to water, the coast provides an abundance of resources required for living.

Since long, humans have fished in the coastal waters. This ‘food gathering’ at sea was combined with food gathering at land or even agriculture. These activities required the people to live near the coast, so housing was needed.

Nowadays these subsistence activities are still present and supplemented by other functions like working as an employee or as entrepreneur. These new functions made it possible for many new functions to be added to the human activities in the coastal zone, for example recreation. The nice environment of the coast is an attraction towards people looking for recreation. The fact that many economical centres are at the coast is an attraction for the poorer people.

This new function as well as the increasing ability to travel also introduced the function of transport. At the coast transport over water and transport over land are linked, leading to inter-modal transport nodes (ports).

2.1.4 Coastal infrastructure

Infrastructure can comprise many different facilities. In this research, coastal infrastructure is determined as the facility to provide building ground, connect places and people and protect land and people.

This leaves open a wide range of facilities, which are not of interest for this research. Civil engineering works are concerned and thus facilities like electricity and phone lines are excluded. Below some examples of infrastructure in the coastal zone are summed up.

- Transport: Roads, waterways, ports, airports, railways, canals
- Livelihood: land-fills, artificial islands, construction land, canals and drainage; sewerage, water supply, electricity, phone, cable.
- Protection: Dikes, breakwaters, piers, quays, beaches, dunes

This research chooses the coastal zone as its research area but could easily be expanded to a wider environment and different types of (infrastructure) project.

2.1.5 Economic activities in the coastal zone

The resources available at the coast are important for several economic activities. These are the places where people at the coast earn a living or work as entrepreneur. The coastal economies are known to have a large impact on the economies as a whole, due to the unique combination of land and water based resources, the need to change transportation means between sea and land and the allure of the coast for tourism.

However, many economic activities that are found land inward are also counted to coastal activities when it is a part of the economy in the coastal district.

Mining

Mining at the coast consists of several physical resources that are exploited: minerals, sand, rock and clay. Mineral are found in the forms of sandy mixture as well as rocky ore. The winning is much the same as winning sand or rock for other purposes. Sand is found on the bottom of the sea, where dredging equipment can win it, as well as on the beach. Rock is found on the coastal shores, on the bottom of the sea and on land. Economically, the location for rock winning is usually on the land. Clay can be found on the sea bottom, tidal flats or land inward on previous flooded areas, in estuaries and
rivers. These forms of mining play an important part in the self serviceability of a region or even a complete country. They deliver product to contractors and industry. Important to notice is the fact that resources used for mining are not re-usable.

Besides physical exploited resources, several living resources are also 'mined'. Examples of these are coral and forest. Both are an important part of the protection of the coast from influences of the sea. They are mined for tourist souvenirs or timber wood.

Fishery

What can be considered another form of mining is fishery. Fishermen 'win' fish from the available fishing grounds. Their ships depend on the port facilities and their ships determine the sailable distance. To the point where ships become far-developed 'fishing factories' the exploitation of the fish stock takes an enormous speed.

Other forms of fisheries exist of shrimp fishing and shellfish gathering. Also counted to fisheries is what is called aquaculture. This is the cultivation of fish, shellfish, shrimps and lobster species on shore or in estuaries.

Agriculture

Some soils near the coast appear to be very fertile. Especially near river mouths and estuaries, where the environment is a little less saline. Agriculture can be a very sustainable use of fertile soil, if applied well with changing corps and periods of rest. The stock of cattle should also be kept to a limited number.

Industry

As nodes in transport-lines start to grow at the coast, also industry will be found. Industry always wishes to locate itself as close as possible to transportation lines and especially to the nodes where various forms of transport unite. The ranges of industry that are found along the coast are enormous. Some are related to other economic activities like fishery or mining, but some are there solely because of the transport facilities. Examples are: shipbuilding, petrochemicals and refining, manufacturing, power generation.

Tertiary services

The more developed the economy, the larger the need for additional services. Nowadays, in even the lesser developed countries, the service sector plays a large role in the economy. This sector is characterized by the fact that it produces non-substantial services instead of goods. Examples of activities are: financial services, government activities, military and defence.

Infrastructure development

Development of infrastructure is also a form of economic activity that could be placed within industry. For the purpose of this research it is treated separately. It comprises the areas of land and real-estate development as well as civil and utility constructing. In paragraph 2.1.4 a more detailed enumeration of coastal infrastructure was provided.

Examples are: ports & shipping, leisure marinas, airports & air transport, passenger ferries, residential housing

Tourism

At the coasts, tourism cannot be thought away anymore. The human population has a love for the coast regarding leisure time and enjoyment. Although beaches are still a large attraction, nowadays eco-tourism is becoming a more popular pass of time.

One should realise that some uses are mutually exclusive; meaning that deploying one activity makes another impossible. A simple example of this is eco-tourism in an industrial area. When planning activities in the coastal zone a thoroughly examined balance of economic activities should be implemented.

2.2 DESCRIPTION OF COASTAL ZONE MANAGEMENT

2.2.1 Definition of Coastal Zone Management

Coastal zone management, whether called Integrated or not, is supposed to be integrated between sectors, governmental agencies, spatial, science and international.
'Integrated Coastal Zone management involves the comprehensive assessment, setting objectives, planning and management of coastal systems and resources, taking into account traditional, cultural and historical perspectives and conflicting interests and uses; it is a continuous and evolutionary process for achieving sustainable development.' [IPCC, 1994]

A parallel can be drawn between integrated water management and Integrated Coastal Zone Management, as for the integral approach. Both arise from the growing awareness of water as the most important natural resource. Actually, the separation is quite arbitrary, as can be concluded from the definition of the coastal zone.

In this research, 'Coastal Zone Management' or 'CZM' is used to appoint the policy creation process for the coast. The term integrated is left out of the equation because is seen as part of the method of implementing this instrument, not required for indication of the policy. There is not such a thing as non-integrated coastal management.

### 2.2.2 Sustainable development in coastal zone management

Since science is revealing how economic development influences the global and local environment, the role of the environment and sustainability in policies is growing. At the World Summit on Sustainable Development in Johannesburg (September 2002), this emphasis was stressed even more, providing a manual for multilateral, bilateral and other governmental agencies around the world.

The Brundtland commission [1987] has defined sustainable development as 'ensuring the needs of the present generation without compromising the ability of future generations to meet their own needs'. Although this definition is powerful and appeals strongly to the responsibility of the present generation, it is not obvious how to work it out.

Another, more widely usable definition of sustainable development is presented by Cicin-Sain & Knecht [1998], who state that it encompasses economic development to improve the quality of life; environmentally appropriate development to support ecological processes, life support systems and biological diversity; Equitable development to distribute economical benefits equally over society, between generations and international. The centre of concern of this approach is the human being.

### 2.2.3 Problems in developing countries

In developing countries, some of the earlier mentioned problems in the coastal zone, and especially with coastal zone management are of limiting proportions to the effectiveness of coastal management.

#### Political stability & law enforcement

Developing countries are known to have less stable political equilibriums than developed countries. This causes problems, because Coastal Zone Management is concerned with short term and long term policy. On the other hand, political stability is required to attract investors, because politics are of influence on exchange rates, interest rates, debt policy, import-export restrictions, tax policy, law and order and economic development.

#### Poverty

Poverty in coastal population is a serious threat to Coastal Zone Management, while the policy is one of the ways to eradicate this situation. People who are fighting for their life every day have a short term focus and cannot easily be convinced that sparse use of resources and take care of the environment for the long run. This effect is amplified by the lack of education, causing lack of knowledge and understanding of coastal processes, and therefore the unwillingness to comply with coastal policy. Insufficient education also lacks to create a suitable workforce required for effective Coastal Zone Management.

#### Economic stability

Coastal policy is based on prediction of demand and supply in resources. This is mostly of concern for the financing of the projects in Coastal Zone Management. Economic instability, as well as Misevaluations in growth opportunities can lead to big losses and are therefore avoided by investors.

### 2.3 Financing of Coastal Zone Management

Cicin-Sain & Knecht [1998] consider coastal zone management financing a matter of the government: "Typically, the national government will provide funds expressly to cover the development phase of an
ICM (i.e. CZM) program; these funds may represent a fixed sum of money available for only a specific period of time. In smaller developing coastal countries, however, the national government may be unable to provide such a funding or may be able to provide only a portion of what is needed. In these circumstances, outside funding becomes a necessity.

Since the Earth summit in Rio de Janeiro in 1992, an increasing number of international organisations provides funds for coastal zone management efforts. The best known ways of funding are: the World Bank, regional development banks, the global environment facility (GEF). Also bilateral relations make large contributions to arrange coastal zone management in their partner countries.

The next part of the report deals with the financing of the projects that are developed under Coastal Zone Management.

### 2.4 CONCLUSIONS

The coastal zone is special because of the presence of the sea. The sea creates additional transport measures and resources that can be used by humans. This has enabled a prosperous living along the coast, causing migration from less prosperous lands. Lately, tourism, stimulated by the pleasant climate and the natural attraction of the sea has caused increased activity and migration at the coast.

The abundance of coastal resources, mild climate and transport options create a large potential for economic development. These opportunities need to be exploited efficiently, to maximise economic benefits. It is with these opportunities also the necessary benefits required for foreign financing can be attracted.

Coastal Zone Management in developing countries needs to integrate economic development with environmental aspects and other uses. Economical efficiency should be given priority.

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3A joint initiative from the World Bank, United Nations Environmental programme (UNEP) and the United Nations development Programme (UNDP)
3 FINANCING PROJECTS

How can the financing of infrastructure projects be structured?

An introduction into financing, with special regard to projects is necessary to comprehend the features of financing of projects. Finance is, beside an important mean to organise companies or realise projects, a source for costs. Starting with some the principles of finance, a basis is laid for further analysis. The financing of projects is divided in three categories: direct financing, project tied financing and project financing. The latter two are better examined and form the scope of financing options for the rest of the research. The chapter concludes with a discussion of special developing countries’ issues and some preliminary conclusions.

Appendix I: holds a glossary of terms used in this chapter.

3.1 PRINCIPLES OF FINANCE

Companies are legal entities that make use of assets to produce goods or services. The sale of these goods and services forms income or revenue. Besides these assets a company uses labour, materials and service of other parties for production, resulting in costs.

To be able to invest in these required assets, the company needs to attract capital from it owners, the shareholders and form other parties (debt).

3.1.1 Capital: debt & equity

Every financial entity, a company with limited or full liability or other legal entity requires capital to realise their goals. Simply put, these funds can be obtained in two ways. One way is by attracting equity capital and the other way is by borrowing money (creating debt). Equity shares hold the ownership interest in a company. The goal of a company should therefore be maximising the return on the capital invested by them [Roos, Westerfield & Jaffe, 2002].

An important feature of equity is that it is sub-ordinate to debt. This means that at liquidation of the company, the holders of equity (also called stock or shares) are paid last, after all obligations to suppliers and debt holders are fulfilled first. The shareholders, the owners of the company, receive the residual capital. This risk of not retrieving the invested capital, which is obviously higher than for lenders, is compensated by a controlling right in the management of the company and a share in the annual profits (dividend). To attract investors to participate in a company with stock, the predicted share of profit needs to be much higher than the return on a loan (interest), to compensate for the higher risk.

Debt holders run a risk limited compared to that of shareholders, because their return is in principle fixed just like their repayment. Because of this lower risk, the returns on debt are usually lower. This means that for a company acquiring capital through debt is often less costly than issuing equity shares, which enables the firm to increase shareholder value. On top of this, in many countries, interest payable on debt is corporate tax deductible, reducing the cost of this form of capital for the company even more.

Why then, do firms not only attract capital through debt? Figure 3-1 shows what happens when debt increases with a constant level of debt + equity. A growing amount of debt, compared to equity, increases the amount of debt service to be paid annually. This puts pressure on the cash flow, with a possible result of bankruptcy (default). So, with a growing debt to equity ratio, the chances at default, as well as the costs subject to default increase. Non corporate taxes, on dividend and interest, are also of influence on the capital structure.
In recent years the debt to equity ratio has increased much, especially in riskier businesses, like in project companies. This has strengthened the debt holders to require a larger influence than traditionally usual in the management of the company and demand more securities for their repayment.

Besides pure debt and equity, there are other forms of investments and financial securities involved in financing projects. An overview of some credit elements and derivatives is provided for an impression of the possibilities that are available for project finance contracts. To keep the number of credit contracts manageable, only debt, equity and grants are used in structuring the financing of projects.

Between equity and debt

Debt and are actually not as rigidly separated. There are actually many hybrid forms, combining the different levels of risk of repayments and various levels of profit sharing. Also convertible forms are known, where for example debt can be converted in equity after a predetermined period. Also the voting rights accompanying shares vary, with for example special voting rights that can be attached to certain shares.

Very typical in debt financing is the so-called subordination of debt. In general, there is a senior lender that has the priority right of repayment as there are lenders that run a higher risk because their repayment at default is next in line. Their liabilities come however again before equity holders' drawing rights.

Debt on favourable terms

Some debt, provided by development finance institutes is provided for special development goals has certain favourable conditions, like a lower interest rate, longer repayment term or lower fees. These debts are usually referred to as soft loans or development loans.

Grants

Development institutes also provide sums of money with no repayment necessary. These grants are often meant for the least developed countries, supporting a project for their development.

3.1.2 Balance sheet

The balance sheet of the company (see Table 3-1) is the administrative basis of the company, registering all properties (assets) and responsibilities (liabilities). The latter are funds or other capital goods acquired, which have to be repaid on liquidation of the firm, and are used to buy assets. Both sides always represent an equal amount of money, which explains the name.

Fixed assets are items for production with a lifetime of several years (for example a factory) while current assets represent items with a turnover of less than a year (materials, cash money, accounts receivable). Current liabilities represent for example debt to suppliers and accounts payable.
Both the cash flow statement and the income statement represent changes in the assets and liabilities of a company and thus the balance sheet. These three statements make up the financial part of companies annual reports.

### 3.1.3 Cash flow

The cash flow of a company is basically made up of capital expenditure; the cash flows resulting from investing in capital assets (productive resources); operational expenditure: the cash flows resulting from costs made for operations and operational income.

The cash flow represents the actual payments and receipts of the company. Knowledge of the cash flow is very important to determine the ability of the company to fulfil its obligations. The most important obligation is the payment of debt service, the annual amount of money to be paid to the lenders in interest and repayment (amortisation). To assess the ability of a borrower to fulfil this obligation, the debt service coverage ratio is determined (Equation 3-1). Generally this ratio needs to be larger than 1,2 for lenders to have confidence that their annual payments will succeed.

$$DSCR = \frac{CF}{debt\_service}$$

Equation 3-1

Debt service = annual interest and amortisation payment to lender

In Figure 3-2 a cash flow is show, with limited volatility (size of deviation of average). To ascertain the ability to pay a debt service, the minimum cash flow needs to be more than the debt service. Because cash flow predictions are mostly quite uncertain, a margin is included, when determining the debt service payable with a certain cash flow. The cash flow not consumed by debt service is available for taxes, additions to the working capital, investments or dividends.

Besides the abovementioned initial cash flows from operations and investments, the financing cash flow needs to be taken into account. This includes the debt and equity capital coming in to cover cash deficiencies and the annual payments of interest, amortisation and dividend as cash flow out. Also taxes form an additional cash flow out of the company.
3.1.4 Income

The cash flow is very important to evaluate projects but companies are usually evaluated based on revenues and profit. The main reason for this is the fact that shareholders receive their income based on the profit. Profit is built up out of administrative flows of money. Cost and benefits are administered when an invoice is provided to a customer or when one is received from a supplier. The actual payments are usually on another date and hence the difference. This is also the case with interest.

Taxes and dividends

Corporate taxes are usually paid over the previous year. This means that the actual cash flow, resulting from taxation is a year later than the operational cash flow that is taxed. This is a very important difference in profit (including the taxes of this year) and the cash flow after taxes (including the previous year’s taxes).

For dividend a comparable situation holds. The profit of this year is determined only at the beginning of next year, when all administration is updated and checked. Only then the dividend, based on this year’s profit, can be declared and paid out later that year. Thus, dividends also represent cash flow with a delay in time compared to underlying operations.

Depreciation

Also the use of depreciation, the administrative spreading of investment in capital assets over multiple administration periods as costs, gives a difference between cash flow and income. The reason for using depreciation is the fact that each large investment needs to be spread over time, when an object has a life time much longer than one administrative period. It enables the cost to be assigned to the period that the asset is used and so equalise the cost of products over the lifetime of the asset.

With projects, depreciation is only used when corporate taxes need to be paid, because depreciation is a way of delaying the profitability of operations. The later the project becomes profitable, the later taxes will be paid.

Debt service

When borrowing capital, repayment and compensation need to be paid in the form of amortisation and interest. Together the make up debt service. Yearly costs vary because of the decreasing amount of interest that will have to be paid. To come to a yearly equal amount of depreciation and interest to be paid, annuity is applied. This calculates the yearly payable amount with the following formula:

\[ \text{annuity} = \text{investment} \cdot \frac{r}{1 - (1 + r)^{t_e - t_0}} \]

Equation 3-2

\[ r = \text{interest rate} \]

\[ t_e = \text{end of depreciation period} \]

\[ t_0 = \text{start of depreciation period} \]

This technique can in general be used to obtain yearly interest payments. If this amount is only administrative or also actually paid depends on the financial arrangement (see next chapter).

Income statement

The income statement presents all revenues, costs and changes in balance sheet posts, except capital expenditure. The capital expenditure is found on the balance sheet by the increase in assets and the change in annual depreciation.

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4 Some companies pay out interim dividend during the fiscal year based on estimate profits. This is not accounted for in this research.
Table 3-2: Income statement of a company

<table>
<thead>
<tr>
<th>Income</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenues</td>
<td>Income from sale of goods or services</td>
</tr>
<tr>
<td>Variable cost</td>
<td>Cost dependent on the number of goods/services</td>
</tr>
<tr>
<td>Fixed cost</td>
<td>Cost with limited or no relation to the number of goods/services</td>
</tr>
<tr>
<td>Operating income</td>
<td>Revenues minus operating costs</td>
</tr>
<tr>
<td>Depreciation</td>
<td>Investment cost administratively spread over time</td>
</tr>
<tr>
<td>Amortisation</td>
<td>Repayment of debt</td>
</tr>
<tr>
<td>EBIT</td>
<td>Earnings before interest and taxes</td>
</tr>
<tr>
<td>Interest</td>
<td>Interest payable over amount of debt outstanding</td>
</tr>
<tr>
<td>Pre-tax income</td>
<td>EBIT minus interest</td>
</tr>
<tr>
<td>Taxes</td>
<td>Corporate taxes</td>
</tr>
<tr>
<td>Net income</td>
<td>The profit of the company (pre-tax income – taxes)</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>Profit that will be reinvested in the company</td>
</tr>
<tr>
<td>Dividends</td>
<td>Share of profit paid out to shareholders</td>
</tr>
</tbody>
</table>

The income statement together with the cash flows determines the changes on the balance sheet of the company.

3.1.5 The cost of capital

The most important cost driver for capital is risk. The cost of accepting certain risk lies in the reserves that has to be maintained, insurance or guarantees that have to be arranged or the risk of loosing an amount of money itself. To calculate the cost of capital, a risk analysis is required to analyse the size of the risk run by a party. In paragraph 5.4.1 the risk analysis for use in this research is described.

Weighted average cost of capital

The weighted average cost of capital (WACC), is the term used in corporate finance to indicate the cost for company to acquire capital. It is a rough estimation of cost because arrangement fees are not included. The cost of equity is usually determined on the basis of stock market returns, which include several uncertainties. Knowledge of these costs is necessary to predict a required return on the capital that is invested in a project. Governments do usually not make financing decisions this way but companies must do so to maintain profitability.

The WACC is determined by the required returns on capital for equity: the dividend yield (dividend per equity value) and the required return on debt: interest. The latter has in many countries the advantage that the interest payment can be deducted from the taxable income, as stated earlier. This is represented in the WACC-equation by the Tax-shield (corporate tax rate) decreasing the cost of debt. Because of this, the value of a firm becomes larger when increasing the amount of debt compared to equity (so called leverage), to a certain amount when lender require a higher return for the increased risk.

\[
WACC = \left( \frac{E}{E+D} \right) \cdot r_e + \left( \frac{D}{E+D} \right) \cdot r_d (1 - T_c)
\]

Equation 3-3

E = value of equity
D = value of debt
R_E = required return on equity (dividend yield)
R_D = required return on equity (interest)
T_C = Tax shield

Terms and cost of debt

The terms under which debt is provided to companies or governments depends on the risk that is accepted by the lender. The grace period, in which no repayments are made and interest is capitalised
by adding it to the amount of debt, and the term in which to repay the loan are not further discussed. If no data is available debt is assumed to be repaid after one from completion of the project and before two years before an operating license (or concession) ends.

This research focuses on the interest rate. This is determined by a national (usually long term government bonds) or international (for example: LIBOR, see Figure 3-3) minimum interest rate for minimal risk. This standard risk-free premium for debt is usually the same for all parties, especially international ones, because they have the same financing options in the international finance market.

![LIBOR Graph](image)

Figure 3-3: Libor interest rates over the past eight years

This risk-free premium is completed with a risk premium. This risk premium is based partly on the (calculated) intuition of the financial institution, but often also related to credit rating by internationally renowned financial credit rating agencies like Standard & Poor’s, Moody’s, the economist Intelligence unit or Euromoney. The availability of information and the accent on developing countries has lead to choose to use Euromoney as indicator for the risk run by lenders. The height of this risk premium will be dealt with in chapter 6.

Cost of equity

The cost of equity is determined by the required return of shareholders. As visualised by the volatility of the stock market, this process is not very accurate, but dependent on sentiment of the market besides measurable parameters, as is used in the widely accepted CAPM model (Ross, Westerfield, Jaffe, 2002). CAPM stands for the capital asset pricing model, which is based on a risk free (investment) premium, a risk premium and an amplification factor (β) (see Equation 3-4).

\[ E(R_e) = R_f + \beta \cdot [E(R_m) - R_f] \]

Equation 3-4

\[ E(R_e) = \text{Expected return on a equity security;} \]
\[ R_f = \text{Risk free rate;} \]
\[ \beta = \text{relation between the capital market and the capital asset;} \]
\[ E(R_m) = \text{Expected return on the market;} \]
\[ [E(R_u)-R_c] = \text{risk premium} \]

The risk free rate is comparable to the LIBOR rate stated in previous paragraph. The risk premium and beta will be determined later. It must be emphasised here that the cost of equity determined here does not refer to project companies, because often equity is not traded in the market but placed directly. This calculation is meant to describe investors’ characteristics.

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5 LIBOR; the London inter-bank offered rate, an agreed standard for debt of very little risk
3.2 DIRECT FINANCING

Researching the available ways projects are being financed, three methods can generally be discerned. First, direct financing, where the government, a company or a private person finances the project individually, without giving account to other parties concerning the project. Second, project tied financing, where the project is the direct concern of the financiers, but financing is provided to the initiator of the project. Third, project financing, in which case a separate company is established to arrange the financing. The first is being discussed in first, with the government as initiator as assumed earlier.

Government direct financing

If the government has sufficient cash available to fund the project itself, it is highly recommendable that the government does so. Not only do other financiers want control over the project, but the cost of capital is usually higher for private companies than for a government to finance itself. An example of this is the issuing of government bonds, which usually represent the lowest interest rate possible in a country.

In Figure 3-4 this form of financing is shown, as the government finances the project directly and financiers only deal with the government as counterparty. The project itself is not examined by the financiers. Two ways of direct financing are available for a government requiring finance: commercial loan and bond financing. When a project company is instituted, these forms of financing also become available, as discussed in paragraph 3.4.

Commercial loan financing

Both governments and companies can address a bank, other financing institute or syndicate of banks directly to apply for a direct commercial loan. The debt is based on the ability of the borrower to pay debt service and on the value of assets on the balance sheet, to cover the liability to the lender in case of default. This type of lending is quite common and mostly not especially bound to projects. This form of finance is therefore typical corporate (or public) finance.

Bond financing

Instead of direct lending, bonds can be placed in the debt market. These bonds - certificates showing that a borrower owes a specific sum [Ross, Westerfield, Jaffe, 2002] - with smaller amounts of debt are sold through a financial intermediary. The interest rates and conditions are similar to commercial loans.

![Diagram showing direct and project tied financing](image)

Figure 3-4: Scope of interest with direct financing and project tied financing

Direct financing is not further examined, because the focus here lies on features of the project which should be financed and not the party initiating or requesting finance. Direct financing does the opposite.
3.3 PROJECT TIED FINANCING

In contrast with direct financing, several forms of financing are known where the project requiring financing is examined by the financiers in order to assess the financial feasibility and suitability to fit in the financiers’ policy. Development finance is a well known form of this project tied finance, where the development institute finances on certain conditions for the project (see chapter 4). In Figure 3-4 (previous paragraph) this form of financing, supplied to the government but with restraints on the project, is compared to direct financing.

Export credit financing

Export finance is a type of finance with features somewhere between corporate finance and project finance. The lending is based on a project (regarding export of services or goods) from a lender in the exporter’s country to the borrower in the importing country. The credibility of the importer is assessed usually before lending, but often credit insurance is required to obtain this type of finance. Export credit is often found with infrastructure projects, accompanying the service of a contractor or supplier. Export credits can be offered by commercial lenders as well as development financiers.

Development financing and co-financing

Financing can also be obtained from multilateral or bilateral development institutes, providing grants, loans or guarantees under favourable conditions.

Some multilateral and bilateral financing institutes offer the possibility to co-finance. This happens when a development finance company (as bilateral and multilateral development institutes are sometimes called) offers the possibility to other financiers to participate in financing a project under their contract. The large size and importance of these development financiers for developing countries, assures the repayment of debt. The development finance company guarantees the repayment of debt to co-financiers. Chapter 4 provides more information on these subjects.

3.4 PROJECT FINANCE

A form of financing where the ties to the project become even closer is Project Financing. In this form a special project company is instituted, with the purpose to arrange the financing, construction and operation of the infrastructure facility. This company then acts as a regular company to attract finance, which is however always tied to the project, because of the company’s dependence.

In order to enable project financing in infrastructure, the facility needs to be brought under a concession agreement, to enable the project company to generate an income to cover debt service and make a profit. Bringing a facility under a concession agreement has been applied much lately in developed countries. This type of contracts, for construction also called BOT (Build Operate Transfer) or BOOT (Build Operate Own Transfer) contracts, privatises the facility and therefore also takes over the responsibility of acquiring finance [Hoffman, 1998]. This means that projects, as far as private companies can arrange the finance of the project independent of the government, become budget neutral. Other advantages are the attraction of foreign investment and knowledge. In Figure 3-5 a typical structure of project financing is shown. This type of financing will be further investigated.

3.4.1 Definition of project finance

“The term “Project Finance” is generally used to refer to a non-recourse or limited recourse financing structure in which debt, equity and credit enhancement are combined for the construction and operation, or the refinancing, of a particular facility in a capital-intensive industry, in which lenders base credit appraisals on the projected revenues from the operation of the facility, rather than the general assets of the facility, including any revenue-producing contracts and other cash flow generated by the facility, as collateral for the debt.” [Hoffman, 1998]

Finnerty [1996] describes Project finance as: “the raising of funds to finance an economically separable project in which the providers of the funds look primarily to the cash flow from the project as the source of funds to service their loans and provide the return of and a return on their equity invested in the project.”

Non-recourse and limited recourse

Most Project financing is non-recourse or limited recourse. This means that the lender can not claim assets of the project sponsor (an investor supporting the project with equity and guarantees) for recourse of his credit. Therefore, other collateral is needed to gain a certain security for the money at
the project disposal. This often means that in a clause the assets of the project company would become at the disposal of the lender to fulfill its debt. Also, a number of additional certainties are required before the lender will agree. These measures comprise certainties in the cash flow, for example obtained by demanding premature off take contracts (with future customers) or sponsor support when the project company would run short of cash. The latter situation, where the project sponsors guarantee financial viability of the project company, with guarantees or cash deposits is called limited recourse.

3.4.2 Project initiative and financing

There are several ways in which a project can be initiated. With the initiation, the recognition of need as well as the project definition is frequently covered by the same party.

- Initiated by government: the governmental policy determines an execution of a project, mostly need driven.
- Initiated by property developer: opportunity recognition, profitability is the greatest driver.
- Initiated by private parties, where the project is a spin-off of regular business (example, new energy plant for Energy Company), based on opportunity recognition and profitability.

Projects in the coastal zone can be started with all three initiatives. The goal of the research is to improve the financing possibilities of developing countries’ governments and thus the first options is selected.

In many cases, where financing can not only be done by the government, private participation is wanted. Increasingly, parties bidding on a project are asked to arrange financing (especially in developing countries) and take an offer up in their proposal.

Recently new forms of tendering have emerged, like Build Operate Transfer (BOT) or Build Finance Operate Maintain (BFOM) contracts, especially for larger projects, integrating the efforts of lender, contractor and operator (often in a Joint Venture). The latter also join in the financing, if not arrange the financing completely.

Concluding, one may say financing is becoming increasingly integrated with tendering and contract forming, which creates opportunities for financing, because not only the costly activities are board out, but the complete facility, providing the option to the bidding party to generate its own benefits from the project. This means that in some cases the government does not even need to provide funding at all.

3.4.3 Project company ownership

Depending on the legal system in a country, the most beneficial legal structure of a company, in this case the project company varies. This depends on the ability to minimise tax payments, liability of participants and other benefits. The government aiming to attract foreign finance should take care of the legal boundary conditions that are able to attract financiers under those conditions. In cases where possible it is assumed a project company with limited liability is incorporated by project sponsors, where possible.

The legal structure of the project company further falls outside the scope of this research.

3.4.4 Project finance participants

In this paragraph, the essence of project finance as described earlier will be treated, for reference in the rest of the research. A simple overview of the most important related parties is shown below according to Finnerty [1996].
Project Company

The project company is the entity, based upon equity invested by the project sponsors that borrows money to accomplish the financial needs of the project. When a client is said to pay in cash or from the budget, it means that an institution or company does the financing internally, and can put forward money to cover cost immediately. The way in which the internal financing is arranged has nothing to do with the project at hand and will therefore not be considered in this research.

Lenders

These are the parties supplying the most of the financing. They comprise commercial lender, like banks or institutional investors, but also multilateral or bilateral public institutions can be part of this branch. Institutional investors are companies with a large amount of money available for investment like pension funds or insurance companies. Often separate loans are provided for the construction phase, by what is sometimes called the construction lender and the loan during the rest of the lifetime of the project, supplied by the operational lender.

Suppliers

The suppliers can be asked to be engaged in supply contracts to be able to share some of the risks of future prices and demand fluctuations. At the beginning of the project, they can also be asked to provide credit for the goods they deliver, to keep the amount of debt at the banks as low as possible.

Purchasers

Purchasers play an important role in project finance, because they are asked to bear a significant risk, that of the demand spread of the project. Lenders are willing to supply debt if the take-off of the project is guaranteed. This is the task of the Purchasers (often also called Off-takers). Eventually they can also benefit from a smooth running project just because of these premature agreements, just like the project benefits from the suppliers contracts.

Equity investors

The equity investors, consisting of the project sponsors and equity investors own the Project Company. Sponsors often are initiators or otherwise participants of the project. Equity investors as described only participate with capital to gain profit. This group can exist of Institutional investors and venture capitalists. Venture capitalists are companies which search for companies with relatively high risk but also with possibly high returns.

Investors / Sponsors

The sponsors of a project, although they are investors, can have an increased liability to the project in the form of guarantees. These guarantees or other credit support are meant to back up the project company in case of a cash deficit of other inability to service the debt. The project lenders demand this arrangement.
Roles for banks

Banks can, besides participating directly by debt or equity (sparse) act as intermediary for other investors, or take the lead in the arrangements otherwise:

- Arranging bank – the financial arranger of the project finance syndicate, needed if the project needs too much financing, to be carried by one bank.
- Managing bank – one of the major lenders in the syndicate.
- Agent bank – the bank acting as the actual lender, administrating collateral and credit and co-ordinates actions needed between lenders.
- Engineering bank – the bank that is responsible for the technical performance, and co-operates with technical advisors for this.
- Security agent – This agent is responsible for the collateral. Sometimes covered by the agent bank.
- Financial advisor – Consultant to one or more parties involved in the project

Roles for other participants

Other parties possibly involved with the financing of a project are the following:

- Contractor – Company with the contract for building the facility
- Operator – Company with the contract to operate the facility
- Technical consultants – Technical performance and quality controllers
- Project finance lawyers – Contract constructors
- Local lawyers – Specialists in local laws
- Host government – National, Provincial or Local government
- Insurers – Securing agencies

These parties are in some ways only required to provide expertise, but can also be assesses for their ability to meet their obligations towards the project.

3.4.5 Advantages and disadvantages of project finance

The advantages of project finance are summed up below. Most of these advantages encourage in particular private parties to participate in project financing. The legal structure of a country should therefore enable this type of financing and these benefits to be applicable.

- Debt based on future cash flows from the asset more than on balance sheet;
- Single purpose company with an often limited lifetime;
- Non-recourse or limited recourse to the sponsors of the project;
- Collateral / guarantees required by the lenders
- Relatively to equity, more debt possible than in corporate finance (high leverage);
- Favourable financing terms;
- Internal capital commitment policies;
- Political risk diversification (lower perceived risk for financiers);
- Because of isolation of project from companies and other assets, a better risk management and allocation possible;
- Collateral limited to project assets;
- Lenders are more likely to participate in a workout than a foreclose;
- Matching specific assets with liabilities;
- Expanded credit opportunities.
There are several disadvantages to project finance. The government should consider these disadvantages carefully and strive to constrain their influence, when project finance is applied. The disadvantages comprise the following:

- Complexity of arrangement and associated cost;
- Complexity of risk allocation;
- Increased lender risk;
- Higher interest rates and fees;
- Lender supervision;
- Increased insurance coverage needed;
- Encourages potentially unacceptable risk taking.

Regarding the positive and negative features of project finance, the structure seems appealing for developing countries to attract private capital and knowledge.

### 3.5 Financing Projects in Developing Countries

#### 3.5.1 Aspects for the government

Why should developing countries strive to apply project financing and attract foreign capital for their infrastructure projects? From all earlier mentioned general benefits, some are especially appealing to developing countries:

- Foreign capital infusion;
- Import of technology;
- Work efficiency;
- Improvement of performance of the economy;
- Budget neutrality.

To be able to benefit from these possibilities, the government of a developing country needs to overcome some difficulties that are met by (private) foreign investors. They find developing countries risky investing climates because:

- Political security;
- Economic security;
- Exchange risks;
- Legislative and regulatory system;
- Centralised infrastructure systems;
- Competition of private with public projects.

These obstacles must be examined within the national policy of the developing country to create an opening for foreign investors. It will become clear that most of these limiting conditions can be altered.

Some early suggestions to improve this situation are

- Government guarantees
- Government funding with grants or loans
- Government investment

It should be realised that project finance arrangement costs are higher in developing countries, because of the larger number of risks run by participating parties, making contractual matter more complex.

Another interesting question is why developed countries should want to invest in developing countries? Four answers of many are provided here. The interests of the developed world are benefitted from the following points:
• Assist with development to decrease the number unsatisfied groups of people in the developing world, because of (amongst others) welfare contrast. Al Quaidia is an example of the anger against the developed world;

• The developing world is a potential export market;

• Global environment protection;

• The developing world has several interesting resources like cheap workforce for example or natural resources.

These benefits can also be exploited by developing nations to attract foreign finance. The next chapter will discuss the foreign sources of finance and their criteria.

3.6 Conclusions

The financing of projects can be done through existing entities like the government or a company, but also special project companies can be started. The financing consists of debt, equity guarantees and insurance, all gathered in an abundance of contracts. The cash flow is the most important feature of the project to assess financing together with the risks involved.

Financing attracted by the government itself is preferable if the government wants to keep full control over the project. The costs of financing are also lower if the government has the capacity to finance out of its own budget. This research aims at attracting foreign capital, wherefore the project is subject of examination for eligibility. The scope of financing is limited to project tied financing, where the financing is arranged by the government based on their capacity, and project financing, where a separate project company is instituted.

Foreign capital infusion; Import of technology; Work efficiency; Improvement of performance of the economy and budget neutrality are some reasons apply project financing and attract foreign capital for developing countries' infrastructure projects. To be able to benefit from these possibilities, the government of a developing country needs to overcome some difficulties that are met by (private) foreign investors. They find developing countries risky investing climates because of: Political security; Economic security; Exchange risks; Legislative and regulatory system; Centralised infrastructure systems; Competition of private with public projects.

There are several disadvantages to project finance, which should be carefully considered and handled.

Further research is necessary to include insurance and guarantees, their costs and implications for risks and mutual liabilities.

Whatever form of financing, the contractor stays responsible for the technical risks and delay risks. This means that participating in financing only increases risks for
4 SOURCES OF FINANCE FOR INFRASTRUCTURE PROJECTS

Which sources of finance are available and what are their criteria?

Financiers for infrastructure can comprise foreign and domestic, public and private companies or institutes. Domestically, only the national government is included here, because of its importance in project initiation, as assumed, and its contribution to financing projects. Local private parties, although not insignificant in infrastructure projects, are not included.

Besides the national government of the developing country, three foreign categories can be distinguished when limiting the scope to foreign financiers: bilateral relations, multilateral institutes and foreign private parties. These four groups of parties are examined further and will lead to a list of criteria per party, for demands on projects for financing.

4.1 NATIONAL GOVERNMENT

The most important source for finance for infrastructure is the national government, which is often also initiator or facilitator of infrastructure development. The 'representative of the nation', has the objective to stimulate, regulate and facilitate socio-economic development. The focus lays mostly on economic development, for which infrastructure plays an important role.

Infrastructure has a public function and often limited commercial attractiveness, compared to other business sectors or investment options, while the economic returns are fairly high. The government, benefiting the most from infrastructure, should therefore often participate.

The regional, provincial or local government could also contribute to investments in infrastructure, but in general, the national government deals with the larger projects, especially when crossing administrative boundaries of lower public administrations.

4.1.1 Governmental decision making

The government acts as policy maker, law provider and manager of decision processes. Considering infrastructure, the government acts as initiator and regulator of the process. Especially in a time of increased privatisation, other tasks are more delegated to other parties. As the representative of the complete national community, the government should strive to an optimal economic return on projects they conduct. To assess this for future projects, an economic feasibility is required besides a political feasibility. Therefore, analysis of the factors influencing the willingness to comply with the project development by local, provincial and national governments is necessary.

Political power in a country or region is assumed to be of most importance. Political power is hereby projected on the national government, although provincial or municipal governments can also be of great influence. The qualification for their criteria is assumed to be equal, except for non-included specific local or individual (party) value.

Other incentives for a government to develop projects could prestige, political gains (votes) or beneficial for friendly parties. Project can also be necessary but insufficiently economically beneficial or with arguable economical feasibility. Projects included here, are assumed to be quantifiable economically profitable for nations.

4.1.2 Government viewed by foreign financiers

To be able to determine the best way to participate in projects, aiming to attract foreign financing, a grasp of the perceived advantages and disadvantages of working with the government of a developing country, must be known. Self-knowledge is herewith beneficial in negotiations and measures can be taken to limit or remove perceived disadvantages. [Hoffman, 1998] & [Leslie, 1987]

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Perceived advantages of government participation by private parties

- Limiting required financing – investing with a loan or other financial contribution limits the risks for all other participants, by decreasing their investments.
- Co-operation on procedures – when a government gains form a project financially, co-operation on all procedures limiting operations are expected;
- Decreasing political risk – the government adopting certain ‘commercial’ risks is expected not to change policy as much to hurt the projects viability.
- Building local support for a project – support form local companies and inhabitants is often very important for co-operation and project success.

Perceived disadvantages of government participation by private parties

- Bureaucracy – the large number of procedures and many people to consult in a government limits flexibility and stretches negotiation time. This can pose a large cost-post for the other parties.
- Different objectives – The objectives of a government might be unable to unite with commercial parties objectives.
- Lack of experience – the lack of experience not only poses a threat to the government itself but can also promote distrust for other parties and uncommon demands because of the lack of understanding for the opposite parties.

4.1.3 Criteria

The criteria for a government to initiate coastal infrastructure and participate in a project, depends mostly on economic feasibility. Underlying requirements for projects are that the project is technically feasible, the financing is complete and that the environment is not harmed (much) on short and long term. Summed up this leads to the following criteria:

- Technical feasibility – the technical ability with the contractor and operator to perform construction and operation as planned;
- Economic feasibility – the economic costs less than economic benefits, in which economic means for the nation as a whole, regarding financial and non-financial values;
- Financial feasibility – the availability of sufficient financing and ability to fulfil financial obligations;
- Environmental sustainability – the effects on the environment with limited negative or positive impact on short and long term.

4.2 Bilateral financiers

4.2.1 Bilateral financing

Contact between one country and another is referred to as a bilateral relation. Internationally, bilateral financing is often development aid provided from western countries to developing countries or export financing. Bilateral relations can comprise much more, but the focus here lies on finance. A smaller number of bilateral arrangements and agreements can be distinguished with regard to infrastructure finance. This view is however still wider than pure development aid.

Development Finance Companies

Development finance is often arranged by the government’s development assistance programme of a donor country. This type of financing aims to address the needs in developing countries to overcome poverty stimulate economic development in order to and Financing by bilateral

NGO’s could also be placed in this category. NGO’s are funded by private initiatives and receive money from national and multilateral development aid programmes. Because of this tied support, and the general aim for development, NGO’s are considered to act like other development financing institutes. Their funds count up to a much lower amount than direct (or via multilateral) development
assistance. The development goals vary greatly, which makes it hard to address them as one group with common features.

Export Credit Agencies

Export Credit Agencies and Investment Insurance Agencies, commonly known as ECA’s, are public agencies that provide government-backed loans, guarantees, credits and insurance to private corporations from their home country to do business abroad, particularly in the financially and politically risky developing world. Most industrialized nations have at least one ECA, which is usually an official or quasi-official branch of their government.

International agreements

An important restrain on development and export finance by developed countries lies in agreements made by the Organisation for Economic Co-operation and Development (OECD).

The OECD group has 30 member countries sharing a commitment to democratic government and the market economy. With active relationships with some 70 other countries, NGOs and civil society, it has a global reach. The OECD produces internationally agreed instruments, decisions and recommendations to promote rules of the game in areas where multilateral agreement is necessary for individual countries to make progress in a global economy. Sharing the benefits of growth is also crucial as shown in activities such as emerging economies, sustainable development, territorial economy and aid. [www.OECD.org, 2003]

In this OECD consensus it is agreed that bilateral financing can only be provided under certain conditions, to keep the government from interfering with international competition. The OECD also publishes a list of development aid recipients each year. This list published by the Development Assistance Committee (DAC) is attached in Appendix V:.

In this research, bilateral financing is examined from the Dutch point of view. The Netherlands have a hybrid system, in which export finance (by the ministry of economic affairs) and development finance (by the ministry of foreign affairs) are co-ordinated by one institute: the FMO. Dutch export credit insurance is arranged by Gerling NCM.

4.2.2 Dutch development aid

The Dutch development programme is initiated and managed by the Ministry of Foreign affairs of the Dutch national government. The policy of the department of development assistance of the ministry consists of several themes, which aim at supporting developing countries with certain goals. The primary goal of the Dutch development aid is poverty reduction. Further, the Netherlands support the ‘millennium development goals’ (see Appendix VI:) as declared in the UN statement of September 2000. The development aid of the Netherlands is spent in three ways [www.minbuza.nl, 2003].

Multilateral, via international organisations

Multilateral organisation, like the World Bank (WB) and the United Nations (UN) (See paragraph 4.3 on multilateral institutes and financing) receive also contributions from Dutch Development assistance.

Private initiatives of social organisations (NGO’s)

Non-governmental organisations (NGO’s) like Novib⁶ and AIDS organisations receive contributions from the Dutch state for their development assistance programmes. This is the so-called Co-financing. Theme-based co-financing (TMF) is a new system for funding Dutch and international civil society organisations involved in development co-operation. The Dutch government uses this way to support NGO’s with the accomplishment of their goals, by granting them financial support.

Bilateral, via structural co-operation with developing countries

Since 2001, 22 countries (see appendix VI) are eligible for development aid on a structural basis. 30 (see appendix VI) other countries are eligible for receiving aid in one or more specific areas. These areas are environment, business environment, human rights, peace keeping and governance.

The focus of the development co-operation policy lies with:

- Integrated approach

⁶ Novib is a Dutch non-governmental organisation, part of an international group of NGO’s (Oxfam), working for a more equitable world (www.novib.nl).
• Regional instead of country boundaries limited approach
• Centre of mass on Africa
• A greater role for the private sector
• Coherence between different policies

The Dutch development aid programme is initiated and managed by the Ministry of Foreign affairs of the Dutch national government. The direct bilateral aid of the Dutch government is executed by the Netherlands Development Finance Company (FMO) and the Dutch embassies abroad.

Criteria for theme based co-financing are coherent with the millennium development goals (Appendix VI):
• Economic development (sustainable economic development, corporate social responsibility, international trade).
• Human development (basic health, drinking water and sanitation, reproductive and sexual health, HIV/AIDS, nutrition, children and young people, sport).
• Socio-cultural development (basic education, culture and communication).
• Political development (human rights, good governance).
• Peace and security (conflict prevention, peace building, mine clearance and post-conflict rehabilitation and reconstruction).
• Environment (ecological development, bio-diversity).
• Gender equality.

4.2.3 Dutch export finance

Export financing comprises all financial means (guarantees, loans, credit support, and export/credit insurance) promoting exported goods or services. Dutch export finance can be obtained through two ways: private export credit and insurance and public export promoting credits. [www.minez.nl, 2003]

Private credits whether used for export or not, are discussed in paragraph 4.4.

Dutch credit insurance is a private company included in this paragraph, because of its ties to export finance. Public export credits are provided by the FMO and export credit insurance by Gerling NCM.

The Netherlands Development Finance Company (FMO)

The FMO, the Dutch public and private owned development financing company, regulates all financing and development assistance on behalf of the Dutch government.

The FMO is a financial institution for development assistance. It is owned by the Dutch government (51 % and some large banks and private investors (49 %). The goal of the FMO is to facilitate sustainable development and returns for its clients. It does so by collaborating (sharing risks) with other international and local financial institutions, creating a credible support for development. In order to be eligible for financing by the FMO, standard FMO criteria should be met.

FMO executes investment and export promotion for (Dutch) businesses wanting to invest in developing countries and emerging markets. On behalf of the Dutch government, FMO manages several programs focused on stimulating specific activities including the delivery of capital goods, feasibility studies in the pre-investment stage and management support in the post-investment phase. Some of these programs are linked to the supply of goods and services by Dutch companies.

The programmes of concern are: Development-Related Export Transactions (ORET/MILIEV); Infrastructure Investment Fund for Least Developed Countries; Netherlands Investment Matching Fund (NIMF). The FMO also arranges more commercial financing products, like equity investments, guarantees and syndicated loans for projects in developing countries, also with the goal to increase development.

ORET/MILIEV programme

FMO facilitates Dutch export of capital goods to developing countries with grants from the Development-Related Export Transactions (ORET) program. By assisting Dutch companies wanting to do business in these markets, ORET aims to stimulate local commercial activity, generate employment and support environmental improvements. The program is executed on behalf of the Netherlands
Ministry of Foreign Affairs. MILIEV used to be the industry and environment programme, but has been combined with the ORET programme since 1998.

Developing countries can reduce the costs of the purchase of capital goods, services or works from the Netherlands through an ORET/MILIEV grant. While the grant is awarded to the developing country, payments are made directly to the Dutch company, which is also responsible for application for the subsidy. The program has an annual budget of € 104 million to extend in various forms of grants, including interest subsidies and the facilitation of lease agreements. The total transaction costs may not exceed € 45 million, of which the ORET grant covers 45%. Often the FMO arranges a commercial loan to finance the remaining 55% of the project sum. The acceptance of this offer is however not required.

Demands for ORET eligibility are:

- Bilateral agreement – a predetermined list of countries eligible for ORET financing;
- Development goals realisation – fulfillment of the millennium development goals;
- Off take obligation – funds to be used for import of Dutch goods or services (export incentive);
- Financial feasibility;
- Taxes - No taxes to be paid over the grant amount;
- Fees - Fees not to exceed 5% of transaction;
- Credit insurance (Gerling NCM) coverage;
- Internationally tendered.

Infrastructure Investment Fund for Least Developed Countries

Aid to the world’s least developed countries that used to be provided via the ORET/MILIEV programme now falls under a separate fund, following a decision by the Organisation for Economic Co-operation and Development (OECD) to unite aid to least developed countries. This decision puts an end to tied aid, which obliged the least developed countries to buy goods and services from donor countries. In four years, the fund makes €180 million available for risk-bearing investments in infrastructure projects.

Netherlands Investment Matching Fund (NIMF)

In the next five years, the NIMF will make €45 million available for promoting direct inward investment in developing countries. It is a participatory fund, to be implemented by the FMO. It will enable the FMO to put as much as €5 million per transaction on a matching basis into the risk-bearing investments of international companies.

Other financing from the FMO

Besides development assistance and export incentives from the Dutch ministries of Foreign Affairs and Economic affairs, the FMO has its own development financing programmes. These comprise commercial export credits, syndicated loans, guarantees, loans and equity investments. These products are however all meant to fill an investment gap in developing countries. This means that commercial financing is not feasible. Criteria for these types of financing, similar to that for other financing by the FMO are:

- Economic prospects of the importing country (country criteria)
- Value of the project / goods as collateral (project criteria)
- The size of risk exposure must be acceptable (risk criteria)
- Credibility of the borrower (borrower criteria)
- A certain minimum percentage of the amount must be spent on the exporting company, from the supplying banks country (export criteria).
- The amount of export financing (loan) must be insured by a credit insurer (insurance criteria)

4.2.4 Dutch Export credit insurance

The insurance of international credits is done by export credit agencies (also called import-export banks) around the world. The Dutch export credit agency is Gerling NCM. For both the bilateral
development aid as export financing, by finance suppliers, credit insurance is required for the borrower. Especially when financing projects in developing countries.

The credit insurance company makes a deal with the national government of the country where the project or the borrower is located. The local government then makes an agreement with the project company. The insurance covers the payments to be made to the lending institutes.

The Dutch Credit Insurer Gerling NCM does not have a restrictive policy limiting insurance to developing countries or stimulating environmental or development projects. It is therefore a typical commercial organisation, like the ones reviewed in paragraph 4.4.

Gerling NCM Credit and Finance AG

By the middle of 2002, the Dutch credit insurer NCM (Nederlandse Crediet Maatschappij), merged with the Swiss Reinsurance Company (Swiss Re, already 90% owner of NCM), the Gerling Credit Insurance Group to become the second largest credit insurer in the world. The group had a total turnover of over € 1.2 billion in 2001 and a global market share of 25%. The services of this group consist of insurance and financing. The new group protects a world trade of more than € 350 billion annually. In addition, Gerling NCM maintains an International information database on the creditworthiness of 35 million companies. This makes this financial player a certainty in the uncertain financial markets. Many international financing arrangements demand credit insurance in their contracts. [www.gerlingncm.com, 2003]

In addition to sources of financing, export-import banks also typically provide political risk insurance to projects.

4.2.5 Criteria for financing

Regarding bilateral financing, as the financing or support from the Dutch government, ORET/MILIEV programme seems representative for both export promoting finance as well as development assistance. The criteria for this programme are therefore taken over as criteria for bilateral financing. These criteria are:

- Bilateral agreement for development assistance
- Sufficiently large proportion of work done by Dutch exporters
- Development goals realisation
- Technical feasibility
- Commercial unattractiveness
- Financial feasibility
- Economic feasibility
- Environmental sustainability
- No taxes on transaction
- International tendering

4.3 MULTILATERAL FINANCIERS

4.3.1 Multilateral financiers

A multilateral organisation is a public institution, supported by sponsors from multiple nations. Multilateral project financing is financing provided by such an institution. Although many financing multilateral organisations exist, the focus lies on parties concerned with international financing of project.

The multilateral financing is for an important part the playground of The World Bank. Other global multilateral financiers are the United Nations (UN) and the International Monetary Fund (IMF). An example of a regional multilateral development banks is the African Development Bank (AfDB). Also there are many multilateral non-governmental organisations (NGO’s). Most organisations serve specific development goals, and are therefore not appropriate to approach for every project. Here, the
World Bank is used as an example, to demonstrate proceedings and boundary conditions for multilateral financing.

Political consideration may also be a part of multilateral and in particular bilateral decision making. The hidden goal of increasing exports of the donor country is often present in bilateral financing.

Regional multilaterals sometimes have agenda’s determined by local or private issues. This should be bare in mind, comparing global and regional multilaterals.

4.3.2 World Bank

The World Bank is the most important source for (project) finance world-wide and in developing countries. Their influence is not merely financial but they support also with knowledge and their involvement is and incentive for other (commercial) investors. The projects have to contribute to the development of a country or region and should fit in the programme of the World Bank, in compliance in the millennium development goals (Appendix VI: ) [www.worldbank.org, 2003].

The World Bank sets an important example for other multilateral and bilateral financiers, concerning their business ethics and environmental and development requirements for projects. [Hoffman, 1998]

The World Bank contributes to projects and policies, via grants, soft loans, commercial loans and advisory. This is accomplished by the various underlying organisations, namely:

The financing programmes of the World Bank are: International Development Agency (IDA), providing grants and financing at very low cost and the International Bank for Reconstruction and Development (IBRD), providing financing for middle range cost. The IBRD and the IDA are usually referred to as the World Bank.

Somewhat separate are International Finance Corporation (IFC), providing commercial financing for developing countries and the Multilateral Investment Guarantee Agency (MIGA) doing research into project and credit risks and providing guarantees and insurance.

Besides these four components, the World Bank also comprises the International Centre for Settlement of Investment Disputes (ICSID), which will not be further discussed here.

International Development Association (IDA)

The IDA is last resort financier that provides soft loans with low interest fees and long repayment terms to the least developed countries. The programmes of IDA aim at countries incapable of borrowing on the international finance market. Besides this the countries governments, with which the World Bank does business only, is appointed as not creditworthy by the Multilateral Investment Guarantee Agency (MIGA). Many projects include life standard improvements like water and sanitation development. The IDA always loans to the government with commitment to a certain project. [Benoit, 1996]

<table>
<thead>
<tr>
<th>Table 4-1: IDA credit conditions [Benoit, 1996]</th>
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<tr>
<td><strong>Interest</strong>: fixed rate of 0.75% on outstanding balance (service charge)</td>
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<tr>
<td><strong>Commitment charge</strong>: not more than 0.5% of un-disbursed balance.</td>
</tr>
<tr>
<td><strong>Fixed charge</strong> over all credits is determined each year, 1996: 0.0%</td>
</tr>
<tr>
<td><strong>Term and amortisation</strong>: 35-40 years, depending on the financial sources of the country.</td>
</tr>
<tr>
<td><strong>10 year grace period</strong></td>
</tr>
<tr>
<td><strong>Principle is repaid in annual instalments.</strong></td>
</tr>
</tbody>
</table>

- The service charge (interest) is a fixed percentage on the total sum of capital of the loan agreement. The commitment charge is a percentage of the amount reserved for a borrowing party, but not yet disbursed. The fixed charge is an optional percentage on all credits. The (repayment) term also called amortisation period is the duration of the credit agreement, in which the amount are repaid. The grace period is a period in which no repayment is required. The principle is the total credit amount. Instalments are the annual repayments or amortisation.

In some countries that are found creditworthy by the MIGA, projects can be supported by the IDA programme in so-called enclave projects.
The International Bank for Reconstruction and Development (IBRD)

Countries found creditworthy by the MIGA that are not able to obtain financing on the commercial market are eligible for the IBRD programme. This programme provides mostly loans and guarantees.

There are two ways of arranging the IBRD loans. One is by a loan to a project company with a repayment guarantee from the national government. Two is by a loan to the government with commitment to project, as IDA financing is also arranged. In the latter case, the government loans to Project Company. [Benoit, 1996]

<table>
<thead>
<tr>
<th>Interest (50 basis points above cost of financing for the World Bank for the relevant class of loans, determined by the bank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable rate currency pool loans</td>
</tr>
<tr>
<td>Variable rate single currency loans</td>
</tr>
<tr>
<td>Fixed rate single currency loans</td>
</tr>
</tbody>
</table>

**Status of timely repayment can benefit from a waiver of 0,25% on interest charges**

**Commitment charge:** 0,75% of un-disbursed balance.

**Since 1989, standard 0,50% waived.**

**Term:** 15-20 years

**Grace period of 3 to 5 years, depending on GNP per capita.**

**Amortisation**

- Either on basis of annuity on principle and interest basis or
- On the basis of level repayments.

- One basis point is 0,01% to be added absolutely. A variable rate is an interest rate fluctuating in time, usually coupled to a basic rate like LIBOR (London Inter Bank Interest Rate). A currency pool loan is a credit facility with a varying group of currencies, to compensate for individual course fluctuations. A single currency loan is usually in hard currency like dollars or Euros. A waiver is a diminishment of costs incurred by timely payments. GNP is Gross National Product, the sum of all that is produced in a country.

The IBRD does not only support IBRD eligible countries but has also some enclave projects in its portfolio. See Appendix VII: for World Bank / IBRD financing structures.

The International Finance Corporation (IFC)

The part of the World Bank, providing loans, guarantees and other services to support private investment in emerging economies. This part of the World Bank fills the gap between development finance from the IBRD and IDA and full availability of private finance.

No state support required as the IFC supports only private projects. Required is however, that the country's economy as a whole benefits from a project. The IFC has no restrictions on financial means and requires no sovereign guarantee. [Benoit, 1996]

The IFC provides two types of loans:

- A loans: own loans, financed by the IFC itself and
- B Loans: arrangements of syndicated commercial lenders

The conditions by which the IFC provides financing are comparable to commercial financiers. The IFC is only capable of accepting a much larger risk, because of the financial backing by the World Bank. The IFC is typically a catalyst for other financier participation and besides investments offers political risk protection. An important criterion for the IFC is however that solely commercial lending is not feasible.

The Multilateral Investment Guarantee Agency (MIGA)

The MIGA is the World Banks' credit insurance agency. The MIGA supports international investments by providing guarantees against non-commercial risks. Especially political risk insurance is an important factor in attracting other investors in developing countries. The MIGA is entitled to guarantee investments against losses from the following risks [Benoit, 1996]:

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• Currency transfer (inconvertibility)
• Expropriation
• War and civil disturbance
• Breach of contract

The MIGA is also a very important research institute for creditworthiness of developing countries. The requirements for a MIGA insurance or guarantee are again development aspects.

4.3.3 Criteria for financing

Summing up the criteria again, the similarity between bilateral and multilateral financiers becomes visible. The main difference lays in the fact that the multilateral finance is not tied to export and that the World Bank has much more capital at its disposal.

• Member of the multilateral institution
• Development goals realisation
• Technical feasibility
• Commercial unattractiveness
• Financial feasibility
• Economic feasibility
• Environmental sustainability
• No taxes on transaction
• International tendering

4.4 INTERNATIONAL PRIVATE FINANCIERS

The available sources for financing with commercial goals are unlimited when overlooking the globe. Many commercial parties are however too small or not even focussed on international activities, and can therefore be left outside the discussion.

Regarding most multinationals (or at least already internationally operating companies), a distinction can be made between commercial banks, institutional investors, private investors and sponsors. Many features regarding their investment criteria remain the same, except for their presence on an international instead of only on a national capital market. Individual private investors are less likely to be found because of the complexity and lack of transparency in this market. Commercial investment banks take over this function by providing international investment services for them.

Investors can and will only accept risks if they obtain a suitable return on their investments. Their profile for project valuation is assumed likewise, with limits to the risk and a minimum return required on investments. Besides financial output, investors also want some security, for example in the form of guarantees from the government. These measures also make up part of the financing arrangements.

Foreign commercial financiers comprise Banks, institutional investors and corporations. Most of these parties are multinationals, with a wide experience in financing and international business. Their financing profiles are not all the same, but are assumed similar on the criteria of profit making. All private parties want to make profit and are willing to take risk for this. However, the higher the risk, the higher the profit they require making the project appealing.

Other incentives for financing could comprise market penetration, competition deflection or even development goals, especially now sustainable corporate governance is increasingly demanded by clients. This is however, not considered a determining mechanism, like profitability.

As representatives for possible foreign private finance participants, the choice is made to treat banks, institutional investors and insurers, as if there was only one party with one policy per category. This simplification is made to be able to gain understanding of the processes involved in providing finance and coming to some representative values. In the case the project investors are known, their preferences and demands should be obtained directly from them.
Information on financing decisions by private parties is scarce, where it concerns actual data. Companies tend to be mysterious about via corporate finance theory [Ross, Westerfield, Jaffe, 2002] a prediction of financing decisions can be made.

4.4.1 Commercial financing companies

Private foreign investment is made either in "direct" or "portfolio" form. Direct here means investing in a company with equity or debt, without further agents, whereas in portfolio investments, an intermediary selects a group of companies to be invested in, and collects capital for this group altogether. Essentially, direct investment involves a significant degree of control by the foreign investor whereas portfolio investment does not involve such control. The investments considered are equity.

Private investors are driven by making a high return on their investments. In return for a large profit on their investment, they are willing to accept a reasonable amount of risk. However, they need to be able to assess the size of risk, and if necessary mitigate or insure it. Investors, although investment market development might suggest otherwise, do not like uncertainty in risk. Political risk is a hardly assessable risk that is therefore a large obstacle for investors.

Multinational banks

Multinational banks are great contributors to the international finance market. Commercial banks can participate as lender, guarantor or investor. The latter they mostly do with capital brought under their management by private or institutional investors. In that case the bank arranges the portfolio investment. In this research their part-taking is considered mainly as lender, as secondary lender in a syndicate or as arranging or managing bank.

The decision for financing is, besides banking regulation, mostly stimulated by limited risks, low costs and high returns. Bank are less risk accepting than private investors, because bank have much liabilities to their customers and have to maintain a solid reputation. The latter can also be the cause of a bank judging projects not only for commercial attractiveness but also for social acceptance.

Institutional investors

Institutional investors are parties managing capital of insurers, pension funds or other savings. These investors have much money at their disposal, but do require a solid return, for their liabilities are of great importance. This makes their profile very risk averse. Their portfolios consist of bonds (debt), shares (equity), real estate and other investments with a relatively low risk profile.

Institutional investors are driven by a high risk-reward ratio like all other private investors, but are more risk-averse than banks and private investors.

They are very important in determining the price of bonds and shares and for placement of large numbers of them in a private or public placement.

4.4.2 Non-financing companies

Suppliers and off-takers are affiliated to a project by means of off take contracts of supply contracts. These contracts are sometimes required by project financiers to be sure of a certain delivery price of materials, of ascertained revenue for the project. Their creditworthiness is therefore also of importance to financiers. The affiliated commercial parties themselves have interest in the ability of the project to pay bills or to be able to supply a certain quality and quantity. They want to assure these criteria via contracts, like they will be required to assure their obligations likewise.

Contractor

The contractor is also a supplier to the project, and has therefore a large stake with the financial performance of the project, so it is able to pay according to agreed terms. Besides this, the contractor is specifically interested in the techniques that must be used to realise the project, the planning and the chance of making within it and how secure the payments are. The technical risk, either by design or construction, is the largest risk the contractor has to bear. It is the only party that is able and probably willing to bear it. This puts a large demand on the technical feasibility study, which has to determine the continuation of the participation (in the tender) of the contractor and determine the required return for accepting this risk.

Generally, because a contractor really understands and can assess and influence construction risk, it is probably the best party to accept and manage this risk. This makes the contractor also a good party
4.4.3 Criteria for financing

Private financing parties, although per participating form or organisation slight differences in financing decisions, four common criteria can be selected stimulating private party investments:

- Technical feasibility
- Financial feasibility
- Commercial attractiveness
- Country risk
- Other contacts and contracts

Only the third party (contractors, supplier) willing to supply financing is also driven by additional work. The pricing of their financing will however by commercial.

4.5 CONCLUSIONS

4.5.1 Summary of criteria

In general a distinction can be made between development financiers, like the World Bank and the FMO, and private financiers. The first group is mostly concerned with development goals, whereas the second group focuses on its own (financial) benefits. Within these two groups, a distinction can be made between multilateral and bilateral development financiers, the latter with more local interests being promoted, and financial institutes and non-financial institutes, the latter besides direct financial benefits also interested in side effects like market penetration and other assignments.

Taking the criteria per party as mentioned earlier, some seem less distinguishing than others. For example technical feasibility is a demand by all parties, because without technical feasibility, the project would and could not be commenced. This criterion is further appreciated as an essential part of other feasibility studies, but not used as selection criterion for one of the optional financiers.

Tax payment on the transaction, is assumed to be a point for negotiation in the financing process, and not a precondition in-or excluding financiers. Therefore, this criterion is further only included in other feasibility studies as a cost for financing parties or benefit for the government.

Also other criteria like international tendering and insurances are assumed to be part of the negotiation process instead of a precondition, and not explicitly included.

In Table 4-3 an overview of the criteria and financiers is shown, making the distinction as mentioned above.

<table>
<thead>
<tr>
<th></th>
<th>Government</th>
<th>Bilateral</th>
<th>Multilateral</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic feasibility</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Financial feasibility</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Development goals realisation</td>
<td></td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Commercial attractiveness</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Inter party agreement</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off take obligation</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Environmental sustainability</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Country risk</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4-3 overview of financiers' criteria
A plus indicates a positive (expected) correlation between the positive outcome of a criterion and the positive decision to participate in financing. A minus implies the opposite and a blank field indicates little or no importance (assumed) between the criterion and the party's financing decision.

Now the analysis of these criteria must be determined, as will be done in the next chapter.
5 FINANCING CRITERIA EVALUATION

How are the financiers' criteria evaluated?

Project appraisal encompasses all methods used by stakeholders to judge the suitability of a project to fulfil their goals. Focussing on the financing of projects, besides discussion of the criteria participants put up for projects, financial and economical analysis shall form the centre of the analysis. This part will provide the tools necessary to assess the suitability of the project for financiers or the government, by assessing their criteria. Special attention is paid to selecting the discount rate calculation and quantification of risk. Finally, sensitivity analysis and its uses and implications are discussed.

The goal of this chapter is to clarify the difference in perception of cost, benefit and risk by various financing sources, especially financiers and governmental institutions.

5.1 FEASIBILITY STUDY OVERVIEW

5.1.1 Background of the feasibility study

Feasibility studies make out a very important part of policy setting and project development. They do not however, comprise all the necessary details that are required to judge projects. Feasibility studies assess a set of necessary but insufficient condition of stakeholders for the project. Inherent to the obvious requirements to a project, other matters need to be arranged. Examples of these are following the right legal procedures, purchasing the required property, predicting cost and benefits well. Things like this need to be taken care of before stakeholders can certain, to a limited extend, that the project will succeed in satisfying their goals. In the end it all comes down to controlling the contract jungle. This aspect is not included in the research.

Feasibility studies are designed to provide information to stakeholders who need to decide to support the policy of project. They need to provide technical information; economic information; contracts; project schedule; government involvement; proposed financing sources; market studies; and needs assessment. This information is required for parties to analyse the policy or project by hand of some criteria. These criteria are based on the goals of the organisation, which are based on value creation.

5.1.2 Value creation in the coastal zone

Project appraisal is all about value creation. The initiator of a project can for example intend to protect the environment, increase transport options, improve the health situation or protect a land from flooding. Value creation, expressed in benefits and cost (financial or non-financial) has a very subjective character, because the value that is created is often for a single group of stakeholders.

Private company initiatives are usually intended to make a profit. The existence of companies is solely owned to making maximum profits, because the money they need to survive can only be 'earned' by increasing the return for their investors: shareholders and debt holders. If these investors can earn more money elsewhere (considering investment risk), they will do so and thereby decrease the amount of capital at the company's disposal. Although individual management decisions do not always rely purely on this criterion and within companies also political games are played, for simplicity it is assumed that maximising profitability is the major motive of private companies.

Unequal distribution of cost and benefits happens also by public initiatives, while the collective of project in the public sector should create value for the population as a whole. An example of distinct benefit comes from a port that is newly built. Some people experience benefits in the form of a job, increase economic activity and travel opportunities, while other experience cost because their land is expropriated in order to build the port, an increase in noise and pollution can also be seen as cost as well as an increase in tax payment to make the project possible while gaining no (obvious) benefits. Therefore judgement by representatives of stakeholders, have different stakes and judge projects differently.
5.1.3 Description of feasibility studies

Political feasibility of the project

Researching the political will to execute the project and the capacity to arrange the legal framework needed. This depends on the political climate, the urgency of the project, the ecological impact of the project, the economic impact of the project and the financial impact of the project.

Policy analysis

Predicting the socio-economic effects of policies and projects over time, by using different development scenarios. The inputs for these analyses are the financial and economic analyses of available alternative projects or policies that are assessed by the different scenarios in time.

Economical feasibility of the project

Determining the economic cost and the returns for the economy of a country as a whole, taking in effect also secondary results. This includes the financial analysis, including all direct and indirect financial benefits and costs. The non-financial cost and effects, measurable in welfare growth, diminishing unemployment etc, are also added in the equation. In some instances, environmental impact is also included in this feasibility study.

Financial feasibility

Judging the suitability of a project to fulfil the stakeholders' financial goals. This is sometimes also called a commercial feasibility of viability analysis. Is the project profitable, considering all cash flows and discounting then in time? There are various ways to determine the required return, assessing the investments in time versus the investments risk. Financial feasibility is often also used to address the financial arrangements, whether all expenses and risk are properly covered by financiers or cash.

Cost and benefit analysis

Comparing costs and benefits of projects. Possible on financial, economical and environmental level. A very important part of this analysis is the cash flow analysis.

The cost benefit analysis is actually a decision technique, to compare value destruction or input with output value or benefits. Other tools are available for this, like multi-criteria analysis [Rogers, 2001]. Because the field of analysis is only financial here, a cost benefit analysis is only discussed.

Typically, financial feasibility is a purely financial cost-benefit analysis and economic feasibility is an integral national economic cost-benefit analysis.

Public risk analysis

Uncertainty could be associated with the probability of cost and benefit as well as with future development. This provides input for risk analyses, here separated in a public risk and financial risk.

Natural disasters are a tragic interruption to the development process. Lives are lost; social networks are disrupted; and capital investments are destroyed. And when development plans are laid and disaster strikes, development funds are diverted to the emergency. Additional aid is directed to relief and reconstruction needs to get the country “back on track” toward economic and social development.

In recent years, however, the development community has been making the links between disasters and development. This evolution would seem inevitable when one considers the disproportionately high costs that developing countries pay for disasters. Moreover, natural disasters impact developing countries in other ways than developed countries. Disaster losses include not only the shocking direct impacts that we see on the news, such as the loss of life, housing, and infrastructure, but also indirect impacts such as the foregone production in utility services, transport, labour supplies, suppliers, or markets. Secondary losses include impacts on such macroeconomic variables as economic growth, balance of payments, public spending, and inflation.

Cash flow analysis

Predicting and analysing investments required and the income of the project, in a careful planning to minimise financing cost and predict the capability of the project to pay interest and repay the loans.

Technology assessment

Assessing the usability of certain technologies and the associated economical and health risk. Also included are often analysis of resources and other aspects: fuel, utilities, water, roads and railways, ports and docks, raw materials, local labour, subcontractors, construction and operation labour, spare parts, residue and other waste disposals. [Hoffman, 1998]
Financial risk analysis

Risk companies run because of their entrepreneurship, is always expressed in financial risk. This is off course because of the financial goal they represent: enhancing the return on investment for shareholders or, simply put, maximising the profit to which the dividends paid to shareholders is linked. Government are interested in financial risks, because of the need to comply with predetermined budgets, which are threatened by financial risks.

This makes financial risk the chance that a certain required return on a project is not reached. For completeness of the definition of risk [CUR, 1997] the financial risk is the chance times the consequence, being the amount earned lower than required.

Financial risks run by financing parties are influence mostly by price and quantity fluctuations in the operational phase. Also construction time and costs miscalculation can pose a serious threat on project viability.

Environmental Impact analysis

Examining the influence on the environment, on short term and long term. This encompasses human health issues and the environment as a natural resource. This analysis van be quantitatively executed or values can be translated into a representative monetary value, which is however always very subjective and disputable. For comparison of alternative policies, this can be helpful.

5.1.4 Importance of feasibility studies

Most projects require all analyses to be conducted, although the size and goals of the project may determine otherwise. Generally, first come economic feasibility, technical feasibility and social acceptability, then comes financial feasibility and sustainability.

In this research, where focus lies on financial aspects, two main streams of feasibility analyses can be discarded. One: economic feasibility, to investigate the interests of the governments and the other public institutes involved, like bilateral and multilateral parties. The fact that a policy analysis would be of better service to them is not rejected, but because of the limits to the research, an environmental and technical analysis are not embraced. It is also more convenient to set out economical feasibility versus financial feasibility, which seems of most importance to financiers.

Most of the feasibility studies need to be able to compare different projects, because normally more projects are available for investment than money is available. So the most beneficial projects should be executed at first. Feasibility studies therefore need to give insight in the difference of these projects, by using the same techniques and comparable parameters.

5.2 QUALITATIVE CRITERIA FULFILMENT

The criteria that have been selected for assessment of project suitability for financiers will have to be evaluated. The selection of the method of criteria assessment has been made so to divide the group of eight criteria in one group of quantitative criteria and one group of qualitative criteria, which will be discussed first.

In some cases the criteria cannot be quantified and in other cases, quantification is disputable or non-super-additive.

5.2.1 Inter-party agreement

The inter party agreement is typically qualitatively assessed. Most development financiers have a list available of the countries or parties eligible for financing. The bilateral relations and multilateral relations are easily assessed for compliance on this criteria, by viewing those lists that are included in this research. For private parties the relationships are far less transparent.

Bilateral

For Bilateral relations, eligible for Dutch financing, the list of ORET countries, as presented in Table 5-1.

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Table 5-1 ORET/MILIEV country list [www.fmo.nl, 2003]

<table>
<thead>
<tr>
<th>ORET country list [<a href="http://www.fmo.nl">www.fmo.nl</a>]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active</strong></td>
</tr>
<tr>
<td>Africa: Ivory Coast, Egypt, Ghana, Nigeria</td>
</tr>
<tr>
<td>Asia: Armenia, China, India, Indonesia, Jordan, Philippines, Sri Lanka, Thailand, Vietnam</td>
</tr>
<tr>
<td>Latin America: Bolivia, Colombia, Cuba, Ecuador, El Salvador, Guatemala, Nicaragua, Peru</td>
</tr>
<tr>
<td>Europe: Bosnia, Georgia, Macedonia, Moldova</td>
</tr>
<tr>
<td><strong>Passive</strong></td>
</tr>
<tr>
<td>Africa: Algeria, Congo, Cameroon, Kenya, Morocco, Namibia, Swaziland, Tunisia</td>
</tr>
<tr>
<td>Asia: Azerbaijan, Fiji, Iran, Kazakhstan, Kiribati, Kyrgyzstan, Marshall Islands, Micronesia, Mongolia, N. Marianas, Uzbekistan, Pakistan, Papua New Guinea, Syria, Tajikistan, Tonga, Turkmenistan, Tuvalu</td>
</tr>
<tr>
<td>Latin America: Belize, Costa Rica, Dominica, Dominican Republic, Grenada, Guyana, Honduras, Jamaica, Paraguay, St. Vincent &amp; Grenadines, Suriname</td>
</tr>
<tr>
<td>Europe: Albania</td>
</tr>
</tbody>
</table>

Active ORET country list: In these countries ORET aid is unconditionally available.

Passive ORET country list: Applications for projects in countries on the ‘passive’ list are only accepted if it can be shown that another foreign company wishes to make a rival bid with assistance from its country’s authorities.

World Bank

For the World Bank, with regard to IDA and IBRD financing programmes, a list is provided in Appendix VIII: . As stated earlier, the creditworthiness of a country, determined by the MIGA, places a country in the IDA or IBRD category. The IFC and MIGA operate in all developing countries, of which a list is included in Appendix V: .

Private financiers

Relations with private company are much less transparent and less restricting on financing eligibility. Positive experience of co-operation between parties may increase the mutual trust and thereby make preferred suppliers or speedup the negotiation process. Relationships with private financiers are, unless specifically known, not further considered.

5.2.2 Off take obligation

Two financiers have demands on the supplier for the project. Those parties are the project sponsors, in case of project financing or the bilateral institute in case of export financing. In both cases it concerns merely contractual matters. Because of the importance of the obligation to attract finance in both cases, the criterion is included, albeit in a qualitative analysis of the financing.

The off-take obligation is satisfied when a contract arranges the agreement of a certain part of the work to be done for a project. Fore Dutch development assistance in the form of ORET/MILIEV the demands as mentioned in Table 5-2 exists. For private parties the arrangements vary.

Table 5-2 Dutch content requirements for ORET/MILIEV programme [ORET/MILIEV Regulations 2002]

<table>
<thead>
<tr>
<th>Products and services from the Netherlands (the 'Dutch content' or 'Dutch share') should account for at least 60% of the transaction sum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Since the use of products and services from the developing country increases the likelihood of the end user continuing the activity using his own resources and also benefits the country concerned, the Dutch content may in two cases be lower:</td>
</tr>
<tr>
<td>- If the products and services produced in the developing country amount to 10% or more of the transaction sum, the Dutch content may be as little as 50%:</td>
</tr>
<tr>
<td>- If there is a service contract involving the deployment of a high number of local experts, the Dutch content may be as little as 40%:</td>
</tr>
<tr>
<td>The fact that service contracts can lead to follow-on contracts for Dutch companies is also taken into account (see section 3.3).</td>
</tr>
</tbody>
</table>

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5.2.3 Development goals realisation

For the realisation of development, a project is tested for compliance with the millennium development goals, internationally seen as the standard for development objectives. ‘At the UN Millennium Summit in September 2000 the 189 states of the United Nations reaffirmed their commitment to work toward a world in which eliminating poverty and sustaining development would have the highest priority. The Millennium Declaration was signed by 147 heads of state and passed unanimously by the members of the UN General Assembly.’ [www.worldbank.org, 2003].

The goals (see Table 5-3) are accompanied by several targets to measure the achievements of development assistance. In Appendix VI: a complete list of development goals and targets is included.

| Goal 1. Eradicate extreme poverty and hunger |
| Goal 2. Achieve universal primary education |
| Goal 3. Promote gender equality and empower women |
| Goal 4. Reduce child mortality |
| Goal 5. Improve maternal health |
| Goal 6. Combat HIV/AIDS, malaria and other diseases |
| Goal 7. Ensure environmental sustainability |
| Goal 8. Develop a Global Partnership for Development |

5.2.4 Environmental sustainability

Environmental sustainability could be analysed in a variety of ways. The definition of environmental sustainability poses a serious discussion already, when trying to define it. Here it refers to a qualitative environmental impact analysis with the goal to identify possible influences of a project on the environment. The decision whether the outcome is ‘good’ or ‘bad’ is more of a political decision, and therefore not predetermined. In the analyses of projects, it is however subject of research to analyse the approach of parties leaning in this criterion in special.

Environmental analysis is usually a part of a policy analysis. Its goal is to assess the impact of the various development alternatives on the environment. In this case also development scenarios are used and a combination of sciences is used to predict environmental development.

For projects under execution, often a monitoring programme for environmental changes is applied, to check assumptions in the assessment made in advance and control certain preconditions for pollution.

5.3 FINANCIAL FEASIBILITY

Financial feasibility, defined as the availability of finance for required investments and the ability to fulfil financial obligations, requires a solid picture of the projects cash flows. Therefore, this paragraph starts with an explanation of cost and benefit analysis and cash flow analysis, which will also be necessary for commercial attractiveness and economical feasibility.

5.3.1 Basics of financial analysis

A financial analysis starts with an analysis of the required investments and the expected revenue of the project. For both different scenarios may be developed, to be used later in a sensitivity and uncertainty analysis. This leads to a gross cash flow prediction for each scenario. A first estimate of the profitability of the project can be made here. At this point it can already become clear that a project is not feasible financially. Based on the cash flow, the costs for financing can be estimated, and a distribution of the cash flow per financier can be estimated. Then, per financier the return on investment can be calculated, to see if it matches their criteria. Here only the financial analyses are discussed, where in the next chapter financing criteria are discussed.

Although the possibility to bring two or more alternative development opportunities into the investment decision process exists, this will be neglected at this point. In the next chapter: investment decision with multiple alternatives will be discussed.
5.3.2 Project cost-benefit analysis

Project cost

Project costs can be divided over four development phases: development phase, the construction phase, the operation phase and the transfer or termination phase. In the first two phases expenditure is mostly referred to as investments, where in the last two is spoken of operating cost. Cost per phase can be split by variable and fixed.

In the preparation phase, purchase of site, management and design cost and legal procedures make out a large proportion of the cost.

During construction: labour, materials, equipment, energy and lease cost make out a large part of required funds. Import and export cost, exchange cost, insurance premium, and risk reservation and depreciation also are a large component of costs.

In operational phase, the operating costs exist of labour, taxes, materials, depreciation, lease cost, concession fees, rent and interest.

In the first stage of a feasibility study, interest and tax costs are not yet available, because they depend on the financing structure, and can only be estimated to account for their payment. In many cases the probable structure of financing is on before hand known, which makes this estimation much easier.

Different scenarios can comprehend for example different construction durations, fluctuating material prices and maintenance required.

Project benefits

The benefits of a project exist at first of commercial revenues made by the project itself. In many cases it is required that these revenues alone are sufficient to pay back all investments and have a remainder of profit for the initiator. For these commercial revenues, scenarios are very important, because of the volatile nature of demand and supply, resulting in price and demands difficult to predict.

If revenues are predicted to be too low, it might be possible that a government or sponsor decides to provide subsidy to the project, by supplying the cash deficiency.

Other forms of non-commercial income are grants. Grants can be obtained by the government supporting a certain initiative, to coincide or replace subsidies. Other sources are multilateral and bilateral institutes. Reasons for this support are usually caused by environmental of economical development goals of the project.

5.3.3 Cash flow analysis

The cash flow analysis is a basic element of the financial feasibility. It predicts the amount of money available for operations and the ability of the Project Company (entity that executes the project) to service debt and interest. It can also be used to calculate the amount of money available to pay the project sponsor (project initiator or party with risk bearing capital in the Project Company).

The importance of the cash flow analysis as a part of the cost benefit analysis lies in the difference in size and in time of administrative costs and benefits and real cash flows. The ‘real’ cash flow indicates the amount of cash available for debt service and operating cost.

This cash flow shows the working capital available, which is an indication for the ability to pay suppliers, debt service, interest and other cost. One of the reasons why working capital is necessary is the long time between production and receipt of payments, which is usually 30 to 60 days [Hoffman, 1998].

5.3.4 Ability to fulfil debt obligations

The financial health of a company can be analysed using a variety of techniques. Here a very simple approach is selected. To make sure a company can fulfil its obligations, its cash flow is analysed to assess it for the ability to pay the obligations towards lenders. This can be done by using the debt service coverage ratio, and the debt to equity ratio.
Debt service coverage ratio

This means that amortisation and interest, together debt service, are covered by the cash flow. This is represented in the so called "Debt Service Coverage Ratio" or DSCR. Generally this ratio needs to be larger than 1.2 for lenders to have confidence that their annual payments will succeed.

\[
DSCR = \frac{CF}{\text{debt}_\text{service}}
\]

Equation 5-1 [Finnerty, 1996]

Debt service = annual interest and amortisation payment

Debt to equity ratio

Another financial health indicator is the debt to equity ratio. As mentioned earlier, this ratio is an important measurement of ability to fulfil financial obligation upon liquidation. It is calculated simply by dividing the amount of debt on balance by the amount of equity.

5.4 COMMERCIAL ATTRACTIVENESS

Commercial attractiveness is important for two groups of parties, resuming chapter 4: development financiers (bilateral and multilateral) and commercial parties. For both a positive outcome of such an analysis (meaning positive commercial attractiveness) has opposite consequences: the project will not be financed by development financiers but is interesting for commercial parties. The problem is that both groups of parties view this analysis in a different way. While commercial financiers tend to look at their individual cash flow, the development financiers look at the total project cash flow. Besides this difference, within commercial financiers, lenders and equity investors have a different way of analysing project attractiveness also. To try and draw one line to follow for commercial feasibility here, a general framework is given, regardless of the cash flow that is analysed. In the next chapter, the calculation and selection of cash flows is subject, allowing the individual financing parties to assess commercial attractiveness.

The commercial attractiveness is determined by the height of the required investment, the time in which the investment is repaid and the return on the investment, to be compared to other investments. Most of these amounts were determined already during the analysis of financial feasibility. The costs benefits and cash flows are used again here to determine the attractiveness, set out against the risk run by financiers. Risk analysis is therefore discussed first. Discussion of some of the various available cost-benefit valuation methods, lead to the selection of the internal rate of return method. The threshold for commercial viability of a project will finally be determined by the required rate of return.

5.4.1 Risk analysis

Uncertainty

When forecasting project development, much is determined on a basis of assumptions and predicted future development in the environment of the project. The predictions are therefore never precise in predicting the real outcome of a project in terms of influence on its environment, and financial outcomes. Uncertainty is the probability of a predicted outcome of a project not being accurate.

Uncertainty can be based on known factors and based on unknown factors. Parties involved in developing and financing projects are always interested in the possible outcomes of a project and will therefore look into uncertainties to determine the spread of outcomes. Unknown influences cannot be included in this and because of that unknown uncertainty is the most dangerous and unwanted to developers and financiers.

Uncertainty could mean a positive variation in outcome or a negative one. Especially the negative side of uncertainty is associated with risk.

Risk

Risk is a much used word to describe a number of principally different features. Risk with regard to infrastructural projects can be defined as both the uncertainty of the outcome of the project and the chance at an undesired event times the consequences. The latter is most commonly used in Civil Engineering, for example in defining the risk of flooding.
The first is mostly used in the financial world, to point out difference with a prediction. An example for this can be found in pricing of stock, where the relative volatility of the stock price against the stock market (measured by Beta (β)) is a measure for the risk run by holders of that stock.

Risk in this research is used to point out the chance at an unwanted event. For financiers this means the chance at a lesser return than required.

Project financing risks

Project development involves anticipating, mitigating and accepting many different risks. This thesis is not intended to provide a manual for risk analysis. The focus is kept on financing, with an additional analysis to anticipate the risks run by contractors.

Some of the risk which should be analysed and dealt with, by phase of the project [Hoffman, 1998]:

- Development cost & risk: the risk of a project not being executed, while capital is already invested in the development phase;
- Construction cost & risk: the risk incurred by higher than anticipated construction costs or a longer than predicted construction duration;
- Operations cost & benefit risk or commercial risk: the risks associated with higher than anticipated operation costs or lower than anticipated revenues;
- Termination risk: the risks caused by a lower sale price at termination or higher costs at termination (for example environmental clean up costs);

So generally, these risk categories influence the return on a project by increasing costs or decreasing benefits, for example by delays, claims, operating failure. The risk of a volatile cash flow and the resulting possibility of a return lower than required will further be referred to as the cash flow volatility risk.

The most important factor influencing the commercial viability of a project is the commercial risk. Especially the volatility of revenues can pose a serious threat to the income of a project and hence the return for investors. Here the difference between equity investors and lenders must also be made, because lenders receive a fixed return on their investment. This is discussed in chapter 6 more thoroughly. Another risky part of projects are the construction costs, which seem to be projected too low often, to make the project look more attractive for investors.

Contractor risks

The contractor is commonly responsible for all risk run during the construction phase. For simplicity, the contractor is assumed to have responsibility for the design as well as the construction, and should deliver a facility ready for operation (design and construct contract). The most compelling risks during this phase are:

- License risk: the risks at obtaining the right licenses and permits on time. This is associated with political or country risk, as discussed in paragraph 5.6.
- Import and export risk: the risk of not being able to import or export goods (or services), also associated with political or country risk;
- Price risk: this risk at price changes unfavourable for the contractor, for example due to exchange rate risk, inflation risk or just a change in prices of goods.
- Quantity risk, the risk that higher costs occur due to for example extra needed structures or longer construction period, leading to more rental costs for machines.
- Planning risk: the risk that the construction takes longer than anticipated for example caused by licence risk, leading to fines or lower payment by the client.

These risks can also be broken up in smaller more specific risks. Contractors with much experience should be able to deal with these risks properly. Especially planning and quantity are dependent on the design and experience of the contractor, and can only be mitigated by simplifying the design and using structures with which much experience is available.

Price risks are possibly mitigated by purchase contracts, specifying price and quantity of goods to be delivered during construction. If this contract is signed with a non-domestic supplier, inflation and exchange risks still need to be mitigated, which can be done by financial institutions.
The license and import/export risks must be allocated as much as possible to the politically responsible institution, here assumed the national government. This is treated with country risk in paragraph 5.6.

When a contractor is demanded to participate in financing, the financial risks then also become his problem.

5.4.2 Dealing with financial risks

Risk allocation is often done by setting up a risk matrix, with each risk being assigned a chance of occurrence and a possible result of the risk. During negotiations, this risk is then appointed to one of the contractual participants, preferably the one best capable of managing or mitigating the risk [Hoffman, 1998]. This will lead to the lowest cost. Another important feature of a party accepting large risks is the capability to cover the risk by means of capital or other measures, in case of an extreme unwanted event. Risks that are unacceptable or unmanageable for parties, must be insured or be addressed in special contingencies fund.

The contract makes up a very important and time consuming part of project financing, because of the large number of risks. Risk mitigation measures like guarantees and insurance are therefore an important part of project finance.

Risk mitigation: guarantees and insurance

There are several instruments supporting the credit worthiness of projects and companies by limiting the risks. Insurance and guarantees are the most common measures of risk allocation to parties (often not further involved in project finance) for the price of a fixed premium.

Guarantees and insurance are only included as qualitative risk mitigation in this research, leaving out their cost and direct influence. This is done because of the abundance of different guarantees and insurances, covering many different levels of risk. It would go too far to assess all these instruments and their influence on the risks for financiers.

Guarantees

Guarantees are contracts with a promise to pay a certain amount of money, or fulfill other obligation in case a certain event happens. An example is the bank-guarantee that when a company cannot pay a bill under a guarantee, the bank will pay the required amount and further deal with its customer who failed to pay, to reclaim the amount. Guarantees are often seen as a token of trust by a renowned institute, and thus limit the perceived risk of the supplier (receiving the guarantee).

Insurance

Many types of insurance apply to project finance, as can be seen in appendix V. Most events can be insured, but the costs of insurance need to be taken into account. Sometimes, risks perceived by an insurer are quite well controllable by a project sponsor of government. The acceptance of this risk could than limit financing cost greatly. Political risk insurance is very important in limiting the perceived risk by foreign investors, but its necessity could be avoided by government participation in the project.

Assessing business partners

When a company or government participating financially in a project goes bankrupt, this could pose a serious threat to the other participants. This especially counts for off-takers, special suppliers or project sponsors.

The creditworthiness analysis enables companies to assess their business partners for it financial ability to fulfil obligations. This analysis values the companies or governmental agencies involved in the project, in particular when financial obligations may require the subjects to disburse large amounts of money during the project. The analysis is done on basis of the financial structure of the company. This analysis is also a part of credit ratings, which are assessments of the creditworthiness of companies (or governments) regarding their debt instruments. Besides the financial capabilities, also the state of record for operators, suppliers, contractors and off-takers is taken into account, because they have to keep the project running. For this analysis the cash flows of the companies are often also reviewed with the same method as mentioned in this research.

Default risk of partners

To assess default risk of a corporation or a project company, credit ratings often are available if bonds are publicly offered. In the cases under consideration, this is not so. Therefore estimation will have to be made for the credit rating of the project company, to be able to estimate the default risk.
In general, the highest credit rating that can be obtained in a country is the sovereign rating or country rating [Leslie, 1987]. Assuming that the contractual matters of the financing contract are solid and that international renowned parties backup the project company, the rating should be able to approach the country rating.

Therefore it is assumed that the rating for the project company is equal to the country rating and the risk premium for default risk should be equal to the country risk premium (see paragraph 5.6). It should be noted however, that this implies (certainly included) inaccuracies to be counted twice in the RRR. Because of this the cash flows will not be discounted with the RRR but are analysed with the IRR method, which is compared to the RRR. The use of the default risk premium stays disputable, because the influence of the country risk and the cash flow risk (see paragraph 6.3.4) in default risk is eminent, and overlap would lead to an overestimation of the total risk premium.

5.4.3 Comparing costs and benefits

To compare cost and benefits, and judge the feasibility of a project for one’s goals, various tools are available, dependent on the company’s goals or the decision makers’ preferences. A selection of most commonly used techniques, according to the Post-academic course in financial engineering for Civil engineering [PAO-CT, 1999]. This course mentions the Net value method, the payback method, the net present value method, the internal rate of return method and the profitability index method.

Net value method

The simplest way of comparing cost and benefit, is using the simple additive method of net value. This method adds all benefits and deducts all cost, resulting in the net value of the project. For very simple and short term investments, this comparison can be a good estimation of the projects value creation for the financier. However, it discards the time value of money.

The fact that interest, amongst other rewards, is paid over an amount of money that is made available for a certain time, makes that the value of a sum of money received now is higher than an amount of money received sometime in the future [Rogers, 2001].

Payback period method

While many projects have a short investment period, in which assets are bought and the project is set-up, followed by a lifetime of benefits from operating the facility, the time benefits are received enjoys some flexibility. For uncertain cash flows, the financiers will want their investment returned as soon as possible, as well as their excess return for reward.

To determine the operation period required to receive the required return, the payback period method is used. This method determines after length of operation period the benefits equal the investments. This method usually discards the time value of money and uses an important criterion for financing, but not the most determining.

Using discounting can easily improve this method, concerning the first objection, but leaves the second obstacle unsolvable.

Net present value method

The method of coping with the time value of money is called discounting. It uses a discount rate, often conditional upon an interest rate or otherwise incurred cost of money, to estimate the value of cash flows over time, hereby obtaining the ‘net’ cash flows. The net present value method uses these net amounts of money to determine the net value of the project, at ‘present’. Present is not to be taken literally but normally the start of operational phase is used as ‘present’ time.

The net value method determines the sum of cost and benefits per year (I), and multiplies this (see Equation 5-2) with the discount factor, constituted from one plus the discount rate (r), involuted by the basic year (t₀) minus the year of the cash flow (t).

\[ NPV = \sum I_i \cdot (1 + r)^{(t_0 - t_i)} \]

Equation 5-2 [PAO-CT, 1999]

This technique is useful to determine the net value, which is unfortunately independent from the amount of money invested. Because the cost of money is based on an annual percentage, this would be a convenient measure for project feasibility. The net present value is an amount of money and is therefore varying in time. This is another disadvantage of this method.
Profitability index

The profitability index, or benefit cost ratio, uses the same technique as the net present value, but separates the cost from the benefits. It focuses on obtaining a return on investment, reckoning with the time value of money. The discounted benefits ($B_i$) are divided by the net present value of cost ($C_i$) at a predefined time (see Equation 5-3).

$$PI = \frac{\sum B_i \cdot (1 + r)^{(t_i - t_o)}}{\sum C_i \cdot (1 + r)^{(t_i - t_o)}}$$

Equation 5-3 [PAO-CT, 1999]

This method has the advantages of being independent of the selection for the time basis as well as the size of the project.

Internal rate of return method

The internal rate of return method uses the same formula as the net present value method. It uses the discount rate, called internal rate of return (IRR) to be a variable, instead of the net value at present, which is set at null (see Equation 5-4).

$$NPV = \sum I_i \cdot (1 + IRR)^{(t_i - t_o)} = 0$$

Equation 5-4 [PAO-CT, 1999]

This technique required more complicated calculation, but results in an internal rate of return, which can be easily compared to the cost of capital for the financier. Furthermore, this parameter is independent of the size of the project and can be provided a suitable range determined by factors like the cost of capital and inflation. However, there are some calculation problems in cases that cash flows change from positive to negative two or more times [Rogers, 2001]. The IRR can only be calculated when the sum of all cash flow is positive.

When using the present value methods like net present value or profit index, the discount rate to be used is disputable. There are several reasons why determining the discount rate meets problems.

5.4.4 Required return or discount rate

First, economists still discuss on the right method for determining the discount rate or required rate of return. Suggested methodologies include discount rates based on the weighted average cost of capital, capital asset pricing model, the reinvestment return-on-capital rate and the return on equity for the investing firm [Cuthbertson and Nitsche, 2001].

Second, the method of commercial project evaluation is dependent on the preferences of the company making the investment and sometimes even on the likings of the concerning manager. This creates variation in the use of these methods and also the discount rates.

Third, the parameters that could be used to determine the discount rate, like the cost of capital or the risk free interest rate, are different for each institution.

Ross, Westerfield and Jaffe [2002] implicitly suggest using the weighted average cost of capital as discount rate.

For risk neutral investments, companies are assumed to require at least their cost of capital to be compensated. If alternative investment opportunities, with similar risk provide the same returns, the cost of capital is certainly the right discount rate. If a company would have investment opportunities higher than their cost of capital, at the company average risk, it should attract more financing to be able to invest in all these projects, although cost of capital would be rising due to increased demand, up until the cost of finance is equal to the re-investment rate. This off course assumes operational cost and revenues to stay relatively equal.

The risk premium to be included in the determination of the required rate of return is calculated in paragraph 6.3.

Inflation and exchange rates are not included in the discount rate, but will be included in the cash flows.
5.5 **ECONOMIC FEASIBILITY**

A complete policy analysis will not be included in this research because of its vastness and therefore inappropriateness for the goals of this investigation. The description is included because of the use especially bilateral and multilateral institution make of the method to predict and assess policy impact and development.

5.5.1 **Economical feasibility**

**Basics of economical analysis**

Economic feasibility is typically used by institutes concerned with the well-being of a nation or region as a whole. These organisations usually are governmental and operate locally, like the national government, regional government or the local government, or operate internationally, like multilateral institutes and bilateral institutes. Their project demands differ significantly from commercial parties, which are basically interested in profit maximising only.

Economic feasibility consists of at least one financial feasibility study, to assess the fulfilment of objectives of the institute which pays the bill. Part of this is the ability of this institute(s) to do so; by making sure enough means are available for financing.

Besides this it encompasses a wide number of other criteria and parameters, dependent on the preferences of the governmental institute and the specific goals of the organisation. The basic features of the economic feasibility are the following:

- Financial feasibility
- National/regional Economic cost benefit analysis
- Secondary effects
- Scenario and development alternatives comparison
- Environmental impact analysis
- Political point of view: cost and Benefits on a national scale.

Besides financial benefits and cost also other benefits and cost are taken up in the project performance. These include economic effects like:

- Cost and benefits for government
- Cost and benefits for community
- Cost for government
- Reduced costs
- Accident reduction

**Required return for economic feasibility**

Economic feasibility makes up an important part of financing decision for public organisations. It uses the same techniques as discussed with commercial feasibility, but

According to IPCC 1994 (p22) no discount rate should be applied at all for project benefiting future generations.

There is something to say for this point of view, although a negative discount rate would in some cases be more appropriate, because the sooner investments in sustainable solutions are made, the more the whole world and future and present people can benefit from the project.

This of course only concerns project judgement by the governments and only projects contributing (partly) to a better future for the earth, the local environment and the human population.

The choice is made to assume the discount rate for economic feasibility at zero, and thus approving project with net benefits, or a positive E-IRR (economic internal rate of return).
5.5.2 Policy analysis

Policy analysis is an integrative approach to valuation of projects and development as a whole. It integrates development programmes with development scenarios and tries to predict future development and the influence of measures. This method of prediction, taking into account socio-economic developments as well as environmental influence, is very complex and requires a very thorough understanding of the system which is being assessed.

Decisions on CZM are always political decisions because choices have to be made between incomparable quantities. Policy analyses typically include:

- Resource inventories and environmental profiles
- Environmental Impact assessment
- Benefit cost studies
- Risk assessment
- Valuation of resources
- Habitat assessment techniques

The most appealing but also time consuming feature of policy analysis is the prediction of future economic, environmental and social development of a region, and assessing the impact of various development policies on them.

5.6 Country Risk

Country risk is an important factor for investments in developing countries. The most important risks especially with regard to project financing are:

- Customs duties; Withholding tax on interest; Political violence, Civil unrest, War and other political force majeure events; Political collapse and succession; Pre-emption and priority (of government with materials etc.); Sovereign risk; Breach of undertakings (contract repudiation); Collateral risk; Law and legal systems risk; Illiquidity of equity investment; Freezing or blocking orders; Export prohibitions; Price controls and regulation; Unavailability of foreign exchange (none available for exchange); Exchange control; Depreciation of the value of the local currency. [Hoffman, 1998]

It is important to realise that risk need not be present for all parties or have the same impact for parties. Also, investors in many cases make investment decisions based on experience and a good feeling on the deal, beside financial analyses. This makes that risk need not be present but when investors believe that a risk is present (perceived risk), it will have to be dealt with.

A useful measure for the perceived country-related risk is the country risk rating. This rating, composed by an international risk rating agency, like Standard and Poor’s, Moody’s or Euromoney, combines numerical data as well as managerial experience to assess the investment climate of a country, and more specific, the creditworthiness of the government. For this research the Euromoney credit rating is used to evaluate the country risk, because of the availability of the rating at low costs and transparency of the method used to determine the value of the rating (see Appendix X:).

Investors can react to the perceived presence on or more of these risks by not investing in a country. When this counts for most private financiers, it is the worst thing that can happen for a country in need of capital, especially when development finance institutes are also unwilling to invest. When the perceived risk is lower, investors will want a premium for the risk they run in a developing country.

A Government will need to limit the perceived risk by investors by addressing all of these issues and provide guarantees or legal arrangements to address them. Also risk bearing participation (with capital), exposing the government to part of the commercial risk, can limit the perceived risk. Otherwise political risk insurance by the World Bank or other development financiers can be an option to mitigate political risk.

5.6.1 Country Risk - Methodology

The country risk is assessed by using the credit ratings of Euromoney, a rating agency that uses experts from international banks as well as other country rating for it risk projection. In appendix XI the rating method of Euromoney is explained and in appendix XII. The ratings of Euromoney as of mid 2003 are inserted.
The score runs from 100 to around zero, which makes it possible to easily apply numerical risk values, compared to for example Standard and Poor's ratings with letters.

No data is available on defaults under certain credit ratings. Fact of the matter is off course that rating does not imply any quantitative measure of risk, because that should be determined per investment option, and by each investor's standards. Trying to grasp the height of the country risk rating, the risk at default will be estimated at: 50 % (half the maximum score) minus half the Euromoney country risk rating in percent. The lower ranges of country rating lay almost at zero, which, taking the whole rating would imply a chance at default of almost 100%. It is assumed that the maximum chance at default is 50 %. Applying a risk premium of 10 % on this risk, leads to the following formula:

\[ CRP = 50\% \cdot (100 - EMR) \cdot 10\% \]

Equation 5-5

CRP = Country risk premium

EMR = Euromoney country risk rating

This leads to a risk premium of 4.8 % for the riskiest country (North Korea) and a premium of 0.33 % for the Netherlands, the 9th less risky country to invest in according to Euromoney.

5.7 Conclusions

The criteria that were chosen as critical for financiers are evaluated partly qualitative and partly quantitative. In Table 5-4 the criteria and the method selected to assess fulfilment of these criteria are summed up.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter party agreement</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Off take obligation</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Development goals realisation</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Environmental sustainability</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Financial feasibility</td>
<td>Project Cash flow f-IRR, DSCR</td>
</tr>
<tr>
<td>Commercial attractiveness</td>
<td>Party cash flow f-IRR, project risk</td>
</tr>
<tr>
<td>Economic feasibility</td>
<td>e-IRR</td>
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<tr>
<td>Country risk</td>
<td>Country rating</td>
</tr>
</tbody>
</table>

Table 5-4 Criteria and measurement

The most eye-catching in the feasibility studies, is the dependence on risk and return. Both economic feasibility, important for the participation of development financiers and commercial feasibility, important for commercial parties, depend greatly on the return on the investments and the risk that this return is lower than anticipated.

For contractors beside financial risks planning risks and costs risk are most important. Price agreements with suppliers and exchange and inflation coverage by financial institutes can limit the price risks considerably. Planning risks are best overcome by using well know technologies for construction.

To analyse project feasibility and attractiveness, the cash flow are most important. This chapter further has assumed that commercial companies are driven by the goal of profit making, while development institutes focus on economical development, just like the national government.

Financial risk determination is very hard when little sources of information are available. The risk estimates used here are therefore very limited in accuracy and applicability. Cost of capital of commercial company plus country risk, default risk and cash flow risk are assumed to determine the required rate of return. The average risk of an investing company is not included. A decreasing debt to equity ratio or a higher debt service coverage ratio can limit perceived risk for lenders.
6 ANALYSIS OF THE INDIVIDUAL CASH FLOWS AND RISKS

How are the individual financiers' cash flows evaluated?

It seemed in the previous chapter, that cash flow analysis per financier was required to analyse their financing behaviour. Therefore, a cash flow model has been designed and build. The goal of the cash flow model as is developed in this research is to structure the feasibility studies required for project evaluation and investment decisions.

The project financing model used exists simply of a project company, which cash flow and resulting balance and income are analysed. Basic corporate finance techniques are used to do this, as described in chapter 3. It will become clear that not only the category of financiers is important to analyse project suitability, but also the role that a party will play in the project financing process.

6.1 CASH FLOW MODEL DESCRIPTION

By means of the given debt and equity of the project company, as well as required return and interest rates, the financial cash flows towards financiers are analysed, calculating financial feasibility, based on their individual cash flow.

For most roles parties can fulfil the model has suitable ways of implementing their financing criteria, based on mentioned assumptions.

Cost and benefits are needed on a yearly basis. It is possible to insert different scenarios to analyse the sensitivity of the outcome to varying commercial or cost predictions.

For financiers net present value and the internal rate of return are calculated, to be compared with the required rate of return.

![Image of cash flow model]

Figure 6-1: structure of the cash flow model

The financiers included in the model are:

- The national government with taxes and subsidies or as investor
- Bilateral institutions with grants
- Multilateral organisations with grants and loans
- Equity investors (sponsors)
- Commercial lenders

Sponsors are in the cash flow model included as regular equity investors. They will of course demand a higher return than regular equity investors; because of the larger share of risk they bear through financial support to the project company.

The commercial lenders are represented as one lender, while it could also be that it is a syndicate of banks lending, or a bank only arranges a public or private placement of bonds.

In Appendix XII: and Appendix XIII: explanations of the actual cash flow model, as set up in Microsoft Excel, are included. This model makes it easier to adjust predictions for cash flows or assess different financing structures. The model enables every form of financing discussed here to be analysed. In chapter 7 two examples are worked out on the basis of this model.

### 6.2 Financiers' Cash Flows

#### 6.2.1 Lender cash flow

The lender is the first party whose claims need to be fulfilled. Their investments are repaid in fixed terms and amounts. They have the first right to claim project company cash flow when the project company does not fulfill its obligations.

Besides the investment, the cash flow exists of annual equal debt service payments. Figure 6-2 shows the cash flows of the lender, resulting from the project. To realise this, the annual amortisation is adjusted so that together with the interest payments, the amount stays the same. This calculation of this annuity is explained in chapter 3.

Other income comes from fees, which are not further included in the model. Tax payment can be burden on the income on these fees and especially on interest. Without double taxation payments, the amounts of taxes increase even more.

![Lender's cash flows diagram](image)

Figure 6-2: Lender cash flow

What becomes clear here is that the cash flow of the lender is quite fixed. At least, the lenders are not concerned with the actual height of the revenues, as long as the project company is able to pay its debt service annually. So in advance, the lender can calculate its return quite accurately, except for unanticipated changes in exchange rates, inflation or other assumptions on which the interest rate is determined. Then of course, there is always the default risk, when the (project) company is not able to fulfil its financial obligations.
6.2.2 Government cash flow

While taxes are a nuisance for lenders, it forms benefits for the government. The cash flow of the government, as projected in Figure 6-3, is built up of subsidies, taxes and fees. The fees are not considered to be significant. The cash flows are kept to most simplicity, leaving out secondary or non-financial benefits. Disputable is the acceptance of income of labour taxes and Value Added Taxes. These are therefore eventually left out of the equation.

![Diagram of Government's cash flows]

The model set-up is also usable for an economic feasibility study. Therefore the revenue, operational costs and initial costs only need to be replaced by economic instead of financial costs and benefits.

So financially speaking, the government is benefited by high taxes and low participation in the form of subsidies or investments. However, the government needs to be aware of the market principle that regulates the price and quantity negative correlation. In this case, this mechanism would suggest that lower taxes result in more investment in projects and hence a higher quantity of projects bringing forth tax revenues. The government will need to be aware of the competition in the capital markets and that attracting capital is best done with high probable return on projects, on which taxes have an important influence.

6.2.3 Sponsor Cash Flow

The sponsor (investors) invests initially in the project and receives back dividends. Optionally is the repayment of initial investment at the end of the operation period, which is however not common in project financing.

Project sponsors have to pay taxes over their income in their own country. If additional taxes are put on expatriating dividend, this can be a serious threat to profitability of an investment.

One sponsor cash flow that is not included in the model (but is shown in Figure 6-4) is the cash support for operations of the project company. This is done because in preliminary project assessment, these cash flows are supposed to be zero. There make up part of a contingency plan.
The sponsors/investors are last in line of receiving, so they bear the largest risks, but receive in return (potentially) the highest income.

6.3 COMMERCIAL RISK PREMIUM CALCULATION

The focus in the model lies at first in attempting to describe and predict investment decisions by commercial financiers. This is because investment decisions of charitable institutions are publicly known. Their conditions for financing will however be just as important in the financing decision.

Finance, participants, government, sponsors, suppliers, off-take purchasers and Project Company are investigated for their creditworthiness, cash availability, and investment profile and security measures.

6.3.1 Portfolio and single investments

Portfolio investments

Investments are usually part of a large amount of capital invested in various projects or assets. The investor viewpoint would in that case be best considered by explaining why one investment would be preferred above the other investment. In the case of portfolio investments, a variation of investments is required to obtain an optimal return of risk. This is called the portfolio theory which makes use of the fact that diversification, the spreading of investments over multiple assets with varying risks reward, and correlation statistics. The risk that so can be diminished is called the un-systematic risk and the risk that remains in the (theoretically) optimal diversified portfolio is called the systematic risk. In the portfolio investment theory, it is assumed that the systematic risk is the only one; investors should deal with, because un-systematic risk should not harm their return.

Systematic risk

The systematic risk is the part of risk that is dependent on global events. This risk, also called market risk cannot be marginalised by changing the size and components of an investment portfolio. Diversification does not work because the events determining the risk are of influence to all possible investments. The systematic risk is however often appointed to a particular group of investments, like the stock market, and not all possible investments. This risk is the risk that investors should strive for, because it represents the lowest risk possible. Of course, lower risk does again mean lesser volatility and lesser optional returns.

Un-systematic risk

The unsystematic risk, also called the diversifiable risk or residual risk is the risk that is unique to a company or project. Examples are: a strike, the outcome of unfavourable litigation, or a natural
catastrophe. This type of risk can be eliminated through diversification within an investment portfolio. This type of risk is the project risk in this research.

Single investments

In project financing, it is difficult to compare one project with another, because other projects may not be at hand or comparable data (in this case) unavailable. In the case of contractors participating in financing, the portfolio theory would certainly not serve their interest.

Therefore, the approach is selected to address systematic and un-systematic risk for each project, to calculate the required return for investors. This is in conformity with the fact that investors (or other companies) often add a risk premium for investing (or operating) in a developing country.

If these investments would be part of large portfolio, the risk margins added for each projects would flat out be more or less based on the systematic risk. This method would also give a better insight in project risks.

6.3.2 Financiers' cash flows and risks

The cash flow of the project is, like spread over the various parties that invested in the project and the government. The latter receives tax revenues from the project, but does usually not use this for investments decisions. Therefore the focus lies so far in the risks associated with the cash flows to financiers, for which a tool for analysis will be provided in the next chapter.

The project company needs to be aware of is liabilities concerning the cash flow, and make sure that it can fulfil it obligation. Its main goal is to keep the facility operating and optimise return to its shareholders, like every other commercial firm.

The Lender will want to monitor the acts of the project company closely, because the largest risk they face is project default. In Figure 6-5 the division of the cash flow over the participants is shown.

![Cash flow and risk distribution with Project finance structure](image)

Figure 6-5: Cash flow and risk distribution with Project finance structure

The project sponsors will want to monitor the project company very closely because of the obligation they often have on project finance contracts to assure cash availability for it. As equity investor they also want the profits of the company to be as high as possible to receive high dividends.

The risks that are assumed to play the largest part in project financing decisions for foreign financiers are the risk associated with investing in a different country: the country risk, the risk at default of the project company and the cash flow volatility risk, where it concerns uncertainty in the height of the revenue and costs.
6.3.3 Project risk valuation methods

The main risks that are to be dealt with by project financiers are country risk, default risk and cash flow risk. In Figure 6-6 the required return on risk neutral investments is provided by the Weighted Average Cost of Capital (WACC). Further, a country risk premium, a project company default risk premium and a commercial risk premium are added. The required rate of return then is adjusted for the risk, producing the required rate of return for risky investments.

Now the three risk factors need to be determined. With the determination of these risks, it soon becomes clear that (without paying large sums of money to credit rating agencies) not much information is available because it is commercially sensitive or lucrative. Therefore a simplified approach is selected, trying to estimate the quantities of the risks and belonging risk premiums.

![Diagram of risk valuation methods](image)

Figure 6-6: Commercial required return structure

6.3.4 Cash flow risk

Eventually, all risks matter because of the influence on the cash flow of the project, which is the source of return for especially equity investors and thus the sponsors. Lenders use the cash flow to determine the ability of the project company to pay debt service.

The return for investors has a certain probability and spreads around an expected value as is shown in Figure 6-5. The expected return of the project must be higher than the required return. If the spread in the cash flow is high, the chance exists that the resulting cash flow is less than required. Or, in return rates, the resulting internal rate of return (IRR) is lower than the required rate of return (RRR).

Spread in cash flow

To predict the chance of this event, the actual spread needs to be known of the return. Very advanced risk and cash flow prediction model could maybe shed a light on this, but exact knowledge is not to be expected. That why a simplification is used assuming that the volatility of the Gross Domestic Product (GDP) in market prices (US$) is a prediction for the cash flow volatility. This needs to be verified in an independent research before application in project cash flow prediction.
Below in Figure 6-8 can be seen how various factors influence cash flow risk and lead to an uncertainty in the outcome of a project. Inflation, exchange rate and fluctuation in the (GDP) are selected to represent volatility of the cash flow of a project, where the actual spread a probability of a cash flow is not available.

The Variation coefficient of the cash flow is thus determined by:

$$V_{CF} = \frac{\sigma_{GDP}}{\mu_{GDP}}$$

Equation 6-1 [CUR, 1997]

$V_{CF}$ = variation coefficient of the project cash flow

$\sigma_{GDP}$ = standard deviation of GDP.

$\mu_{GDP}$ = Mean of GDP.

Statistics of the IMF (International Monetary Fund) can be used on GDP data from the past 15 years, to calculate the volatility. The variation coefficient describes the relative variation regarding to the mean expected growth of the national GDP. The GDP is provided in current prices, reflecting exchange rates, inflation and change in GDP.
In Table 6-1 some examples of GDP volatility are given (which will come in handy later).

Table 6-1: Mean, standard deviation and variation coefficient of current GDP for some countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Mean (US$ billions)</th>
<th>St.Dev</th>
<th>Var.coef</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLOMBIA</td>
<td>70.43</td>
<td>23.13</td>
<td>0.33</td>
</tr>
<tr>
<td>Annual change</td>
<td>5.14%</td>
<td>14.5%</td>
<td>2.83</td>
</tr>
<tr>
<td>MOZAMBIQUE</td>
<td>2.91</td>
<td>0.73</td>
<td>0.26</td>
</tr>
<tr>
<td>Annual change</td>
<td>0.11%</td>
<td>19.0%</td>
<td>166.11</td>
</tr>
<tr>
<td>SOUTH AFRICA</td>
<td>126.27</td>
<td>18.30</td>
<td>0.14</td>
</tr>
<tr>
<td>Annual change</td>
<td>4.10%</td>
<td>12.6%</td>
<td>3.06</td>
</tr>
<tr>
<td>NETHERLANDS</td>
<td>359.94</td>
<td>68.83</td>
<td>0.19</td>
</tr>
<tr>
<td>Annual change</td>
<td>5.46%</td>
<td>9.2%</td>
<td>1.69</td>
</tr>
<tr>
<td>World</td>
<td>27.428.49</td>
<td>4.542.69</td>
<td>0.17</td>
</tr>
<tr>
<td>Annual change</td>
<td>4.58%</td>
<td>0.04</td>
<td>0.93</td>
</tr>
</tbody>
</table>

Table 6-1 is based on World Economic Outlook by the IMF, September 2003. The National GDP in current prices in US$, is based on the following assumptions:

**Gross Domestic Product, Current Prices (national currency)**

GDP is expressed in billions of national currency units. The last available year is consistent with that which appears for GDP in constant prices in the statistical tables in the WEO publication.

**Gross Domestic Product, Current Prices (U.S. dollars)**

Values are based upon GDP in national currency and the exchange rate projections provided by country economists for developing and transition countries. Exchanges rates for advanced economies are established in the WEO assumptions for each WEO exercise.

[www.imf.org, 2003]

So the GDP in current prices in US$ represents GDP development as well as exchange rate and inflation. The exchange rate against the US$ seems justified by the fact that most international finance transactions are still made in this currency. Hereby a parameter arises, inclusive of the three volatile aspects assumed to have influence on the project's cash flow.

Assuming here that the average annual GDP growth rate is chosen as project revenue growth rate, the deviation of the annual GDP change, or volatility around this average, is a measure for the risk that the expected growth (equal to average GDP growth) does not occur. The standard deviation is a useful measure for this.

Should the growth rate of the project be chosen different from the GDP growth rate, the variation coefficient can be used to assess volatility, independent of the growth rate.

**Risk at lesser than required return**

The variation coefficient can be used to determine the chance at too little return. Assuming that a standard distribution function represents the spread in the cash flow well, the following function can be helpful to predict the chance at a lesser return

\[
F_{CF} (RR) = \phi_{N} \left( \frac{RR - \mu_{CF}}{\sigma_{CF}} \right)
\]

Equation 6-2 [CUR, 1997]

\[ F_{CF} = \text{the distribution of chance function} \]
\[ RR = \text{the required return (RRR x investment)} \]
\[ \mu_{CF} = \text{mean expected result of cash flow, or the expected value of net cash flow.} \]
\[ \sigma_{CF} = \text{variation in cash flow} \]

\[ \sigma_{CF} = V_{CF} \cdot \mu_{CF} \]

Equation 6-3
\[ \Phi(z) = \text{is the (numerical) distribution function for the normal distribution, its value can be read from appendix X by using the next formula.} \]

\[ \frac{RR - \mu_{CF}}{\sigma_{CF}} = z \]

Equation 6.4 [CUR, 1997]

From the table now the chance at a return lower than the required return can be read. Now, what to do with this chance?

Risk premium

It is assumed here, that 10% of the chance at a return smaller than the required return should be added as risk premium. The acceptability of this can be checked with the following reason: A project is not acceptable when the expected rate of return is lower than the required rate of return (assumption). Then, the maximum chance at a return lower than required is maximum 50%. This implies that the maximal risk premium for this event is 5% according to above assumptions.

This seems acceptable, regarding the stock market returns compared to the debt market returns. Although lately the stock market has been through some changes, in the last 30 years the additional return on the stock market (S & P 500) the return on the stock market was on average 3.3% on long term government bonds, with a range of about 1% up and down, according to Wendt [2002]. With this, it must be realised that the S&P500 is a diversified portfolio, not representing individual company of project risk.

6.4 Financiers' selection criteria

In this paragraph, a check is executed whether all criteria can now be evaluated and how. Going by all criteria, it becomes clear which criteria are most important for which parties.

6.4.1 Economic feasibility

Economic feasibility can be calculated by monetising the all financial and non-financial cost and benefits to the project. These can be calculated as cash flow for the project and so be evaluated for feasibility. The required return is therefore set at zero. This analysis is important for the government of the developing country, as well as development financiers.

6.4.2 Financial feasibility

The cash flow model can compare all cash flows and determine if no cash deficiencies occur with cash flow projections and if capital inflow is sufficient. For debt service, the debt service coverage ratio is determined. The influence of this on default risk is obvious. Therefore it has impact on all participants in financing. And in particular the lender, who mostly put forward the largest amount of capital.

6.4.3 Development goals realisation

The assessment for fulfilment of development goals is a qualitative judgement, which will have to be made on the basis of the project description. The goals and impact of the project can be compared with the provided millennium development goals in Appendix VI.

6.4.4 Commercial attractiveness

Commercial attractiveness analysis is based on the individual cash flows as described in this chapter. The calculated return on investments can be compared with the risk adjusted required rate of return, determined in the previous chapter. What is not included in the model, but could be of significance importance is the fact that commercial parties are not willing to take a certain risk at any cost. Also, large assumptions have been made, which asks for a critical look at the findings in this analysis.
6.4.5 Inter party agreement

Based on the country list provided in appendix VI; showing all development aid recipients and the Dutch development assistance recipients, it can be investigated which bilateral programmes country takes part in and on what multilateral institutions it can depend for financing. Commercial partnerships are not addressed here.

The agreements between multilateral and bilateral development finance companies must be investigated for the limitation with regard to the supported projects goals and other conditions. It is often the case that only for certain development goals or for certain regions in a country financing is available.

6.4.6 Off take obligation

The Off-take obligation counts for two parties: sponsors and bilateral (export) financiers. In both cases the off-take or export agreement must be arranged before certainty can be obtained for financing. In many cases however, this is covered by a letter of intention from a financier assuring co-operation.

The need for purchase must be assessed for the benefits that are received in return. Often, despite these restrictions on financing, the result is quite positive.

6.4.7 Environmental sustainability

Environmental sustainability could be assessed within the economic feasibility. Because of the difficulty of doing so, requiring disputable monetising of environmental values, the assessment of environmental impact is kept qualitative. It must be compared with the millennium development goals.

6.4.8 Country risk

The country risk has been treated in paragraph 5.6. A country risk rating will is used to determine the level of risk, which will be used to determine the required return for commercial parties. If the risk is very high, not only do the cost grow much, but it probably decreases the number of interested investors or even force one of the needed project sponsors to back out. Therefore, the perceived risk needs to be minimised.

The country risk for multilateral and bilateral institutes is virtually non-existent, because of their importance in international finance.

6.5 CONCLUSIONS

Analysing cash flows and risks per individual party as separately analysed in chapter 4, not all aspects of finance can be attributed to the group. For a clear analysis of cash flows and risks, the role of the party in the financing process is of much importance. The most dominant financing roles are those of lender and sponsor, which can be fulfilled by commercial as well as non-commercial parties. The government also plays an important role in financing, by the taxes it imposes and the facilitation of the project, even when it shouldn’t initiate the project.

For the lenders to the project, the cash flows are fixed. The actual height of the cash flow is therefore not really important to the lenders, as long as the project company can surely pay annual debt service. Therefore the default risk is very important to lenders. Together with the country risk premium, this makes up the risk premium to be added to the cost of capital (WACC) to obtain the required rate of return.

The project sponsors have an additional risk compared to lenders, because they will have to wait and see how much of the project cash flow is left when their returning cash flow is determined. The cash flow volatility risk is therefore of much importance to the sponsors.

The government of the country where the project is located can be benefited greatly by a project. The financial flows in the form of taxes or duties must be taken into account when analysing a project form this perspective. For economical analysis, the economical cash flow needs to be addressed to the government also.
7 EXAMPLES OF COASTAL PROJECTS AND FINANCING

How are the financiers' criteria fulfilled in known projects' evaluations?

Previously, three main foreign sources of financing of projects have been identified, being bilateral, multilateral and private financing. The criteria that these parties have for financing are evaluated with the methods discussed in the previous chapter. Two examples are treated, namely Bilateral financing by Dutch development assistance and a project financed by private companies. In both cases the World Bank had an advising role in the background and more parties were involved with financing.

First, for bilateral financing, the Stabilised Tidal Inlet project in Cartagena de Indias in Colombia is reported and discussed. Besides ORET funding the costs of this environmental improvement project were all for the ministry of Transport of Colombia. The second project is the concession for a period of 15 years of the operation of Maputo Port in Mozambique.

7.1 BILATERAL FINANCING: STABILISED TIDAL INLET, CARTAGENA, COLOMBIA

7.1.1 Description of the project

Cartagena de Indias in the north of Colombia (Figure 7-1) is surrounded by water. The Lagoon that intersects with the town in the north, the Ciénaga de Virgen, has a poor water quality due to sewerage and industry waste disposal in the lagoon for many years. Health costs are very high, lagoon fishery has become impossible and tourism, which has great potential, does not develop to full capacity due to the state of the Lagoon.

![Map of Colombia and Cartagena de Indias](image)

Figure 7-1: (left) Overview of Colombia and the placement of Cartagena de Indias and (right): a satellite image of Cartagena de Indias with in the north the Ciénaga de Virgen lagoon.

The lagoon is separated by a strip of land (a spit called Baraquilla) that is crossed by the sea for a maximum of two months a year. This has proved insufficient to refresh the water in the lagoon. The Government of Colombia has requested help from the Dutch government to find a solution for this problem, leading to the design and construction of a stabilised tidal inlet.

The project was made up out of a tidal inlet and canal, to refresh the water in the Ciénaga Lagoon with the work of the daily tide and currents. To improve the refreshing strength of the solution chosen, the lagoon was almost split in two by a sheet-pile dam. Sluices in the tidal inlet arranged that with an incoming tide (alongside only one side of the dam) fresh water would flow in, and along the other side the most contaminated water would flow out alongside the other side of the dam, through the inlet sluice again. The project further consisted of measures to prevent sediment rich long-shore current to congest the canal and inlet and road crossings for the canal.
The stabilized tidal inlet restored the water quality in the lagoon thanks to a permanent connection between the lagoon and the Caribbean Sea. Via this connection, an intermittent flow of water through the lagoon occurs - in with high tide and out with low tide - restoring the self-cleansing capacity of the lagoon. In Appendix XIV: a more extensive report on the Cartagena Tidal inlet project can be found.

7.1.2 Reasons to develop the tidal inlet

The government of Colombia, initiated the project to reduce the economic costs that are incurred by the bad health of Cartagena's population, partly caused by the bad state of the lagoon. Furthermore, the city has a large tourist potential that is limited by the bad state of the environment of (amongst others) the lagoon. The Ciénaga lagoon used to have a large fish stock used for fishery that could be returned when the water is cleaned. The project is part of a larger, World Bank supported project to improve the environmental and health situation in Cartagena, by improving sewerage and waste disposal methods and improve water quality in general.

7.1.3 Financial assumptions

The assumptions used to predict cash flows for the project are derived from a Netherlands Economic Institute (NEI) report concerning the assessment of eligibility of the project form ORET/MILIEV financing by the Dutch state.

Basically, the income of the project is build of the following components: dredging of the tidal inlet and a canal on the northwest side of Cartagena; dredged soil sanitation, land reclamation with dredged soil and sale of the new land.

Besides the cost for dredging and sanitation, construction costs include the four groins, two breakwaters, one small and one large tidal sluice, a sheet pile dam of 2.2 km and a road bridge over the tidal inlet.

<table>
<thead>
<tr>
<th>Main assumptions</th>
<th>NEI-ORET report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dredged soil</td>
<td>250.000 m³</td>
</tr>
<tr>
<td>Land reclamation with dredged soil</td>
<td>83.000 m³</td>
</tr>
<tr>
<td>Price of reclaimed land</td>
<td>$110 per m²</td>
</tr>
<tr>
<td>Price of dredged soil</td>
<td>$37 per m³</td>
</tr>
<tr>
<td>Full project costs</td>
<td>$22,427,255</td>
</tr>
<tr>
<td>ORET grant</td>
<td>45 %</td>
</tr>
<tr>
<td>Sanitation cost (15 % of revenues of dredged soil)</td>
<td>$1,375,000</td>
</tr>
<tr>
<td>Annual maintenance cost</td>
<td>1,25 %</td>
</tr>
</tbody>
</table>

Table 7-1: Financial assumptions [Hoogland et. al., 1997].

Land reclamation of 83,000 m² at the shallow shores of the Ciénaga de Virgen Lagoon is assumed to be sold for US$ 110 per m². This is based on the price of land in Cartagena in 1997 varying between 120 and 150 US$ per m². Per m², 3 m³ of dredged material is assumed to be necessary for reclamation. The total revenue from the sale of reclaimed land is then US$ 9,13 million, in the year directly after completion. The sanitation of the soil that is required before use for land reclamation, is assumed at 15 % of the dredged soil revenue, mounting up to US$ 1,375,000. The net benefit from land reclamation is thus US$ 7,76 million dollars in year 2.

The calculation of the benefits resulting form the project, besides the benefits form land reclamation, is limited to the reduced costs in health. It will become clear that the economic benefits from reduction of these costs are already sufficient to make the project economically feasible.

The improved health standards are assumed to have an impact on 33 % of the population of Cartagena, mainly the poorer part. Therefore the family of a fisherman is taken as standard for health cost reduction calculation. A fisherman's family counts on average 6 persons, which is supported by an income of US$ 1200 annually. The household expenditure is about 7 % of the annual income (World Development Report [World Bank, 1993]) which is estimated to be reduced by 70% due to the increased health situation. This provides a reduction in health cost of US$ 2,32 million. The first year only half of these benefits are taken into account due to the delay in the effectiveness.
The total construction costs are US$ 22,427,255, of which 1.5% US$ 280,000 forms the estimated annual maintenance cost. The FMO will grant 45% of the project sum in the first year: US$ 10,1 million.

7.1.4 Project cash flows

Based on the previous mentioned assumptions, the following cash flows can be discerned: the economic cash flow and the cash flow for the government, resulting form the project partly financed by the FMO through the ORET/MILIEV programme.

![Project cash flows diagram]

When taking into account that the health improvements are not directly measurable, and the ORET grant is included, the following financial cash flow for the Government of Colombia can be drawn.

![Governmental financial cash flow diagram]

7.1.5 Criteria assessment

The project is economically feasible, when concerning the internal rate of return (IRR) of 7.3% after 15 years is considered sufficient. Based on the assumptions in chapter 5, this is the case. When viewing the financial cash flows, it becomes clear directly that the government will have to keep on
paying for the maintenance costs during the lifetime of the project. This means directly that the project is both financially unsustainable and commercially unattractive. However, for completeness of the analysis, the feasibility studies as mentioned by the NEI will be discussed also.

Financial feasibility

Financial feasibility analysis by the NEI is done by excluding the grant from the cash flows and determining the IRR. For the investment a loan is assumed, leading to debt service payments for 10 years (the assumed repayment term). The project lifetime is set at 15 years for this analysis and the interest rate at 6.75 % (the real interest rate for foreign loans). This concerns a project tied loan, because it is assumed that the government cannot attract sufficient financing by itself. In Figure 7-4 the cash flows for the government, which will not have to bear the initial investment but do have to pay annual debt service from year 1999 to 2008.

The IRR must rise above the Commercial Interest Reference rate (C-IRR), a standard measure for commercial loans agreed by the members OECD.

![Financial sustainability: Government cash flow](image)

Figure 7-4 Government cash flows assuming a loan for the complete investment

Result: the cash flow is not sustainable, because expenses are much higher than income.

However, the NEI appoints the project to viable, as long as the deficient in the project cash flow is filled in by the government of Colombia. The FMO will need strong guarantees that the government will do so, otherwise the project is financially not sustainable.

Economic feasibility assumptions

For economic feasibility, the NEI poses a required rate of return of 10 %, based on the opportunity cost of capital (OCC), a measure of return for other investment options in a Country, in this case Colombia. This is higher than the economic rate of return calculated earlier. This was based on a lifetime of 15 years and the NEI uses 40 years to determine economic feasibility. The Earlier determined IRR then turns out to be 11 % and thus sufficient to claim economic feasibility.

Commercial viability assumptions

For commercial attractiveness (or viability as the NEI states), the NEI uses a lifetime of 10 years. The project should according to the NEI be able to sustain while being financed by a local at commercial terms. These terms mean a real interest rate of 8 % (33% market interest rate and 25 % annual inflation) and repayment in 10 years. Regarding the even more detrimental conditions than the ones in the financial feasibility, it can surely be said that the project is, under these conditions, commercially not viable.

Country risk

Because of the fact that no commercial parties participate in financing, the country risk is of minor importance. The largest financier is the country, so of a country risk should then be no discussion. For other parties, like the contractor, the country risk can still be a point of nuisance. Therefore, export
credit insurance is arranged with the Dutch Credit insurer Gerling NCM. The contractor may also include a risk premium if the perceived risk is still possible taken into account in the price of the work.

**Qualitative criteria**

The inter-party agreement is evidently present between the Dutch government and the Colombian government, by means of a development assistance agreement.

The financing supplied by the Dutch government was coupled to the execution of the work by Boskalis, which assures the off take obligation criteria fulfilment.

The development goals were addressed in this project by the environmental and health improvement. Also, the position of women was expected to improve due to higher health standards.

The evident environmental sustainability is discussed more expensively in Appendix XIV:

### 7.1.6 Participant and criteria evaluation

**Government**

The Ministerio de Transporte of Colombia invested the largest sum initial and during the lifetime of the project for maintenance. The benefits of the project are merely economical, which justifies this financing.

Economic feasibility, environmental sustainability and financial feasibility (by its own account) are all accounted for and found positive.

**Dutch government (FMO / ORET)**

FMO (Financiering Maatschappij voor Ontwikkelingslanden) granted 45% (ORET programme on behalf of the Dutch government) of the total project amount. With this grant, the FMO also arranged for a commercial loan for the remaining 55% of the project amount. The government of Colombia rejected the loan-offer and financed the rest of the amount out of its own means. The conditions for the ORET grant were standard, demanding credit insurance by the NCM and the national government of Colombia to act as ‘borrower’ for the agreement.

The eligibility for this financing program, concerning financial feasibility, economic feasibility and non-commercial viability, has been shown. The conditions of an agreement between Colombia and the Netherlands as well as the obligation to assign the work to a Dutch contractor were also met.

To get an idea of the benefits the Dutch government receives in return from granting the amount to the Colombian Government, a simple calculation is carried out.

Of the US$ 22.4 million, 65.6% is paid to Dutch (sub)contractors [Hoogland et al., 1997]. Assuming that most of this amount is paid to Boskalis, the taxes Boskalis pays annually are used to locate the cash flow to the Dutch Government.

Boskalis had a revenue of € 1.083 million in 2001, with € 106.9 million (9.87% of revenue) operating result before taxes [Boskalis Annual report, 2001]. The operating result before taxes for this project would therefore be US$ 1,452,085, assuming the same ratio to count for the project revenue. The average corporate tax rate on operating result is 27.3% for Boskalis [Boskalis Annual report, 2001]. Assuming that the same relation holds for the project cash flow, the taxes flowing towards the Dutch government by corporate taxes are estimated at US$ 396,420.

To include the labour taxes, assumed to also form a large cash flow, the work of 80 people at the project [Hoogland et al., 1997], with an average annual income of US$25,140 (based on Gross National Income (GNI) per Capita [World Bank: World Development Indicators, 2001]). So the total revenue of labour is US$ 2,011,200. The average tax rate for employees is 33.6% [World Bank, 2001] leading to an estimate tax revenue of US$ 675,763.

The financial benefits seem to be in the order of one tenth of the grant amount, and can therefore hardly be seen as an incentive for this investment. However, other results from the investment are less measurable: for example employment, a good relationship with Colombia or international prestige.

**Gerling NCM**

The Gerling NCM insures foreign investments and co-operates closely with the Dutch government. It supplied insurance for the payment of the contractor with coverage of 95%. It is a commercial insurance company, specialised in country risks. The premium of the insurance, paid by Boskalis is calculated into the contract price by the contractor.
Boskalis International

The contractor awarded the project by tendering was Royal Boskalis International (Boskalis), a part of Royal Boskalis Westminster in the Netherlands. For competitive bidding, Boskalis requested support from the ORET/MILIEV grant programme for developing countries. Boskalis has executed projects under ORET financing more often and is itself eligible for participation in this program, because it (officially) never bankrupted.

Reasons for Boskalis to participate in this project is the plain entrepreneurial drive of making a profit by doing what is its core business: dredging and constructing. The contract had no special financial obligations for Boskalis, and because of the Gerling NCM export insurance, the risk of non-payment was reduced to 5% of the project sum.

7.1.7 Financing structure

In Figure 7-5, the connections between the parties are shown. The FMO agreed (on behalf of the Dutch state) to grant 45% of the project amount to the Government of Colombia. The payment however, went straight to the Dutch contractor Boskalis. The NCM credit insurance had to be covered by a repayment guarantee of the National Colombian Government, which was counterparty for the credit agreement. The amount falling under the insurance was disbursed by the Municipality of Cartagena, acting as direct client for Boskalis. Boskalis was as main contractor responsible for payment and contracts of (local) subcontractors.

Risk allocation

The design and contract where carried out under FIDIC regulation, which had to be adjusted slightly to comply with Colombian law. The contractor carried design and construction risk. As discussed, the risk of the contractor Boskalis were limited because of the export credit insurance. Commercial and economic risks are concern of the government of Colombia, Ministry of Transport. The project was delivered as a turnkey project with 12 months guarantee of service. The Dutch government expected no repayment of its financing, so no (financial) risk is associated with them.

7.2.1 Project description

The port of Maputo, part of a large transportation network between South Africa, Swaziland and Mozambique: the Maputo corridor. In this corridor recently some major infrastructure and industrial developments have occurred, increasing the potential of the Maputo port. The government of Mozambique has decided that the port should no longer be operated by the Caminhos de Ferros de Mocambique (CFM) the current port, authority alone. The port, which has suffered from poor maintenance of over a decade, will be placed under a concession to a combined public and private project company, the Maputo Port Development Company (MPDC), to rehabilitate, operate and maintain the port and in return to receive port handling and lease fees. The long-term objective of the project: re-establish the ports of Maputo and Matola (Maputo’s subsidiary port) as competitive transit ports for the markets of southern Africa, and as important growth generators in Mozambique.

The activities of the MPDC involve marine operations; towage; stevedoring; terminal and warehousing operations and port planning and development. Rights of earlier private operators of facilities were respected; the MPDC obtained the rights to the concession agreements made by the CFM.

The activities to tune up the port are: purchase of two new tugs; co-operation with CFM for the construction of a port entrance link to N4; New cranes and handling equipment; upgrade of roads and rail in the port; berth repairs and dredging.

In Appendix XVII: a more comprehensive report of this project is included.

7.2.2 Reasons to develop project

The project, initiated by the government of Mozambique to provide an economic boost to the country, supported by the World Bank privatisation programme. This is an advisory group guiding developing countries into privatising part of their infrastructure, to increase capital and technical knowledge inflow from developed countries. Its experience [World Bank, 2000] is that private capital and expertise lead to an increased efficiency, better educated workforce and increased economic growth.

Maputo port has a large potential, both by historical figures and by recent industrial development in the region. The government wishes Maputo port to develop according its potential and make Mozambique benefit economical and financially from this potential. It is viewed that (foreign) private parties can realise this at best.

7.2.3 Financial assumptions

Limited data was available for analysis of this case, however more than in other cases. Many assumptions are derived from a project preposition done by a preliminary sponsor consortium in 1997. More than five years before the concession agreement was finally signed (April 2003). This piece is referred to as Standard Bank Group (1997), Maputo port, Preliminary project information, internal document. Other sources of information were publication by Cadwalader, Wickersham and Taft (2003), Maputo Port financing: new legal structure used to permit privatization of port, in International securiation & structured finance report (2003), London: World Trade Executive Inc. Norris, S. and Ogumbi, C. (2003), Letting the crown jewels fall into private hands, A case study of the Maputo port Project, in The journal of structured and project finance, summer 2003, New York: Institutional Investor. Other information had been gathered and reported by Klazinga, D. (2003), Memo: Deepening of the port of Maputo, Hydronamic BV, Papendrecht.

Assumptions for income

The tonnes of cargo have exceeded 15 millions before the civil war in 1993. Now the port handles only 4 million tonnes annually, leaving a large potential. The estimate is, that the port will handle 13 million tonnes of cargo by the end of the concession period. (Growth of 8,8 % per year).

The most uncertain feature in this case was the income of the Maputo port. Therefore, estimates of income have been made on the basis of some ports. The final analysis is subject to a sensitivity analysis.
The average revenue per tonne of cargo is given in Table 7-2 for Two ports in Eritrea: Massawa and Assab; the Port of Rotterdam and the combined results of Liverpool and Medway, both run by Mersey Docks and Harbour Company (MDHC), one of the sponsors of the MPDC.

Table 7-2 Estimating an average revenue per ton for Maputo

<table>
<thead>
<tr>
<th>Port</th>
<th>Revenue US$ millions</th>
<th>Cargo traffic '000 tonnes</th>
<th>Pricing US$</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Massawa, Eritrea</td>
<td>11,1</td>
<td>578.0</td>
<td>19.3</td>
<td>Average 1998 - 2005</td>
</tr>
<tr>
<td>Assab, Eritrea</td>
<td>24</td>
<td>1,564.7</td>
<td>15.7</td>
<td>Average 1998 - 2003</td>
</tr>
<tr>
<td>Rotterdam</td>
<td>371.4</td>
<td>315,300s</td>
<td>1.18</td>
<td>Average 1998-2002</td>
</tr>
<tr>
<td>Liverpool &amp; Medway</td>
<td>198.6</td>
<td>33,500</td>
<td>5.9</td>
<td>2002*</td>
</tr>
<tr>
<td>Maputo estimate</td>
<td>40-130</td>
<td>4 – 13</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Based on the data provided here, an estimate of US$ 10 per tonne is taken for calculations. It should be noted that large amounts of bulk goods and limited container goods in Rotterdam is probably the cause for the low revenue per tonne.

Besides the revenue per tonne, a fixed benefit from port operations is assumed at US$ 10 million per annum, because of the fixed lease fees to be collected from other (sub) port operators and stevedores.

Expenditure assumptions

Capital expenditure US$ 70 million in equal amounts in 3 years, to be invested in mostly new tugs, road and rail improvement in the port area, berth rehabilitation and dredging.

The operating costs are assumed to have a fixed part of US$ 5 million per annum, and variable cost of 50% of operating revenues, which is also growing with 8,8% annually.

The concession fee, to be paid by the concessionaire to the government of Mozambique has a fixed component of US$ 5 million per annum and a variable component with different rates for year 1 to 5 (10% per year 6-10 (12,5 %) and year 11-15 (15%)

The corporate tax rate corporate tax rate in Mozambique is 32 % [Ernst & Young, 2003]. Losses may be carried forward for 5 years by regulation.

Project finance assumptions

Linear depreciation of all assets equally in 12 years (after a 3 years delay), although depreciation is disputable when debt is amortisation is paid annually. Depreciation can however contribute greatly to tax delay tax payments. The amortisation of debt is assumed to take place in 10 years after a grace period of 3 years (construction period). Debt service (interest + amortisation) is paid in annual equal amounts (annuity). The commercial interest rate is taken at 8%. The development finance institutes are assumed to participate under commercial conditions. They are less exposed to risk and willing to absorb more risk, especially concerning country risk.

The financing structure of the project company used a debt to equity ratio (D/E ratio) of 4. Profits are paid out as dividends completely (no retained earnings). The value of equity is assumed not to be traded publicly and of constant price.

For financiers, a 20% withholding tax on is imposed on interest and dividends earnings. Because of the complex holding structure, with the residence in Madeira, this tax rate may be 10% or lower, because of double tax treaties. The overhead cost of making an investment is assumed 2,0% per investment for both debt and equity.

7 From: Eritrea Port rehabilitation, The World Bank Project Staff appraisal.
8 From: Eritrea Port rehabilitation, The World Bank Project Staff appraisal.
7.2.4 Project financing structure

The project company is called the Maputo Port Development Company (MPDC): the private participation was tendered to an international port development company made up of Mersey Docks and Harbours groups (UK), Skanska (Sweden), Liscont (Portugal).

![Diagram of project financing structure]

Figure 7-6: participations in financing of the Maputo port

The contribution of the financiers to the Maputo Port Development Company is shown in Figure 7-6, where on the left hand side the sponsor consortium can be seen, and on the right hand side the lender consortium. The red rectangles represent governmental institutions; the blue rectangles represent private companies.

![Diagram of finance structure Maputo port concession]

Figure 7-7: finance structure Maputo port concession

The Government of Mozambique bares the risks associated with tax and legislation changes. For the rest the MIGA has provided political risk insurance to the sponsors. Because of the involvement of
development finance institutions, required because of political risk, environmental issues were important. The structure of the project company was very complicated, as can be seen in Figure 7-7.

Due to the solid concession agreement, leaving very little risk with the project company, the lenders would participate without amendment in the concession. A special license to claim right of land was needed for security of the loans. Therefore a special change of the constitution of Mozambique had to be made.

The off-shore holding structure became very complex, because of the very view double taxation treaties by Mozambique. Eventually, the holding (project) company was stationed in Madeira, with a beneficial tax regime and a double tax limitation agreement with Mozambique.

The period of the concession would possibly be extended for another 10 years after completion. The concession also comprised the rights to take over the work of the CFM as port authority. The Government by means of the CFM was supposed to obtain a minority stake of 33 % in the newly founded Project Company, whereas an International Consortium would obtain a 51 % majority share in the Project Company. This was done to make sure the company would in fact be private, with major efficiency and management benefits. The remainder of 16 % shares would be sold publicly at a later stadium (when the project becomes profitable) to regional private investors.

7.2.5 Project cash flows

The main cash flow of the project is constructed from the capital expenditure (investments) and operational income and costs (opin and opex). The blue line is the net cash flow from operations and investments, and will further be used to determine the cash flows per financier.

![Project cash flow diagram](image)

Figure 7-8: Project company cash flow

The net cash flow can be split up in several financial components, used to determine the financial cash flows and the components of the financial statements. The cash flow terms, which are used in Figure 7-9 are all discussed in chapter 3. The only item that is commonly not found between the cash flows is depreciation. Because depreciation is not a cash flow. Is does however, fill the gap between the operational cash flow and the outgoing cash flows to lenders (debt service) and sponsors (dividends). This is therefore an addition to the working capital of the project company only, which thereby creates a cash buffer. This money can be used for new investments or to repay shareholders (buy back stock). Another item that is not show in this graph but also adds to the working capital is the cash that is the result of the delay in tax payment and dividend payment. This delay is usually at most half a year and therefore not considered significant for calculations.
Sensitivity analysis

Because the prediction of the cash flows for the Maputo port was largely based on estimated data, a sensitivity analysis was carried out. The results showed that the cash flow was most sensitive for tariff and quantity changes (commercial risk) as expected. The quantity is obtained from quite reasonable sources, which leaves the question if fees are estimated right. Limiting the total income with 10 %, the internal rate of return for the project becomes halved. So some certainty in the size of this parameter, must have been part of the project start-up, although better information and control over the matter would be available for these financiers.

A further study should provide more certainty if necessary. See Appendix XVIII: for the complete sensitivity analysis.

7.2.6 Criteria assessment

Financial

Financial feasibility has been shown by the cash flow in the previous paragraph. It appears that the project company can service debt very well and that for all costs financing is available. The debt service coverage ratio varies between 2.2 and 4.0 for the period of debt service. The project is financially feasible under assumptions.

Economical

The project holds obvious financial benefits for all parties, especially the government. The expected benefits for the economy as a whole are for example: increased import and export, more transport activity, business development around the port, employment, employee education, technology import and capital import. Disadvantages of the project include job loss, environmental effects of port activity, loss of control over the port authority. It is assumed that in general Mozambique is benefited by the project, based on the experience of the World Bank [World Bank, 1996] and specifically the involvement of development financiers with experience with this kind of projects. So the project is economically feasible.

Country risk

Mozambique is still, although the situation has improved much in the late nineties, a developing country with much uncertainty for investors. In Table 7-3 the parameters used to determine the country risk of Mozambique are shown. Mozambique ranks number 128 of 186 on the Euromoney country risk rating. The rating is 32.51, leading to a country risk premium of 3.73 %.
Investors see Mozambique still as a risky investment environment. In Appendix XV: a comprehensive description of the investment climate of Mozambique is provided.

Commercial

The internal rate of return of the project cash flow is 31.7 % over a 15 years period, based on earlier stated assumptions. This suggests commercially feasibility of the project. However, as stated earlier, the cash flows of the individual parties are required to determine the individual commercial attractiveness. This is discussed for this project in the next paragraph.

Quantitative

Mozambique has development agreements with both the Netherlands (FMO) and Sweden (Sida: the Swedish FMO, so to speak). Mozambique is also a member of the Development Bank of Southern Africa. This explains their involvement in the first place.

For the case of the sponsors, the obligation to the project company to purchase goods and services with them is eminent, but if the participation of the Sida is tied to the participation of the Swedish company Skanska is unclear.

Development goals are addressed in the fact that economic development is stimulated as well as education. Further, it seems very important that Maputo is an important port for food import in Africa, especially in cases of extreme hunger. This together with the fact that multilateral and bilateral development institutes wish to bring the private sector into action for development, makes the project attractive regarding development objectives. The fact that financing or guarantees are supplied under commercial conditions (assumed) this issue is of less importance.

There is evident that an environmental impact assessment has been carried out, but the results are not available. Over viewing the little amount of work to be done, it seems perfectly reasonable that the impact on the environment can be limited, in particular with regard to the enormous financial and economical potential.

7.2.7 Participant criteria evaluation

The private sponsor consortium

![Cash flows of Mersey Docks Consortium](image-url)

Figure 7-10 Cash flow for the sponsor consortium

The private sponsor consortium exists of the following four parties: MPDC, Mersey Docks and Harbour Company, a large port operator from the United Kingdom, leader of the sponsor consortium; Skanska,
a large multinational contractor from Sweden, sponsor; Gestores Mozambique – a local consultant and agent and Liscont, a large Portuguese port operator. The group is advised by SBSA - Standard Bank group South Africa. The participation of the sponsors has probably been determined by the work they agreed to receive from the project company.

The cash flow of the private sponsors, as shown in Figure 7-10, gives insight in the late but high returns for this group. Much of this delay is caused by depreciation. This means that the cash working capital is very large during the project. For improved certainty for their returns, the sponsors might demand the abundant cash balances to be put on an off-shore account, to assure future disbursements as dividends. The internal rate of return of the sponsors' cash flow is 28,0 %.

To determine if this return is high enough, for the company with the highest cost of capital, the required rate of return is calculated. This is the Mersey Docks and Harbour Company. Besides the investment as sponsor, the company will want a share of the operational work and capital work to be allocated to it. These activities, often the reason sponsors participate in the first place, will certainly generate additional benefits from operational activities beside the financing cash flow. This will however, because it is hardly quantifiable, not be taken into account.

The WACC of MPDC is 10,9 %, based on interest and dividend payments in 2002. [MPDC Annual report, 2002]. The country risk premium is 3,73 % and so is the default risk premium. The net value (sum) of the cash flows of the sponsor consortium is US$ 84,2 million.

The standard deviation of the net value of the cash flow is variation coefficient of the annual GDP change in Mozambique (see Table 7-3) times the average net value of the cash flow.

Sigma CF = .26 * US$ 84,2 million = US$ 21.9 million.

The preliminary required rate of return is WACC + Country risk + default risk = 18,36 %

The required return (RRR x net value): RR = 18.36% * 84,2 US$ million = US$ 15.46 million.

Using equation Equation 6-2 the value of the standard normal distribution function becomes Z = -3.14. The chance that the realised value is below this threshold is P(Return<RR) = 0,0008 (Appendix IX: )

Cash flow volatility risk premium is therefore 8*10^{-5} or irrelevant compared to other risks. This has as result a required rate of return of RRR = 18.36 % compared to an internal rate of return of IRR = 24,59%. (see Figure 7-11).

![Required and internal rate of return for Sponsors](image)

Figure 7-11 required rate of return and internal rate of return for sponsors

This seems sufficient, especially because the country and default risk are probably estimated too high. Risk mitigating measures have also not been taken into account.

Operator sponsors like Mersey Docks and Harbour Company, probably execute a large part of the work falling under operational expenses. Contractors benefit especially form capital works like dredging at the beginning of the project. The return on these works is probably quite high because no tendering is involved. Because they depend on the profit as well, costs need to be tempered.
To estimate the additional benefits from Skanska BOT, first its investment of 16.3% of 20% of US$ 70 million is US$ 2.28 million is calculated for comparison. If half of the capital work is theirs (MDHC is probably more benefited by operating) a revenue of US$ 35 million. With a profit margin of 3% (Dutch estimate average), the result from the investment would be raised with US$ 2.1 million. Of course the invested capital in assets to perform this project have to be taken into account, but it becomes clear that the investment is in concordance with the return on work available by participating in financing.

Public sponsors

The 49% of shares of the project company not in hands of the private consortium, is in hands of the government and the CFM, Portos e Caminhos de Ferro de Mocambique: the national (government owned) port and rail company, sponsor and former operator and the Government of Mozambique.

The cash flow for the CFM is comparable to the one from the commercial sponsors, only no taxes are assumed to be paid to the government of Mozambique. Of course, being a state company, the benefits of the CFM are actually for the government.

![Cash flows of Government of Mozambique (concessions and Corp. Taxes)](image)

*Figure 7.12: Cash flow for the Mozambique government*

The government is financially the most benefited from the project (see Figure 7.12. The cash flows are all positive (assuming the CFM makes all investments, here only concession fees and tax income for the government are shown). On the side there are many other benefits like (probable) economic stimulation and import of knowledge.

Lenders

The lenders consortium consists of the private SCMB: The standard Corporate and Merchant Bank South Africa and the development banks FMO: Financiering Maatschappij voor Ontwikkelingslanden (see chapter 4), DBSA: The Development Bank of Southern Africa. Their cash flows are projected in Figure 7.13.

The commercial lender has nothing to worry about if default risks are mitigated or insured. The lending syndicate receives a reward of 9 percent on their investment. This is quite low compared to the sponsors return, but risks are lower.

Commercial lenders usually have a very low cost of capital. Bank should at least earn the lowest interest rate (for example Libor), which represents about the lowest borrowing cost for a bank. At this moment this rate is around 2% percent. If the country and default risks are added to this amount, the return on investment for banks is too low (see Figure 7.14).

In this case, it would be very plausible if the risk premium would be much lower, due to the fact that two of the lenders are development institutes (with a lower country risk) and that the only private lender is backed by a political risk guarantee (form the Sida). If default risk was to be maintained and country risk discarded, the required rate of return would better fit the internal rate of return, and even leave some space for a higher cost of capital. The cost of capital are, not even taking into account transaction cost etc. somewhat higher than the inter bank rate. For example, the ABN AMRO has a cost of capital of about 4%, based plainly on dividend and interest payment.
What further must be taken into account is the fact that the difference in debt in equity is not as strict as assumed here. There are some hybrids or mixed forms of lenders could, in other words also have a share in the company, for a larger influence in the business and possibly higher returns.

7.3 **CONCLUSIONS**

7.3.1 **Cartagena, Colombia**

**Financing**

The economic benefits from the project, caused by (amongst others) an improved health situation in Cartagena, is the strongest incentive to carry out the project. The conditions for participation of the two financing parties, the Dutch Government and the Colombian government, are fulfilled, as shown in Table 7-4. It is also clear that the project is unsuitable for commercial financing in any way. This mostly because of the lack of income during its lifetime. The maintenance cost could pose a threat to project continuity, although the project would probably run well without maintenance for many years. It would be best however, if any financial benefits could be posed opposite of these costs, for example by imposing special lagoon sanitation taxes on fishermen or other users of the lagoon.
Would this project be combined with for example tourism development, the government might have to finance initially, but could also generate an income to make the project financially attractive for the government or enable debt servicing if a loan is used to finance. Fact of the matter is that an unstable political and economical situation in Colombia, limits the appeal of the country to commercial financiers and tourist.

<table>
<thead>
<tr>
<th>Fulfilment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic feasibility</td>
<td>+</td>
</tr>
<tr>
<td>Financial feasibility</td>
<td>+</td>
</tr>
<tr>
<td>Development goals realisation</td>
<td>+</td>
</tr>
<tr>
<td>Commercial attractiveness</td>
<td>+</td>
</tr>
<tr>
<td>Inter party agreement</td>
<td>+</td>
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<td>Off take obligation</td>
<td>+</td>
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<tr>
<td>Environmental sustainability</td>
<td>+</td>
</tr>
<tr>
<td>Country risk</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 7.4 Fulfilment of criteria for Cartagena, Colombia

Technical aspects

The technical design and planning of the project is strong. Especially when looking at the low maintenance costs and low-tech solution that has been chosen. Also the non requirement for electricity or any other power source is important to keep the project running, even when the authority has little of no funds available.

Question marks could be placed with the land reclamation assumptions, because some additional costs are left out, like shoe protection and land preparation (drainage and roads) before it can be sold. Also the assumption of selling the land one year after start of dredging is disputable, although the dredged material from the spit (between the sea and the lagoon) is probably course of grain.

Project planning could hardly have been stretched (in order to delay costs and thereby limit the cost of capital). Besides the fact that contractors want to finish projects as soon as possible, in order to receive payments, the economical benefits are gained only after completion of the complete work. The only item that could be delayed is possibly the sheet pile dam, splitting the lagoon in an inflow and an outflow area. This dam could be realised in phases, measuring the resulting water quality regularly (as has been done anyway) and estimate if additional dam length would matter much. So, possibly some costs could be cut and the structure would be matched perfectly with the assignment.

7.3.2 Maputo, Mozambique

Financing

The project is feasible for private financing, mostly because of the high potential income from port operations and services, while low costs are associated with rehabilitation of the port. The entire infrastructure is already there, and only needs to be improved slightly. In Table 7-5 the criteria for financiers are displayed, leading to the conclusion that all financiers could be participating, except for the parties (or programmes) limited by commercial viability. So clearly, development aid programmes like the ORET, IBRD or IDA are not possible.

The return for the sponsors seems very high compared to that of lenders, which expresses the difference in risk. When assessing the additional benefits for sponsors, it becomes very clear that their investment decision was positive. For lender, regarding their high experience with risk mitigation would probably have found a much lower risk premium suitable and therefore supported the project.

The government of Mozambique (together with the CFM) could have benefited more if they had the means to exploit the enormous potential, because the investments were not so high. And much of the funds have eventually been lent by development finance institutes anyway, which perhaps could have lent to the government or to a government lead project company. Apparently, either the government or (more likely) the development financiers assumed the government (and the CFM) incapable of exploiting the potential.
The financing for the Maputo port concession, has been a complex and time consuming negotiation process. This must have had a negative impact on the possible return, that government and sponsors had in mind when negotiations started. The required change of law to give lenders right to the port as collateral, took much time, just as the difference in valuation of the current port. The double taxes are a threat to profitability for sponsors and lenders and double tax treaties appeared to be very important.

Method

In the case of Maputo, in which most of the possible financier groups participate, it becomes very clear that the method chosen in this research has still several shortcomings. Beside the simplifying assumptions, like sharp debt and equity division, and the limitation of inside information on the project finance deals, some aspects could possibly be improved. It is for instance very hard to assess the role of the development finance institutes, when they do not supply development assistance but co-operate in a commercial project. This case however, commercial loans alone probably where not feasible, because of the high country risk. The reason participation in the case of Maputo, beside the criteria other than commercial viability, which are fulfilled, driven by the fact that especially the development financiers themselves can reduce the perceived country risk.

For participation of the sponsors the work that is certainly acquired by participating as sponsor in a project company, must also be taken into account. The largest benefit for the contractor is then that the assignment of work is certain, because tendering is not required anymore because the project company is private as long as the development finance institutes or government does not object. It would however be striking if the sponsors would agree to terms of tendering project work.

The used method of risk assessment and risk premium determination seems inaccurate in its prediction. Country and default risk seem to be estimated to high, especially for development lenders, and the volatility risk is estimated to low. Normally a thorough analysis of the project itself would provide the knowledge necessary to predict risks and determine the required risk premium. This was nonetheless impossible in this case. The risk mitigating measures like guarantees and insurances must be quantified to get a good picture of the risk that is run by participants.

The predicted cash flows and resulting financing decisions are still very sensitive to the revenues, which in this case (and also often in real life) pose large uncertainties. Therefore it seems that the cash flow volatility is estimated extremely low.

Technical aspects

Technically, the project is not very complicated. The repairs and rehabilitation are possible with very common techniques and therefore technical risks are low. Because the investment costs are relatively low, because only the most necessary works are executed in first instance to be able to use the port to its full potential. Some other investments and works are, although uncertain under which agreement, supposed to be made during the lifetime of the concession. Delay of works planned in the first three years seems impossible. For example the dredging works, need to be done as soon as possible, enabling the port to receive large ships again. The dredging company, not part of the project company, will want to use it material as efficient as possible, limiting the time available for this work. The purchase of a new dredger or repair of the old dredge for maintenance dredging is an investment that
Foreign financing for coastal infrastructure in developing countries could possibly be delayed, because adjusted capital dredging in the first three years can make maintenance dredging abundant.

Examples of coastal projects and financing

The extension of the services and poor facilities compared to earlier, are also setback to the time when the expected return are realised.
8 FINDINGS FOR DEVELOPING COUNTRIES

How can governments of developing countries influence the fulfilment of the financiers’ criteria?

Studying the criteria of financing sources, a range of measures seems available to increase the attractiveness of project in a certain country. Governments could implement a lot of these measures, as long as they comply with their own demands. This chapter treats these measures and discusses the applicability for a developing country’s government. The text starts with discussion of the criteria of importance to all financiers.

8.1 TECHNICAL FEASIBILITY

Technical feasibility, defined as the feasibility of delivering on-time and within budget with a predetermined quality of output, is required for a project by all parties. Different for each party could be the perceived risk of underperformance. The risk that the predicted technical feasibility does not hold during construction is given much importance by commercially dependent parties. These parties could comprise off-takers, suppliers, operators or dependent (sub-) contractors. For financiers the most dependent is the equity investors, because their revenues might be delayed, messing up their return on investment. Lenders are only influenced if the revenues become too low to repay debt and interest. When this occurs the risk at default arises, and this poses a serious threat to all stakeholders.

Technical feasibility does therefore need to be optimised, which is in most cases done by applying well-known techniques in realising the project. Especially commercial financiers can be revolted by innovative techniques, of which is little known about risks and future behaviour.

Bilateral and multilateral financiers might feel the opposite. Using innovative techniques could also mean education and import of knowledge for a developing country, supporting development goals.

The choice of techniques used must be tuned to the most important financing party willing to finance the project. The criterion of technical feasibility has therefore a dual importance, at both the beginning and at during financing arrangements of the project.

8.2 FINANCIAL FEASIBILITY

Financial feasibility, the ability of the project to fulfil its financial obligations, is demanded by all parties. Often the government can support this feasibility by supplying guarantees for certain obligations, or plainly to replenish the project cash flow when necessary.

This role is often taken by project sponsors in the case that the project company is a private entity. The risk of sponsors not being able to fulfil their obligations to the project company could then also be mitigated by guarantees of the government (in case of local sponsors) or bilateral or multilateral institutions.

In cases of bilateral or multilateral financing, is for this reason that the institutes demand repayment guarantees of the national government.

It becomes clear that certain guarantees, but also other financial dependence like holding shares or debt in the project, could lead to a lesser perception of risk regarding the financial obligations of the project.

The risks with a special link to investors can also be mitigated or diversified in portfolios. Involvement of the World Bank is for example an indication that the country risk indication can be lowered.

Public and private financing co-operation

Many large infrastructure projects are not profitable. Therefore, it is seldom possible to interest private parties for a project. In such a case, it could be possible for public and private parties to join in an agreement to spread the cost and benefits and risks to the liking of both parties. In that way, the public party can strive for economic benefits maximisation (or development goals), while the private party can
be concerned with maximising financial benefits. Public parties should not look for financial benefits for their sake alone, but keep in mind what their investments are usually for.

8.3 TAXES

The effect of taxes on a construction and a financing transaction can be large. On one hand, bilateral and multilateral institutes are willing to support certain projects stimulating the development of the country, do not wish to fund the government cash directly. Therefore, import duties and taxes should be abandoned for these types of transactions.

For commercial parties, taxes can also be a serious source of cost and thereby decrease the party's interest in a project. Taxes and duties in general can pose a threat to inter-country competitiveness. The government does however, need an income for governmental expenditure and should not abandon tax on foreign sources. It requires the government to maximise its tax income within acceptable limits for foreign financiers. Tax incentives, like a tax reduction discount or a tax holiday (period relief of tax payments) could have a large attraction on foreign (private) financiers. A subsidy could be a good incentive for investments, especially when returns are relatively low but economic benefits are high.

8.4 ECONOMIC FEASIBILITY

Multilateral and bilateral institutes that require a solid economic feasibility or policy analysis, strive for goals that are much the same as those of the government. The differences are subtle. A country could care nothing about their economic activities polluting a neighbouring country, while this would be unacceptable for public institutions like multilaterals and bilateral relations and probably any party with an international reputation to keep up. Discussion could also comprise the measurement of economic feasibility. Difficulty lies with prediction of economic development and translation into scenarios.

8.5 DEVELOPMENT GOALS REALISATION

To improve the attractiveness of the policy by analysis or economic feasibility, best is to address some development goals in the project, and aim for balance in short and long term benefits. Financial feasibility is also a part of economical feasibility, and if the project in not financial viable, including all financing alternatives, it certainly is not economically viable.

It should be bared in mind that economic and included financial feasibility address the complete project, and the sum of investments required and available for the project, while commercial (financial) feasibility analyses the returns and investments for individual parties.

The coastal policy should be focussed on economic and environmental development. This has been stated at the World Summit of Sustainable development in South Africa in 2002 (see Appendix VI: ), as it was declared at the Millennium Summit in 2000, where the 189 member states of the united nations accepted the following millennium declaration of development goals:

By addressing the development goals, more developed countries are more willing to support the program, as they agreed in the abovementioned statements. Also multilateral institutes adopted these goals in their assistance strategy.

8.6 ENVIRONMENTAL DEVELOPMENT

In the coastal zone are abundant environmental development opportunities. It is a place where land water and air join in to a dynamic mix, suitable as a habitat for many species of animals and plants.

The needs of this nature can be addressed most easily by appointing special protected areas, designated for nature and virtually free of human influences.

The problem with this is however, that it usually only costs money, and contributes nothing to the economic situation. It is therefore attractive to assign a part of a piece of land to be developed a compensatory nature development area, which financing is supported by other developments. Often recreational activities do hardly prevents nature development, if regulated well, and can raise some financial benefits.
Other environmental actions include pollution restriction and clean up. Support for these actions is often supplied and taking care of decent pollution regulation is a must to attract more investors.

To assure assistance in project with an environmental character, for which financing is not sufficiently available, best is to involve some assistance in policy making, by which not only money but also knowledge and or services are sometimes offered.

An integrated approach is necessary to make economic developments, which are discussed in the next paragraph, go smoothly hand in hand with environmental requirements.

Of course, improving the environment is not only a case of foreign parties. The government of any country should be supporting environmental conservation and promotion, for a better future of its country, the inhabitants and the world as a whole.

8.7 INTER PARTY AGREEMENT

An inter-party agreement is especially of importance for bilateral institutions. From the viewpoint of development need, a political agenda in compliance with that of the donor country and historical perspective, donor countries selected their counterparts.

This implies that democracy and especially political ties with a developed country can be very helpful in obtaining development funds and also in making contact with entrepreneurs from the donor country. These companies could also be backed by development assistance.

The World Bank has made lists available of classifications of countries eligible for IDA or IBRD support. The selection based on national income per capita and distribution over the population, and can hardly be influenced by the national government, on the short term.

8.7.1 International treaties

Internationally, several treaties and agreements exist that deal with the difficulties encountered by international trade and financing. There are free-trade agreements, custom unions and treaties and import and export agreements that are discussed.

International treaties cover a variety of terms of agreement. For example: [CIA world fact book]

The treaties of interest for developing countries are trade agreements, removing limiting custom duties and financial traffic limitations.

8.7.2 Bilateral relations

Bilateral agreements usually concern development aid and trade agreement. This means that free trade, supported by both governments becomes available, often supported by export financing. This also counts for services like construction. Governments of developing countries should lobby for eligibility of these agreements, by searching for friendly developed countries with a policy that could address their problems.

Bilateral relations can also include tax agreements including double taxation prevention.

8.7.3 Trade partners

The government should strive to friendly and steady relationships with developed countries, willing to contribute to the economic development of the lesser developed nation. Also relationships with multilateral institutes can be a key factor of development success.

8.8 OFF TAKE OBLIGATION

Within some boundaries, the development goals might be the same. Nonetheless, bilateral relations, often have the (underlying) objective of promoting export to their counterpart. This can still be a beneficial situation, where a residual value remains in the importing country. This can be obtained by profitable export credits or grants. The condition to acquire these benefits is to purchase goods or services from the donor country. However, in some cases this procedure can be prohibited by international laws, promoting competition. One of the conditions resulting from this regulation is that grants or ‘soft’ loans cannot be provided to commercially feasible projects [OECD, 2002].
8.9 COMMERCIAL ATTRACTIVENESS

Apparently projects have different value for different stakeholders. How should a government deal with this? The different views on valuation need not collide. The project initiator needs only find similar goals and means to make projects appealing to different views.

Commercial feasibility of a project, or financial feasibility through the eyes of commercial organisations, has one large advantage for the government. It provides the opportunity to have at least the same amount of money available for new projects, after the one up for assessment is completed. For country with little or no financial means, this is a way of ensuring that a project does not become an endless financial drain.

Governments are forced to assess projects likewise due participation of private parties. It also provides the necessary information to judge project attractiveness for investors.

A pitfall for developing countries is nonetheless the greed with which some commercial organisations negotiate and operate. The governments of the developing country should bear in mind that corporate organisation exist only to make the highest profit, and that some do anything to fulfill that goal. It should always be aware, by means of policy analysis for example, where benefits are coming from and how they together with cost and risks are allocated.

Default risk

An empirical research into influences of project finance arrangements to default in project finance [Kloppjan and Wouters, 2002], the following factors were investigated: experience of the sponsor, proven technology, presence of commercial risk cover, presence of political risk cover, presence of a public party, presence of a multilateral, the industry, country risk rating at the date of signing and at the date of this study, debt service coverage ratio, presence of an off-take agreement, currency, term to maturity; Debt to equity ratio.

According to this research, the use of proven technology, the sponsor with experience, a high debt service coverage ratio, and the absence of a commercial risk cover are associated with lower default risk. The first three factors can easily be associated with risk mitigation and therefore improving the success possibility of the project. For the latter, this is however not true. Because only statistical effects were investigated, it is likely that cause and affect are the other way around then one would expect in this case: the high default chance causing the need for commercial risk insurance.

8.9.1 Strategic use of resources

To use the resources available at the coast, to their best economic result, it is suggested that a SWOT technique is used to analyse, value and allocate to economic activities.

SWOT analysis

A SWOT analysis on coastal resources is projected to consist of the following components:

- Resource analysis, researching quantity and quality of economic natural resources, forming strengths and weaknesses; Economic development opportunity and threat identification; Allocation of resources to developments in a confrontation; Selecting most economically suitable developments.

- Resources as strengths and weaknesses

Considered strong resources are available base material like minerals, sands, and space. Also live stock like fish, shellfish, coral and forest can be positive resources of the coast, just like human resources.

Weaknesses of the coastal zone can be a low level of education and weak law enforcement on human level. Lack of physical resources and pollution are also seen as properties weakening the economical position of the coast.

- Economic development as opportunity or threat

Possible developments, financially or economically benefiting the coastal region or at least several parties, willing to provide financing, are opportunities. Examples of them are found in the previous paragraph. Threats of the coastal zone are poverty, regional competition, changing boundary conditions like the global or regional economy.
Strategy and project selection

In a confrontation the influence of resources on economic development is analysed. For example: tourism coupled to beautiful beaches and nature or mining and industry to iron ore that is available. A selection is made of the most promising combinations.

After determination of the most promising combinations of resources and economic opportunities, a strategy can be formulated for the coastal zone, so that largest benefits come first, to increase the funds available for new projects.

The Strategy is therefore merely a tool to set priorities in coastal policy. The best opportunities and worst threats need to be addressed first, using the best strengths and avoid or diminish weaknesses.

Once the project is selected, the objective becomes to maximise returns with minimised input of financial means.

8.9.2 Economic opportunities

Economic development opportunities can come in various forms, as was shown in chapter 2. Examples are Tourism development; Mining projects; Industry development; Infrastructure projects; Agriculture projects; Real estate projects (Urban development); Fishery projects and Sanitary infrastructure.

How these economic opportunities can be combined with infrastructure development, to make this type of project more attractive for financing. Infrastructure is typically the concern of the government, but when a government falls short of funds, alternative measures must be invoked, which are discussed here. The measures suggested aim at providing an independent financing for the project discussed. Loans directly to the government to improve financial capabilities are

The most appropriate infrastructure facilities for discussion are construction land, shore protection, transportation infrastructure and inter-modal facilities.

Land development

Before starting construction of housing, industry or use the land for agriculture, the land needs to be prepared. The rough land that needs this treatment can be undeveloped land anywhere in the country, reclaimed land or an artificial island. This involves for example drainage and other water household arrangements, access roads and a solid or fertile bottom. The benefits from land development are pretty obvious, the land that is prepared needs to be sold, rented or leased to future users. These users could be private development companies, industrials or people who will live there. The problem arises when land development is used for non-commercial purposes like housing for the poor or environmental development. Best seems to identify a secondary goal for the developed land, that does provide enough return, especially when funds supporting development goals fall short.

Shore protection

Shore protection comes in the forms of erosion or accretion mitigation or flood protection. These measures have a very common purpose and are therefore hardly ever paid for by parties other than governments. To acquire sufficient financing, the project should be attached to more direct beneficial development. Examples of these coupled developments are tourism development, always abundant along the coast or industry development. In both cases, the value of the hinterland is increased, which can be used to gain a higher return on these developments, to pay for the infrastructure.

Transportation infrastructure

The simplest way to raise money is by implementing a toll structure that can be an attractive option for economically important connections, for which the users have the capacity to pay the duty required to pay for the facility. Another way is again joining projects to improve feasibility the set of projects. Economic developments that require a road or canal for connection can provide the necessary benefits. The same counts for sanitary (transport) facilities.

Inter-modal infrastructure

This concerns airports and harbours, connecting different modes of transport. Most inter-modal facilities ask fees for passenger or cargo handling. If the government lacks the ability to finance the initial or incremental development of such a facility, even with direct support, private parties might be interested in financing and operating the facility for an agreed period of time. This policy is also part of the privatisation policy, promoted by The World Bank [Port privatisation Toolkit, World Bank 2002].
8.9.3 Limit project risks

Risk
Several measures are of influence of risk.

Much of the risk perceived by investors in developing countries is government related. To diminish this, the government should put itself in a (limited) vulnerable position. By doing so, shared risk seems less of a threat to financiers, because the government is expected to follow objectives in best interest with their investments. This can be done by investing with debt or equity in the project, or by providing guarantees to suppliers.

Should the countries reputation be of very little credit worth, help of the World Bank or other capital strong multilateral institutes could provide a solution. The World often participates in development of project plans, participates in financing or guarantees payments in developing countries. That way they operate as a catalyst for commercial investors.

Other risks associated with the project need to be approached integrally and are quantitatively discussed in the following chapter.

8.10 Country risk

8.10.1 Investment climate improvement

To attract investment by foreign parties in general, governments can take several measures to increase their competitiveness in the international finance market.

Assessing the needs and wishes of investors, the governmental policy that can be used to improve investment attractiveness are copious. Here these measures are assessed by legal, financial and economical investments incentives.

Of course countries starting wars or being at war have much trouble attracting finance, but such obvious point are left out of the discussion.

Also guarantees from the government or otherwise securisation as well as World Bank involvement can contribute greatly.

Policy alteration flexibility

To realise large infrastructure projects, with or without partaking by private organisations, the government should have some flexibility in changing policy to avert long and difficult procedures to develop and realise project plans. The government should be able to quickly anticipate on development opportunities and initiate and participate to keep control over this development.

Policy execution

Capable governmental institutes must be set up to make development plans and control development. To be able to do this the national policy needs to be clear, people should be aware of this and executing agents must be well educated and well organised.

Policy and law enforcement

In several developing countries law and policy enforcement is poor. Financial means to train and employ policemen are missing. The poorest people do everything that is needed to survive, even though it is to the loss of the whole population, the economy and the environment. Although a solution for resolving this poverty is not always at hand, in case of foreign investments poverty reduction needs to be taken into account, to make sure the difference in wealth is not increasing.

Environmental regulation

In international politics, environmental issues are significant matters, where politicians are accounted for their performance in promoting sustainable development and pollution reduction. Governments lacking the drive to participate in this could find much trouble in finding other governments to assist in development.
8.10.2 Financial system

Solid governmental budgeting

Governmental budgeting must be in order. Credit rating agencies, like Standard & Poor’s and Moody’s, rate also governments and governmental agencies, besides corporations. These rating determine the minimum costs of borrowing in the international credit market.

Interest rate

Interest rate should be comparable to global interest rates, to which an addition for uncertainties in the financial system is often added. A high interest rate in a country can be the force behind high returns for investors, because it sets the basis return on (relatively) risk free investments. Local impact should however, not be ignored. Interest rate adjustment is an instrument with wide consequences and many dependable parameters, like inflation and exchange rate.

Inflation/deflation

Inflation and deflation can somewhat be controlled by governmental actions, which measures should be taken. Especially volatility, a measure of risk for many investors, should be avoided.

Exchange rate control

The central bank of a country, as extension of governmental policy, should work towards a controllable and preferably less volatile exchange rate with hard currency like the European euro and the US dollar. Besides control over the amounts of virtual and real money, the interest rate is the most appropriate option of control. This control is in some cases unfortunately not feasible. This situation, encountered by many developing countries, sometimes calls for adaptation of a foreign hard currency in the legal financial system, to prevent black market domination.

Currency risk mitigation

To overcome currency risk an investing or exporting company will require hard currency payments, foreign exchange risk insurance or indexed local currency payments. The government must be supportive of this policies if the national currency has poses a risk to foreign investors.

Money transfer limitations

Some countries have set limits to amounts of money to be transferred out of the country. These measures can sometimes create a better foreign exchange position, but do limit foreign investors’ interests. Particularly when, the transfers are completely limited.

8.10.3 Government participation

Besides setting the right investment climate in their country, the government should participate actively in international lobby groups for development and the environment. Strong international relation and reputation seem a large benefit for trade development, access to finance and aid.

In the coastal zone management the government should perhaps give away some control to outsiders, to make sure that their interest and a suitable reward for this favour is included. In projects, the government should strategically participate, to accept their share of risk that can be quite large in developing countries. The World Bank and other development assistance organisations can assist in realising this.

Involvement of (small) private local investors has not yet been extensively discussed, but should be introduced, to obtain an equal spread in acquired wealth.

For advice to governments about project financing there are several independent consulting companies, specialised in project financing. For developing countries the World Bank offers the most comprehensive information.

Property laws

Expriation is a risk that investors in general do not appreciate. In some countries, laws exist that limit rights of foreigners to own land, property or assets. These laws could pose a serious threat to attracting investments.

Import

A restriction on import seems often a good way to stimulate the national economy and limit foreign product. The amount of foreign currency required to pay for these goods as well as the negative
impact on the trade balance and currency exchange, are turned aside. These regulation could however, result in rejecting investors, that would like their own economy to benefit as well, by encouraging exports to the receiving country.

**Export**

Export regulations are usually not exiting in developing country, except perhaps for some food resources and oil. There are however, several import restrictions on the receiving size of the stream, limiting exports. With bilateral and multilateral agreements these limitation could be altered, for which the government again must lobby in international politics.

### 8.11 Conclusions

The opportunities for governments of developing countries, to attract finance for the infrastructure projects, are simply to increase return on investments and to limit the risk for financiers. The most persuasive methods available for this are measures directly influencing financial results, like taxes adjustments.

In developing countries the risks for financiers play an important role in the unattractive investment climate. These risks are based on uncertain economical development and uncertain political development dominantly. The responsibility of for improvement of the investment climate lies with the developing countries. Measures to limit the (perceived) risks for financiers are available, but limited in influence or availability. Options are the use of insurance and guarantees, involvement of a bilateral or multilateral development institutes or risk bearing participation of the government.

For negotiations in the financing process, some experience with the developing country’s government is useful to quicken this process and be able to negotiate efficiently and more effectively. Lack of experience with a developing country can be dangerous, if the government deals with highly experienced private parties. Economic benefits and the environment could become under pressure by this.
9 FINDINGS FOR CONTRACTORS

How should contractors influence financing and their participation?

This chapter discusses the position of the contractor in projects in developing countries, as financier and as executor of project works. Consecutively the influence of technical performance on the financing, the benefits and risks form a contractor only point of view, the contractors financing point of view are discussed. This results in a set of opportunities of Boskalis in the current market of increasing demands on contractors for arrangement of or participation in finance, followed by general conclusions regarding the role of contractors.

9.1 CONSTRUCTING RISK AND COST

The technical execution of projects, has much influence on the costs of a project and thus on the financial result. It is attempted here to identify the most important items influencing these costs. Secondly, the risks associated with construction are reviewed for their influence on the project risks and the financing risks. Although infrastructure development itself often does not generate financial benefits, it would be better to integrate design and cost benefit analysis to come to an optimal (financial or economical) design, instead of looking at the cost only. The latter situation could namely cause the situation where costs are saved on for example the size of a land fill, when eventually it turns out that additional sold space could increase the return on the project much. This cost benefit optimisation is however not seen as a primary technical matter.

9.1.1 Costs

The major factors in determining infrastructure costs are costs of materials, quantity of materials and the duration of construction. It is directly clear that construction planning is very important just like the right sources for materials and availability of suitable and affordable equipment. The quantity of goods is usually dependent on the project itself and the physical conditions around the project location.

As seen earlier, the government can play an important role in the planning process by means of regulation and permit requirements and bureaucracy.

9.1.2 Risks

Construction risks exist of price change risk, quantity change risk or planning change risk. Often regarded most important are cost overrun and time overrun.

Change of prices can be mitigated by making use of predetermined off-take agreements with suppliers, allocating the price risk to them. Price changes due to exchange rate development or inflation can be mitigated by financing institutes providing fixed exchange or inflation coverage.

The risk of unwanted change in quantity and change in planning is much determined by the design. With project in risky environments, like in many developing countries, this risk is therefore limited as much as possible by using common techniques. The experience of the contractor can have much influence on this risk.

Planning risk is also determined much by political or country risk. An unprecedented change of law or regulation may delay a project much, so country risk is also of much influence on construction risks.

Other risks are often extra budgetary, like calamities, breach of contract, war or bankruptcy of client.

9.1.3 Risks in developing countries

The contracting business in developing countries can be very low-tech. This means that finding the right equipment and right personnel can be very difficult. The inefficient governmental procedures can be a time consuming factor, which makes it necessary to estimate preparation and construction time
much larger than when operating in western countries. The same counts for possible import and export limitations and costs, which are however not only found in developing countries. International contractors should be able to overcome these risky obstacles by experienced mitigation.

9.2 INFRASTRUCTURE COST AND RISK DETERMINANTS

Examining the construction features discussed above for the infrastructure projects as selected in chapter 2, more important technical aspects appear. The focus lies on costs aspects in specific.

9.2.1 Erosion protection

When looking at the coast, is often done by sand suppletion, a sea wall or groins.

In the first case, sand needs to be available in the neighbourhood, at low cost and good (large grains, not polluted) quality. Equipment also needs to be in the neighbourhood to limit the costs of arranging a dredger to address the site. Especially if sand suppletion is required more often on the long run, it might prove worthwhile to buy a dredger instead of renting it regularly.

Groins require solid foundations and large rock to be build. This rock, delivering various rock sizes, needs to be found in a quarry nearby or available at low transportation cost, because a port is nearby for example. The machinery (crane / grab) need to be available nearby. The environment at sea needs to be workable to place the groins.

A sea wall, brick stones or concrete, requires a solid foundation and further much brick, rock and concrete, available nearby. The equipment for construction can be quite simple.

9.2.2 Flood protection

Under flood protection is meant a sea wall, dike, dam or storm surge barrier. The seawall has been discussed already.

For a dike required sand and clay or geotextile are required. For cheap construction clay and sand need to be available cheaply and abundantly. In areas where clay is scarce, other protection against erosion of the structure might be more useful like a concrete block revetment (with geotextile) or asphalt. This again depends on availability of the materials near to the site or cheaply transported. The foundation for the dike needs to be solid and protected from erosion. For the displacement of large amounts of material like sand heavy machinery is often required.

For construction of a dam, sand (in bags or loose), large rocks or concrete elements can be used, dependent on current in the opening to be closed and cost of materials locally. When manpower is very cheap, like in many developing countries, and sand is abundantly available at low cost, this may make a very useful combination. For dam building with loose sand or rock or concrete heavy equipment is often required.

A storm surge barrier is quite high-tech and therefore a factor of risk. In the Netherlands several storm surge barriers have been built of which none in time and within budget. This risk cannot be bared by private parties alone. The ability to construct a storm surge barrier instead of a dam is more of a luxury, benefiting often mostly the economy as a whole or the environment.

9.2.3 Land reclamation

Land reclamation at the coast can be done by making polders or a land fill.

For polders just a length of dikes (or dams) must be constructed, limiting the materials to be used, but intensifying the maintenance costs and need. The polder will need to be dredged, so equipment will have to be available as well as operative personnel. The water where the dike is built must have limited depth, but in-polder depth is less demanding (except for groundwater flows). The country where this type of land reclamation is carried out must have a strong regulatory body to arrange the necessary maintenance and cash flow to pay for it, during the lifetime.

Land fills require much more material to be used, because the complete land is places above sealevel. This puts more restraints on the depth of the water, where shallow water obviously limits costs greatly. The decision to reclaim land depends greatly on the price and availability of land in the vicinity of the project requiring land. Besides the large amounts of fill material that needs to be available, also shore protection and equipment play an important, be it subjective role.
An advantage of a landfill to a polder, besides the fact that not many people like to be under average sea water level, is that it can be executed in phases easier.

9.2.4 Canals / waterway

Construction of waterways and canals exist for the most of dredging or excavating and bottom and shore protection. Some of the structures that are also part of canals are for instance sluices and bridges.

Here excavation equipment is very important, although in dry situation canals have known to be dug by hand. Depending on the soil condition, the canal or waterway needs bottom protection, requiring for example rock and geotextile.

Preferably, the trace of a canal is already partly water or at least level and possible bowl shaped, so that the containments of water needs little work. Bottom protection against leakage can also be very costly if the soil is not impenetrable already. The construction of a canal needs to be compared to other transportation ways, which have to be more expensive or have other disadvantages.

9.2.5 Road, rail and airport construction

Construction of road rail and airports are similar in the way that large areas need to be supplied with a solid foundation and that the surface needs to be finished with a hard but smooth material.

For all, the path must show little variation in height preferably and if possible a solid ground already. Materials as sand or small rock need to be available for the foundation or the finishing of the ways. Concrete and asphalt need to be available at low costs.

For airports the area around the paved parts also will have too leave room for approach ways trough the air and thus be free of high obstacles.

The additional constructions required for roads and railroads could be viaducts, tunnel and bridges, while the airport needs more buildings like cargo storage, passenger terminal and parking places.

9.2.6 Land preparation

Preparation of land includes the preparation of the soil for its new goal, like excavating and replacing the previous soil with more suitable (strong, fertile, porous) material. This new material must be available at reasonable costs, and the disposal of the former material needs to be possible.

Further land preparations exist of drainage, for which the technology and the material needs to be available and construction access roads.

9.2.7 Port construction

Port construction consists of constructing breakwaters, quays, waterways and preparation of land for use by port terminals. Depending of the goal of the port and environmental conditions, the construction of the port can be quite high-tech. It involves normally much concrete for quays and berths and involves much dredging or excavating. Equipment is an important factor for cost in port construction.

The geometric environment of the future or to be extended port needs to have the shape of a port already if possible. So deep water (for loaded ships) and solid shores just above sea level, in a naturally protected bay would be excellent. Otherwise the ability to use dredged material for land fill of the future terminals could save costs.

For ports it is very important to keep costs very low due to competition of neighbouring ports.

9.3 Financing risk and result for contractors

With a growing demand on contractors to participate in financing projects, it becomes interesting to see whether this trend poses benefits or setbacks for contractors. What here follows is a discussion on the effect of the contractor taking on a role as sponsor in a project.
9.3.1 Financing by contractors

When demanded to participate in financing, contractors are almost always demanded to participate as sponsor. As lender, they would probably demand a too high return to make those loans attractive. Plus the fact that the additional risk that a contractor bears by sponsorship, is helpful to create a relationship between the project company and the contractor as builder, in which disputes can be resolved more easily.

Contractors often finance part of the work by accepting payments at dates when milestones in construction have been reached. This delay in payment, compared to the payment of equipment and materials for example, can be large burden on the company cash flow of a contractor. This type of financing is further not discussed.

For contractors, this leaves three options open, when asked to help arrange financing. First, the contractor can set up and participate in a project company, searching support from banks and other stakeholders of the project. Second, the contractor could arrange an (export) loan tied directly to the project and the contractor. Third, the contractor can advice the client on how to arrange financing and keep away form the financing itself.

9.3.2 Financing sponsorship

Contractors participating in finance, have to have capital available to do so. They can off course, use their regular capital structure, by issuing debt and/or equity.

Contractors, like other companies, need to maximise shareholder wealth, and therefore need to compare all investment options to select the most beneficial, to maximise return. If enough investment options are available, at least the cost of capital needs to be gained.

So, as the comparison has been made earlier in this report, the cost of capital form a threshold for project return analysis. But, although contractors’ projects often have a low profit margin (return compared to revenue), they have quite a high return on capital. So, if contractors have a choice, not the cost of capital but alternative investments, being for example regular projects, or project enabling assets, should be the threshold for financing. Or are there additional benefits?

9.3.3 Benefits

Regarding the fact that contractors should be less enthusiastic on financing projects than on contracting projects, even if return are equal lies in the fact that businesses should stick to their core business. So unless contractors have much experience and knowledge in house for financing, they should not want to be financing.

An additional benefit for example is the assurance that certain construction revenues will be made, because of the participation in financing. As shareholder of the project, the contractor may demand the right to execute all works that fall within its expertise. This means that higher revenue in contracting can be realised, and that lower cost on acquisition are spend, because of the lack of necessity for costly bidding on tenders. Other benefits could mean a good relationship of the contractor with the client for the project and thus the access to a market and goodwill for following projects. These uncertain benefits would however probably not be sufficient to invest a large sum.

9.4 OPPORTUNITIES FOR CONTRACTORS

The question to be answered in this paragraph is: How can Contractors use the knowledge of financiers, their criteria and projects financing in developing countries to their and their clients' advantage?

Contractors are not lenders. If construction funding, in whatever form, is provided by the contractor, it is generally understood that the price for the financing will be higher than for financing from traditional sources. Yet, in some circumstances, the unique risk involved in a project financing requires that the project company look for untraditional financing sources.

A contractor is especially well suited for bearing risks before completion, because he understands construction and start-up risk the best.
9.4.1 Client advisory

Contractors can use financing knowledge by applying it as it was written: as advice to developing countries’ governments. This would be mostly in the interest of Contractors if providing this knowledge could bind customers. Unfortunately, in more and more countries, often under pressure from bi- or multilaterals, it is required that construction work above a certain amount of money must be internationally tendered. Except for an acquaintance with the client, the advantage for Contractors in the bidding on tenders would be relatively small.

A larger advantage is the fact that the total market for work could be increased by the aid in financing. Assuming that Contractors gain a certain percentage of the available work, the amount of work for Contractors would increase. The cost for this initiative must be kept low, especially when the increased revenues by advising are estimated low. A possibility of applying this method is making available a website with information and on the side personal service for larger project opportunities.

9.4.2 Offer finance with partners

Many parties are in the market with abundant knowledge on financing infrastructure projects in developing countries. These parties could be consultants, development institutes or banks. Contractors could form partnerships with parties willing to provide financing knowledge and participate in financing. These parties, with possibly already knowledge of the business and operation of Contractors, could be interested because of further service to be provided to Contractors or new customers like the developing government. Contractors acts as project opportunity locator and shares this information with the financial advisors.

With development financiers it could be the other way around. The World Bank for example, initiates and catalyzes many infrastructure projects in developing countries. By a partnership with the World Bank, Contractors could be well informed about these projects, and make sure that the most interesting are bid on. Certain concessions in the direction of the environment and development goals will probably have to be made to be able to realise such a partnership. On a smaller scale, the Dutch FMO seems like an interesting partner.

Possibilities for financing, although the investment alternatives must also be assessed. The return on capital employed in regular business is over 20% for a contractor (Boskalis). It is difficult to receive such returns on other, not-core business activities, although the example of Maputo might suggest otherwise. Boskalis has a very solid financing structure (low debt to equity ratio) that could acquire additional loans easily.

Looking at the example of Maputo, where Skanska from Sweden participated, participation in financing seems attractive. Further research on the execution of this plan and the possible financial support by banks must be performed.

9.4.3 Offer standard finance package

An option not earlier discussed is the possibility of offering and standard financing contract to clients and other participants. This contract could for example be co-developed by the World Bank or FMO, for international support. This could possibly limit the need for endless negotiations and the knowledge required with the client. Contractors could take on a standard role as sponsor, lender or just arranger. This is probably best done in a strategic partnership with an experienced commercial bank.

9.4.4 General observations

While ever more projects require the contractor to participate in financing, Contractors will have to try and fulfill these demands as smooth as possible to still be able to acquire the work of these projects. The role as lender is probably not best suited for a contractor like Boskalis, and therefore strategic partners could best be searched, to jointly offer finance solutions to customers. This counts for both commercial and development banks.

In the construction phase, the risks are best known by a contractor. Therefore, the demands for financing by a contractor are highest in this phase. It could be required for example that the contractor participates with a large share of equity in a project company, which is terminated when the project is delivered turn key. This type of financing requires the contractor to have many funds available to finance the construction.
For a spread of investments and enrichment of a contractor’s portfolio, a participation as sponsor in the operational phase of projects could be interesting, but require intensive risk research and mitigation.

9.5 CONCLUSIONS

Regarding the determinants of infrastructure costs and risks, the infrastructure projects need an advantageous environment to be able to develop against low cost. Not discussed here, are the benefits that are required to find financiers for such a project, albeit the government alone.

For limitations in prices, materials, labour and equipment should be available at low price in the neighbourhood or at low transport costs. For limitations in quantity of work, the location and environment of the project must be selected carefully, aiming preferably at locations with similarities with the infrastructure to be built.

Most often, a contractor participates as sponsor in a project or arranges an export loan for projects. For the first option, the contractor will not only have to be aware of the return on investment, but possibly quantify the benefits from not having to bid on underlying work and the associated certainty. If possible, export loans are more attractive to contractors, because they pose much less risk.

So, in general, contractors should limit the amount of money invested in projects, but use their knowledge and reputation to make financing for projects feasible. Therefore a knowledge partnership with pure financial companies could assure benefits for both parties. One could think of a construction finance package, to be offered with standard terms, limiting the costly negotiation time, and bringing transparency to the financing market for clients and contractors. Other contractors or operators could be included in such a partnership to complete competencies.

The ultimate form of such a partnership is the creating of a project finance joint venture, able to support many projects in stead of one, and thereby able to spread and limit project finance risks. Even a pool of companies could be created (compare NEDECO) of different contractors and financiers, to together agree to partner in case suitable projects occur.

Involvement of development finance institutes like the World Bank could help this development much by supporting such financing conditions. They could operate as quality assurance.

To attract development financiers to participate in financing, which often creates a beneficial climate for financiers as well as the client, knowledge should be gathered on all available financiers, bilateral and multilateral and their conditions.

If a contractor wishes to have less involvement in financing, a partner able to provide advice and finance could be employed without further bothering the contractor.
10 CASE COUNTRY: SOUTH AFRICA

How can the financiers' criteria be fulfilled in South Africa?

South Africa has been chosen as case to research opportunities to develop infrastructure and to attract the necessary financing from abroad. This chapter focuses on the current situation of South Africa, the investment climate and the measures the government is taking to improve it. One type of projects is further examined, regarding the technical execution and the financing options in South Africa: a landfill for tourism.

10.1 SELECTION OF THE CASE COUNTRY: SOUTH AFRICA

10.1.1 Selection of South Africa

The selection process of South Africa is discussed here, giving insight in the used methods. The selection process started out with all countries in the world.

First round of selection: Dutch development assistance

A country has been searched to use as case for this study. The option to choose a cluster of countries or a part of a country is left open at this point. It should be noted that it is not intended to select the best country for project finance, but to select a country suitable to develop the model

At first, the country must be a developing country according to the goal of the research. This leaves more than 150 countries that match the criteria in the set. To be able to take up Dutch development assistance in the research, the country should be a part of a Dutch collaboration (in this case based on the list of ORET aid recipients) programme. Not selecting by the support provided, the list counts now only 55 countries (see appendix VI). Picking the countries with a considerable coastline leaves a list of 40.

Second round of selection: Governance indicators

The country needs to be able to attract foreign investors. Fore this selection, research of the World Bank, by Daniel Kaufmann et al.: Governance matters II [2002], is used. Here, six aggregate indicators are used to capture various dimensions of country governance. These measures are used to make a further selection of the countries. The indicators:

- Voice and accountability
- Political stability and Lack of violence
- Government effectiveness
- Regulatory quality
- Rule of Law
- Control of corruption

For each parameter, the countries in the segment of the lowest 25 % are not further taken up in the research. See the table for these countries.
Table 10-1: Countries not further considered because of non-qualifying governance: Kaufmann et al. [aggregating governance indicators, governance matters I and II].

<table>
<thead>
<tr>
<th>Voice Accountability</th>
<th>And</th>
<th>Political stability</th>
<th>Lack of violence</th>
<th>Government effectiveness</th>
<th>Regulatory quality</th>
<th>Rule of Law</th>
<th>Corruption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuba</td>
<td>Sri Lanka</td>
<td>Guinea-Bissau</td>
<td>Cuba</td>
<td>Guinea-Bissau</td>
<td>Kenya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakistan</td>
<td>Indonesia</td>
<td>Nigeria</td>
<td>Ecuador</td>
<td>Bosnia-Herzegovina</td>
<td>Kenya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vietnam</td>
<td>Nigeria</td>
<td>Ecuador</td>
<td>Bosnian-Herzegovina</td>
<td>Indonesia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>Colombia</td>
<td>Albania</td>
<td>Suniname</td>
<td>Yemen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>Guinea-Bissau</td>
<td>Georgia</td>
<td>China</td>
<td>Guatemala</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eritrea</td>
<td>Yemen</td>
<td>Vietnam</td>
<td>Indonesia</td>
<td>Nicaragua</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guinea-Bissau</td>
<td>Georgia</td>
<td>Benin</td>
<td>Ethiopia</td>
<td>Nicaragua</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>Kenya</td>
<td>Benin</td>
<td>Benin</td>
<td>Senegal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This results in:

Table 10-2: countries left for selection after second round

<table>
<thead>
<tr>
<th>Brazil</th>
<th>Cape Verde</th>
<th>Philippines</th>
<th>Thailand</th>
<th>Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costa Rica</td>
<td>Mozambique</td>
<td>Ghana</td>
<td>South Africa</td>
<td>El Salvador</td>
</tr>
<tr>
<td>Namibia</td>
<td>India</td>
<td>Peru</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This list, after short review, is used to fill in an analysis, to find the country most suitable for further research.

Third round of selection: experts view on suitability (for what?)

To comprise the amount of data to be researched, the two biggest countries by far India and Brazil are left out of the equation. These countries could of course be split in several parts, which could be further examined, but this would complicate the research unnecessary.

The research will in this instance focus on single countries with a manageable but comprehensive size of the coastline. Comprehensive meaning: with a coastline with a variety of resources and problems to be handled. Therefore, The Philippines are too much scattered and should be subject to multiple coastal policies; Cape Verde is too small to be taken up in the final selection.

This also counts for the countries in Middle America. However, all countries in Middle America can be joined in a group, because of their adjacent coastlines and comparable situation. For this situation, also Honduras, which was deselected earlier, is put in the group. It is however noted that international boundaries do not simplify the research, because the possible large differences in coastal policy. This cluster consists of El Salvador, Honduras, Nicaragua and Costa Rica.

The list remaining is:

Table 10-3: Starting group of countries for suitability analysis

<table>
<thead>
<tr>
<th>Central America</th>
<th>Namibia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>Peru</td>
</tr>
<tr>
<td>Ghana</td>
<td>Thailand</td>
</tr>
<tr>
<td>Mozambique</td>
<td>South Africa</td>
</tr>
</tbody>
</table>

These countries are judged for the following criteria:
Foreign financing for coastal infrastructure in developing countries  

Case country: South Africa

Space in front of the coast: Is the coast suitable for development of for example a harbour of a tourist beach?

Space behind the coast: Is there a hinterland that needs to develop the coast?

Existing harbours: Current stage in development of the coast?

Growth potential: Is there a growth potential at the coast, suitable for investments?

Tourist potential: Are there any possibilities of attracting more tourists?

Resources offshore: Is there a potential need from offshore to develop the coast?

Environmental: Need for environmental action

Table 10-4: score for suitability of final country selection

<table>
<thead>
<tr>
<th></th>
<th>Central America</th>
<th>Egypt</th>
<th>Ghana</th>
<th>Mozambique</th>
<th>Namibia</th>
<th>Peru</th>
<th>South Africa</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space in front of the coast</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Space behind the coast</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>existing harbours</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>growth potential</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>touristic potential</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>resources offshore</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>environment</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 10-1: radar graph of country valuation

From this appreciation of countries, South Africa is chosen to use as a case country. Other options, which can be used later to verify the model, are Thailand and Middle America. Thailand would be more suitable, because of earlier mentioned political boundaries within Middle America Group.

10.2 DESCRIPTION OF SOUTH AFRICA’S ECONOMY & INVESTMENT CLIMATE

10.2.1 Economical situation of South Africa

Economy

Economy - overview: South Africa is a middle-income, developing country with an abundant supply of resources, well-developed financial, legal, communications, energy, and transport sectors, a stock exchange that ranks among the 10 largest in the world, and a modern infrastructure supporting an efficient distribution of goods to major urban centres throughout the region. However, growth has not
been strong enough to cut into high unemployment, and daunting economic problems remain from the apartheid era, especially the problems of poverty and lack of economic empowerment among the disadvantaged groups. Other problems are crime, corruption, and HIV/AIDS. At the start of 2000, President MBEKI vowed to promote economic growth and foreign investment, and to reduce poverty by relaxing restrictive labour laws, stepping up the pace of privatization, and cutting unneeded governmental spending. The economy slowed in 2001, largely the result of the slowing of the international economy.

10.2.2 Investment climate

Tax system in South Africa

In Table 10-5 an overview of the tax system is given. Compared to other countries, South Africa has quite normal tax rates, but does provide much tax relief form foreign investors.

<table>
<thead>
<tr>
<th>Tax Rates</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Tax (non-mining)</td>
<td>30%</td>
</tr>
<tr>
<td>Secondary Tax on Company Distributing profits (STC)</td>
<td>12.5%</td>
</tr>
<tr>
<td>Small company rate (only applying to certain activities)</td>
<td></td>
</tr>
<tr>
<td>up to a maximum profit of R100,000 Profit in excess</td>
<td></td>
</tr>
<tr>
<td>of SAR 100,000 taxed at normal rate</td>
<td>15%</td>
</tr>
<tr>
<td>Branch profit tax*</td>
<td>35%</td>
</tr>
<tr>
<td>Individual marginal tax rate (@ SAR 200,000 max)</td>
<td>42%</td>
</tr>
<tr>
<td>Value Added Tax (VAT)</td>
<td>14%</td>
</tr>
</tbody>
</table>

*SAR is South African Rands.

South Africa also has comprehensive double taxation agreements with the Netherlands as well as a number of other countries.

Country risk in South Africa

The country risk in South Africa is determined according to the earlier used method of the Euromoney credit rating. Euromoney gives a rating of 60.38 to South Africa, resulting in rank 53 of 186 on the list. The country risk premium based on this rating is 1.98%.

The volatility of the Gross Domestic Product is very low, as can be seen in Table 10-6.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTH AFRICA</td>
<td>Current GDP (US$ billions)</td>
<td>126.27</td>
<td>18.30</td>
</tr>
<tr>
<td></td>
<td>Annual change</td>
<td>4.10%</td>
<td>12.6%</td>
</tr>
</tbody>
</table>

This should result in low cash flow risks, according to the earlier discussed and disputed method.

10.3 ACCESS TO FOREIGN FINANCE

10.3.1 Bilateral relations of South Africa

Dutch development aid:

The current development co-operation programme in South Africa is of limited duration and will end at the end of December 2004. The available budget for the period 1 January 2000- 31 December 2004 is approximately 670 million Rand. In order to achieve maximum output and efficiency, the development cooperation support of the Netherlands Embassy concentrates on four sectors selected in consultation with the South African Government: Youth, Justice, Education and Local Government. The Embassy is in the process of determining, in close consultation with the South African Government, the focus
areas within these sectors. At the request of the South African Government, at least 20% of the available funds within each sector will be allocated to gender related activities.

Sectoral approach: In each of the sectors, the Dutch assistance will be supporting the transformation process of the South African Government. The Embassy will, for each sector, agree on a policy framework with the South African counterparts. Institutional strengthening and capacity building activities will form a considerable share of the programmes. Newsletter on the Development Cooperation:

Civil Society: The important role that civil society plays in the transformation process is recognised by both the South African Government and the Royal Netherlands Embassy. Over the last years, the Embassy has built up a valuable network of South African and Dutch stakeholders in the various sectors. The Embassy will promote the continued involvement of civil society in policy development and implementation. Donor Coordination: The Netherlands Government aims to align its cooperation efforts as much as possible with other international donors present in the sectors. It strongly supports the South African Government in taking the lead as regards donor coordination, in order to maximize the efficiency of donor support.

Cross-cutting Issue: Environment

Amount available: 23 million Euros (in 2002)

10.3.2 Multilateral aid to SA

World Bank

The World Bank puts forward very little support to South Africa, because of its relative welfare compared to the rest of Africa. Two programmes do however, receive much attention from the World Bank: The SADC HIV/AIDS summit in which the World Bank participates and the World Bank stimulates the Country Assistance Strategy (CAS). Some of the recent projects in South Africa by the World Bank are shown in Table 10-7

<table>
<thead>
<tr>
<th>Project Name</th>
<th>IBRD/IDA</th>
<th>Product Line</th>
<th>Status</th>
<th>Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Financial Management Technical Assistance Project</td>
<td>15 IBRD/IDA</td>
<td>IBRD/IDA</td>
<td>Active</td>
<td>9/12/2002</td>
</tr>
<tr>
<td>Maloti - Drakensberg Transfrontier Conservation and Development Area Project (GEF)</td>
<td>0 Global Environment Project</td>
<td>Global Environment Project</td>
<td>Active</td>
<td>9/13/2001</td>
</tr>
<tr>
<td>Conservation Farming Project</td>
<td>0 GEF Medium Sized Program</td>
<td>GEF</td>
<td>Active</td>
<td>5/25/1999</td>
</tr>
<tr>
<td>Industrial Competitiveness and Job Creation Project</td>
<td>48 IBRD/IDA</td>
<td>IBRD/IDA</td>
<td>Active</td>
<td>5/29/1997</td>
</tr>
</tbody>
</table>

Table 10-7 World Bank projects in South Africa.

IFC

Since resuming activities in 1994, and as of June 30, 2002, IFC has committed financing to projects in South Africa amounting to US$ 253 million. Investments include US$ 238 million for IFC’s own account and US$ 15 million for the account of banks participating in loan syndications. IFC strategic priorities in South Africa include a focus on:

- Providing financing for projects with a strong export focus and job creating potential
- Encouraging South African corporates to expand into other countries in Africa by providing finance and covering against risks.
- Helping further develop South Africa’s advanced financial sector.
- Supporting small and medium enterprises in projects that are catalytic to development.
- Investing in software and information technology projects. In addition, IFC works throughout Africa via specialized facilities: The Africa Project Development Facility (APDF) identifies African
entrepreneurs and helps them organize, diversify and expand their businesses by assisting them throughout the project preparation cycle. The African Management Service Company (AMSCO) helps strengthen African enterprises by providing experienced managers and by training local management teams.

**IFC's committed portfolio in South Africa**

US$169 million

- **Pulp & Paper**: 4%
- **Health Care**: 4%
- **Scientific and Technical Services**: 4%
- **Finance and Insurance**: 59%
- **Tourism**: 7%
- **Collective Investment Vehicles**: 22%

Figure 10-2 spread of IFC portfolio in South Africa

### 10.4 Investment & Finance Incentive Policy

South Africa works very hard already to attract foreign financiers to improve the economic development in the country. The most important initiative for coastal infrastructure is the critical infrastructure fund.

#### 10.4.1 Current investment incentive policies

**Critical infrastructure fund (CIF)**

This programme has been established to support the provision of economic infrastructure directly linked to committed private sector investment where immediate requirements are not in place to expedite the investment process.

Two funding windows are primarily envisaged, namely to municipalities and secondarily to the private sector.

Only projects in excess of R100 million may apply for the Critical Infrastructure facility.

A limited number of projects will be supported to the level of between 10% and 30% of the total capital costs incurred.

Critical infrastructure is defined to mean economic infrastructure that supports the establishment of investment projects deemed to have strategic value that pass assessments of their compliance with the following criteria:

- long-term financial viability of the investment project supported by the infrastructure;
- supports investment projects that will improve their environmental performance;
- conforms to national, regional and local economic, industrial and development policy and land use planning;
- supports the development of industrial complexes that have strategic economic advantages;
- supports investment projects that are internationally cost competitive;
- supports investment projects that create significant direct and indirect employment opportunities;
supports investment projects that stimulate linkages with upstream supplier industries and downstream customer industries; and

Supports investment project that generate opportunities for the growth and development of small and medium enterprises.

10.4.2 Possible finance incentives policies

Because of the small amounts of investments from bilateral and multilateral finance (FMO and World Bank) with strict limits to applicability, private financing seems the most promising for infrastructure projects. The country risk is also not very high so the government should be able to attract foreign investors. The finance incentive policies need therefore be focussed on (perceived) risk mitigation, cost reduction and benefits enhancement.

10.5 COASTAL ZONE MANAGEMENT

10.5.1 Current coastal development incentives

Coastal zone management has been well developed in South Africa. Some of the programmes stimulating and regulating development are:

- ICZM – integrated coastal zone management
- MAP – millennium African renaissance programme, to increase (foreign and domestic) investments
- GEAR – Growth, employment and redistribution economic policy framework
- RDP – reconstruction and development programme
- SDI – spatial development initiatives

Priority issues identified during the course of the policy formulation process include:

- Diversifying coastal economies and optimising benefits for local coastal communities.
- Promoting coastal tourism, leisure and recreational development
- Establishing "one-stop-shops" for development approvals
- Identifying supplementing and managing State coastal assets
- Identifying opportunities for improving public access to the coast and coastal resources
- Introducing effective planning and development mechanisms and incentives for effective coastal management
- Exploring opportunities for development of ports and harbours
- Identifying opportunities for Mari culture and aquaculture development
- Developing and implementing a representative system of coastal protected areas
- Introducing mechanisms and incentives to avoid physical development in high risk coastal areas
- Creating incentives to promote better estuary and river mouth management practices
- Improving co-ordination and integration of coastal and marine resource management
- Improved co-ordination of monitoring and management of coastal pollution
- Rehabilitating degraded coastal areas and resources.

Coastal infrastructure projects

Main categories of coastal infrastructure, selected for this research:

Erosion protection; Flood protection; Land reclamation; Canals / waterways; Port construction; Airport construction; Road construction; Rail construction and Land preparation.
10.6 STRATEGY TO ATTRACT FOREIGN FINANCE

Analysing South Africa’s coast and determining the strategies to attract foreign finance are based on subjective numbers, representing qualitative data about South Africa. The strategies should therefore be read non-deterministic and be further investigated for suitability. It is attempted only to provide a handhold for designing strategies for the coastal zone in developing countries, with respect to attracting finance.

10.6.1 Strengths and weaknesses of South Africa’s coast

Studying South Africa ability to attract foreign financing, several strengths and weaknesses can be appointed. Insight in this ability or inability can be helpful to strengthen the South African position.

10.6.2 Coastal Resources and Development Opportunities and threats

Subsistence activities

Many South Africans are dependent on the coast for their subsistence. Activities include line-fishing, collection of inter-tidal organisms, beach- and seine-netting and agricultural practices. The value of subsistence activities is difficult to determine, but is believed to exceed R1 billion annually. Preliminary indications are that at least 3.6 million South Africans depend to a large degree on the coast as a subsistence food source.

Trade

South Africa is engaging in trade relations with many countries in an increasingly global economy. Our coastal cities are a gateway to world trade through shipping and harbours. More than R140 billion of cargo is transported through South Africa’s ports each year, generating over R4.2 billion in annual revenue. Most harbour traffic (75-80% by volume) goes through the ports of Durban and Richards Bay.

Tourism, recreation and leisure

These sectors have grown into a global growth industry. With over 40 different recreational activities taking place at our coast, they attract more than 20 million international and domestic visitors each year, generating at least R15.2 billion. For example, a surfing competition event attracts over 800 000 visitors and generates over R220 million for local Durban businesses in only 10 days.

Commercial and recreational fishing

The South African commercial fishing industry is worth about R1.7 billion annually. The west coast is the centre of the fishing industry, with smaller commercial fisheries located on the south and east coasts. The industry directly employs between 26 000 and 27 000 people. An additional 60 000 people are employed in related sectors that are exclusively or partly dependent on the fishing industry as a market for the supply of stores, equipment and services. Recreational fishing attracts over 600 000 enthusiasts, employs more than 131 000 people and generates at least R1.3 billion in revenue each year. This activity is especially popular on the KwaZulu-Natal coast [Green paper, 1997].

Development opportunities

Many other economic benefits are derived from our coast, and future development prospects are enormous. For example, in recognition of current and future economic opportunities, and in response to the marked inequalities along the coast, eight of the ten Spatial Development Initiatives (SDI’s) are linked to the coast. These multi-billion-rand coastal development proposals have an anticipated total value of R90 billion and a projected employment of 90 000 people.

Development opportunities in South Africa are: Tourism; Mining; Industry; Agriculture; Fisheries; Transport/Infra; Services and Housing.

Tourism and transport form the most beneficial and potential development opportunities for South Africa at the moment, and should therefore be exploited first.

Tourism is selected as an opportunity to generate benefits to be used for other projects.
10.7 EXAMPLE DEVELOPMENT: A LANDFILL FOR TOURISM

Tourism offers great benefits in South Africa. The number of tourists and their spending is still growing. With the increasing economic welfare of Southern Africa, as seen in recent years, the spending in tourism will continue to grow. The tourism industry is also quite well developed in South Africa, which enable to cash future tourism revenues in advance via real estate and other commercial developers. When a piece of land is needed for housing for example only part of the new land needs to be arranged for tourism.

Tourism is most flourishing around Cape Town and on in KwaZulu-Natal on the east coast. The latter also contains lots of shallow waters and swamps, where project development through land reclamation could be done with limited cost. The different (lucrative and non-commercial) should be able to co-exist.

10.7.1 Project description

The idea is to make use of the tourism attracted by the beautiful environment in the South African northeast. There just beside a national park (KwaZulu-Natal game park), a resort will be created, by making a landfill in a swampy area. This resort will need an access road, housing, shops, recreational areas, restaurants. The resort can be located near to the coast. Because the region is very poor, the resort will create new jobs and to create additional benefits, part of the landfill will be used to house local people who will work in the resort or be part of the rangers protecting and taking care of the park. So beside the resort a small village can arise, creating large benefits for local people.

10.7.2 Commercial analysis

More land inward, further away from the national park, land is available sufficiently to build many resorts. These locations however, lack the nearness of the park and the sea. The question then is, are visitors of such a resort (assuming visitors can be expected) willing to pay a higher price for these benefits? So, do these benefits create a competitive advantage of this resort to others? It probably will, because tourists nowadays have to travel much to reach the park, while this resort can limit the travel time to a minimum. Also the combination of beach and nature, poses a good advantage.

On thing that should be kept in mind is the ability to reach the resort. Airports are not very near so a good approach road is a necessity.

The swamp may bring forth the problems of mosquitoes, which problem should be considered for its implications for tourists, especially when they carry diseases like malaria.

Assuming that resort visitors are willing to pay more for these advantages, the costs need to be limited to assure the required return for the developer. The government is assumed to develop this project, but with help of private companies for financing, construction and operation of the resort.

A problem could be the right personnel to complete the job. Enough people are unemployed in the northeast region, but their education level is very low. So people from other location need to be imported or an education programme must be set up to teach people to construct, run a resort or take care of the park. The government should be willing to support this. If the resort could house a medical centre also, limiting the health risks for tourists, this could improve the medical situation for the local people also, which could attract support from the World Bank or other development institutes.

10.7.3 Technical analysis

To make sure the landfill is created as cheaply as possible, the discussion of chapter 9 is resumed. A shallow part of the swampland area needs to be found, with a preferably walk able distance to the sea and the park, because otherwise additional cost need to be made to enable transport of people. A balance needs to be found between these potential additional costs and the cost of the landfill and connections with the main land.

So the space where the landfill can be made is limited, but because the area is partly dry, the amount of filling should be limited. The availability of sand to create such a landfill needs to be researched, with regard to the coastal depths and balance of the shoreline. However, the availability of sand should not be a problem, concerning the many ports along the east shore of South Africa, where dredged materials are available, albeit of lesser quality. Otherwise fill material could possibly be obtained from mining sites, which are abundant in South Africa, somewhat inland. Beside for the landfill, materials for houses and other buildings need to be available.
For the land fill, if made by dredged material from sea, the access to shore for the material (pipeline) needs to be addressed, as well as the wave and current climate for dredging.

Labour force, although still, to be educated or employed for low-tech applications is available sufficiently. Quarries for harder materials are available in the hinterland as well, but the construction of a solid entry road (or other transport facility) needs to be accomplished first.

Because of the environmental support goal of the resort, regulations for environment, national and international, must be enforced.

The boundaries of the resort, which are for safety reasons preferably closed, need little additional work if the land fill is situated in the middle of a swamp. Then only the access road and beach access need to be controlled.

10.7.4 Financing

How should the government set up such a development? If project developers have not spotted such opportunities first, the government could address known (with good reputation) tourist project developers, and contractors, and try to set up a project company, in which project developer, financial institutes and contractors are represented, so that an optimal solution for all parties can be reached.

Before doing so, the government must try to identify the requirements of possibly participating parties, and see how the government's needs can go hand in hand with theirs. For this example, the planned housing of local people and education of people to take care of the park, need to be carefully included in the commercial picture the private parties want to see. The government must be aware of the need to bear the (financial) burden that these demands incur. However, by leasing or selling the rest of the land to the project developer of resort operator, these costs can be compensated.

If the expected return on the project, considering the costs of the project compared to the benefits generated by tourism in the neighbourhood, is high enough, financially the project could be feasible. When foreign financiers are involved however, the perceived risks need to be limited. Therefore, the government must find ways to assure the other parties that its intentions will not change during the development period of the project, or thereafter. Therefore, an investment of the government is needed, preferably with backup from a development institute.

The contractor in this project could for example sponsor the project with about 5% of the expected revenue of the work the contractor derives from the project. The contractor could best, as performance incentive, receive payment at the end of its work or be able to cash out (part) of its share capital. The main risks of a contractor in this project are probably the time of consolidation of the land fill and the availability of fill material. The contractor should not or very limited be exposed to commercial risk. The risk that tourist will not come to the resort should be allocated to the project developer and the government. The latter should be exposed because of the thrust that this would imply for other financiers and the fact that the government in initiated the project. The government should also take care of the concerning regulation, to match their plans and the plans of the project company.

10.8 Conclusions

South Africa is a relatively far developed country, compared to the region. In recent years it has come off the developing countries list, although local and ethinical differences in wealth still exist. Development financiers are not supporting many projects anymore, but focus more on other countries in the region, with much lower welfare. In South Africa small local projects are still supported, especially to battle AIDS.

South Africa is however very active by itself to promote equal development over the country and has several development programmes to stimulate infrastructure and economic development. The country can still count on support from the commercial parts of development institutes for loans for very important development projects. This is important especially for political risk mitigation.

The political environment is stabilising, although violence has not been eradicated. This makes South Africa, despite their large growth opportunities an average risky investment environment. The regulation surrounding investments is however competitive, which should and does attract foreign investments already.

The difficulties in South Africa lie in the low development of the southern region of southern Africa, which could limit South Africa's growth. Also AIDS and political unrest pose limitations to investments.
and development. Locally, South Africa has a shortage of recourses like fresh water and infrastructure.

South Africa has on other location abundance of recourses like minerals, fertile soils and beautiful nature and landscapes. The strong position as transport node can be further developed by rail, road and port development. These recourses can be used to generate financial recourses to resolve some of the countries problems, like the shortage of infrastructure and housing.

An example of tourism combined with housing on a landfill in the northeast of South Africa has been qualitatively examined. This potential tourist development, combined with the need of housing and employment, seems like a reasonable option for resolving some of the regional problems.
11 CONCLUSIONS AND RECOMMENDATIONS

What can and should be done to attract more foreign financing?

This last chapter tries to summarise the most important findings of the research, and review lessons learned from it to not only complete the researchers learning process, but also enable other researcher to learn.

11.1 DISCUSSION

11.1.1 Research goal fulfilment

Choice of problem:
An increasing number of problems arise along the coasts of developing countries, needing an appropriate approach like Coastal Zone Management, involving solutions to these problems. The limited domestic financial means and the inadequate access to international finance restrain the capability to apply these solutions and will have to be conquered.

Research goal:
Research the possibilities, risks and feasibility of attracting foreign investment for a strategic approach to Coastal Zone Management projects, in developing countries. This should be covered in a model for application, usable for Dutch contractors like Royal Boskalis Westminster NV, in order to assist foreign clients in arranging financing for the development of coastal infrastructure.

Result:
This research has provided the financing criteria of a small but very important group of financiers. The research into multilateral financing by the World Bank is very useful because of its vastness and support to many countries and project sectors. For Boskalis especially, the research into the FMO regulations is useful. A model has been made, but this has gotten less far than initially anticipated. Although cash flow prediction can be very useful in project and finance planning, this model is not suitable to be used for financing decisions only. More suitable to assist developing countries is seems the development to a database of infrastructure financiers and their criteria. The cash flow model could be a tool to assist in predicting returns for financing partners before the final arrangement.

The scan for opportunities to attract more finance should be further developed and deepened.

11.1.2 Method

The method used here to research financing sources and requirements has its limitations. The categorisation in three roughly defined groups has made it difficult to assess all available financing option. It seems especially that development financiers have more financing sources available that are not so easily places together with development assistance. Beside the divers groups within categories, the borders between them were not always that clear, concerning for example the

The criteria that were chosen to represent the financiers have much limitation because of the need to constrain the amount of work. The do however, seem to justify realised projects, although their assessed number is limited. The feasibility studies are shortened much and could and should be executed more intensively in real assessment.

Risk analysis has only been executed on a high level on a qualitative basis, limiting its comprehensiveness and importance. It was intended to provide an overview and grasp the essence of the risk, and it impact on financing and contracting. An intensive quantitative risk assessment is a basic necessity of financing arrangements.

The cash flows have in this research been based on yearly estimates, while in real projects a monthly projection of the cash flow is more practical. Differences in the actual payments of taxes, use of
depreciation and the use of debt and equity or mixed forms, has a large impact on the calculations carried out here.

The advice to contractors and developing countries must be seen as a direction in which to find the possibilities for foreign financing, and make the steps to attract it. Every country and every financier should be assessed for its own specific criteria and demands.

11.2 CONCLUSIONS

Developing countries need to access foreign sources for finance to accelerate their development. Infrastructure poses a difficulty for attracting private finance because of the limited options to generate financial benefits.

Coastal zone management, when used to allocate economic development options to required infrastructure development, could enable more financing options and improve development in general.

Financing can be done through equity and through debt, for returns in the forms of dividend and interest. Equity bears the largest risk and has the highest expected return, by the principle that a high risk will need a compensating high return. Project finance differs from corporate finance by the limited goal of the company and the length of its existence.

Secondary benefits from foreign financing, like import of knowledge and efficiency are significant additional reasons for governments of developing countries to attract foreign finance.

Developing countries must limit perceived risks for foreign commercial financiers and comply with the millennium development goals to receive development finance. A good competitive investment policy and a stable political climate are very important aspects.

Development financiers stimulate a greater role for private parties in development realization. Even though a country may not be entitled to receive development assistance, the involvement of a development financing institution is helpful in reducing perceived risks by investors.

Developing countries can attract foreign investment for non-commercial infrastructure from bilateral financiers by arranging political alliances and addressing development goals.

Developing countries can attract foreign investment for non-commercial infrastructure from multilateral financiers by addressing development goals.

Developing countries can attract foreign investment for infrastructure from private sources by assuring the commercial attractiveness of the project.

By development finance institutes, a developing country is placed in a finance category by its level of development, limiting the types of finance available for them.

Other factors influencing the choice of development financiers to participate are economic feasibility; Financial feasibility; off take obligation; environmental sustainability and for commercial parties in particular country risk.

The cost of capital is lowest for bilateral grants, secondly soft loans, third commercial loans and fourth commercial investments. A government that is able to finance form its own budget is has higher cost of capital than grants but certainly lower than commercial loans.

To analyse the fulfilment of financiers’ criteria, besides the project cash flows the individual cash flow and risk play an important role.

For parties to participate as sponsors in a project, other than direct financial benefits, like assurance of work, play an important role.

Development financing institutes, both bilateral and multilateral have a limiting effect on the perceived risks by commercial financiers.

Lenders to project companies are found to be governments, development banks, commercial banks or institutional investors, determined by the low cost of capital and financing expertise, needed to provide loans on competitive terms. Contractors and other non-financial companies are usually not suitable to provide these loans against competitive tariffs.

Developing countries should look at their resources and problems strategically and come to a strategic allocation of resource to needed developments, to maximise benefits and development.

Contractors should assess the total package of benefits that come from participation in financing, regarding direct financial return, surety of work and goodwill for example. When a contractor will
choose to participate in financing, a partnership with a financial institution is beneficial for both, concerning their specialist knowledge.

Besides participating in finance, contractors might decide only to advice or arrange financing, provided by another party.

South Africa faces many problems in the investment climate, but has a large potential to exploit tourism, mining and transport to generate the financial benefits needed to develop infrastructure, housing, employment and other development which is seriously needed.

11.3  **Recommendations**

It is recommended that a larger investigation into the presence of financiers and their actual precise criteria is necessary for developing countries, or parties that are willing to support them.

With a scope of most likely interested parties for financing, conversation, instead of desk research, can contribute greatly to the understanding of the parties criteria. Especially commercial parties have been assumed to work according to general financial management principles, while it is known that individual management decisions can make large differences.

The financial model that is used could be investigated by or discussed with financial experts. Especially private financiers could shed new light on the model.

The outcome of a risk assessment, at best coupling risks to cash flows should be interested with the financial model.

The number of cases is very limited and should be extended to assess the quality of the used criteria.

A partnership of contractors and financial institutes should work together to be able to understand fully financial risk and technical risk.
Appendix I: Glossary and abbreviations

Accounts payable: All amounts that have to be paid to suppliers, because the invoice has been received, but still need to be paid (because of a for example thirty day payment term)

AFDB African Development Bank;

Agent The decision-maker in a principal-agent relationship.

Amortisation The repayment of a loan by installments.

AsDB Asian Development Bank

Asset Any possession that has value in an exchange.

Asset-based financing Methods of financing in which lenders and equity investors look principally to the cash flow from a particular asset or set of assets for a return on, and the return of, their financing.

Balance Total assets = Total liabilities + Total stockholders' equity.

Balance sheet Also called the statement of financial condition, it is a summary of a company’s assets, liabilities, and owners' equity.

Bilateral organisation involved in activities or financing between two countries

BIS Bank for International Settlements

Bond Bonds are debt and are issued for a period of more than one year. The US government, local governments, water districts, companies and many other types of institutions sell bonds. When an investor buys bonds, he or she is lending money. The seller of the bond agrees to repay the principal amount of the loan at a specified time. Interest-bearing bonds pay interest periodically.

Capital Money invested in a firm.

Capital budget A firm’s planned capital expenditures.

CAPM Capital asset pricing model. An economic theory that describes the relationship between risk and expected return, and serves as a model for the pricing of risky securities.

CIRR Commercial interest reference rate [OECD, 1999]

Collateral Asset than can be repossessed if a borrower defaults.

Commercial bank Bank that offers broad range of deposit accounts, including checking, savings and time deposits and extends loans to individuals and business. Commercial banks can be contrasted with investment banking firms, such as brokerage firms, which generally are involved in arranging for the sale of corporate or municipal securities.

Commercial loan Loan provided by a private financing g company on market terms.

Commercial risk The risk that a foreign debtor will be unable to pay its debts because of business events, such as bankruptcy.

Commercial viability 1. Ability to borrow the required capital from a commercial bank

Commercial viability party 2. Return on investment compared to risks competitive for a commercial bank

Commitment charge A percentage of the amount of credit not yet disbursed. [World Bank]

Commitment fee A fee paid to a commercial bank in return for its legal commitment to lend funds that have not yet been advanced.

Common shares In general, a public corporation has two types of shares, common and preferred. The common shares usually entitle the shareholders to vote at shareholders meetings. The common shares have a discretionary dividend.

Common stock Securities that represent equity ownership in a company. Common shares let an investor vote on such matters as the election of directors. They also give the holder a share in a
company's profits via dividend payments or the capital appreciation of the security. Units of ownership of a public corporation with junior status to the claims of secured/unsecured creditors, bondholders and preferred shareholders in the event of liquidation.

Completion risk The risk that a project will not be brought into operation successfully.

Concession agreement An understanding between a company and the host government that specifies the rules under which the company can operate locally.

Consortium A group of companies that cooperate and share resources in order to achieve a common objective.

Construction loan A short-term loan to finance building costs

Contingency: Unexpected event costing money

Corporate bonds Debt obligations issued by corporations.

Corporate finance One of the three areas of the discipline of finance. It deals with the operation of the firm (both the investment decision and the financing decision) from the firm's point of view.

Corporation A legal entity that is separate and distinct from its owners. A corporation is allowed to own assets, incur liabilities, and sell securities, among other things.

Cost of capital The required return for a capital budgeting project.

Country economic risk Developments in a national economy that can affect the outcome of an international financial transaction.

Country financial risk Centers around the ability of a national economy to generate enough foreign exchange to meet payments of interest and principal on its foreign debt.

Country risk General level of political, financial, and economic uncertainty in a country which impacts the value of the country's bonds and equities.

Country risk The risk run because of political, economical or social instability dependent on the country.

Credit Money made available to a borrower.

Credit rating An evaluation of an individual's or company's ability to repay obligations or its likelihood of not defaulting. See: Creditworthiness.

Credit Rating Agencies Firms that compile information on and issue public credit ratings for a large number of companies.

Credit risk The risk that an issuer of debt securities or a borrower may default on its obligations, or that the payment may not be made on a negotiable instrument. Related: Default risk.

Credit Standards The guidelines a company follows to determine whether a credit applicant is creditworthy.

Credit Terms The conditions under which credit will be extended to a customer. The components of credit terms are: cash discount, credit period, net period.

Creditworthiness Eligibility of an individual or firm to borrow money.

Cross-border risk Describes the volatility of returns on international investments caused by events associated with a particular country as opposed to events associated solely with a particular economic or financial agent.

Currency Exchange Risk Uncertainty about the rate at which revenues or costs denominated in one currency can be converted into another currency.

Currency risk Risk of currency exchange rate fluctuations.

Current assets Value of cash, accounts receivable, inventories, marketable securities and other assets that could be converted to cash in less than 1 year.

Current: On a balance sheet current means with a term of less than one year

CZM Coastal zone Management: management of assets, resources and the economy at the coast.

Debt capacity Ability to borrow. The amount a firm can borrow up to the point where the firm value no longer increases.
Debt instrument bond. An asset requiring fixed dollar payments, such as a government or corporate debt.

Debt/equity ratio Indicator of financial leverage. Compares assets provided by creditors to assets provided by shareholders. Determined by dividing long-term debt by common stockholder equity.

Debt: interest Capital borrowed, with the obligation to repay the amount as well as annual interest.

Default Failure to make timely payment of interest or principal on a debt security or to otherwise comply with the provisions of a bond indenture.

Default premium A differential in promised yield that compensates the investor for the risk inherent in purchasing a corporate bond that entails some risk of default.

Default risk The risk that an issuer of a bond may be unable to make timely principal and interest payments. Also referred to as credit risk (as gauged by commercial rating companies).

Deferred taxes: A tax liability that however may be paid later.

Depreciation A non-cash expense that provides a source of free cash flow. Amount allocated during the period to amortize the cost of acquiring long-term assets over the useful life of the assets.

Development financiers Institutes financing for development (multilateral and bilateral)

Development goals addressing one or more of the millennium development goals;

DFC Development finance company. Financial institute with the goal to stimulate development.

Diversification That portfolios of different sorts of assets differently correlated with one another will have negligible unsystematic risk. In other words, unsystematic risks disappear in diversified portfolios, and only systematic risks persist, those related to particular assets.

Dividend A portion of a company's profit paid to common and preferred shareholders. A stock selling for $20 a share with an annual dividend of $1 a share yields the investor 5%

Due Diligence: The practice of researching the feasibility of a project including evaluating contracts, visiting the project site, meeting with project participants, building a financial model, and confirming key legal and regulatory aspects.

EBIT: Earnings before interest and taxes

EBITDA: Earnings before interest, taxes, depreciation and amortisation

ECA Export Credit Agency

Economic feasibility the financial and non-financial costs and benefits for a nation as a whole;

EIB European Investment Bank

Environmental sustainability the effects on the environment with limited negative or positive impact on short and long term, with regard to other social and financial costs and benefits.

Equity investments. Ownership interest in a firm. Equity is also shorthand for stock market equity.

Equity Kicker: Additional compensation or rights that may be obtained in connection with a loan to a project or company, following the lender to obtain equity interest in the project or corporation. This may include options to purchase equity interest on favourable terms, warrants, preferential rights, to convert debt to equity, or other similar rights.

Escrow contract are met. Property or money held by a third party until the agreed upon obligations of a contract are met.

EU European Union

Exchange A marketplace in which shares, options and futures on stocks, bonds, commodities, and indexes are traded. Principal US stock exchanges are: New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and National Association of Securities Dealers Automatic Quotation System (Nasdaq).

Export credit credit tied to export
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Facility</td>
<td>asset that is the main subject of the project</td>
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<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
</tr>
<tr>
<td>Finance</td>
<td>A discipline concerned with determining value and making decisions. The finance function allocates resources, including the acquiring, investing, and managing of resources.</td>
</tr>
<tr>
<td>Financial feasibility</td>
<td>The availability of sufficient financing and ability to fulfil financial obligations</td>
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<tr>
<td>Financial risk</td>
<td>The chance times the consequence of not obtaining the required return on an investment.</td>
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<tr>
<td>Financial structure</td>
<td>The way in which a company’s assets are financed, such as short-term borrowings, long-term debt, and ownership equity. Financial structure differs from capital structure in that capital structure accounts for long-term debt and equity only.</td>
</tr>
<tr>
<td>Fixed asset</td>
<td>Long-lived property owned by a firm that is used by a firm in the production of its income. Tangible fixed assets include real estate, plant, and equipment. Intangible fixed assets include patents, trademarks, and customer recognition.</td>
</tr>
<tr>
<td>Fixed charge</td>
<td>An optional percentage on all credits [World Bank].</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product, all that is produced in a country</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross national Income, all that is earned by people with a certain nationality</td>
</tr>
<tr>
<td>GNP</td>
<td>Gross National Product</td>
</tr>
<tr>
<td>Grace period</td>
<td>A period in which no repayment is required.</td>
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<tr>
<td>Grant</td>
<td>donation of capital, under certain conditions.</td>
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<tr>
<td>HIPC</td>
<td>Heavily Indebted Poor Country</td>
</tr>
<tr>
<td>IBRD</td>
<td>International Bank for Reconstruction and Development [World Bank]</td>
</tr>
<tr>
<td>ICZM</td>
<td>Integrated Coastal Zone Management:</td>
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<tr>
<td>IDA</td>
<td>International Development Association</td>
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<tr>
<td>IIB</td>
<td>International Investment Bank</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>Income statement</td>
<td>(Statement of operations) A statement showing the revenues, expenses, and income (the difference between revenues and expenses) of a corporation over some period of time.</td>
</tr>
<tr>
<td>Income tax</td>
<td>A state or federal government's levy on individuals as personal income tax and on the earnings of corporations as corporate income tax.</td>
</tr>
<tr>
<td>Independent project rejection</td>
<td>A project whose acceptance or rejection is independent of the acceptance or rejection of other projects.</td>
</tr>
<tr>
<td>Inflation</td>
<td>The rate at which the general level of prices for goods and services is rising.</td>
</tr>
<tr>
<td>Inflation risk</td>
<td>Also called purchasing power risk, the risk that changes in the real return the investor will realize after adjusting for inflation will be negative.</td>
</tr>
<tr>
<td>Inflation uncertainty factor</td>
<td>The fact that future inflation rates are not known. It is a possible contributing factor to the makeup of the term structure of interest rates.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>A country's fundamental system of transportation, communications, and other aspects of its physical capabilities.</td>
</tr>
<tr>
<td>Instalments</td>
<td>Annual repayments or amortisation.</td>
</tr>
<tr>
<td>Institution</td>
<td>An organization, probably very large, engaged in professional investing in securities. Normally a bank, insurance company, or mutual fund.</td>
</tr>
<tr>
<td>Institutional investors</td>
<td>Organizations that invest, including insurance companies, depository institutions, pension funds, investment companies, mutual funds, and endowment funds.</td>
</tr>
<tr>
<td>Instruments</td>
<td>Financial securities, such as money market instruments or capital market.</td>
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<tr>
<td>Term</td>
<td>Description</td>
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<td>------------------------------</td>
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<tr>
<td>Insurance</td>
<td>Guarding against property loss or damage making payments in the form of premiums to an insurance company, which pays an agreed-upon sum to the insured in the event of loss.</td>
</tr>
<tr>
<td>Intangibles</td>
<td>Assets on a balance sheet that are given a certain value (like goodwill), which cannot be determined exactly.</td>
</tr>
<tr>
<td>Inter party agreement</td>
<td>Agreement for bilateral or multilateral relations.</td>
</tr>
<tr>
<td>Interest</td>
<td>The price paid for borrowing money. It is expressed as a percentage rate over a period of time and reflects the rate of exchange of present consumption for future consumption. Also, a share or title in property.</td>
</tr>
<tr>
<td>Interest rate risk</td>
<td>The chance that a security's value will change due to a change in interest rates. For example, a bond's price drops as interest rates rise. For a depository institution, also called funding risk: The risk that spread income will suffer because of a change in interest rates.</td>
</tr>
<tr>
<td>Interim dividend determination</td>
<td>The declaration and payment of a dividend prior to annual earnings.</td>
</tr>
<tr>
<td>Investment</td>
<td>The creation of more money through the use of capital.</td>
</tr>
<tr>
<td>Investment bank</td>
<td>Financial intermediaries who perform a variety of services, including aiding in the sale of securities, facilitating mergers and other corporate reorganizations, acting as brokers to both individual and institutional clients, and trading for their own accounts.</td>
</tr>
<tr>
<td>Investment climate</td>
<td>Factors such as economic, monetary, and other conditions that affect the performance of investments.</td>
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<tr>
<td>Investment company</td>
<td>A firm that invests the funds of investors in securities appropriate for their stated investment objectives in return for a management fee. See also: Mutual fund.</td>
</tr>
<tr>
<td>Investment decisions</td>
<td>Decisions concerning the asset side of a firm's balance sheet, such as the decision to offer a new product.</td>
</tr>
<tr>
<td>Investment Risk</td>
<td>Uncertainty about the future benefits to be realized from an investment.</td>
</tr>
<tr>
<td>Investment-grade bonds</td>
<td>A bond that is assigned a rating in the top four categories by commercial credit rating companies. S&amp;P classifies investment-grade bonds as BBB or higher, and Moody's classifies investment grade bonds as Baa or higher.</td>
</tr>
<tr>
<td>Investor</td>
<td>The owner of a financial asset.</td>
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<tr>
<td>IRR</td>
<td>Internal Rate of Return</td>
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<tr>
<td>LDC</td>
<td>less developed country</td>
</tr>
<tr>
<td>Letter of credit (LOC)</td>
<td>A form of guarantee of payment issued by a bank on behalf of a borrower that assures the payment of interest and repayment of principal on bond issues.</td>
</tr>
<tr>
<td>Letter of Guarantee</td>
<td>A letter from a bank to a brokerage firm which states that a customer (who has written a call option) does indeed own the underlying stock and the bank will guarantee delivery if the call is assigned. Thus the call can be considered covered. Not all brokerage firms accept letters of guarantee. Also: letter issued to Option Clearing Corporation by member firms covering a guarantee of any trades made by one of its customers, (a trader or broker on the exchange floor).</td>
</tr>
<tr>
<td>Liability</td>
<td>A financial obligation, or the cash outlay that must be made at a specific time to satisfy the contractual terms of such an obligation.</td>
</tr>
<tr>
<td>LIBOR</td>
<td>London Inter bank Offered Rate. The rate of interest that major international banks in London charge each other for borrowings. Many variable interest rates in the US are based on spreads off LIBOR. By contrast with the bid rate LIBID quoted by banks seeking such deposits.</td>
</tr>
<tr>
<td>LLDC</td>
<td>least developed country</td>
</tr>
<tr>
<td>Long-term</td>
<td>In accounting terms, one year or longer.</td>
</tr>
<tr>
<td>Long-term debt issued</td>
<td>An obligation having a maturity of more than one year from the date it was issued. Also called funded debt.</td>
</tr>
<tr>
<td>Maturity</td>
<td>For a bond, the date on which the principal is required to be repaid. In an interest rate swap, the date that the swap stops accruing interest.</td>
</tr>
</tbody>
</table>
Maturity date: Usually used for bonds. Date that the bond finishes and is paid off. Date on which the principal amount of a note, draft, acceptance, bond, or other debt instrument becomes due and payable.

Maturity: time after which repayment of debt is agreed.

MDB: Multilateral Development Bank

MIGA: Multilateral Investment Guaranty Agency, the PRI of the World Bank.

Multilateral: Organisation owned (financed) by multiple nations

Negative Pledge: The borrower agrees not to pledge any of its assets as security and/or not to incur further indebtedness.

NGO: Non-Governmental Organizations

NIC: newly industrializing country

NIE: newly industrializing economy

Non-Recourse: without the option to collect debt outstanding with a sponsor at default

Notes: Debt instruments with maturities between 1 and ten years

NPV: Net Present Value

ODA: official development assistance

OECD: Organization for Economic Cooperation and Development

Off take obligation: Obligation to use finance for a certain party (for example the contractor)

Off-take contracts: Contracts specifying quantities and prices for future purchase form a facility

Offtake(r): client of a project, in some cases with a contract to purchase a certain quantity against a predetermined price

OCC: opportunity cost of capital, measure of other investment options in a country

ORET: Dutch

Participation: In this research a party taking part in the financing process of a project.

Partnership: Shared ownership among two or more individuals, some of whom may, but do not necessarily, have limited liability with respect to obligations of the group. See: General partnership, limited partnership, and master limited partnership.

Partnership agreement: A written agreement among partners detailing the terms and conditions of participation in a business ownership arrangement.

Performance Bond: A bond of 5-10% of a contract payable if a project is not completed as specified. Usually part of a construction contract or supply agreement.

Political risk: Possibility of negative events such as expropriation of assets, changes in tax policy, restrictions on the exchange of foreign currency, or other changes in the business climate of a country.

PPI: Private Participation in infrastructure

PPP: Purchasing Power Parity: A view that differential escalation rates (in different countries) determines the systematic change in FX rates.

Preferred stock: A security that shows ownership in a corporation and gives the holder a claim, prior to the claim of common stockholders, on earnings and also generally on assets in the event of liquidation. Most preferred stock pays a fixed dividend that is paid prior to the common stock dividend, stated in a dollar amount or as a percentage of par value. This stock does not usually carry voting rights. Preferred stock has characteristics of both common stock and debt.

Premium: Addition to the price of an asset on top of its nominal value

PRI: Political Risk Insurance

Price risk: The risk that the value of a security (or a portfolio) will decline in the future. Or, a type of mortgage pipeline risk created in the production segment when loan terms are set for the borrower in advance of setting terms for secondary market sale. If the general level of rates rises during the production cycle, the lender may have to sell the originated loans at a discount.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime Rate:</td>
<td>A bank Interest Rate charged to prime customers for loans (in excess of $100,000).</td>
</tr>
<tr>
<td>Principal</td>
<td>(1) The total amount of money being borrowed or lent. (2) The party affected by agent decisions in a principal-agent relationship.</td>
</tr>
<tr>
<td>Principal amount</td>
<td>The face amount of debt; the amount borrowed or lent. Often called principal.</td>
</tr>
<tr>
<td>Principle</td>
<td>Total credit amount.</td>
</tr>
<tr>
<td>Private</td>
<td>non governmental (public) assumed to strive for profit.</td>
</tr>
<tr>
<td>Privatization</td>
<td>The transfer of government-owned or government-run companies to the private sector, usually by selling them.</td>
</tr>
<tr>
<td>Pro forma:</td>
<td>A financial projection based on assumptions.</td>
</tr>
<tr>
<td>Pro rata:</td>
<td>Shared or divided according to a ratio or in proportion to their Participations.</td>
</tr>
<tr>
<td>Probability</td>
<td>The relative likelihood of a particular outcome among all possible outcomes.</td>
</tr>
<tr>
<td>Profit</td>
<td>Revenue minus cost. The amount one makes on a transaction.</td>
</tr>
<tr>
<td>Project company</td>
<td>Legal entity established especially for the project's financing.</td>
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<tr>
<td>Project financing</td>
<td>A form of asset-based financing in which a firm finances a discrete set of assets on a stand-alone basis.</td>
</tr>
<tr>
<td>Protectionism</td>
<td>Notion that governments should protect domestic industry from import competition by means of tariffs, quotas, and other trade barriers.</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
</tr>
<tr>
<td>Public risk</td>
<td>chance times consequence of an unwanted event regarding public welfare, in the future.</td>
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<tr>
<td>Put</td>
<td>An option to sell (back) a Security or commodity at a set price at a given time.</td>
</tr>
<tr>
<td>Recourse:</td>
<td>option to collect remainder of debt at default with a party</td>
</tr>
<tr>
<td>Repayment term</td>
<td>Duration of the credit agreement.</td>
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<tr>
<td>Retained earnings</td>
<td>Accounting earnings that are retained by the firm for reinvestment in its operations; earnings that are not paid out as dividends.</td>
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<tr>
<td>Return</td>
<td>The change in the value of a portfolio over an evaluation period, including any distributions made from the portfolio during that period.</td>
</tr>
<tr>
<td>Revenue:</td>
<td>All income from regular operations</td>
</tr>
<tr>
<td>Risk</td>
<td>Often defined as the standard deviation of the return on total investment. In context of asset pricing theory. See: Systematic risk.</td>
</tr>
<tr>
<td>Degree of uncertainty</td>
<td>Return on an asset.</td>
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<tr>
<td>Risk premium</td>
<td>The reward for holding the risky equity market portfolio rather than the risk-free asset. The spread between Treasury and non-Treasury bonds of comparable maturity.</td>
</tr>
<tr>
<td>Risk-averse</td>
<td>Describes an investor who, when faced with two investments with the same expected return but different risks, prefers the one with the lower risk.</td>
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<tr>
<td>RRR</td>
<td>Required rate of return</td>
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<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
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<tr>
<td>SCZM</td>
<td>Strategic Coastal Zone management</td>
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<tr>
<td>Service charge</td>
<td>A fixed percentage (interest) on the total credit. [World Bank]</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Shares</td>
<td>Certificates or book entries representing ownership in a corporation or similar entity.</td>
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<tr>
<td>Soft Loan</td>
<td>Loan provided on favourable terms.</td>
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<tr>
<td>Stock</td>
<td>Ownership of a corporation indicated by shares, which represent a piece of the corporation's assets and earnings.</td>
</tr>
<tr>
<td>Stockholder equity balance sheet item that includes the book value of ownership in the corporation. It includes capital stock, paid-in surplus, and retained earnings.</td>
<td></td>
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<tr>
<td>Stockholder</td>
<td>see shareholder</td>
</tr>
<tr>
<td>subordination</td>
<td>placement of debt in a lower order compared to senior debt (first in line)</td>
</tr>
<tr>
<td>Treasury stock: the company itself.</td>
<td>Stock capital that has not been issued yet or that has been bought back by the company itself.</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Unknown outcome of a value, with often an expected value and possible deviation of that expected value.</td>
</tr>
<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>UNDAF</td>
<td>United Nations Development Assistance Framework</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Program</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific, and Cultural Organization</td>
</tr>
<tr>
<td>UNIDO</td>
<td>United Nations Industrial Development Organization</td>
</tr>
<tr>
<td>Value-at-risk (VaR)</td>
<td>Procedure for estimating the probability of portfolio losses exceeding some specified proportion based on a statistical analysis of historical market price trends, correlations, and volatilities.</td>
</tr>
<tr>
<td>Venture capital</td>
<td>An investment in a start-up business that is perceived to have excellent growth prospects but does not have access to capital markets. Type of financing sought by early-stage companies seeking to grow rapidly.</td>
</tr>
<tr>
<td>Volatility</td>
<td>A measure of risk based on the standard deviation of the asset return. Volatility is a variable that appears in option pricing formulas, where it denotes the volatility of the underlying asset return from now to the expiration of the option. There are volatility indexes. Such as a scale of 1-9; a higher rating means higher risk.</td>
</tr>
<tr>
<td>WACC</td>
<td>Weighted average cost of capital. Expected return on a portfolio of all a firm's securities. Used as a hurdle rate for capital investment. Often the weighted average of the cost of equity and the cost of debt. The weights are determined by the relative proportions of equity and debt in a firm's capital structure.</td>
</tr>
<tr>
<td>Warrant</td>
<td>A security entitling the holder to buy a proportionate amount of stock at some specified future date at a specified price, usually one higher than current market price. Warrants are traded as securities whose price reflects the value of the underlying stock. Corporations often bundle warrants with another class of security to enhance the marketability of the other class. Warrants are like call options, but with much longer time spans—sometimes years. And, warrants are offered by corporations, while exchange-traded call options are not issued by firms.</td>
</tr>
<tr>
<td>Withholding tax</td>
<td>A tax levied by a country of source on income paid, usually on dividends remitted to the home country of the firm operating in a foreign country.</td>
</tr>
<tr>
<td>Without recourse</td>
<td>Giving the lender no right to seek payment or seize assets in the event of non-payment from anyone other than the party specified in the debt contract (such as a special-purpose entity).</td>
</tr>
<tr>
<td>Without Recourse Financing</td>
<td>Financing in which the right of recourse to the party receiving funds is forfeited to the party advancing funds. This may be evidenced by conditions added to the endorsement of a draft being sold by an exporter in order to protect the exporter, if the instrument is not paid at maturity by the original obligor.</td>
</tr>
<tr>
<td>World Bank</td>
<td>A multilateral development finance agency created by the 1944 Bretton Woods, (New Hampshire) negotiations. It makes loans to developing countries for social overhead costs.</td>
</tr>
</tbody>
</table>
capital projects that are guaranteed by the recipient country. See: International Bank for Reconstruction and Development.

WToO World Tourism Organization

WTiO World Trade Organization
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Used and suggested literature


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• Keuning S. (1995), Accounting for economic development and social change, with a case-study for Indonesia, sl: sn. dissertation Rotterdam.


• Stichting Postacademisch Onderwijs Civiele Techniek en Bouwtechniek (PAO-CT) (1999), *Financial engineering in de civiele techniek*, Delft: Stichting PAO.


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Appendix IV: Types of insurance for project finance

TYPES OF INSURANCE COVERAGE:

Revenue risk mitigation: This is most applicable to projects and concessions that do not benefit from long-term revenue contracts, but are exposed to market risks in some form.

Coverage Against Commodity Pricing Risk: coverage is crafted to protect a project from downward swings in COMMODITY prices; coverage would be triggered whenever prices fall below a certain negotiated trigger level.

Revenue Guaranty for Toll Road Projects, where payments are made by an insurer to a project or concession if actual vehicle traffic demand is lower than forecast traffic demand, thus removing the downside on traffic demand risk.

Coverage Against The Default Of An Offtaker in the payment of its contractual revenue obligations to the project. This type of coverage has been offered by preferred creditors under partial risk guaranties or enhanced political-risk coverage.

Liquidity substitute: a less expensive coverage that is designed to substitute for liquidity mechanisms. It could be a substitute for a fully funded debt service reserve, or for commercial bank letters of credits.

Technology Insurance: In some cases, insurance cover may be raised from unconventional or conventional insurance markets. This can be expected to be difficult for brand-new technologies.

Business Interruption Insurance: This takes effect upon Project startup and can provide useful protection of the Assets or the Project Financing in the event of lost income arising from an accident. If a total loss, the banks will often want to be the loss payee under this type of insurance policy as well as the all-risks general insurance policy. This is indirect cover for the Technical Component of Operating Risk.

Key-Man Insurance: This may literally insure the life of a few key people to a level equal to the debt outstanding should one or more of these individuals die.

Delay-In-Startup Insurance: This can cover completion risk either through contract work policies or startup delay policies, which latter cover the capitalised interest bill caused by a delay.

Reserve Insurance: This has been used in the oil and gas industry. The minerals industry, which usually has a quantum leap in better reserve definition than oil and gas reservoirs, should be able to obtain insurance coverage.

Environmental Insurance: In North America, insurance firms are now specialising in assessing projects for environmental event, disaster, and clean-up policies. These skills are being transferred rapidly around the world. However, capacity is limited and deductibles tend to be high.

Political Risk Insurance ("PRI"): Some political risk agencies such as ECAs, Lloyds of London, and various private insurers will provide very effective insurance against currency inconvertibility, creeping expropriation, unfair calling of performance bonds, and the like. Usually a delay of six months is built in to the PRI defined events to ensure that the government action is not a temporary squeeze.

Transfer and Convertibility Insurance Compensation against a deterioration in the ability to convert and transfer investment returns from insured investments, whether due to active restrictions or a shortage of foreign exchange.

Currency Devaluation Insurance

Expropriation Compensation against the nationalization, confiscation, or expropriation of an enterprise, including "creeping" expropriation.

War Risk, Political Violence: Compensation for property and income losses caused by violence undertaken for political purposes, including declared or undeclared war, hostile actions by national or international forces, civil war, relocation, insurrection, and civil strife.

Force Majeure Insurance: Insurance can cover Acts of Nature but is less able to cope with Act of Man or Acts of Government. Business interruption insurance perhaps applies more readily than under the Technical component of Operating risk since, if negligence or management causes can be proven, most insurance policies would not pay up.
Engineer/ Design Insurance: Professional indemnity insurance may cover such items as error and omission but usually nowhere near the level of cover commensurate with the project finance loan size. Other conventional insurance policies can be obtained for design errors at a more realistic cover level.

Title Insurance: This can sometimes be effective to cover deficiency in the title to tenure of the site. Title searches should be done professionally.

The Insurance Policy needed to be assigned to lender and any payments made by an insurer should be made to the lender. The lender should then have a choice of whether the debt is paid out or the plant or asset is rebuilt or replaced. If insurance premiums are not paid by the SPE, the lender should be notified. No changes to the insurance coverage should be made without the consent of the lender.

Insurance coverage must be from an institution with a reasonable credit rating vis-à-vis the project debt rating (generally not significantly lower than the project debt rating).

http://www.mzprojectfinance.com/ [31-10-2002]
## Appendix V: Developing countries list and Dutch aid recipients

<table>
<thead>
<tr>
<th>List of Development aid recipients [<a href="http://www.oecd.org/dac">www.oecd.org/dac</a>]</th>
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<tbody>
<tr>
<td>Afghanistan</td>
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<td>Albania</td>
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<td>Algeria</td>
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<td>Angola</td>
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<td>Anguilla</td>
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<td>Antigua and Barbuda</td>
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<td>Argentina</td>
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<td>Armenia</td>
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<td>Aruba</td>
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<td>Azerbaijan</td>
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<td>Bahrain</td>
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<td>Bangladesh</td>
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<td>Barbados</td>
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<td>Belize</td>
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<td>Bhutan</td>
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<td>Bolivia</td>
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<td>Bosnia &amp; Herzegovina</td>
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<td>Botswana</td>
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<td>Brazil</td>
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<td>Burkina Faso</td>
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<td>Burundi</td>
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<td>Cambodia</td>
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<td>Cameroon</td>
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<td>Cape Verde</td>
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<td>Central African Rep</td>
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<td>Chad</td>
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<td>Chile</td>
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<td>China</td>
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<td>Colombia</td>
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<td>Congo</td>
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<td>Cook Islands</td>
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<td>Costa Rica</td>
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<td>Cuba</td>
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<td>Djibouti</td>
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<td>Dominica</td>
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<td>Dominican Republic</td>
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<td>East Timor</td>
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<td>French Polynesia</td>
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Appendix VI: The Millennium development goals

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<thead>
<tr>
<th>Goals and targets</th>
<th>Indicators</th>
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<tbody>
<tr>
<td><strong>Goal 1. Eradicate extreme poverty and hunger</strong></td>
<td>1. Proportion of population below $1 per day  &lt;br&gt;2. Poverty gap ratio (incidence x depth of poverty)  &lt;br&gt;3. Share of poorest quintile in national consumption</td>
</tr>
<tr>
<td>Target 1. Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day</td>
<td>1. Proportion of population below $1 per day  &lt;br&gt;2. Poverty gap ratio (incidence x depth of poverty)  &lt;br&gt;3. Share of poorest quintile in national consumption</td>
</tr>
<tr>
<td>Target 2. Halve, between 1990 and 2015, the proportion of people who suffer from hunger</td>
<td>4. Prevalence of underweight children (under five years of age)  &lt;br&gt;5. Proportion of population below minimum level of dietary energy consumption</td>
</tr>
<tr>
<td>Target 3. Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling</td>
<td>6. Net enrolment ratio in primary education  &lt;br&gt;7. Proportion of pupils starting grade 1 who reach grade 5  &lt;br&gt;8. Literacy rate of 15-24-year-olds</td>
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<tr>
<td><strong>Goal 5. Improve maternal health</strong></td>
<td>16. Maternal mortality ratio  &lt;br&gt;17. Proportion of births attended by skilled health personnel</td>
</tr>
<tr>
<td>Target 6. Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio</td>
<td>16. Maternal mortality ratio  &lt;br&gt;17. Proportion of births attended by skilled health personnel</td>
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</tbody>
</table>
### Goal 7. Ensure environmental sustainability

**Target 9.** Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

25. Proportion of land area covered by forest
26. Land area protected to maintain biological diversity
27. GDP per unit of energy use (as proxy for energy efficiency)
28. Carbon dioxide emissions (per capita) (Plus two figures of global atmospheric pollution: ozone depletion and the accumulation of global warming gases)

**Target 10.** Halve by 2015 the proportion of people without sustainable access to safe drinking water

29. Proportion of population with sustainable access to an improved water source

**Target 11.** By 2020 to have achieved a significant improvement in the lives of at least 100 million slum dwellers

30. Proportion of people with access to improved sanitation
31. Proportion of people with access to secure tenure (Urban/rural disaggregation of several of the above indicators may be relevant for monitoring improvement in the lives of slum dwellers)

### Goal 8. Develop a Global Partnership for Development

**Target 12.** Develop further an open, rule-based, predictable, non-discriminatory trading and financial system (Includes a commitment to good governance, development, and poverty reduction — both nationally and internationally)

[Some of the indicators listed below will be monitored separately for the least developed countries (LDCs), Africa, landlocked countries and small island developing States]

32. Net ODA as percentage of OECD/DAC donors’ gross national income (targets of 0.7 per cent% in total and 0.15 per cent for LDCs)

33. Proportion of ODA to basic social services (basic education, primary health care, nutrition, safe water and sanitation)
34. Proportion of ODA that is untied
35. Proportion of ODA for environment in small island developing States
36. Proportion of ODA for transport sector in landlocked countries
37. Proportion of exports (by value and excluding arms) admitted free of duties and quotas
38. Average tariffs and quotas on agricultural products and textiles and clothing
39. Domestic and export agricultural subsidies in OECD countries
40. Proportion of ODA provided to help build trade capacity
41. Proportion of official bilateral HIPC debt cancelled
42. Debt service as a percentage of exports of goods and services
43. Proportion of ODA provided as debt relief
44. Number of countries reaching HIPC decision and completion points
45. Unemployment rate of 15-to-24-year-olds

**Target 13.** Address the special needs of the Least Developed Countries

(Includes: tariff and quota free access for least developed countries’ exports; enhanced programme of debt relief for HIPC countries; and more generous ODA for countries committed to poverty reduction)

32. Net ODA as percentage of OECD/DAC donors’ gross national income (targets of 0.7 per cent% in total and 0.15 per cent for LDCs)

33. Proportion of ODA to basic social services (basic education, primary health care, nutrition, safe water and sanitation)
34. Proportion of ODA that is untied
35. Proportion of ODA for environment in small island developing States
36. Proportion of ODA for transport sector in landlocked countries
37. Proportion of exports (by value and excluding arms) admitted free of duties and quotas
38. Average tariffs and quotas on agricultural products and textiles and clothing
39. Domestic and export agricultural subsidies in OECD countries
40. Proportion of ODA provided to help build trade capacity
41. Proportion of official bilateral HIPC debt cancelled
42. Debt service as a percentage of exports of goods and services
43. Proportion of ODA provided as debt relief
44. Number of countries reaching HIPC decision and completion points
45. Unemployment rate of 15-to-24-year-olds

**Target 14.** Address the special needs of landlocked countries and small island developing States (through the Programme of Action for the Sustainable Development of Small Island Developing States and the outcome of the twenty-second special session of the General Assembly)

36. Proportion of ODA for transport sector in landlocked countries
37. Proportion of exports (by value and excluding arms) admitted free of duties and quotas
38. Average tariffs and quotas on agricultural products and textiles and clothing
39. Domestic and export agricultural subsidies in OECD countries
40. Proportion of ODA provided to help build trade capacity
41. Proportion of official bilateral HIPC debt cancelled
42. Debt service as a percentage of exports of goods and services
43. Proportion of ODA provided as debt relief
44. Number of countries reaching HIPC decision and completion points
45. Unemployment rate of 15-to-24-year-olds

**Target 15.** Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term

36. Proportion of ODA for transport sector in landlocked countries
37. Proportion of exports (by value and excluding arms) admitted free of duties and quotas
38. Average tariffs and quotas on agricultural products and textiles and clothing
39. Domestic and export agricultural subsidies in OECD countries
40. Proportion of ODA provided to help build trade capacity
41. Proportion of official bilateral HIPC debt cancelled
42. Debt service as a percentage of exports of goods and services
43. Proportion of ODA provided as debt relief
44. Number of countries reaching HIPC decision and completion points
45. Unemployment rate of 15-to-24-year-olds

**Target 16.** In cooperation with developing countries, develop and implement strategies for decent and sustainable social, economic and environmental development

46. Unemployment rate of 15-to-24-year-olds
<table>
<thead>
<tr>
<th>productive work for youth</th>
<th></th>
<th>Appendices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target 17.</strong> In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries</td>
<td><strong>46. Proportion of population with access to affordable essential drugs on a sustainable basis</strong></td>
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</tr>
<tr>
<td><strong>Target 18.</strong> In cooperation with the private sector, make available the benefits of new technologies, especially information and communications</td>
<td><strong>47. Telephone lines per 1,000 people</strong>&lt;br&gt;<strong>48. Personal computers per 1,000 people</strong></td>
<td></td>
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</table>
Appendix VII: World Bank and Project financing arrangements

The examples of financing are based on a hypothetical project, in which a Power company (PowerCo) will operate a power plant. Equity investors and commercial lenders make up the operational capital of the project company. An important role is reserved for the national government of the country where the power plant will operate.

**FIGURE 1 IBRD LOAN TO POWERCO**

IBRD loan directly to PowerCo with a repayment guarantee by the government.

**FIGURE 2 IBRD OR IDA LENDING THROUGH THE COUNTRY**

IDA or IBRD providing a loan through the countries government.

**FIGURE 3 IBRD PARTIAL RISK GUARANTEE**

IBRD providing a risk guarantee for on political risks to commercial lenders.
IBRD ‘enclave’ project in an IDA only country, making use of an escrow account. Escrow means property or money held by a third party until the agreed upon obligations of a contract are met.

IBRD or IDA used to finance equity investments in PowerCo.

IBRD or IDA used to finance a governmental supported facility.
The IFC providing equity and direct loans (A) and syndicated loans (B) to the PowerCo.

**FIGURE 8 MIGA INSURANCE**

A typical MIGA insurance for commercial lenders and shareholders.

**FIGURE 9 WORLD BANK GROUP COMBINED SUPPORT**

Combined support by the World Bank Group's MIGA, IBRD and IFC.
Appendix VIII: IDA and IBRD eligibility country list

Country Eligibility for Borrowing from the World Bank as of July 2002.

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<tr>
<th>Income group and country</th>
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<th>Income group and country</th>
<th>2001 GNI per capita*</th>
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<td>Per capita income $2,976–$5,185</td>
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<td>Countries eligible for a blend of IBRD and IDA funds*</td>
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<tr>
<td>Per capita income $2,976–$5,185</td>
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<td>Per capita income less than $746</td>
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<td>St. Lucia*</td>
<td>3,970</td>
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<td>Grenada*</td>
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<td>Dominica*</td>
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<td>Per capita income $1,436–$2,975</td>
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* GNI per capita is calculated using World Bank Atlas methodology.
## Foreign financing for coastal infrastructure in developing countries

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<th>Income group and country</th>
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Source: The World Bank Annual report 2002, appendix II.

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M.Sc. Thesis Civil Engineering: XXXVI

TU Delft / Boskalis
Appendix IX: Normal distribution function table

![Normal Distribution Curve](image)

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http://people.holstra.edu/faculty/Stefan_Waner/RealWorld/normaltable.html
Appendix X: Euromoney credit rating methodology

September 2003

Country Risk Methodology

To obtain the overall country risk score, Euromoney assigns a weighting to nine categories. These are political risk (25% weighting), economic performance (25%), debt indicators (10%), Debt in default or rescheduled (10%), credit ratings (10%), access to bank finance (5%), access to short-term finance (5%), access to capital markets (5%), discount on forfaiting (5%).

The best underlying value per category achieves the full weighting (25, 10 or 5); the worst scores zero and all other values are calculated relative to these two. The formula used is the following: $A - (A/(B-C)) \times (D-C)$, where $A$ = category weighting; $B$ = lowest value* in range; $C$ = highest value* in range, $D$ = individual value.

*NB for debt indicators and debt in default, B and C are reversed in the formula, as the lowest score receives the full weighting and the highest gets zero.

Political risk (25% weighting): the risk of non-payment or non-servicing of payment for goods or services, loans, trade-related finance and dividends, and the non-repatriation of capital. Risk analysts give each country a score between 10 and zero - the higher, the better. This does not reflect the creditworthiness of individual counterparties.

Economic performance (25%): based (1) on GNI (Atlas Method) figures per capita and (2) on results of Euromoney poll of economic projections, where each country’s score is obtained from average projections for 2003 and 2004. The sum of these two factors, equally weighted, makes up this column - the higher the result, the better.

*GNI Figures were unavailable for unavailable for the following countries, so GDP data were used instead: Afghanistan, Bahrain, Bermuda, Cuba, Iraq, North Korea, Liberia, Libya, Myanmar, Oman, Qatar, Somalia, Taiwan.

Debt indicators (10%): calculated using these ratios from the World Bank’s World Development Indicators 2002: total debt stocks to GNP (A), debt service to exports (B); current account balance to GNP (C). Scores are calculated as follows: $A + (B \times 2) - (C \times 10)$. The lower this score, the better. Figures are for 2001.

Because of lack of consistent economic data for OECD and rich oil-producing countries, these score the full weighting, except where they report debt figures to the IMF. Developing countries which do not report complete debt data get zero.

Debt in default or rescheduled (10%): scores are based on the ratio of rescheduled debt to debt stocks, taken from the World Bank’s World Development Indicators 2003. The lower the ratio, the better. OECD and developing countries which do not report under the debtor reporting system (DRS) score 10 and zero respectively.

Credit ratings (10%): nominal values are assigned to sovereign ratings from Moody’s, S&P and Fitch IBCA. The higher the average value, the better. Where there is no rating, countries score zero.

Access to bank finance (5%): calculated from disbursements of private, long-term, unguaranteed loans as a percentage of GNP. The higher the result, the better. OECD and developing countries not reporting under the DRS score five and zero respectively. Source: the World Bank’s World Development Indicators 2003.

Access to short-term finance (5%): takes into account OECD consensus groups [source: ECGD] and short-term cover available from the US Exim Bank and NCM UK. The higher the score, the better.

Access to capital markets (5%): heads of debt syndicate and loan syndications rated each country’s accessibility to international markets at the time of the survey. The higher the average rating out of 10, the better.

Discount on forfaiting (5%): reflects the average maximum tenor for forfaiting and the average spread over riskless countries such as the US. The higher the score, the better. Countries where forfaiting is
not available score zero. We would like to thank Guy Brookes at Deutsche Bank, Mezra Finance, Standard Bank, and WestLB who kindly supplied data.

**Economic projections methodology**

Euromoney received replies from 32 economists at financial and economic institutions. They gave each country's economic performance for 2003 and 2004 a score out of 100. The fastest-growing, best-performer in an ideal year would score 100; the worst economy in a disastrous year would score zero. Respondents were asked to consider economic growth, monetary stability, current-account, budget deficit or surplus, unemployment and structural imbalances. Economists also gave 2003 and 2004 GNP growth forecasts. Countries that got no votes were excluded from this table.
### Appendix XI: Euromoney country ratings

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www.euromoney.com [October 2003]
Appendix XII: Explanation of the cash flow model

This appendix covers a short description of the model, for users only. A more deep explanation, going into used calculations is provided in appendix XIV. The sheets in the workbook will be treated from left to right, and the sheet will be explained top-down. A listing of the excel work book is included in appendix XIV.

Assumptions

General assumptions

- There is a project, with a clearly defined goal and at least one party willing to support it
- The project is politically feasible, and change of law or development plans is not considered
- The project is in the coastal zone
- The project is to the benefit than more than one company or organisation
- The project cannot be financed out of budget of the initiator
- The government initiates the project, or is eager to stimulate its development
- Acting parties have blank record upon one another
- Financing parties have money available and are willing to invest it on certain conditions

Assumptions in excel model:

- Taxes are paid over the previous year
- Operating cost are including taxes
- The equity value of the firm rose each year with the sustainable growth rate
- Growth rate formula
- Pay or invest?
- Benefit allocation only to equity investors
- Debt service cover ration
- Different scenarios

Assumptions sheet

This assumption sheet comprehends most assumption done in the model so far. It must be noted that the required rate of return of financing parties is not yet included.

For each assumed (or provided by a source like a simple cost benefit analysis) parameter, three different scenarios can be filled in, for comparison and the sensitivity analysis. In the next sheet (financials) these assumed scenarios could easily be used while looking at the outcomes.

The yellow cells are used to fill in values, the others only calculate. All is calculated on a yearly basis with disbursements at the end of the year.

Benefits (of operations): This has three scenarios, which are evolved around the centre row. The top row (scenario 1) is the centre row minus deviation (column D) and the bottom row holds the centre (average) row plus the deviation.

Capital expenditure (Capex): This involves all major investments that are to be financed and which will be depreciated on a yearly basis. Here also three scenarios are possible.

Operation cost: again three scenarios. This involves all cost, which are not to be depreciated.

Additional income: this involves subsidies on operating cost and grants of for example ORET or the World Bank. These amounts, which do not have to be paid back, are taken up in the cashflow of the
project. The scenarios involve the different disbursement schemes possible. When the subsidy or grant is just a percentage of Capex or costs this can be addressed in the financial sheet.

Equity financing: (This is not used in this case.) These scenarios pictured describe for one growth scenario of equity traded in the market (three scenarios) and three scenarios for equity issuance during the project, for the case that not only initial investments are financed with equity.

Loan (bond) financing: In case the amount of debt is not a percentage of Capex, the issuance of new debt or repurchase of debt can be put into scenarios.

World Bank financing: These scenarios cover the grace period, the repayment term and the interest rate involved during the project. This has different scenario options for IBRD financing as well as IDA financing. Besides interest rate also the yearly amount disbursed by the World Bank is a possible option to fill in as different scenarios.

Private loan (Variable payments): this has the same characteristics as the World Bank loans, but is assumed that disbursement is a percentage of Capex. The feature of selective disbursement will be added later. Parameters: grace period, loan term and interest rate.

Private loan (Constant payment): this feature is built in to cover those loans that are repaid in annual equal amounts. Three scenarios are again possible for a combination of grace period, repayment term and annual amount.

Financials sheet

In this sheet, amongst many other colours, there are light blue and (light) yellow cells. These are the cells to fill in parameters, where the blue ones cover scenarios (1,2,3) of on/off (0,1) or combined (0,1,2,3) references. The yellow one requires mostly percentages for a certain financing decision. Only in column B or C figures need to be filled in.

The income statement, the profit and loss accounts and the balance sheet concern the Project Company, whether it is a separate company or a part of a larger entity (government or company). Individual financing cash flows are provided below.

Income statement: using the selected scenarios, displaying benefits, costs and capital expenditure (Capex). Also additional incomes like subsidies and grants are taken up here, to contribute to the profit and loss account.

Profit and loss account: Here operating costs and subsidies as well as operating benefits are processed to determine the profitability of the project on a yearly basis and eventually the cash flow per year.

Gross project cash flow: this is simply all money coming in and all money leaving the project, with which it can be determined if the project has a viable cash flow at all. The internal rate of return associated with the gross project cash flow is also provided.

Balance sheet: the balance sheet covers all assets and liabilities of the project, making it possible to determine the value of it. The current accounts are used to complete the balance.

Ratios: a couple of financial ratios are calculated to express the viability and attractiveness of the project's financing.

The financing is all done based on a percentage of the Capital expenditure, unless a different scenario is provided at the assumptions sheet. In blue the discount rate (still assumed) is provided.

Additional income: Here the grants and subsidies are expressed as a percentage of the Capex or as the scenario presented in the assumptions-sheet.

Governmental financiers: this financier has the benefit of collecting taxes on the project, also being financial benefits. The tax-benefits are optional calculated by filling in the percentage (of tax over operating cost, operational taxes are deducted from the profit and loss account).

Internal private financiers: same as with the governmental internal financiers, except for the tax benefits. (See figure for explanation of figures)
### Foreign financing for coastal infrastructure in developing countries

<table>
<thead>
<tr>
<th>Internal (Private) financier 1</th>
<th>Column B</th>
<th>Column C</th>
<th>Column E</th>
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<td>IRR</td>
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<tr>
<td>Discounted cashflow</td>
<td>Discount rate</td>
<td>Value CF at year 1</td>
<td></td>
</tr>
</tbody>
</table>

**Equity financing:** This covers the different growth scenarios of the value of the company.

**Loan (bond) financing:** another statement of cash flows per financiers, this time for debt financiers (see picture). This involves private and World Bank financing.

<table>
<thead>
<tr>
<th>IBRD</th>
<th>Column B</th>
<th>Column C</th>
<th>Column E</th>
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<td>Scenario of interest</td>
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<tr>
<td>Amortization</td>
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<td>(% of Capex)</td>
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<tr>
<td>Discounted cashflow</td>
<td>Discount rate</td>
<td>Value CF at year 1</td>
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</table>
Appendix XIII: Cash flow model development tutorial

PROJECT CASH FLOW MODEL TUTORIAL

This writing offers a manual for use and an explanation for the structure of the model used for calculating cash flows of projects, and especially the cash flows of participating financiers.

The model is based on basic business administrative accounting rules, to determine cash flows dependent on the tax-system, method of depreciation and cost of capital.

The structure is assumed to be typical project financing, where a project company is agent for all the transactions, at least on financial level. For deviating financing structures, such as bilateral or multilateral financing, adjustment facilities are included.

At first general assumptions, underlying the model are discussed and explained, providing insight in the goal and structure of the model. Next the cost-benefit-analysis yielding the basic cash flows for the project based on capital expenditure during construction and revenue and costs during operation. For sensitivity analyses, three scenarios options are introduced per main cash flow determinants; being capital expenditure, operating costs and operating benefits. In the final calculations these three options per determinant are available for adjustment, just as several other build-in scenarios for interest, amortisation and depreciation.

ASSUMPTIONS

A project company is instituted to arrange construction and operation of the facility.

The project company may contract contractors and operators to do the actual execution of works, and function only as a manager of project cash flows.

The project company's capital is constituted of equity, invested by project sponsors, and debt, invested by lenders.

Equity yields dividend when operating profit and available cash flows allow for it.

Debt is repaid in annuities, after a period of grace.

Interest is capitalised during the grace period.

Capital expenditure gradually over the year,

Interest in year of borrowing

Balance at end of year

COST BENEFIT ANALYSIS

This paragraph explains the terms and use of the cost and benefit sheet, as mentioned in the financial model. This sheet covers the calculation of the

Year – count of years as of the start of construction.

Cash flow during construction

Capital expenditure – all costs associated with the initial investments and construction.

Construction – the costs associated with the construction of the facility.

Dredging – a separate post assigned to capital dredging as part of the initial works of facility creation
Purchase – purchase of land, equipment and materials, required for initial operation of the facility and realised in the construction phase.

Cash flow during operation

Growth – this factor comprises the estimated growth in benefits and costs, due to fluctuations in price levels and sale and purchase quantities. Price changes are assumed to be most influenced by changes in the global and local economy (dependent on the type revenue of project), represented by changes in the GDP of the host country or rather the one that generates revenues or delivers materials. This factor is based on the GDP data in the currency of project output provided by the World Bank in it’s World Development Indicators report [2001].

Operations – the cost of personnel, basic materials and rent or lease of materials, equipment or property, required for normal operation.

Maintenance – The construction works required during operation, needed for a stable quality of service

Dredging – Maintenance post separated from other construction

Concession fixed – fixed fee for the right of concession, to be paid by the concessionaire to the government

Operating cost – the sum of costs associated with regular operation of the facility.

Benefits – all benefits generated by the project and accountable for the project company.

Lease fees – Income generated by the lease of facilities to third parties (like stevedores)

Harbour/docking – fees generating income by the project company owned port authority by harbour and docking works

CALCULATIONS AND CASH FLOWS

Assumptions sheet

This assumption sheet comprehends most assumption done in the model so far. It must be noted that the required rate of return of financing parties is not yet included.

For each assumed (or provided by a source like a simple cost benefit analysis) parameter, three different scenarios can be filled in, for comparison and the sensitivity analysis. In the next sheet (financials) these assumed scenarios could easily be used while looking at the outcomes.

The yellow cells are used to fill in values, the others only calculate. All is calculated on a yearly basis with disbursements at the end of the year.

Project cash flow determinant scenarios

Benefits – Three scenarios for the development of benefits during the project lifetime. The middle scenario (#2) holds the values calculated in the cost benefit analysis, as presented in the previously discussed sheet (cost benefit). Although the first and third scenario could be manually adjusted, the choice is set to a percentage deviation of the second scenario by default. This is accomplished by deducting (#1) or adding (#3) the percentage mentioned in the third column.

Capital expenditure (Capex) – sum of all capital expenses during construction period of the project. Three scenarios are applicable here; with one displaying earlier calculated values (#2) a minimum costs scenario (#1) and a maximum cost scenario (#3). Both extremes are by default calculated by deducting a given percentage (column D) from the average case (#2).
Operating costs – the cost during operation as calculated in the cost / benefit sheet are displayed in three scenarios also. Again, number one represents the minimum cost scenario, number two the costs as calculated and number three the maximum costs scenario.

When referring to minimum and maximum here, it implies only to the input of values, not to any ‘real’ occurring values.

Benefits (of operations): This has three scenarios, which are evolved around the centre row. The top row (scenario 1) is the centre row minus deviation (column D) and the bottom row holds the centre (average) row plus the deviation.

Capital expenditure (Capex): This involves all major investments that are to be financed and which will be depreciated on a yearly basis. Here also three scenarios are possible.

Operation cost: again three scenarios. This involves all cost, which are not to be depreciated.

To add:

Capex subsidies

Interest rate scenarios

Interest rates are calculated according to the theory, of this research. For sensitivity analyses three scenarios are optional for evaluation. Scenario number two is provided according to calculation, scenario one holds lesser values for interest and scenario three presents larger than calculated values. Besides sensitivity analyses the scenarios could also suit different financiers’ perspectives.

Additional income: this involves subsidies on operating cost and grants of for example ORET or the World Bank. These amounts, which do not have to be paid back, are taken up in the cashflow of the project. The scenarios involve the different disbursement schemes possible. When the subsidy or grant is just a percentage of Capex or costs this can be addressed in the financials sheet.

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Private loan (Constant payment): this feature is built in to cover those loans that are repaid in annual equal amounts. Three scenarios are again possible for a combination of grace period, repayment term and annual amount.

FINANCIAL CALCULATIONS AND CASH FLOWS

If no time indicator (T for current time of calculation and + or – a number for relative references) is provided in formulae, all values are taken from the same year.
Basic cash flows

Benefits (Opin) – benefits are taken from, the previous calculations by filling in the wanted scenario number.

\[ \text{Excel} \ (\text{row } 5): \text{Benefits} = VLOOKUP(\$C5;\text{assumptions!B5:B7};\text{FINANCIAL!S2+4}) \]

Capital expenditure (Capex) – capital expenditure taken from, the previous calculations by filling in the wanted scenario number.

\[ \text{Excel} \ (\text{row } 6): \text{Capital expenditure (Capex)} = VLOOKUP(\$C5;\text{assumptions!B9:B11};\text{FINANCIAL!S2+4}) \]

Capex subsidies (CapSub) – subsidies provided on basis of the capital expenditure (such as ORET financing) is added to the cash flow here. The amounts are determined in the assumptions sheet.

\[ \text{Excel} \ (\text{row } 7): \text{Capex subsidies} = F\$75 \]

Operating cost (Opex) – the costs as determined in the previous calculations during the operational phase of the project.

\[ \text{Excel} \ (\text{row } 9): \text{Operating cost} = VLOOKUP(\$C9;\text{assumptions!B13:B16};\text{FINANCIAL!S2+4}) \]

Operating subsidies OpSub) – subsidies possibly provided by a government on operating expenses. This could also comprise other governmental provided income.

\[ \text{Excel} \ (\text{row } 10): \text{Operating subsidies} = F\$85 \]

Project Cashflow project company, no financing (PCF1) – the abovementioned cash inflows and outflows constitute this net cash flow, including grants and subsidies but without further financing cashflows. This cash flow will have to be divided amongst financiers.

\[ PCF1 = \text{OpIn} - \text{CapEx} + \text{CapSub} - \text{OpEx} + \text{OpSub} \]

\[ \text{Excel} \ (\text{row } 11): \text{Project Cashflow project company, no financing} = F\$5.5 - F\$6 + F\$7 - F\$8 + F\$9 + F\$10 \]

IRR moving (IRRPCF1) – calculating the internal rate of return of the project cash flow if year 1 to the year of presentation. This provides an image of the influence of the duration of the project on profitability.

\[ \text{Excel} \ (\text{row } 12): \text{IRR moving} = IRR(\$E11:F11) \]

Cumulative Project Cashflow (CumPCF1) – adding the cash flows each years shows the amount of liabilities which need to be taken up to be able to execute the project. This shows a large required financing during and just after construction which is gradually diminished during operation, to lead a positive cash flow at the end, however without financing cost.

\[ \text{Excel} \ (\text{row } 13): \text{Cumulative Project Cashflow} = F\$11 + E\$13 \]

Profit and Loss account -

Operating revenue (EBITDA) – represents the earnings before interest, taxes, depreciation and amortisation and is calculated from the initial project cash flow (PCF1) without the capital expenditure and possible subsidies. This is thus the operating cash flow, before financing.

\[ \text{EBITDA} = \text{PCF1} + \text{CapEx} - \text{CapSub} \]

\[ \text{Excel} \ (\text{row } 16): \text{Revenue} = IF(F\$11 > 0; F\$15 - F\$9 + F\$10; 0) \]

Depreciation (Depr) – the administrative processing of investment, spreading the (administrative) costs over several years (TDepr: depreciation period in years). This factor is not of influence for the cash flow, but is determining for the annual profit calculation and therefore the calculation (non-cash flow) and payment (cash flow) of dividends.
Depr = $Ass - \frac{AccDepr(t - TDepr)}{TDepr}$; $TstartUp <= TstartUp + Tdepr$

$TstartUp$ = construction period.

$Excel$ (row 17): depreciation (see assets) =IF($F$2<=$B$17;0;IF($F$40>=E$41;IF($F$40>=E$41+$F$2-$B$17>$C$17;($F$40-HLOOKUP($F$2-$B$17>$C$17;$F$2:$B$17-$C$17;$F$2:$BD$71:34))/$C$17;$F$40/$C$17);IF($F$2-$B$17>$C$17;($F$40-HLOOKUP($F$2-$B$17>$C$17;$F$2:$BD$71:34))/$C$17;$F$40-$E$41);0);0)

Amortisation (Amor) – the annual repayment of debt is called amortisation, determined in annually varying amounts due to the administrative and treasury benefits of annual equal payments of amortisation and interest together (so-called debt service). The latter decreases in time because of the diminishing amount of debt outstanding while amortising it.

$Tgrace$ = duration of grace period, in which interest is capitalised (directly added to debt) and no debt service is paid.

$TAmor$ = duration of debt service period.

$Amor = Ann - IntRate$; $Tgrace <= Tgrace + Tamor$

$Excel$ (row 18): amortisation (see debt) =IF($F$47>E$48;IF($F$2>$B$18;$D$18-$F$20*($F$47-E$48);0);IF($F$47-E$48>0;($F$47-E$48);0))

Annuity (Ann) - To calculate annual equal amounts of debt service, annuity of debt outstanding is calculated, using the following formula:

$Ann = \frac{IntAv}{1 - (1 + IntAv)^{-Tamor}}$

$Excel$ (cell D18): Annuity (cell D20) = $D$47*$($D$20/(1-(1+$D$20)^*$C$18))$

Operating profit (EBIT) – the earnings before interest and taxes.

$Excel$ (row 19): Operating profit =F$16-$F$17-$F$18

Interest rate average (IntAv) – the interest rate on average, for scenarios using an annually varying interest rate. This is required for annuity calculations, although the calculated and realised debt service will show some deviations due to this approximation.

$Excel$ (cell D19): interest rate average =IF($BS$149>0;VLOOKUP($C$20;assumptions($C$97:$BD$99;$F$2+3));0)

Interest (IntRate) – The interest rate is calculated on an annual basis. In most cases this rate will represent a single interest rate used by lenders or a syndicate of lenders. Variation of loans conditions is therefore not included. Three scenarios are available for evaluation.

Interest (Int) – the amount of interest to be paid, calculated by the interest rate times the amount of debt outstanding. The latter is determined by subtracting accumulated amortisation from the total amount of debt.

$Int = IntRate \cdot (Debt - AccAmor)$; $t>Tgrace$.

$Excel$ (row 21): interest =IF($C$21=1;IF($F$2>$B$18;$F$20*($F$47-E$48);0);0)

Taxable income (EBT) – EBIT minus the interest paid, for calculation of taxes.

$Excel$ (row 22): taxable income =F$19-$F$21

Corporate tax rate (TaxRate) – percentage of taxes on profit.

Taxes (Tax) – The rate of corporate taxes times the EBT. This yield a negative cash flow in the year after calculation (the year when the profit is made).

$Excel$ (cell D23): taxes (cash flow delay) =IF($F$22>0;IF($F$2<=E$23;$F$22*$B$23;IF(SUM($A$22:$E$22)>0;$F$22*$B$23;IF($F$22+SUM($A$22:$E$22))*$B$23);0));0)

Net earnings (NetE) – the resulting profit of operation is called net earnings.

$Excel$ (row 24): Net earnings =F$19-$F$21-$F$23
Retained earnings (RetE) – Besides appointing dividends to shareholders, a certain percentage (retention rate) of earning can be withheld to create an (administrative) reserve for future expenditure.

\[
\text{Excel (row 25): retained earnings } = \text{IF}($C$25=1; IF($F$24>0;$BS25*$F$24;0);0)
\]

Dividends (Div) – part of the net earnings are paid out to share holders as dividends. This percentage (pay out rate) is the adverse of the retention ratio. The cash flow incurred by dividend payments is occurs in the years after the profits are made. (cash flow delay)

\[
\text{Excel (row 26): dividends (cash flow delay) } = \text{IF}($C$26=1; IF($F$24>0;$BS26*$F$24;0);0)
\]

Check of debt service payments.

\[
\text{Excel (row 27): debt service check } = F21 + F18
\]

Interest capitalised (IntCap) – over the amount borrowed interest should be paid. During construction, often no revenues are available for payment of interest, so interest is capitalised. This means that the interest is plainly added to the debt outstanding, to be repaid at a later date. It is assumed that the expenditure for which capital is borrowed is spend gradually over the year, so the average of start and end of year is used.

\[
\text{IntCap} = \frac{[\text{Debt}(t-1) - \text{PCF1}]}{2}
\]

\[
\text{Excel (row 28): interest capitalised } = \text{IF}($C$47=1; IF($F$2<=-$B$18;$F$20*$E$47+(-$F$11)/2;0);0)
\]

Net Project Cashflow (PCF2)

\[
\text{PCF2} = [\text{Debt} - \text{Debt}(t-1)] - [\text{AccAmo} - \text{AccAmo}(t-1)] + [\text{Equ} - \text{Equ}(t-1)] + \text{PCF1} - \text{Div}(t-1) - \text{Tax}(t-1) - \text{Int} - \text{IntCap}
\]

\[
\text{Excel (row 29): Net Project Cashflow } = (F$47-E$47)-(F$48-E$48)+(F$49-E$49)+F$11-E$26-E$23-F$21-F$28
\]

IRR moving (IrrPCF2)

\[
\sum_{t=1}^{n} \frac{\text{PCF2}(i)}{[1 + \text{IrrPCF2}(t)]^t} = 0
\]

\[
\text{Excel (row 30): IRR moving } = \text{IF}($\text{AND}($E$29:F29)>0;Irr($E$29:F29)<0.5);Irr($E$29:F29);0)
\]

Cumulative Project Cashflow (CumPCF2)

\[
\text{Excel (row 31): Cumulative Project Cashflow } = F$29+E$31
\]

Financiers’ cash flows

\[
\text{Excel (row 35): Financiers cashflows } = F36+F37
\]

Project sponsors / Investors (SpoCF)

\[
\text{Excel (row 36): Project sponsors / Investors } = (F$48-E$49)-(F$47-E$47)+F$21+F$28
\]

Private loan financing Var payment (LenCF)

\[
\text{Excel (row 37): Private loan financing Var payment } = E$26-(F$49-E$49)
\]

BALANCE SHEET- assets

Fixed assets (Ass)

\[
\text{Excel (row 40): Fixed assets } = \text{IF}($C$40=1;F6+F8+E40;0)
\]

accumulated depreciation (AccDepr) (less)

\[
\text{Excel (row 41): accumulated depreciation (less) } = F17
\]

closing post (Clos)

\[
\text{Excel (row 42): closing post } = F$53-F$40+F$41
\]
Total Assets (TotAss)

Excel (row 43): Total Assets =F40+F41+F42

BALANCE SHEET - liabilities

Long term debt (Debt)

Excel (row 47): Long term debt =IF($C$47=1;IF($F$2<=$B$18;IF($F$11<0;(-F$11)*$B$47+F$20*(E$47+(-F$11)/2)+E$47;(1+F$20)*E$47);E$47);0)

accumulated amortization (AccAmor) (less)

Excel (row 48): accumulated amortization (less) =SUM($F$18:F$18)

equity (Eq)

Excel (row 49): equity =IF($C$49=1;IF($F$11<0;(-F$11)*$B$49+E$49;E$49);0)

Excel (row 50): book value =IF($C$50=1;($F$49+E$50)*(1+$B$50)-F$49;0)

Total Liabilities (TotLiab)

Excel (row 53): Total Liabilities =F46+F47+F48+F49+F51-F52

(check)

Excel (row 54): balance check =F53-F43

EQUITY FINANCING

Project sponsors / Investors (SpoCF)

Excel (row 117): Project sponsors / Investors =E$49-F$49+E$26

Project sponsor 1 (Spo1CF1)

Excel (row 118): Sponsor 1 =IF($B118<>0;-$B$118/$B$117*F$117;0)

overhead and taxes (SpoTax1)

Excel (row 119): overhead and taxes =IF($F$117>0;$F$118`;($C$119);F$118*($B$119))

net cash flow (Spo1CF2)

Excel (row 120): net cash flow =F118+F119

cumulative net cash flow (Spo1CumCF2)

Excel (row 121): cumulative net cash flow =E121+F120

IRR (IrrSpo1CF2)

Excel (row 122): IRR =IRR($F$120:F$120)

discounted cashflow (Spo1DCF2)

Excel (row 123): discounted cashflow =F120/(1+$C123)^$F$2

cumulative discounted cashflow (Spo1CumDCF2)

Excel (row 124): cumulative discounted cashflow =E124+F123

Project sponsor 2 (idem)

Excel: Sponsor 2 =IF($B126<>0;-$B126/$B$117*F$117;0)

Excel: overhead and taxes =IF($F$117>0;F126*(-$C127);F126*($B127))

Excel: net cash flow =F126+F127

Excel: cumulative net cash flow =E129+F128
LOAN (BOND) FINANCING

Private loan financing (LenCF)

Excel (row 149): Private loan financing Var payment = ($F$48 - $E$48) - ($F$47 - $E$47) + $F$21 + $F$28

Lender 1 (Len1CF1)

Excel (row 150): Lender 1 = IF($B150 <= 0; $B150/$B$149*$F$149; 0)

overhead and taxes Len1Tax)

Excel (row 151): overhead and taxes = IF($F$149 < 0; $F$150 * ($B151); 0) - $C$151*$B150/$B$149*($F$21 + $F$28)

net cash flow (Len1CF2)

Excel (row 152): net cash flow = $F$150 + $F$151

cumulative net cash flow (Len1CumCF2)

Excel (row 153): cumulative net cash flow = $E$153 + $F$152

IRR (Len1IrrCF2)

Excel (row 154): IRR = IRR($F$152:$F$152)

discounted cashflow (Len1DCF2)

Excel (row 155): discounted cashflow = $F$152/(1+$C$155)^$F$2

cumulative discounted cash flow (Len1CumDCF2)

Excel (row 156): cumulative discounted cash flow = $E$156 + $F$155

Lender 2 (idem)

Excel: Lender 2 = IF($B158 <= 0; $B158/$B$149*$F$149; 0)

Excel: overhead and taxes = IF($F$149 < 0; $F$158 * ($B159); 0) - $C$159*$B158/$B$149*($F$21 + $F$28)

Excel: net cash flow = $F$158 + $F$159

Excel: cumulative net cash flow = $E$161 + $F$160

Excel: IRR = IRR($F$160:$F$160)

Excel: discounted cashflow = $F$160/(1+$C$163)^$F$2

Excel: cumulative discounted cash flow = $E$164 + $F$163

Loan check = $F$175 + $F$170 + $F$160 + $F$152 + $F$145 + $F$140 + $B$46*$F$46

=$B$135*($F$6) + $F$18 + $F$21

Ratios

Net Worth

Excel: Net Worth = $F$43 - $F$47 - $F$45

Solvency

Excel: Solvency = IF($F$40 <= 0; $F$58/$F$40; '0')
Debt service coverage ratio

\[ Excel: \text{Debt service coverage ratio} = \text{IF}((F$21+F$18)>0.01; F$16/(F$21+F$18); 0) \]

Debt ratio

\[ \text{Debt ratio} \]

\[ \text{debt \_ratio} = \frac{\text{total \_debt}}{\text{total \_assets}} \]

Equation 11-1

\[ Excel: \text{Debt ratio} = \text{IF}(F$40<>0; F$46+F$47)/F$40; "(F$22+F$23)=0") \]

Debt to equity ratio

\[ \text{Debt to equity ratio} \]

\[ \text{debt \_to \_equity \_ratio} = \frac{\text{total \_debt}}{\text{total \_equity}} \]

Equation 11-2

\[ Excel: \text{Debt to equity ratio} = \text{IF}(C60<>0; \text{IF}(F49<>0; F47/F49; "F30=0"); "") \]

Interest coverage

\[ \text{Interest coverage} \]

\[ \text{Interest \_coverage} = \frac{\text{EBIT}}{\text{interest \_expense}} \]

Equation 11-3

\[ Excel: \text{Interest coverage} = \text{IF}(F$21<>0; F$19/F$21; "F15=0") \]

Net profit margin

\[ \text{Net profit margin} \]

\[ \text{net \_profit} = \frac{\text{net \_income}}{\text{operating \_revenue}} \]

Equation 11-4

\[ Excel: \text{Net profit margin} = \text{IF}(F$5=F$24/F$5; "F5=0") \]

Gross profit margin

\[ \text{Gross profit margin} \]

Gross margin measures the profitability considering only variable costs and is a measure of the percentage of revenue that goes to fixed costs and profit.

\[ \text{gross \_profit} = \frac{\text{EBIT}}{\text{operating \_revenue}} \]

Equation 11-5

\[ Excel: \text{Gross profit margin} = \text{IF}(F$5<>0; F$19/F$5; "F5=0") \]

Net return on assets

\[ \text{Net return on assets} \]

ROA is a measure of the return on money provided by both owners and creditors, and is a measure of how efficiently all resources are managed.
Foreign financing for coastal infrastructure in developing countries  

\[
\text{net \_ return \_ on \_ assets} = \frac{\text{net \_ income}}{\text{average \_ total \_ assets}}
\]

Equation 11-6

\[
\text{ROA} = \frac{\text{profit}}{\text{asset \_ turnover}}
\]

Equation 11-7

Excel: Net return on assets =IF(F$40<>0;0.2*F$24/F$40;"(F$22+F$23)=0")

Equity multiplier

Equity multiplier

\[
\text{equity \_ multiplier} = \frac{\text{total \_ assets}}{\text{total \_ equity}}
\]

Equation 11-8

\[
\text{equity \_ multiplier} = \frac{\text{average \_ total \_ assets}}{\text{average \_ equity}}
\]

Equation 11-9

Excel: Equity multiplier =IF($C85<>0;IF(($F$49+F$50)<=0;F$40/($F$49+F$50);"(F$30+F$31)=0");")

ROE (net income / average stockholders equity)

ROE (net income / average stockholders equity)

\[
\text{ROE} = \frac{\text{net \_ income}}{\text{average \_ equity}}
\]

Equation 11-10

\[
\text{ROE} = \text{profit \_ turnover} \times \text{equity \_ multiplier}
\]

Equation 11-11

Excel: ROE (net income / average stockholders equity) =IF($C66<>0;IF($F$49<>0;F$24/($F$49+F$50);"F30=0");")

Sustainable growth rate

Sustainable growth rate

\[
\text{future \_ growth} = \text{ROE} \times \text{retention \_ ratio}
\]

Equation 11-12

Excel: Sustainable growth rate =IF($C67<>0;F$66*$B$25;"")

market value

Excel: market value =IF($C68<>0;F$49+F$50;"")

P/E ratio

Excel: P/E ratio =IF($C69<>0;IF($F$26<>0;F$68/$F$26;"H19=0");")

dividend yield

Excel: dividend yield =IF($C70<>0;IF($F$49<>0;F$26/$F$49;"F30=0");")

Market to book value

Excel: Market to book value =IF($C71<>0;IF($F$56<>0;F$68/$F$56;"F37=0");")

Return on Equity (ROE) = defined as Net Income / Equity
Where the equity value is the shareholder’s equity at the end of the period in which the income was earned. ROE is a measure of the return on money provided by the firm’s owners.

ROE can be calculated indirectly as:

\[
\text{ROE} = \frac{\text{Net Income}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity}}
\]

ROE also can be calculated using DuPont analysis:

\[
\text{ROE} = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity}}
\]

This states that ROE is determined by multiplication of three levers:

\[
\text{ROE} = \frac{\text{net profit margin}}{\text{total asset turnover}} \times \text{leverage}
\]

These levers are readily viewed on the company’s financial statements. While ROE’s may be similar among firms, the levers may differ significantly.

**Market value**

**Market value ratios**

Book value = Stockholder equity

*Balance sheet item that includes the book value of ownership in the corporation. It includes capital stock, paid-in surplus, and retained earnings.*

\[
\text{market value} = \text{number of shares} \times \text{share price}
\]

**Equation 11-13**

\[
\text{P/E ratio} = \frac{\text{share price}}{\text{earnings per share}}
\]

**Equation 11-14**

\[
\text{Dividend yield} = \frac{\text{dividend per share}}{\text{share price}}
\]

**Equation 11-15**

**Market to book value**

Market to book value

\[
\text{Market to book value} = \frac{\text{market value}}{\text{book value}}
\]

**Equation 11-16**

Interest payment plus repayments of principal to creditors (retirement of debt).

Debt service coverage

The ratio of cash flow available to the borrower to the annual interest and principal payments on a loan or other debt.

Debt-service coverage ratio

Earnings before interest and income taxes, divided by interest expense plus the quantity of principal repayments divided by one minus the tax rate.

Debt service parity approach

Payment alternatives that provide the firm with the exact same schedule of after-tax debt payments (including both interest and principal).
Appendix XIV: Cartagena stabilised tidal inlet

PROJECT AREA AND PROBLEM DESCRIPTION

Colombia

Colombia was one of the three countries that emerged from the collapse of Gran Colombia in 1830 (the others being Ecuador and Venezuela). A 40-year insurgent campaign to overthrow the Colombian Government escalated during the 1990s, under girded in part by funds from the drug trade. Although the violence is deadly and large swaths of the countryside are under guerrilla influence, the movement lacks the military strength or popular support necessary to overthrow the government. An anti-insurgent army of paramilitaries has grown to be several thousand strong in recent years, challenging the insurgents for control of territory and illicit industries such as the drug trade and the government's ability to exert its dominion over rural areas. While Bogotá steps up efforts to reassert government control throughout the country, neighbouring countries worry about the violence spilling over their borders.

Colombia’s economy suffers from weak domestic and foreign demand, austere government budgets, and serious internal armed conflict. Other economic problems facing the new president Uribe range from reforming the pension system to reducing high unemployment. Two of Colombia's leading exports, oil and coffee, face an uncertain future; new exploration is needed to offset declining oil production, while coffee harvests and prices are depressed. Colombian business leaders are calling for greater progress in solving the conflict with insurgent groups. On the positive side, several international financial institutions have praised the economic reforms introduced by President Uribe and have pledged enough funding to cover Colombia's debt servicing costs in 2003.

Table 11-1 Colombian GDP volatility

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COLOMBIA</td>
<td>Current GDP (US$ billions)</td>
<td>70.43</td>
<td>23.13</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>Annual change</td>
<td>5.14%</td>
<td>14.5%</td>
<td>2.83</td>
</tr>
</tbody>
</table>

Cartagena de Indias

The city of Cartagena de Indias in Colombia is almost surrounded by water (see Figure 7-1). In the west there is the Caribbean Sea, in the south the city lies against the Bahía de Cartagena (Cartagena Bay) and in the northwest, a lagoon is found: the Ciéñaga de la Virgen (Ciéñaga). The presence of water and the fact that Cartagena is one of UNESCO’s cultural heritage sites makes the city an attraction for tourism, especially during the summer.

The number of inhabitants in the city has been growing fast (doubled in twenty years) to approximately 750,000 (1999). The city's necessary facilities like sewerage and drink water supplies have had much difficulty keeping pace, harming the environment with the most effect on the poorer population.

For several decades, the water quality of the Ciéñaga de la Virgen has been severely deteriorating due to the wastewater discharge, which has had an acute influence on the health of the population. The pollution was considered the main cause of sickness and death in the poorer communities that live along the southern shore of the lagoon and the canals that intersect the city. In addition, fishing in the lagoon had all but disappeared, with fish mortality incidents being an annually reoccurring event. Furthermore, the terrible odour hampered the development of tourism.
Ciénaga de la Virgen (depth average 1.10 m, area 22.5 km², see Figure 7-1) is separated from the sea by a small strip of land, only continuously open for two months per year (August and September, rainy season and low waves) and closed during February and March.

The strip of land called Boquilla between the lagoon and the ocean is used for tourism and urban development, since the construction of the road from Cartagena to Barranquilla. East shore: mangroves and swamps separating the lagoon from an agricultural zone. South: urban expansion of Cartagena coincides with the lagoon boundaries, former flooding swamps. Southwest: international airport Rafael Nunez

The lagoon caught 60 % of the disposal and sewerage water, from the city as well as the accompanying industry, together making up to some 150,000 m³ of disposal fluids. Part of this disposal water flowed though the streets of the poorer areas. The lake and open sewers became a serious threat to the health of the city and its inhabitants. Effects on health of the poorer part of the population of Cartagena are significant, striking 300,000 inhabitants.

The Colombian Department of Planning requested assistance from the Netherlands in developing an environmental action plan for Cartagena to address this pollution issue. At the request of the Netherlands government, Royal Haskoning, a Dutch consulting firm, prepared a plan of action for the region. Subsequently Royal Haskoning designed a system to restore the self-cleansing capacity of the lagoon. The design for a stabilized tidal inlet uses the tidal effect to allow clean seawater from the Caribbean Sea to flow through the lagoon.

The project was made up out of a tidal inlet and canal, to refresh the water in the Ciénaga Lagoon with the work of the daily tide and currents. To improve the refreshing strength of the solution chosen, the lagoon was almost split in two by a sheet-pile dam. Sluices in the tidal inlet arranged that with an incoming tide (alongside only one side of the dam) fresh water would flow in, and along the other side the most contaminated water would flow out alongside the other side of the dam, through the inlet sluice again.

The project further consisted of measures to prevent sediment rich long-shore current to congest the canal and inlet and road crossings for the canal.

The stabilized tidal inlet restored the water quality in the lagoon thanks to a permanent connection between the lagoon and the Caribbean Sea. Via this connection, an intermittent flow of water through the lagoon occurs - in with high tide and out with low tide - restoring the self-cleansing capacity of the lagoon.

**History**

September 1997. Tender written by Haskoning BV, on behalf of Ministry of Transport, to six Dutch contractors. Royal Haskoning was also responsible for the design of the stabilized tidal inlet, the tender and the supervision of Works.

December 1997 contract signed. And becomes effective once ORET financing has been agreed upon. Construction was awarded to Boskalis International.

November 2000: the tidal inlet sluice was taken into operation. Within three weeks, the required water quality was reached in the lagoon.

---

M.Sc. Thesis Civil Engineering: LXIV  TU Delft / Boskalis
The project started operations in December 2000. During construction and the twelve months thereafter, environmental monitoring took place. The results confirmed compliance with the water quality design criteria. Within the first week the water appeared much less polluted in nearly all of the 23 measuring points in the lagoon and surrounding canals. An unexpected stroke of good fortune was the return of a large number of fish, which has improved not only the health but also the economic situation of the inhabitants.

TECHNICAL DESCRIPTION OF THE PROJECT

Objective of the project: recovery of the self-regenerating capacity of the lagoon.

Major technical challenges:

- tidal inlet stability;
- regeneration maximisation;
- Water quality to be established. Water quality standards set to Dutch measure because of absence of Colombian water quality standards.

According to Royal Haskoning advice, a tidal inlet was designed; enabling inflow during high water and outflow during low water, creating a circulation in the lagoon, guaranteed by watershed from the in- and outflow of the tidal inlet to the centre of the lagoon.

Morphology

To prevent siltation of the inlet, two breakwaters were designed and constructed, preventing sediment accretion in the inlet. The two sea breakwaters, 200 and 250 m long, are stretching to a depth of 3 m. L-shaped to stop accretion in inlet. Construction was done with stones of 1 to 25 kg with a floating crane. The core placed base to trunk, using special depot for stones and the top layer placed from trunk to base, land based.

The littoral transport of sediment, caused by the wave climate provided mostly waves of northern origin. The Tidal fluctuations are very low and lie around 0,25 meters on average (maximum of about 0,50 m). The dominant waves cause a long shore transport of sediment between 20.000 and 30.000 m³ a year on a long term average.

Sand trap was build to collect abundant sediment, to be dredged only once every 8 years. Sand trap: capacity 85.000 m³, to be dredged at 50.000 m³. Siltation in the basin varied much after construction, leading to unequal filling of the trap. Because sand is valuable in Cartagena, a contractor could be found willing to remove 1200 m³ with backhoe for free. Recurrence of this measure would be sufficient to maintain the silt trap for 8 years.

South of the breakwaters, erosion was predicted and therefore three new groins were constructed and a fourth existing groin extended. Also 200.000 m³ of sand was nourished at this point of the coast.

Hurricane Lenny caused unexpected whether conditions and waves during construction, and damaged coast severely. The sedimentation and erosion process was accelerated due to this because the hurricane flattened the cross-shore profile, enlarging the breaker zone.

UNIBEST was used for prediction of coastline development after construction of the tidal inlet and associated breakwaters. To see predicted and observed coastline changes (measured at MSL – 1 m, considered reasonably representative of the coastal advance) at 150 meters north of the breakwaters, expected to be about 200 m.

The effect of hurricane Lenny can be seen in Figure 11-2, were three depth levels are shown. The effect of seasonal high and low waves can clearly be observed in the variation of the coastal slope, whilst the coast as a total is growing.
**Circulation in the lagoon**

The inlet channel (see Figure 11-3) has a length of 580 m and a width of 60 m. The depth is 3 m compared to Mean Sea Level (MSL). The location of the inlet is chosen especially close to the pollution sources, at the south of the lagoon, to ensure circulation in that part.

**Construction of the inlet**

Construction of the inlet is done hydraulic excavators and transport by truck to a depot at a temporary berth for barge loading. Simultaneously, geo-textile and rock will be placed for bottom and slope protection. Execution: dry channel excavation with 16 m deep wells, lowering the water level 3 meters for 9 months.

Cartagena has an anomalous semi diurnal tide, where the floods tend to last 1.5 times the period of ebb. Therefore 6 inlet and 4 outlet sluices are designed. Inlet and discharge sluices, 10 locks, 6 entrances, 4 exits, two wooden doors (3.3 x 4.2 m) per lock, automatic opening and closing by tidal differences. Complex 115 meters long. Locks are constructed in the open air as the excavated channel is pumped dry.

A guiding dam was designed and built, with a length of 3300 meters from the sluice complex to the centre of the lagoon. At first, an earth construction was considered but finally, a sheet pile wall was constructed, because of the low bearing capacity of the soil.

In Chambacu lake, a separate tidal inlet was constructed, existing of a separate lock with two doors of 3.3 by 4.2 m. Opening and closing would be automatically done by the water level difference between the Ciénaga lagoon and the Bahia Interna de Cartagena (Cartagena Bay). The lock width is 12 m. It is connected by a causeway of 120 m to the Chambacu Lake.

Improvement of the Juan Angola channel, the connection between the lagoon and the lock in Chambacu, was done by dredging. Design width was 15 meters and the length to be dredged 1400 m. Execution was done with a floating crane excavator, which loaded trucks for transport to a special deposition zone, from where barges could be loaded.
For sufficient refreshing of the lagoon, about 30 m³/s was required, as calculated by Mike 21, a Danish bi dimensional hydraulic model. Because the sewer plants to be build under the sanitation plan were some years away, in calculations it was assumed that new sewer treatments plants were not installed until 2008. Until then, sewerage would be disposed in the lagoon.

Modelling the designed inlet and lagoon with and without an open natural inlet (at Boquilla), gave average flow of 32 to 34 m³/s.

Other construction aspects

A restriction to equipment was applicable due to possible obstruction of flight routes of Cartagena airport. Radio contact between control tower of the airport and the contractor was therefore installed. Booms were lowered when planes landed or departed and equipment sizes were adjusted. First only dredging at night because the height of the spuds of the larger Cutter Suction Dredge (CSD), later a smaller CSD was employed, unfortunately leading to double handling of dredged material.

A pre-stressed concrete bridge was constructed to connect Cartagena de Indias with Barranquilla. The bridge has a free span of 90 m, a width 11 m and is constructed on columns with a length of 30 m. The construction was executed in dry with temporary facilities for construction of columns, after which the pre-stressed elements could be placed.

Unexpectedly, many fishermen used the Caño Juan Angola, for which a lifting derrick was installed to transport small fishing boats over the sluice when closed.

Construction of an information and maintenance centre, also housing education facilities, administration, exhibition and a laboratory.

The Monitoring of water quality and morphology. Before, during and after construction, and the need for a wastewater treatment plant. The Environmental monitoring takes place monthly at 30 locations in and around the Ciénaga lagoon. See also the paragraph about environmental assessment.

**FINANCIAL DATA**

Financial feasibility

<table>
<thead>
<tr>
<th>Financial assumptions by NEI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate Pesos / DFL</td>
<td>544.34</td>
</tr>
<tr>
<td>Exchange rate DFL / US$</td>
<td>2.02</td>
</tr>
<tr>
<td>Exchange rate Pesos / US$</td>
<td>1.099.56</td>
</tr>
<tr>
<td>Annual inflation rate</td>
<td>25 %</td>
</tr>
<tr>
<td>Official local interest rate</td>
<td>33 %</td>
</tr>
<tr>
<td>Real interest rate</td>
<td>8 %</td>
</tr>
<tr>
<td>Foreign interest rate</td>
<td>6.75 %</td>
</tr>
<tr>
<td>Commercial interest reference rate (CIRR)</td>
<td>4.10 %</td>
</tr>
</tbody>
</table>

- Calculating Financial IRR
- Grant is excluded
- All loans at real interest rate (no loans)
- Working capital is taken up as revenue
- Period of analysis is economic lifetime of project
- CIRR is threshold
- Real interest rate 6.75 %, repayment in 10 years

Lifetime 15 years
Recipients of payments

Means and budget:

- Value transaction: NLG 45,303,000
- ORET: NLG 20,386,000 (45 %)
- Ministry of Transport of the Republic of Colombia will pay remaining 55 %
- Materials price increase could raise costs by 2,265,000 NLG. ORET would then become 1,019,000 NLG.
- A year's delay due to contractual matters and donation agreements. Change in construction time from 13 to 18 months.

Schedule

- 30 % down payment in April 1998 (ORET)
- After: 12 times US$ 2,642,000 a month (of which US$ 566,000 ORET)
- At least 30 % of local works must be done by local contractors

FINANCING OF THE STABILISED TIDAL INLET PROJECT

Organisations involved

The amount of money that Boskalis charged for the project had to be specified for the FMO, in compliance with ORET conditions. In Table 11-3, the amount paid to Boskalis is specified to the eventually receiving parties.

<table>
<thead>
<tr>
<th>Contract value</th>
<th>US$ 20.5 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product provided by Boskalis</td>
<td>43.5 %</td>
</tr>
<tr>
<td>Contracted out by Boskalis</td>
<td>16.4 %</td>
</tr>
<tr>
<td>Insurance and freight</td>
<td>5.7 %</td>
</tr>
<tr>
<td>Supplied from outside the Netherlands</td>
<td>21.6 %</td>
</tr>
<tr>
<td>Local activities (including commission)</td>
<td>12.8 %</td>
</tr>
<tr>
<td>The commission fee</td>
<td>Less than 5 %</td>
</tr>
</tbody>
</table>
In the financing room for 5% contingencies equalling NLG 47,568 million was agreed upon. The work provides 80 person years of labour in the Netherlands, of which 60 at supplier and 115 person years locally.

FEASIBILITY STUDIES

See appendix XV for the complete feasibility studies.

The FMO disburses US$ 10,1 million in the first year, while the Government of Colombia (see Figure 11-5and Figure 7-3) pays the rest of the US$ 22,4 million of investments.

![Figure 11-5: cash flows before financing](image)

![Figure 11-6: Governmental cash flows](image)

The internal rate of return cannot be calculated for the project cash flows as well as the government's cash flow, because the sum of all cash flows is negative.
Economic viability

Also indirect effects in other sectors of the economy or the environment.

Perspective of whole national economy instead of only a few economic agents.

CBA:

All taxed, subsidies and duties paid and received are excluded

All prices are corrected for distortions (Standard Conversion Factor)

Wherever possible, external cost are internalised by using monetarised cost and benefits

Period is 40 years

<table>
<thead>
<tr>
<th>Year</th>
<th>Benefits</th>
<th>Capital expenditure</th>
<th>Operating cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.000</td>
<td>22,427</td>
<td>0.000</td>
<td>22,427</td>
</tr>
<tr>
<td>1</td>
<td>9.167</td>
<td>0.000</td>
<td>1,655</td>
<td>1.655</td>
</tr>
<tr>
<td>2</td>
<td>1.262</td>
<td>0.000</td>
<td>0.280</td>
<td>0.280</td>
</tr>
<tr>
<td>3-40</td>
<td>2.324</td>
<td>0.000</td>
<td>2.604</td>
<td>2.604</td>
</tr>
</tbody>
</table>

E-IRR = 10.96% thus economically viable.

Other benefits: increase of land value, tourism, fisheries, avoided cost of sick people not able to work.

Economical ‘Cash Flow’

The economic cash flow is constituted of the previously mentioned costs and benefits. This results in a positive view on viability, because the sum of cash flows is positive resulting in an IRR of 11% (see Figure 7-2).

Figure 11-7: project economic cash flow

Environmental impact

Haskoning and local engineering consultant Carinsa. EIA commission in NL judged acquired information right.

Environmental permit: provided by Cardique (local) and MERC in Holland.

Turbidity due to dredging and construction. Erosion at the beach.

Minor changes in sea water quality and major changes in lagoon water quality (see Figure 11-8).
Financial sustainability

In case a project does not generate sufficient revenues, financial sustainability is judged by financial guarantees provided by the client.

Cash flows financial sustainability

The lenders cash flow looks less promising when a lesser amount is financed (see Figure 11-9). This is due to the fact that earlier payments have larger weight in discounting. If a financier will finance under these conditions is even more disputable.

The government's cash flow (Figure 11-10) has improved much by the ORET grant, but still leaves a large amount uncovered. The government must find benefits, financial or economical to cover these investments, to make the project viable.
Figure 11-10: government cash flow including ORET financing

Should the government not being able to finance the losses out of budget, the following cash flow (Figure 11-11) becomes applicable. Here the accumulated cash balance is borrowed at 8% interest rate at local commercial lenders.

Figure 11-11: continuous financed net project cash flow with ORET

In this case the project would never be viable. Guarantees of the Government of Colombia, Ministry of transport, should provide sufficient security, together with the NCM insurance.

Commercial viability

Non commercial viability is a demand of ORET/MILIEV regulations, requiring that the project is not possible commercially financed. This is checked by projecting the cash flows for the project financed on market terms.

Definition of commercially non viable: project produces insufficient cash flow to service operating cost and service capital employed. This involves a CBA, excluding depreciation, including all other relevant marginal costs and benefits. It is assumed that the repayment takes place over 10 years.

Foreign commercial loans are assumed to have an interest rate equal to the commercial interest reference rate (CIRR). Domestic loans are priced at prevailing commercial interest rate. (In case of not well-functioning debt market, the local interest rate may be used.)
Risk margin developing countries is 2.5 % equal to inflation in the Netherlands. CIRR 6.5 % (in the Netherlands, based on government bonds with maturity longer than 8.5 years).

All calculations are in constant prices and assume that the difference between domestic and foreign inflation is completely offset by exchange rate adjustments (see chapter project financing)

This practise was however, not accepted by the OECD, suggesting that a risk margin for lending to developing countries must be adopted, being a CIRR of 4.1

Two tests:
- Accumulated cash flow for 10 years (greater than zero) ACCF10
- IRR method, commercial IRR should exceed the cut-off rate (CIRR)

Sensitivity: rising prices to 400 US$ per m² resulting in a price of US$ 133 m³ a positive cash flow can be realised. Not realistic. (Present 150)

Commercial cash flows

Table 11-5: financial feasibility cash flows (millions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>sum($)</th>
<th>years</th>
<th>0</th>
<th>1</th>
<th>2 to 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>9,17</td>
<td>0,000</td>
<td>9,167</td>
<td>0,000</td>
<td></td>
</tr>
<tr>
<td>Capital expenditure</td>
<td>-22,43</td>
<td>-22,427</td>
<td>0,000</td>
<td>0,000</td>
<td></td>
</tr>
<tr>
<td>Operating cost</td>
<td>-12,58</td>
<td>0,000</td>
<td>-1,655</td>
<td>-0,280</td>
<td></td>
</tr>
<tr>
<td>Gross cash flow</td>
<td>-17,44</td>
<td>-22,427</td>
<td>7,585,12</td>
<td>-0,28</td>
<td></td>
</tr>
</tbody>
</table>

Accumulated cash flow is US$ 17,44 million. In 10 years

The cash flows based on this scenario, are divided in a gross lender cash flow, for the foreign commercial loan provider (). Secondly, the project cash flow for the government is shown, taking up all remaining costs and benefits.

![Net project cash flow for commercial lender](image)

**Figure 11-12: foreign commercial lender cash flow**

The interest rate assumed by the NEI is quite low, and it is disputable if a foreign commercial bank would loan against these conditions, resulting in such a low IRR of less than 5 %, but sufficient compared to the CIRR of 4.1 %.
Figure 11-13: government cash flow when financed with commercial foreign debt

The government's cash flow results in a negative total result.
Appendix XV: Mozambique investments statement

An investment climate statement by the Government of Mozambique

INVESTMENT CLIMATE STATEMENT

Mozambique has emerged from its conflict-torn past to become one of the most dynamic economies in Sub-Saharan African. In the past, political risk, corruption, bureaucratic red tape, dilapidated infrastructure, and the relatively small size of the market served as strong deterrents to foreign investment. While these issues have not been entirely resolved, they have improved markedly. In particular, the GRM’s policy of granting management concessions and privatizing part of their transportation network is paying dividends in creating a more trade friendly environment. The donor community has also been involved in improving the country’s infrastructure with USAID taking the lead on road, bridge, and rail line rehabilitation and construction. Even though there are still areas for improvement streamlining the bureaucratic process for bringing in new investment, the GRM has initiated the types of policies that will foster continued success in attracting investment.

OPENNESS TO FOREIGN INVESTMENT

Mozambique is eager to encourage foreign direct investment. CPI, the government’s Investment Promotion Center, has been active in bringing investors into Mozambique and should be a potential investor’s primary entrée with the government. It is particularly interested in increasing investment in the center and north of the country, to combat large regional differences in development.

Investment Promotion Center (CPI)
Mahomed Rafique Jusob, Director
Rua da Imprensa, 332 (Ground Floor)
Caixa Postal 4635, Maputo
Tel: (258) (1) 42-25-30, 42-25-25
Fax: (258) (1) 42-26-04
Internet: http://www.mozbusiness.gov.mz, or www.cpi.co.mz

Foreign investment in Mozambique is governed under the Law on Investment, No. 3/93 of June 24, 1993. Additional amendments were passed in Decree No. 12/93 on July 21, 1993, and Decree 37/95, on August 8, 1995. The law generally does not make distinctions based on investor origin, and generally does not limit foreign ownership or control of companies. Lengthy registration procedures can be problematic for any investor, national or foreign. Working with a local consulting firm or partner familiar with the requirements will facilitate the registration process. Foreign investors have participated in Mozambique’s privatization program without impediment. To date, the program has been transparent with open and competitive tendering procedures in which both foreign and domestic investors have been welcome to participate. Remaining parastatals are in strategic public utilities, making their privatization more politically sensitive. While the government has indicated an intention to take on strategic partners for most of these entities, progress has been slow.

All foreign and domestic investment must be approved. CPI handles the process for foreign investments. The investment approval process is automatic within 10 days, if no objections are voiced by the relevant ministries; the provincial governor for investments under $100,000; or the Minister of Planning and Finance for investments between $100,000 and $100 million. The Council of Ministers must review investments over $100 million and those involving large tracts of land (5000 hectares for agriculture, 10,000 hectares for livestock or forestry projects). The Council has 17 working days to voice an objection before approval becomes automatic. The government has not used screening mechanisms to limit investment or protect domestic industry.
CONVERSION AND TRANSFER POLICIES

Access to foreign exchange was greatly liberalized by the passage of a new Exchange Control Regulation Law, 3/96, promulgated on January 4, 1996. Foreign exchange retention accounts are permitted for 100 percent of foreign exchange earnings without formal justification. These may be used to purchase required imports. Investment registration and repatriation application procedures must be followed to repay foreign loans, and for the repatriation of invested capital, profits, and dividends, in amounts greater than $5000. Application procedures include the presentation of audited accounts.

Investment laws guarantee foreign investors the right to remit loan repayments, dividends, profits, and invested capital abroad. Investment registration and repatriation procedures must be followed for amounts greater than $5000. Procedures include the presentation of audited accounts, and registration through the Investment Promotion Center. A repatriation certificate is then issued from the Central Bank. Debt servicing also requires a letter from the Central Bank indicating bank approval at the time of the loan. Changes in regulations now allow for 100 percent repatriation of profits, and the full retention of earned foreign exchange in local accounts. Delays beyond those typical for administrative processing in a developing country are uncommon.

EXPROPRIATION AND COMPENSATION

Property was nationalized throughout Mozambique in 1975 following independence. After Mozambique's turn away from socialism in the 1980s, citizens had a period of time to reclaim personal property, such as their family homes. The government as part of its privatization efforts usually sold commercial property. All but a handful of religious properties nationalized during the revolution have been returned; negotiations are ongoing in this area. There have been no significant cases of nationalization since the new constitution in 1990. According to Mozambican law, "When deemed absolutely necessary for weighty reasons of national interest or public health and order, the nationalization or expropriation of goods and rights comprised...shall (result in the owner being) entitled to just and equitable compensation."

Dispute Settlement

The current commercial code in Mozambique dates from the colonial Portuguese code of 1888, and does not provide an effective basis for modern commerce or resolution of commercial disputes. A much needed reform of the code is in process, but progress has been slow.

The judicial system in Mozambique is not effective in resolving commercial disputes. Most disputes among Mozambican parties are settled privately or go unresolved. The business community is still so small that a damaged reputation from a commercial dispute or accusation of illegal activity can seriously damage a business. In February 1999, the Assembly legally recognized alternative dispute resolution (ADR) and an ADR facility is now functioning under the auspices of the Confederation of Economic Associations (CTA). At present, this facility only offers arbitration for complaints between companies and does not deal directly with labor issues. For disputes between international and domestic companies, the law closely follows the UNCITRAL, the United Nations Commission of International Trade Law model. For domestic arbitration, the law is formulated to cover potentially a wide range of disputes, including non-commercial ones. Mozambique acceded in mid-1998 to the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards.

PERFORMANCE REQUIREMENTS/INCENTIVES

Mozambique is generally in compliance with WTO TRIMS obligations. To encourage direct foreign investment, a variety of tax incentives are available. They vary according to the region of the country and the nature of the investment concerned, but often include a 50 to 80 percent reduction in the industrial contribution and supplemental taxes. Customs exemptions are possible for the importation of capital equipment and raw materials. To qualify, a minimum investment of $50,000 and pre-approval from the Investment Promotion Center are required.

The government grants special fiscal, labor and immigration arrangements for companies operating in a designated "Special Economic Zone." Currently, the only such zone is in the Zambezi River Valley, a swath covering Tete Province, the northern regions of Sofala and Manica Provinces, and the central and southern regions of Zambezia Province. Goods entering the Special Economic Zone are exempt from customs duties and fiscal charges.
Specific performance requirements are built into mining concessions and management contracts and sometimes into the sale contracts for privatized entities. Investments involving partnerships with the government usually incorporate milestones that must be met for the investor to continue with the project.

Visa and work permit requirements in Mozambique are lengthy and bureaucratic. The employment of foreigners requires the approval of the Ministry of Labor. Once the Ministry approves the application, a “DIRE,” a work permit and identification card, is issued. This process can be lengthy; representation by a local lawyer, consulting firm, or individual familiar with the process will help facilitate obtaining a work permit.

RIGHT TO PRIVATE OWNERSHIP AND ESTABLISHMENT

Private ownership now enjoys full protection under the law, including industrial property rights. The legal system recognizes and protects property rights for buildings and movable property. It does not recognize private ownership of land. The government grants land-use concessions for periods of up to 50 years with options to renew. Essentially, land use concessions serve as proxies for land titles, but make it difficult to use land as collateral. Mozambique is currently working to record land-use concessions, as large parts of the country are still unmapped. Land surveys using Global Positioning Systems are being carried out throughout the country to allow individuals to register their land concessions.

PROTECTION OF PROPERTY RIGHTS

Mortgages, on items other than land, are used by the Mozambican banking community. The inefficient nature of the Mozambican judicial system makes protection of such rights extremely problematic. Intellectual property right infringement is not a significant problem in Mozambique at this time, although there are transgressions with audio and videotapes. The law guarantees the security and legal protection of industrial property rights, copyrights, and other related rights. A new copyrights and related rights bill was passed by the National Assembly in 2000. This combined with the 1999 Industrial Property Act brought Mozambique into compliance with the WTO Agreement on the Trade Related Aspects of Intellectual Property Rights (TRIPS).

TRANSPARENCY OF THE REGULATORY SYSTEM

The transparency of the regulatory system will be boosted enormously by the passage of a new commercial code. Currently, regulations governing businesses are antiquated and may be contradictory. Bureaucracy associated with all aspects of doing business in Mozambique remains a serious problem. Investors face a myriad of permits, approvals, and clearances that take a significant amount of time and effort to obtain. Bribes are often requested to provide necessary clearances. The government is aware of the problem and intends to launch a donor-funded effort to streamline procedures across the board.

Regulations in the areas of labor, health and safety, and environment are not routinely enforced. Threats to enforce antiquated regulations that remain on the books have been used by working-level civil servants in an attempt to coerce bribes.

Efficient Capital Markets and Portfolio Investment

Mozambique has a small capital market of eleven commercial banks, which compete vigorously for clients and deposits. Access to credit for the private sector remains difficult and expensive, and interest rates for loans for the private sector often exceed 20 percent.

Access to capital in the rural areas is limited as the lack of private ownership of land prevents its use as collateral. Various development agencies offer micro-credit-financing programs to fill this gap. Lack of a rural credit market has inhibited the spread of financial institutions beyond Maputo. Small cities often have one bank, offering prohibitively high interest rates to a captive agricultural market.

The small stock exchange, founded in October 1999, lists shares in one company, a local brewer named Cervejas de Mocambique, and in five bonds.
POLITICAL VIOLENCE

The incidence of political violence has declined since the 1992 Rome Peace Accords. There were a few incidents of violence during the 1999 general elections, but they were not widespread. RENAMO supporters have complained of intimidation since the elections, and periodic incidents of political violence have occurred between FRELIMO and RENAMO supporters. These tend to occur away from the capital, and have not affected the business community. Labor unions are becoming more vocal, but still do not have the financial and institutional capacity to be effective. Protests are rarely associated with violence. As in many capital cities, crime is problematic in Maputo, but has not reached the epidemic proportions of neighboring South Africa. Groups of criminals specialize in home assaults, car jacking, and highway robbery.

CORRUPTION

Corruption is a serious problem in Mozambique. Bribe-seeking activity by officials throughout the government is commonplace. Senior officials often have conflicts of interest between their public roles and their private business interests. Bribery is considered a criminal offense.

The government launched a new anti-corruption unit in the Office of the Attorney General, which is charged with investigating and prosecuting corruption-related offenses. A new anti-corruption law was passed by the National Assembly in mid-2002 that updates previous antiquated legislation. Civil society, has become more vocal on corruption-related issues and is demanding stronger government action. A new anti-corruption NGO, Etica Mocambique, has been formed to work with ameliorating this problem.

BILATERAL INVESTMENT AGREEMENTS

In December 1998, Mozambique concluded a Bilateral Investment Treaty with the U.S. Ratified by the U.S. Senate in November 2000, it is currently awaiting ratification in the National Assembly. Mozambique has also signed bilateral investment agreements with South Africa, Portugal, Zimbabwe, Mauritius, France, Italy, and China. It is currently negotiating one with the UK. The country's most significant bilateral commercial relationship is with South Africa. Since 1995, Mozambique has engaged in regular discussions with South Africa to harmonize regulations and facilitate cross-border trade and investment.

INVESTMENT INSURANCE PROGRAMS

OPIC, the Overseas Private Investment Corporation, is an independent U.S. government agency that can assist with both project finance, through loans or loan guaranties, and political risk insurance, up to a total of $400 million. It has been available for project participation in Mozambique since 1999. OPIC is currently reviewing several proposals for possible funding.

Mozambique is also a member of the Multilateral Investment Guarantee Agency (MIGA), part of the World Bank Group.

LABOR

The estimated work force numbers 8 million, of which 17 percent earn regular wages. The minimum wage of about $40 per month has been a source of discontent. Most working Mozambicans derive income from more than one activity, and grow corn and vegetables on a small plot of land for personal consumption. Three-fourths of the working population are family farmers. Nationwide literacy levels are estimated at 40 percent; in general, educational standards are considered low. Common working wages in Maputo are higher than in the rest of the country, averaging approximately neighborhood of $50 a month. Literacy is also believed to be higher, around 80 percent.

Labor unions, created during the socialist years, are still weak although they are asserting greater independence from the ruling party, FRELIMO. Total membership among Mozambique's thirteen unions is less than 200,000. A great concern for unions is the minimum wage. The restructuring of state-owned enterprises, and consequent potential reductions in the number of union employees or the closing of facilities, is another important issue.
FOREIGN TRADE ZONES/FREE PORTS

The government is anxious to see industrial free zones (export processing zones) take hold and Decree no. 61/99 of September 21, 1999, supports this. These regulations established an Industrial Free Zone Council, which approves companies as industrial free zone enterprises thereby providing them customs and tax exemptions and benefits. Approvals are made based on the proposed projects economic impact and on the stipulation that at least 85% of the annual production must be exported. Exploration for and extraction of natural resources and the processing of cashew nuts, fish, and prawns are not acceptable industrial free zone activities. Free zone concessions are granted for a renewable period of 50 years.

http://web.ita.doc.gov/tlcwebsite/afweb.nsf/3f65e3b9d3cd3a0a852566d40062a3bd/00fd91513a226ca0852568ab005261341OpenDocument

21-08-2003
Appendix XVI: Tax structure Madeira for Maputo port concession

Madeira: Holding Company

A Holding Company (sociedade gestora de participacoes sociais) is a corporate entity which for a period of at least 12 months holds at least 10% of the voting share capital of the company in which it has a participating shareholding. Holding companies are governed by Decree law 495/88 and Decree Law No 21/87.

Holding companies can be either Private Limited Liability Companies or Stock Corporations and must have their accounts audited annually. The initials SGPS must be included in the Holding Company's name.

A Holding Company is not permitted by law to buy its own shares, purchase debentures in companies in which it does not hold a participating shareholding (subject to certain exceptions), make loans other than to companies in which it holds part of the share capital or engage in any commercial activities other than holding shares in other companies.

See Offshore Legal and Tax Regimes for details of the taxation of Holding Companies, which receive generous tax breaks on income from their holdings.

Mixed Holding Companies: As its name suggests, a Mixed Holding Company can both hold shares in other companies and trade in its own right. It cannot engage in the type of trading activities which are carried on by banks and financial institutions and which require licensing and authorization from the Bank of Portugal.

A Mixed Holding Company must combine its activities. Its trading activity cannot be exclusively limited to the holding of shares; nor can it be a pure trading company which does not hold shareholdings in any other company. Mixed Holding companies can be either Private Limited Liability Companies or Stock Corporations. License authorization comes from the regional authorities.

Most European Union member countries do not accept that the Parent Subsidiary Directive No 90/435 on withholding tax on dividends applies to Mixed Holding Companies (see Withholding Taxes and Double Tax Treaties).

NB: The Tax Reform Act of December 2000 has somewhat reduced the tax advantages of both Pure and Mixed Holding Companies, particularly for Portuguese residents.

http://www.lowtax.net/lowtax/html/jmdcos.html#hold

Holding Companies and Mixed Holding Companies in Madeira receive a 95% deduction from taxable income received from their holdings, so that they are taxed at 36% of 5% of income, equals 1.8%.

If a Holding Company is established under Free Trade Zone Legislation then income received from its holdings in the EU is taxable but income from non-EU sources is exempt from tax. Dividends distributed by such companies to non-resident shareholders are free of withholding tax.

Income earned by a Mixed Holding Company licensed under the Free Trade Zone Legislation from trading activities (other than through the holding of shares) is exempt from corporation tax until the year 2011. However income earned from trading activities carried out in mainland Portugal or with Portuguese residents is taxed at Portuguese corporation tax rate of 35%. Note however that most EU member states consider that Madeiran Mixed Holding Companies fall outside the ambit of the EU Parent/Subsidiary Directive, so that participation exemption is not given in respect of payments made to such companies.

Capital gains tax of 36% is payable by a Madeira Holding Company on the profitable sale of shares in a company in which it has a participating shareholding. Until 2000 these gains are not taxed where they are re-invested in the purchase of shareholdings in other companies ("roll over relief"), but the Tax Reform Act 2000 made them subject to Portuguese capital gains tax, payable in five equal annual instalments after the gain occurs.

Holding companies registered under Free Trade Zone Legislation pay an application fee and continuing annual fees of $750.

Mixed Holding Companies: Where a Madeira Mixed Holding Company receives dividends from a corporate entity in which it holds a participating shareholding and the participating company is a
European Union entity then only 5% of these dividends will be taxed at a corporation tax rate of 36% meaning that the effective tax rate is 1.8%. If the participating entity is a non European Union company then no corporation tax is payable on the dividends received by the Mixed Holding Company.

Mixed Holding Companies registered under the Free Trade Zone Legislation pay an application fee of $1,500, then $1,500 annually plus 0.5% of the previous year’s profits in excess of $1m, with a ceiling of $25,000.

Withholding Taxes All types of company in the International Business Centre (ie licensed under the Free Trade Zone Legislation) are exempt until 2011 from charging withholding tax on remittances of dividends, interest or other payments to non-residents (whether on Portuguese territory or not) or to other companies within the Centre.

Broadly speaking, the shareholders of companies in the International Business Centre (other than Portuguese residents) are exempt from tax until 2011 on dividends and other payments received from them.

NB: The Tax Reform Act 2000 made some changes to the withholding tax regime applying to Holding and Mixed Holding Companies, particularly for Portuguese residents. The Act also made the non-resident status of MISC companies subject to documentary evidence that all transactions are with non-Portuguese residents.

Death Duties: No death duties are payable in Madeira on the transfer of a shareholding in a company licensed to operate under the Free Trade Zone Legislation unless the shareholder was resident in Portugal.

Stamp Duty: No stamp duties are levied on the documents or transactions of companies incorporated under the Free Trade Zone Legislation.

Capital Transfer Tax applies to real estate purchases made by Free Trade Zone companies, except that the purchase of land or buildings for use as a head office is exempt. Standard rates apply: 8% for urban properties and 10% for rural ones.

VAT applies in Madeira at the rate of 12% (17% in Portugal).

Offshore Trusts established in the International Business Centre under Free Trade Zone Legislation have Madeiran-resident trustees. All income earned by a trust and all income distributed in favour of a beneficiary is free of tax in Madeira unless the source of that investment income is Portugal in which case it is taxed in the hands of the trustee.

http://www.lowtax.net/lowtax/html/jmdcos.html#hold
Appendix XVII: Maputo port project

MOZAMBIQUE

At independence in 1975, Mozambique was one of the world’s poorest countries. Socialist mismanagement and a brutal civil war from 1977-92 exacerbated the situation. In 1987, the government embarked on a series of macroeconomic reforms designed to stabilize the economy. These steps, combined with donor assistance and with political stability since the multi-party elections in 1994, have led to dramatic improvements in the country’s growth rate. Inflation was brought to single digits during the late 1990s although it returned to double digits in 2000-02. Fiscal reforms, including the introduction of a value-added tax and reform of the customs service, have improved the government’s revenue collection abilities. In spite of these gains, Mozambique remains dependent upon foreign assistance for much of its annual budget, and the majority of the population remains below the poverty line. Subsistence agriculture continues to employ the vast majority of the country’s workforce. A substantial trade imbalance persists although the opening of the MOZAL aluminium smelter, the country’s largest foreign investment project to date has increased export earnings. Additional investment projects in titanium extraction and processing and garment manufacturing should further close the import/export gap. Mozambique’s once substantial foreign debt has been reduced through forgiveness and rescheduling under the IMF Heavily Indebted Poor Countries (HIPC) and Enhanced HIPC initiatives, and is now at a manageable level.

THE MAPUTO CORRIDOR SYSTEM

(MCS), consists of a large network of transport infrastructure, connecting South Africa, Swaziland, Zimbabwe and the South of Mozambique (see Figure 11-14). This corridor, entailing the Maputo port as well as rail, roads, rivers and canals, is traditionally managed by the "Caminhos de Ferro de Mozambique Sul"(CFM-S), the national port and rail operator owned completely by the Government of Mozambique (GoM). Under assistance of the World Bank, the Government of Mozambique started a program of privatisation, known as the railways & ports restructuring project.
World Bank Railways & Ports Restructuring Project [source World Bank]:

The main objective of the Railways and Ports Restructuring Project is to substantially increase the operating efficiency of three major port-rail systems in Mozambique, and enable share increases in their international traffic with neighbouring countries. Six main components and their related sub-components follow: 1) Although Portos e Caminhos de Ferro de Mocambique (CFM) has advanced in its concession procedures, the component will provide advisory services in the development of bidding documents; the design, negotiation, implementation, and monitoring of concession agreements; and, structure its role as equity shareholder in concessions/joint ventures. 2) Staff rationalisation will include redundancy and redeployment issues, social mitigation, and pension reform aspects. 3) Corporate restructure will focus on the spin-off of CFM commercial activities, through studies, and consultant services. Required equipment will be supplied. 4) The Ministry of Transport and Communications (MTC) will be strengthened, through the revision for new organisational requirements, private sector participation, and policy formulation on aviation issues. 5) The development of a regulatory framework for the transport sector will be studied, covering economic and technical aspects. 6) The tertiary port component will include rehabilitation works in small ports.

In this programme the Toll road N4 as well as the Ressano-Garcia railway is already under concession. The concession for the Maputo port has been issued for bidding in 1997, to maintain, operate and finance the port.

MAPUTO PORT

The port of Maputo in southern Mozambique is situated on the northern bank of the Matola River (previously Rio Espirito Santo) about 60 km from the open sea within Maputo Bay (formerly Delagoa Bay). Before Mozambican independence and civil war the port handled about 15 million tonnes of cargo. The amount of cargo has diminished greatly due to lack of investment; effects of war; draught; famine; floods and lack of technical and managerial resources. This has resulted in quay and Tamil; Poor maintenance; ancient and occasionally operating equipment; poorly trained staff (6000) and a mass of cargo of only three million tonnes.

Maputo is the principal port in Mozambique, serving also Swaziland, Zimbabwe and South Africa. The port consists of two parts: the primary port of Maputo, and the subsidiary port of Matola 4 km upstream. Matola has a coal terminal and a terminal for handling aluminium from the Matola aluminium smelter (Mozal) that has recently been built. The channel leading to Matola does not have sufficient capacity to cope with the increased demand.

The port has a theoretical volume capacity in excess of 15 million tonnes but currently handles considerably less. In January 2002 Business Day reported that volumes had dropped to 1.2 million tonnes.

The Maputo container terminal is awarded in concession to and managed by P&O Ports Mozambique (MIPS), which makes use of a 300-m berth and two gantry cranes. The port also has a citrus terminal alongside a 380m berth operated by Fresh Produce Terminals of South Africa (Capespan), as well as a terminal for the handling of sugar. Maputo has twelve berths totalling 2,225m in length.

The oil terminal is situated upriver at Matola, and comprises a single jetty with a current (2002) depth alongside of about 9.5m. The port also handles a variety of other cargo including break-bulk (steel) and bulk products (grain). The multi purposes berths are well equipped with warehouse facilities.

Maputo has a small dry dock capable of accepting ships up to 115m length and 17m wide, with normal ship repair facilities. Bunkers and fresh water are available from all working berths including at Matola.

Stevedoring and ship handling services are readily available.

PROJECT RATIONALE

Important incentives for commercial investors:

- historical proven potential min 2 million tonnes in early nineties was 12 million in 1976 now 4 million expected: 13 million (what does this mean)
- Political stability of the region
- Maputo corridor project
- Institutional reform supported by the World Bank
Foreign financing for coastal infrastructure in developing countries

- Participation by government
- Importance port in whole corridor and other concessions
- Mozal aluminium plant of 13 billion $ (now 30% of total exports)

Incentives for multilateral and bilateral investing
- Development of the region;
- Swedish contractor involved;
- Importance of port for food supply in southern Africa.

Incentives for government:
- employment
- development of associated industry
- increased tax revenues
- knowledge addition
- additional investments
- increased trade
- (1 job in the port generates 6 in supporting industries in first 10 years)
- It strengthens the links between South Africa and Mozambique

Problems with the arrangement:

Had the consortium been aware of the timeframe of negotiations and resulting development costs, they probably would not have gone through with the project. Important)

Public sector risk
- Dependence of the performance of public parties
- Mitigation:
  - Political risk insurance – cost of insurance
  - Compensation arrangements in the concession
  - Solvency risk of public entity

MPDC exclusive rights to land side and waterside services (so not only operation but act as port authority)

Public land issues
- Prohibited to own land for a private entity to own public land.
- New legislation cover a way of granting the MPDC the rights over the land during concession (also for lenders)

Valuation of assets
- Different views
- Degrading assets vs crown jewels
- Share input for CFM
- No transfer back
- Solution: shareholder loans to keep overall equity low but debt to equity also.

Other discouragements:
- Container terminal not part of concession
- Abundance of workforce – arrangement with government
- Little experience of government negotiators
• Negotiation with the very entity to be privatised was hard (negative feeling about privatisation and resistance to change)
• (also because of communist history and emerging market situation)
• Lack of education and bureaucracy
• Taskforce (Inter Agency Committee) for consultation
• All large parties and some smaller on ad hoc basis
• Expected welfare and benefits for Mozambique eventually enormous
• Time for negotiation must be reduced to attract more investors

PROJECT FINANCING

Financing structure
World Bank arrangement and advisory costs for concession in the country’s infrastructure (US$ 100 IDA)
• Minimal risks with MPDC
• GOM bares risks associated with tax and legislation changes
• No-restrictions of debt service, management and other foreign exchange based fees and distributions to shareholders
• Development finance institutions required because of political risk, this would attract commercial lenders
75 million and 40 long term project financing and rest equity and internal cash generations
• equity and sponsor loans (backed by political risk insurance from MIGA
• 2 branches of senior debt US$ 27 million by FMO, SCMB (backed for political risk and partly commercial risk by SIDA (Swedish international development agency)), and DBSA. Interest rate/margin SCMB affordable because of insurance
• subordinated debt by FMO (US$ 5 million)
• Mezzanine debt, by Note Instrument, also as contingent standby facility
• debt with equity kicker or profit share
• only senior debt counts for debt to equity ratio
• also contingent mezzanine facility, lowering burden on sponsors balance sheets
• high debt to equity ratio: high lender risk
• because of low project comp risk> agreeable
• also sponsor support package for certain risks
• Local banks could not lend at a competitive rate or at a long enough term
• Sub participation for local banks and acting as account bank
• Due to the solid concession agreement, leaving very little risk with the project company, the lenders would participate without amendment in the concession

Complex off-shore holding structure because of lack of double taxation treaties. In Madeira, with double taxation treatment with Mozambique and an overall profitable tax regime.

Environmental issues were important because of development financiers’ involvement.
• Hold harmless provisions
• Liabilities passed on to contractor
• Environmental risk assessment
• Number of ongoing environmental conditions
Special license to claim right of land needed for security

New investment law: ability to hold offshore account, repatriate foreign exchange, tax holidays and tax reductions in levels of withholding tax. Possibly look beyond project financing for future re-financing

The period of the concession would possibly be extended for another 10 years after completion. The concession also comprised the rights to take over the work of the CFM as port authority. The Government by means of the CFM was supposed to obtain a minority stake of 33 % in the newly founded Project Company, whereas an International Consortium would obtain a 51 % majority share in the Project Company. This was done to make sure the company would in fact be private, with major efficiency and management benefits. The remainder of 16 % shares would be sold publicly at a later stadium (when the project becomes profitable) to regional private investors.

The project company is called the Maputo Port Development Company (MPDC): the private participation was tendered to an international port development company made up of Mersey Docks and Harbours groups (UK), Skanska (Sweden), Liscont (Portugal).

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Appendix XVIII: Sensitivity analysis Maputo financing case

EXPLANATION

In this sensitivity analysis, much parameters have been changed to research sensitivity of the financial outcomes to this parameter.

The scenarios mentioned in the following tables, are filled in as follows:

1. 90% of the average scenario, based on assumptions in chapter 7;
2. The average scenario as determined in chapter 7;
3. 110% of the average scenario.

This counts benefits, capital expenditure, operation costs, concession fees and interest rate.

*Sum() holds the sum of all costs/benefits over the lifetime of the project. This is merely included as a number to check quantity consistency.*

For depreciation and amortisation, the grace period and the number of years of repayment of depreciation after the grace period are shown.

Following comes the cash flow for the project company, with the project financial IRR and the sponsors and lenders stake and group IRR. The government as party is included as tax and concession fee receiver, which explains the IRR larger than 100%, the government does not invest.

Next the tariff per million tonnes is mentioned followed by the annual growth rate of cargo. The variable costs, as share of the revenues are also shown here.

**WORST CASE (3) WITH REGULAR GROWTH RATE AND TARIFF**

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### BEST CASE SCENARIO (1) WITH REGULAR GROWTH AND TARIFFS

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<td>annual cargo growth rate</td>
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### MEDIUM SCENARIO (2) WITH LOWER PRICE (8 %)

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<tr>
<td>Operational cost share of revenues</td>
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### MEDIUM SCENARIO WITH LOWER GROWTH RATE (5%)

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<td>Annual cargo growth rate</td>
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<td>Operational cost share of revenues</td>
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## MEDIUM SCENARIO WITH HIGHER OPERATIONAL COSTS (60%)

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<td>6,5%</td>
<td>12,5</td>
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<tr>
<td>Lenders</td>
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<td>8,9%</td>
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<tr>
<td>annual cargo growth rate</td>
<td>8,78%</td>
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</tr>
<tr>
<td>Operational cost share of revenues</td>
<td>60,00%</td>
<td></td>
</tr>
</tbody>
</table>

## MEDIUM SCENARIO WITH SHORTER DEPRECIATION AND AMORTISATION PERIOD (10 AND 8 YEARS):  

<table>
<thead>
<tr>
<th>millions of US$</th>
<th>scenario</th>
<th>sum($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits</td>
<td>2</td>
<td>1304,6</td>
</tr>
<tr>
<td>Capital expenditure (Capex)</td>
<td>2</td>
<td>70,0</td>
</tr>
<tr>
<td>Operating cost</td>
<td>2</td>
<td>727,3</td>
</tr>
<tr>
<td>subsidies - Concession fees</td>
<td>2</td>
<td>subs</td>
</tr>
<tr>
<td>interest rate</td>
<td>2</td>
<td>8,0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>millions of US$</th>
<th>grace</th>
<th># years</th>
<th>sum($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation (see assets)</td>
<td>3</td>
<td>10</td>
<td>70,0</td>
</tr>
<tr>
<td>Amortisation (see debt)</td>
<td>3</td>
<td>8</td>
<td>6,5</td>
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</table>

<table>
<thead>
<tr>
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<th>stake</th>
<th>IRR</th>
<th>sum($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Cashflow project company, no financing</td>
<td>31,7%</td>
<td>256,4</td>
<td></td>
</tr>
<tr>
<td>Sponsors</td>
<td>15%</td>
<td>28,0%</td>
<td>84,2</td>
</tr>
<tr>
<td>Lenders</td>
<td>85%</td>
<td>9,0%</td>
<td>19,7</td>
</tr>
<tr>
<td>Government</td>
<td>&gt;100%</td>
<td>308,7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>millions of US$</th>
<th>price</th>
<th>rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>tariff per million tonnes</td>
<td>10,00</td>
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</tr>
<tr>
<td>annual cargo growth rate</td>
<td>8,78%</td>
<td></td>
</tr>
<tr>
<td>Operational cost share of revenues</td>
<td>50,00%</td>
<td></td>
</tr>
</tbody>
</table>
### MEDIUM CASE SCENARIO WITH ONLY INTEREST ADJUSTED (HIGHEST = 9%)

<table>
<thead>
<tr>
<th>millions of US$</th>
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<th>sum($)</th>
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</thead>
<tbody>
<tr>
<td>Benefits</td>
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<td>2</td>
<td>727,3</td>
</tr>
<tr>
<td>subsidies - Concession fees</td>
<td>2</td>
<td>subs</td>
</tr>
<tr>
<td>interest rate</td>
<td>3</td>
<td>9,0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>millions of US$</th>
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<th># years</th>
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<tr>
<td>Depreciation (see assets)</td>
<td>3</td>
<td>10</td>
<td>70,0</td>
</tr>
<tr>
<td>Amortisation (see debt)</td>
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<td>6,9</td>
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<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Project Cashflow project company, no financing</td>
<td>31,7%</td>
<td>256,4</td>
<td></td>
</tr>
<tr>
<td>Sponsors</td>
<td>15%</td>
<td>27,2%</td>
<td>82,2</td>
</tr>
<tr>
<td>Lenders</td>
<td>85%</td>
<td>10,1%</td>
<td>22,7</td>
</tr>
<tr>
<td>Government</td>
<td>&gt;100%</td>
<td></td>
<td>307,8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>millions of US$</th>
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<th>rate</th>
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</thead>
<tbody>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Operational cost share of revenues</td>
<td>50,00%</td>
<td></td>
</tr>
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### MEDIUM SCENARIO WITH ADJUSTED DEBT TO EQUITY RATIO (3)

<table>
<thead>
<tr>
<th>millions of US$</th>
<th>scenario</th>
<th>sum($)</th>
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</thead>
<tbody>
<tr>
<td>benefits</td>
<td>2</td>
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</tr>
<tr>
<td>Capital expenditure (Capex)</td>
<td>2</td>
<td>70,0</td>
</tr>
<tr>
<td>Operating cost</td>
<td>2</td>
<td>727,3</td>
</tr>
<tr>
<td>subsidies - Concession fees</td>
<td>2</td>
<td>subs</td>
</tr>
<tr>
<td>interest rate</td>
<td>2</td>
<td>8,0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>millions of US$</th>
<th>grace</th>
<th># years</th>
<th>sum($)</th>
</tr>
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<td>10</td>
<td>70,0</td>
</tr>
<tr>
<td>amortisation (see debt)</td>
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<td>8</td>
<td>6,1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>millions of US$</th>
<th>stake</th>
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</tr>
</thead>
<tbody>
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<td>256,4</td>
<td></td>
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<tr>
<td>Sponsors</td>
<td>15%</td>
<td>25,8%</td>
<td>84,3</td>
</tr>
<tr>
<td>Lenders</td>
<td>85%</td>
<td>9,1%</td>
<td>18,6</td>
</tr>
<tr>
<td>Government</td>
<td>&gt;100%</td>
<td></td>
<td>309,8</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>millions of US$</th>
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<td>8,78%</td>
<td></td>
</tr>
<tr>
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<td>50,00%</td>
<td></td>
</tr>
</tbody>
</table>
Appendix XIX: Valuation of South Africa’s coastal resources

PHYSICAL ENVIRONMENT AND THE COAST OF SOUTH AFRICA

South Africa’s coast

The coast of South Africa runs in a great arc of over 3000 kilometres from the Orange River in the west to Kosi Bay on the east coast. The west coast is dominated by the cold Benguela current and the east coast by the warm Agulhas current. These currents give rise to different communities of marine life along the west, south and east coast.

West Coast

This coast supports a rich fishing industry that catches thousands of tonnes of pilchard, anchovy, hake and other fish species each year. Inshore there are large kelp forests and dense populations of limpets, mussels, and rock lobsters. Large concentrations of seabirds breed on the offshore islands, while seals breed both on the islands and the mainland. Langebaan Lagoon and the Berge and Olifants River estuaries are important feeding ground for birds that migrate to the northern hemisphere to breed. Sanctuaries have been established to protect bird islands and rock lobsters.

South Coast

This section of the coast extends from the Cape Peninsula to East London, and experiences much pressure from land use and tourism. The Cape Peninsula National Park is of special interest as an overlap zone between the west coast and south coast communities. Smaller protected areas occur in False Bay and at Betty’s Bay where perlemoen were abundant. De Hoop Nature Reserve, east of Cape Agulhas, has a magnificent stretch of coastline with a combination of rocky shore and extensive dune fields. Southern right whales breed in the sheltered bays. Trails go through the reserve which is also used as an education centre for school camps. Tsitsikamma National Park is a well-managed wild stretch of coast that boasts an underwater diving trail and the famous Otter Hiking Trail. Knysna lagoon is South Africa's richest estuary and a major centre for tourism and oyster culture.

East Coast

If one travels north from East London to Kosi Bay, the coast becomes more tropical and mangroves line the river banks. Dwesa, Hluleka and Mkambati Nature Reserves protect part of the beautiful Transkei coast. They provide a stark contrast to the heavily exploited neighbouring shores where edible shellfish and Gelidium (a seaweed) are harvested. Gelidium is used commercially as a source of agar. In KwaZulu-Natal, a large area from Cape Vidal to Ponta da Ouro is set aside for conservation. This area contains the only coral reefs in the country. Access to these beaches is strictly controlled as they are the breeding grounds of the loggerhead and leatherback turtles, which come ashore in summer to lay their eggs. Sharks are plentiful on the KwaZulu-Natal coast and bathing beaches are protected by shark nets. These have been very effective in catching sharks, causing
concern over the removal of so many of these predators of the seas. Shark nets also catch dolphins, skates, rays and turtles and this is another source of concern.

COASTAL ZONE AND RESOURCE MANAGEMENT

The economic value of the coast

The Direct benefits of the SA coast: 168 billion SA Rand, Indirect 134 billion Rand per year. The South African fishing industry is worth about R2.4 billion every year. This figure does not include secondary industries such as fish processing, boat building and transportation of fish products. Millions of tourists visit South Africa's beaches and coastal resorts every year. Coastal tourism is estimated to generate R13.5 billion for the South African economy every year. South Africa's ports and harbours link the country to the world. The coastal shipping industry generates R4.2 billion every year. Coastal features, such as dunes and high cliffs, protect the coastal environment (including roads, buildings and farmlands) from the damaging effects of waves and wind. This natural form of erosion control is estimated to be worth R715 million. Waste assimilation, detoxification and recycling by coastal wetlands, forests and grasslands is estimated to be worth R4 billion.

Coastal ecosystems are capable of sustaining more than one activity at the same time. For example, Cape Town's Victoria & Alfred Waterfront supports a busy harbour, attracts tourists and shoppers and serves as a port for the commercial fishing industry. More than 25 000 people are directly employed in the South African fishing industry. Over R140 billion worth of cargo is transported through South Africa's ports every year, generating R4.2 billion in revenue every year. About 40% of the building activity in South Africa is conducted at the coast.

The Social Value of the Coast

Tourism, recreation and leisure activities have grown into a global growth industry and the coast has particular value in this regard.

Together these sectors generate more than SAR 15.2 billion, with over 20 million international and local visitors each year. Over 40 different recreational activities take place at the coast. For instance, the Ocean Action event which takes place in Durban every year attracts over 800 000 visitors and generates over R220 million for local Durban businesses. Recreational diving is another popular sport that attracts over 100 000 South Africans. This activity generates R36 million every year.

The poverty rate reflects the proportion of people in a population group or area falling below the "poverty line" - taken as a monthly household expenditure level of R353 per adult. This indicator reveals that poverty in the coastal provinces is most severe in the Eastern Cape, at 71%, and considerably lower for the Western Cape, at 28%.

The coast provides enormous benefits in meeting basic needs and improving the welfare of all South Africans. Putting a monetary value to these benefits highlights the importance of coastal services to our economy.

A distinction can be made between:

Direct benefits. These are goods that are consumed, such as fish, or that are used for production of other materials, such as kelp for fertilisers. Other direct benefits include coastal tourism, diamond and titanium mining, and timber harvesting.

Indirect benefits. These include the waste absorbing and water purification services provided by coastal ecosystems. These services provide an indirect but substantial coast saving to coastal communities.

The value of direct benefits provided by our coast has recently been estimated at R168 billion per year, and the value of indirect benefits R134 billion per year. These figures show that the benefits gained from the coast make an enormous contribution to the people of South Africa, and provide the cornerstone for the economic development and well-being of coastal communities.

Of course, these values do not reflect the intangible benefits many people derive from the coast as a place of spiritual significance for renewal, peace and relaxation. The coast also has immense aesthetic, cultural, educational and scientific value that is impossible to measure in financial terms.

Estimating the value of coastal benefits
The Coastal Policy Green Paper summarised the benefits provided by the coast and attempted to place a monetary value on the services provided by coastal ecosystems. The annual value of indirect and direct benefits was at that time estimated to be SAR 44.8 billion and SAR 134.3 billion respectively.

The value of direct benefits (Table 1) was estimated through an analysis of revenue generated by the main sectors operating in the coast: fishing, agriculture, ports, tourism and mining.

Table 11-6: Estimated Value of Direct Benefits Provided by Coastal Ecosystems

<table>
<thead>
<tr>
<th>Services</th>
<th>Examples of opportunities and activities</th>
<th>Financial benefits (Millions of SAR p.a.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsistence production</td>
<td>Line fishing, inter-tidal collecting, beach and seine netting, coastal agriculture</td>
<td>1 121</td>
</tr>
<tr>
<td>Commercial production</td>
<td>Commercial fishing and agriculture</td>
<td>11 070</td>
</tr>
<tr>
<td>Raw materials</td>
<td>Diamond and titanium mining</td>
<td>3 752</td>
</tr>
<tr>
<td>Transportation</td>
<td>Ports and harbours</td>
<td>4 580</td>
</tr>
<tr>
<td>Recreation</td>
<td>Boating, sport-fishing, shore-beach recreation, diving</td>
<td>1 715</td>
</tr>
<tr>
<td>Tourism</td>
<td>International and national visitors to the coast</td>
<td>13 500</td>
</tr>
<tr>
<td>Aesthetic value</td>
<td>Turnover of property with a sea view</td>
<td>9 075</td>
</tr>
<tr>
<td>Waste disposal</td>
<td>Waste disposal into coastal waters</td>
<td>17</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>44 830</strong></td>
</tr>
</tbody>
</table>

Valuing indirect benefits (Table 2) is a recent phenomenon, often based on incomplete knowledge. This method is, however, particularly useful to illustrate the possible order of magnitude of the value in a form that can be compared with other, more familiar monetary values, such as those derived from direct benefits.

Table 11-7: Estimated Value of Indirect Benefits Provided by Coastal Ecosystems

<table>
<thead>
<tr>
<th>Services</th>
<th>Examples of opportunities and activities</th>
<th>Financial benefits (Millions of SAR p.a.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion control</td>
<td>Damage protection from storms, wave action and wind</td>
<td>715</td>
</tr>
<tr>
<td>Waste treatment</td>
<td>Waste assimilation, detoxification and recycling by coastal wetlands, forests and grasslands</td>
<td>3 875</td>
</tr>
<tr>
<td>Soil formation</td>
<td>Unique coastal soils, derived from sediment accumulation</td>
<td>44</td>
</tr>
<tr>
<td>Water regulation and supply</td>
<td>Coastal forests and grasslands</td>
<td>151</td>
</tr>
<tr>
<td>Nutrient cycling</td>
<td>Up welling of food for fish from deep in the ocean</td>
<td>125 510</td>
</tr>
<tr>
<td>Biological control</td>
<td>Maintaining the balance and diversity of plants and animals</td>
<td>1 983</td>
</tr>
<tr>
<td>Habitats</td>
<td>Places where plants and animals live</td>
<td>43</td>
</tr>
<tr>
<td>Pollination</td>
<td>Horticultural crops within 60 km of high water mark</td>
<td>1 114</td>
</tr>
<tr>
<td>Climate regulation</td>
<td>Maintaining normal climate patterns</td>
<td>476</td>
</tr>
<tr>
<td>Genetic resources</td>
<td>Medical and agricultural uses of plants and animals</td>
<td>86</td>
</tr>
<tr>
<td>Gas regulation</td>
<td>Oxygen and carbon cycles</td>
<td>311</td>
</tr>
<tr>
<td>Existence value</td>
<td>Unique plants and animals</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>134 312</strong></td>
</tr>
</tbody>
</table>