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THE EFFICACY OF ENVIRONMENTAL IMPACT ASSESSMENT ON DEVELOPMENT PROPOSALS WITH RESPECT TO COST AND TIME IN SOUTH AFRICA: A THREE CASE STUDY REVIEW

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A research report submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Masters of Science in Engineering.

Johannesburg, 2015

DECLARATION

I declare that this research report is my own unaided work. It is being submitted for the degree of Masters of Science to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination to any university.

……

(Signature of Candidate**)**

…….....DAY OF……, …….……

(Day) (Month) (Year)

ABSTRACT

This research report reviews the efficacy of Environmental Impact Assessment (EIA) from the perspective of a developer. Three development proposals from South Africa were reviewed and are presented as case studies. The case studies were the Pelican Park Low Cost Housing Project, the Kommetjie Mixed-Use Development, and the Wild Cost Sun Water Park. Efficacy in the broader sense is used to describe the combination of efficiency, or how well something is done, and how useful. In this study, the definition of efficacy was limited specifically to the cost and time implications of conducting an EIA on development proposals for developers.

Information was reviewed from the following sources: Development Project Proposals, Reports, Project Plans and Budgets.

In the three case studies, it was largely evident that the conducting of an EIA had similar cost implications for the developer as has been reported in the literature, but some indications are emerging that the costs may be increasing. In terms of time implications, it became apparent from this research that continuous changes to legislation over the last few years has had a dramatic effect on the completion of projects. When modelling the case studies under current legislation the negative impact in comparison is evident and substantial.

Recommendations for the major findings are suggested. These are that interim legislative protocols be considered to prevent developers finding themselves between two sets of legislative requirements, and that property developers consider incorporating formalised methods of risk management that speak directly to environmental risks in their plans.

The research further found an overwhelming positive sentiment exists among developers towards the spirit of the EIA legislation and towards environmental sustainability principles and ideals that are aimed at protecting the South African environment.

Key words: Developers, Environmental Impact Assessment, Efficacy, Cost, Time.

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I am gratefully appreciative to the University of the Witwatersrand not only for being the tertiary institution from which I received an education, but also for providing me the opportunity to be the captain of the WITS Varsity Cup Rugby team.

"Everyone has the right – (a) to an environment that is not harmful to their health or wellbeing, and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislation and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecological sustainable and use of natural resources while promoting justifiable economic and social development."

(Section 24 of the Bill of Rights chapter 2 of the Constitution of the Republic of South Africa, 1996 Act 108 of 1996).

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LIST OF ACRONYMS

Where possible, acronmyms are written in full at the beginning of a section in which they first appear:

BAR	Basic Assesssment Report
BIONET	Biodiversity Network System
BPEO	Best Practicable Environnetal Option
CESA	Critical Ecological Support Area
DWAF	Department of Water Affairs and Forestry
EAP	Enironmental Assessment Practioner
EBITDA	Earning Before Interest, Tax, Depreciation and Amortization
EIA	Environmnetal Impact Assessment
ECA	Environmental Conservation Act
EMP	Environmental Management Plan
DEAT	Department of Environmental Affairs and Tourism
DEA&DP	Department of Environmental Affairs and Development Planning
GDP	Gross Domestic Product
I&AP	Intersted and Affected Parties
IEM	Integrated Environmental Affairs
IFC	International Finance Corporation
LFTEA	Less Formal Township Establihment Act
NEMA	National Environmental Management Act
NEPA	National Environmental Policy Act
PMBOK	Project Management Book Of Knowledge
PPP	Public Participation Process
PAJA	Promotion of Administrative Justice Act
PAIA	Promotion of Access to Information Act
POS	Public Open Space
SEA	Strategic Envoronmental Asessment
SDP	Site Development Plan
WCED	Western Cape Education Department

CHAPTER 1: INTRODUCTION

1.1 Background

Over the last few decades, the environmental field of study has grown in prominence in both developed and developing countries. For South Africa, a developing country, this is true. Of particular interest to this country, is the balance of socio-economic growth and development initiatives with environmental sustainability. Obtaining this balance has become a formidable challenge for the country and one that it has embraced in policy and legislation (Morrison-Saunders & Retief, 2012).

A widely used definition of sustainable development that captures the essence of the concept is: *" ...development that meets the needs of current generations without compromising the ability of future generations to meet their needs."* (World Commission on Environment and Development, 1987:9).

The environmental field of study is a broad, multidisciplinary science. A definition of environment is the surroundings of an organism and indeed everything that affects it during its lifetime. This includes physical, social and cultural conditions (Gilpin, 2000). Over the years, governments have increasingly designed and implemented laws to protect the environment.

The theory and assessment of EIA has grown considerably over the last ten years since its early roots in the United States of America and specifically the National Environmental Policy Act 1966 (NEPA) (Pope, Bond, Morrison-Saunders & Retief, 2013). Today 191 of the 193 countries who are members of the United Nations have some form of formal process to evaluate the consequences of a proposed development on the environment that is typically referred to as an Environmental Impact Assessment (EIA) (Morgan, 2012). EIAs are considered as one of the most successful policy innovations of the 20th Century as they have ensured that developers and decision makers proactively and systematically

assess, investigate and report on both positive and negative impacts of potential development activities on the environment (Sadler, 1996).

Essentially, EIAs are regarded as a systematic process to identify potential positive and negative impacts on the environment (biophysical, socio-economic and cultural) associated with a proposed activity. However, the purpose goes beyond this to examining alternatives or instituting management interventions to minimise negative consequences while optimising positive outcomes. This means that the EIA is regarded as a tool to accurately identify to planning authorities the possible environmental consequences of a planned development (Geneletti, 2002). It is made up of a number of disciplinary studies, each one addressing a different category of effects (e.g. noise) or an environmental component (e.g. water). In general, the intent is to assess the impact of the proposed development on habitats, ecosystems and species with the guiding principle of preventing substantial detriment to the environment (Chand & MEGA, 2010).

South Africa is one of the 191 countries that have a formal EIA process. New legislation to this effect was passed on the 2nd of August 2010. The purpose of the legislation was to improve and streamline the EIA process. This legislation replaced the National Environmental Management Act (NEMA) EIA regulations of 2006. It was argued that the new legislation would be an enhancement on previous legislation (Sonjica, 2010).

Pope et al. (2013:1) argue that periodically it is important to consider the impact of EIA practice and in doing this, ask the important question of what are we achieving. There have been many attempts over the years to measure the effectiveness of the EIA system. Governments have commissioned some of these attempts while independent researchers have done others. Effectiveness refers to what is being achieved (Pope et al. 2013:5) and can be long-term (e.g. sustainability objectives) or short-term (e.g. quality measures such as cost or time). There are a number of evaluation systems to determine effectiveness (Kolhoff, Driessen & Runhaar, 2013). Ahmad and Wood (2002) have developed

such a system that includes 24 indicators, which are clustered into four categories: EIA legislation, EIA process, EIA administration and EIA foundation measures. Sadler (1993), in a concise framework, refers to three types of EIA outcomes, namely, 1) Substantive, 2) Procedural, and 3) Execution (referring to transactional activities). In terms of the latter, 'execution' or 'transactional' includes the time it takes to produce EIA applications and documents as well as time to evaluate such in the application process. All things considered, it is the time that an EIA takes that has been argued as one of the most important aspects of efficiency in addition to the monetary costs of EIAs. These two factors are of utmost importance (Masakong Management Report, 2008: ii).

After 40 years of global implementation, it is reasonable to come to the conclusion that EIAs are now universally recognised and well entrenched as a key tool for environment management in many contexts. Indeed, the practice is well embedded in law both internationally and locally (Morgan, 2012). Despite being well entrenched, opinions vary in the literature as to the effect of EIAs in general with opinions largely being that, from a sustainability perspective, the broader ideals may not as yet have been achieved, but with the growth of Strategic Environmental Assessment (SEA) this is being addressed. From a project perspective, literature on the impact of EIAs is contradictory, with the caution being made that well formulated legislation and available guidance do not necessarily lead to or result in good practice (Morgan, 2012). Meyer (2006:1) notes that the EIA process is costly and time consuming and that "three decades of creeping environmental controls has strangled the economy and undermined economic competitiveness", however when examined in depth and across different industries and when using a variety of economic indicators and covering different time periods, it would appear that neither national nor state economic performance has been significantly or systematically affected by environmental regulation. In fact, Meyer (2006:2) argues there is little credible evidence supporting the view that environmental legislation has crippled companies. However, he further notes that large organisations dominate evidence on the positive effects of environmental regulation while, in contrast, it is the small

companies with low cash flow who have folded due to the environmental legislation dominate the negative impacts. This is of concern to Small Businesses Enterprises (SMEs), where it is estimated that they employ 22% of the adult population in developing countries such as South Africa (SEDA, 2013). As early as 1995, the democratically elected Government of South Africa realised the importance of SMEs to the economy and a White Paper on National Strategy for the development and promotion of small businesses in South Africa highlighted this fact (Department of Trade and Industry, 1995). It was noted that they represented an important vehicle to address the challenges of job creation, economic growth and equity in the country.

A further concern is the potential reluctance of developers to propose development in sensitive ecological environments. Trousdale (2001) aptly notes that there is a growing gap between information generated by tourism research and its practical application on natural and human environments. He calls for a balanced pragmatic model that is appropriately adapted to the unique contextual requirements of tourism in developing countries in order for developers to proceed, with positive outcomes for both tourism and development. This is essential for South Africa as tourism is a key economic sector. Tourism figures have increased by 10.2% visitors to the country in 2012 compared to 2011 which is more than double the global average (South African Tourism Information, 2014).

Of particular interest to this study is the efficacy of EIAs and in particular, the impact it has had on development proposals with regard to two variables: cost and time. In doing this, facts are reviewed of three recent South African case studies and hence this study is factual, objective and empirical in nature.

1.2 Objectives

The objectives of this research report are as follows:

- To investigate the efficacy of the EIA process in relation to cost and time in three South African case studies.
- To review what the impact of the EIA process was in terms of cost and time on these three projects.
- To offer recent, objective and factual data to the debate around efficacy of EIAs that currently exists in South Africa for the benefit of researchers, consultants and property developers. The information may be of use to policy makers and government institutions.
- To offer recommendations based on the findings that may improve the current EIA execution process.

1.3 Research Question

EIAs are required by law in South Africa. This study focuses on the efficacy of the EIA process in three recent South African projects. In particular, the impact of completing an EIA on the project development proposal stage of a project is examined in relation to the cost and time impacts on the developments.

A project is typically defined as having three broad stages: 1) Study, 2) Design, and 3) Implementation (Sherwin, 2013). However, in the construction, engineering and built project environment, further stages are commonly delineated. For example, the Association of South African Quantity Surveyors advocates that projects typically have 7 stages, namely, 1) Concept design stage, 2) Project feasibility, 3) Design development, 4) Design detail, specification and approval, 5) Project tendering or procurement, 6) Construction, and 7) Commissioning and final account. Of interest to this research is the project feasibility stage within the project life cycle as it is within this stage that an EIA process is required and completed. This is where significant cost and time

implications would be experienced. Furthermore, significant cost implications could also be experienced during the construction phase and even into the entire lifecycle of the facilities. However, while the cost and time implications have an impact here, the Environmental Management Plan (EMP) that is devised at this stage of the project influences the later stages of a typical project and hence has a long lasting and cumulative effect.

Within the design development stage, project developers typically seek funding from financial institutions. In doing this they may be required to submit an EIA report. In the case of international finance providers such as the World Bank or the International Finance Corporation (IFC) and other financial institutions who subscribe to the Equator Principles, the submission of an EIA study is mandatory before lending will be approved. This has become a driver of the EIA practice (Pope et al. 2013).

In applying these criteria, a number of implications may arise for the cost and time aspects of a project. These implications can have considerable consequences, which has led to the identification of the problem statement. Such consequences can be both cost and time related as well as having other significant indirect consequences, such as reputational damage, which are consequences that are not easy to measure or quantify.

1.4 Methodology

The following steps were undertaken in this study:

- The research objectives were defined and a research question was composed.
- A literature review was undertaken with a brief review of international literature and a more in depth examination of South African studies, particularly the more recent studies.

- Three South African developments were reviewed where EIAs were conducted. Factual data related to cost and time of the EIAs was gathered and analysed. This information was gathered from project proposals, reports, project plans and budgets. Direct impacts were drawn from the information while indirect data was ascertained by mathematical calculations and through deductions based on the facts. (Refer to Chapter 4 and Chapter 5 for further information).

1.5 Limitations and Scope of Study

This research is concerned with cost and time implications of EIAs for development proposals. It is important to note that these are two variables, albeit important ones, in a complex, multi-faceted process. Therefore it is important to note that the research is narrow and does not offer a full end-to-end analysis of a comprehensive EIA process and all the possible outcomes and consequences. However, in a study on efficacy, cost and time parameters are the most significant as other aspects would be largely unchanged whether or not the EIA process was expensive or time consuming.

The research methodology is based on specific case study reviews and while case studies are a sound research methodology, they do have drawbacks and limitations. One such limitation is that case studies are, in effect, direct studies and do not offer the opportunity for statistical analysis that can be used for generalisations. In fact, conclusions drawn from case studies are only specific to the case study that is being presented.

1.6 Structure of the Report

This research report addresses the practical execution of EIAs in relation to cost and time in three recent South African case studies. This is reported as follows:

a. *Chapter 1* describes the background to the research problem and stipulates the specific research question addressed in this research. The limitations of the study are mentioned. The structure of the research report is also outlined.
b. *Chapter 2* provides a review of current literature on the research question with particular emphasis on recent South African research. This draws from professional journals, reports, internet searches and books. It addresses the main themes of the research from a review perspective and provides definitions of associated concepts where applicable.
c. *Chapter 3* provides the research methodology and discusses the research approach that was used.
d. *Chapter 4* presents the case studies. Here the details of the case studies are documented as it pertains to the research question.
e. *Chapter 5* records the results which is a consolidation analysis of the case studies results as is relevant to the research question. Factual data is presented from the three case studies.
f. *Chapter 6* offers a discussion of the findings and makes recommendations based on the findings with regards to EIAs and to further research directions.
g. *Chapter 7* draws final conclusions of the study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In reviewing the literature, the work of Sadler (1996) is regarded as one of the most prominent and useful sources on the effectiveness of the EIA process (Morris, 2012). In addition to this work, Sadler's (1996) *Environmental Assessment in A Changing World: Evaluating Practice to Improve Performance*, and *In defining Environmental Impact Assessment* is credited as also being highly significant and a well detailed source of information on EIA.

EIAs are a formalised process applied extensively in 191 countries and used by organisations to assist decision makers in considering the environmental consequences of proposed actions. While countries have adopted different formats to EIAs, they typically include the following steps: screening, scoping, public participation, consideration of alternatives and steps to mitigate, significance of impact assessment, authorisation, and post-decision monitoring (Wood, 2003; Retief, Welman & Sandham, 2011). Underlying this widespread global implementation of EIAs is the fundamental belief that the benefits exceed the costs, in whatever way "costs" are defined (Oosterhuis, 2007).

International research on effectiveness of EIA has been conducted over the years. It has been argued that this early research was largely conducted in developed nations and who due to this have been able to shape the definition of effectiveness criteria. Fischer and Gazzola (2006) in a review of professional literature of 45 publications show that most early EIA studies were conducted in the UK and the Netherlands and suggest that conclusions drawn must be interpreted within a developed nation's context and experience. Indeed, they go further and argue that the general validity of the findings of such research must be questioned when applied to developing nations.

However, since these earlier studies, research has been conducted in developing nations and the number of studies has grown considerably in such nations (Appiah-Opoku & Bryan, 2013, Kolhoff, Driessen & Runhaar, 2013). This is particularly true of South Africa where it has been noted that this country is leading developing nations in the evolution of environmental assessment in Africa, particularly in the SADC region (Retief & Jones, 2007).

2.2 South African Overview

In South Africa, the EIA legislative process has been in force for 15 years. Prior to this, an EIA was undertaken on a voluntary basis. If an EIA processes was undertaken voluntarily, the process was in accordance with the Integrated Environmental Management process (IEM) and was guided by a framework published by the National Department of Environmental Affairs (Duthie, 2001). The implication of this was that prior to 1997 no formal procedures, methods, triggers or products were codified in law and no administrative systems existed to process EIAs at any level of government. This is despite enabling clauses that occurred in the Environmental Conservation Act (ECA) (Duthie, 2001).

Retief et al. (2011: 156) eloquently summarise the legislative period of South Africa and note that there have been three legislative regimes. The first, also known as the old regime, was in effect from September 1997 to July 2006. Within this period the relevant legislation was the Environmental Conservation Act (ECA), 73 of 1989 and ushered in an era where EIA became law. During this period a number of inadequacies were revealed. For example, a study by Duthie (2001) reviewed the levels of provincial capacity available to administer the regulations and identified the following deficiencies:

- Staff shortages were acute in a number of provinces and the high numbers of applications were thus not timeously processed;
- Although personnel in most provinces had sound qualifications, they were inexperienced, and a lack of service contracts and poor salaries resulted in the loss of experienced staff; and

- There was little follow up, enforcement and compliance monitoring, thus losing a valuable opportunity to see the consequences of decisions. This has had the effect of undermining public confidence in the EIA process.

Other concerns were:

- Wide interpretation of activities resulting in inconsistent application by authorities;
- Small sized and insignificant activities made subject to EIA;
- A lengthy and inflexible process with many bureaucratic decision points;
- Inadequate provisions for public consultation;
- No alignment to other legislation e.g. Promotion of Administration Justice Act (PAJA) and Promotion of Access to Information (PAIA);
- An absence of strategic planning tools (Chand, 2012).

Perhaps the most concerning criticism of this legislative period was that EIA was an obstacle and stood in the way of development. Within a context of a developing country, this was of great concern to the government. This paved the way for a review of the legislation that commenced in 2000 and resulted in a new set of laws.

This second regime is known as the first of two NEMA periods. NEMA refers to the National Environmental Management Act 107 of 1998 (South Africa 1998), the main purpose of which was to address the considerable backlog in applications and to essentially expedite the process. This legislation therefore addressed: detailed thresholds that resulted in some activities being excluded automatically; extension of the coverage of activities requiring an EIA particularly in the mining sector; introduction of time frames; provision of post decision follow-up, and the introduction of different types of EIAs, namely either a basic assessment or a full scoping and EIA. Both types are governed by a list of activities that trigger the need for a basic assessment or a full scoping and EIA as defined by Government Notice No. R386 of 21 April 2006.

The EIA legislation of South Africa has developed over the years but the EIA process has remained relatively unchanged. Although the requirements for every EIA differ as these are set out by the DEAT and are project specific, there is a general guideline of the EIA process and the requirements for each stage of the process (Department of Environmental Affairs & Tourism, 2008). This guideline is as follows:

- Stage 1 – Developer / EAP decide whether a Basic Assessment or Scoping and EIA is required.
- Stage 2 – EAP meets with DEAT to determine precise requirements and the application procedure to be followed.
- Stage 3 – DEAT will issue to the EAP in writing the scope and content that needs to be presented in the application. The DEAT will outline any specialist studies and any specific requirements that the project may require.
- Stage 4 – Once completed the EAP will submit the application.
- Stage 5 – DEAT will review the application and will furnish the EAP with a decision as to if the proposed project may go ahead or not.

In 2007, the Department of Environmental Affairs and Tourism (DEAT) commissioned a review of the EIA process. This study was done by Komen (2011) and he referred to the assessment as "The Ten Year Review". His study highlighted the following key issues:

- At the time of the "Ten Year Review", the EIA had been regulated in South Africa for ten years and although it was seen as a relatively efficient process, various criticisms had been levelled against the instrument, including that it was or had become a somewhat ineffective process;
- It was questionable if the EIA instrument met its objectives and delivered "a return on investment" from the DEATs perspective. The commissioned review focussed on assessing whether the EIA met the objectives and fulfilled the purpose as conceived in the legislation of this process, and also whether the department's time and money invested in the process resulted in commensurate returns.

While the study concluded that overall the EIA was relatively efficient, and could be more so if some activities were managed through other suitable instruments, it was also however found that the process was not as effective as desired. The DEAT chief-director of environmental impact management stated: *The overall effectiveness of EIAs in SA meeting the requirements put forward in the National Environmental Management Act (NEMA) was marginal at best* (McCourt, cited in Swanepoel 2008:8). She further stated: *that the performance timeframes indicated in the EIA regulations were optimistic, and were not attainable across the board, with some assessments taking noticeably longer than planned.* In addition, Swanepoel (2008) found that the interpretation of the regulations varied significantly from authority to authority and that the process of "one-size-fits-all" approach to EIAs that has been generally adopted in South Africa could not be implemented effectively across all authorities.

The problems and concerns as raised above led to the third regime of legislation. This was introduced in August 2010 as revised regulations (South Africa, 2010) and is governed too by NEMA. Research from this period still suggests that the results have been far from adequate. For example, Sandham et al. (2013) reporting on the quality of EIA found that, despite the changes in legislation, the EIA quality had declined. Their study concluded that modifications to the regulations have not resulted in the expected improved performance of the quality of EIA reporting.

At the very heart of environmental authorisation is the intent to implement sustainable development (Komen, 2011). However, as the definition of sustainable development is unclear, it is unknown if this criterion has indeed been achieved by the EIA process. Komen (2011) argues that it has not and asserts that a decade of failing to meet sustainable development criteria has exacerbated the degradation of the environment and the loss of biodiversity, and has called for a new approach to taking environmental issues into consideration (Komen, 2011). However, he qualifies this by noting that the current status quo, which is that the project level EIA, has achieved substantial success over the past 15 years and

remains a valuable tool that should not be discarded. However, certain improvements are required to improve its overall effectiveness and to achieve the required levels of development sustainability in the future.

South Africa has embraced the concept of sustainability and has set a strong mandate through policy and legislation. However, as Morrison-Saunders and Retief (2012) argue, there is some way to go until these objectives are met and note that instead of further legislation and refinement, they suggest attention should fall on human behaviour to align policy and law with environmental practices.

Broadly, the strengths of the EIA process are as follows:

- It contributes both direct and indirect benefits to decision making, such as the withdrawal of environmentally unsound proposals and the generation of "green industry" opportunities (Sadler, 1996);
- It is successful in identifying appropriate mitigation measures and in providing clear information to decision makers on the potential consequences of proposals (Komen, 2011).

Chand (2012) delineates the advantages in terms of benefits to different parties. Specifically, for authorities the advantages are: informed decision-making, improvement or protection of environment quality, management of resources and understanding demands on bulk services (e.g. waste management services). For interested and affected parties the benefits are: an opportunity to be heard, protecting environmental rights, utilisation of local and indigenous knowledge and increased knowledge and awareness. Similarly, the benefits to developers are in proactively asking the right questions (e.g. adequate natural resources, risks associated with environmental factors such as geologic stability, hydrology regimes, fire etc.), what savings may arise in energy, water and finances and the appropriateness of the activity in terms of strategic planning for the area.

The weaknesses of the EIA process are as follows:

- It lacks the necessary authority required to impose the findings and directives of an EIA process which has led to some ineffectiveness in the process once the record of decision has been made (Morris, 2012);
- There is a lack of adequate resources and competence in the relevant government and local authorities reviewing these EIA applications;
- There are concerns regarding political interference in the EIA process and outcomes, as well as a perceived lack of political will and commitment to the legislated process;
- There is a perception of excessive bureaucracy of the EIA process and instrument (Komen, 2011);
- That they take place without due consideration of the context in which they operate and that they have failed to make meaningful decisions (Swanepoel, 2008);
- There are concerns around the average time taken to complete an EIA process with the resulting cost in time and money as well the lost opportunity costs often experienced by developers (Cashmore, 2004; Gilpin, 2000; Mosakong Management report, 2008; Morrison-Saunders & Retief, 2012; Oosterhuis, 2007; Pope et al. 2013; Retief & Chabalala, 2009; Weaver, et al. 2000).

Perhaps the most damning criticism is that it is merely a "tick box" exercise and that instead of adding value to the decision making process, it is mostly used to justify what is already planned in the project (Chand, 2012).

2.3 Efficacy

Measuring effectiveness is fraught with many difficulties. Cashmore et al. (2004) refer to it as the "interminable" issue where evaluations of effectiveness are dependent on the perceived purpose of EIA and their processes and mechanisms. If the primary purpose of an EIA is to influence decision making this therefore infers that development proposals should be modified to reflect the findings of the

EIA, most commonly the introduction of mitigation measures or possibly even the rejection of a development proposal (Pope et al. 2013: 5). Over the past 25 years of both informal and formalised legislated EIA implementations, a number of studies have been conducted on the effectiveness of an EIA (Sadler, 1996 and Duthie, 2001). This has largely been driven by growing concerns of how useful and impactful they are in practice. Effectiveness refers to whether an EIA process obtains its objectives, at least with minimum cost delays and without bias or prejudice, and includes concepts such as efficiency of operations, fairness of procedures, cost effectiveness of the project, the potential to deliver a result and compliance with specific procedural requirements (Sadler, 2004).

Research suggests that the impact of EIA on development proposals varies. For example, Ortolano and Shepherd (1995) found positive results that arose out of an EIA. They cite the withdrawal of unsound proposals, improved proposals such as improved location, enhanced project plans and improved roles and responsibilities. Other research suggests the opposite and that the outcome of an EIA results in nothing more than minor modifications (Cashmore, 2004). However, as Pope et al. (2013) suggest, perhaps the greatest contribution that EIAs are making is during the pre-proposal stage where such considerations are taken into account and factored into the development proposal at a stage well before the final decision making one. Gibson (2005) suggests that the effectiveness of EIAs is still debatable and that despite success stories, the environmental issues are not being addressed adequately. He further adds that case study research that reports positive outcomes, one study at a time, is not at the pace that is required for overarching and far reaching action from all relevant bodies.

There has been considerable interest over the years on measuring effectiveness of the EIA system in South Africa (Morrison-Saunders & Retief, 2012). Based on Sadler's concise framework of EIA outcomes, effectiveness can be substantive (i.e. outcomes), procedural (i.e. processes), and transactive (i.e. efficiency). In terms of the latter, there has been growing concern from practitioners, specialists

and authorities around the overall execution effectiveness of South African EIA record of decisions. This lack of effectiveness has largely been evident in the inability of authorities to properly manage the environmental impact from authorisation and through the lifecycle of the development of the project (Komen, 2011). Kolhoff et al. (2013) state that EIA frameworks do not achieve the results envisioned, particularly in developing countries, due to constraining contexts. In South Africa, the weaknesses have been evident in the areas of the authorities' capacity, public participation, descriptions of the methods used, impact prediction, EIA follow-up monitoring and consideration of alternatives and cumulative effects (Sandham et al. 2013). Certainly more research is required to accurately identify the issues particular to South Africa that are being experienced of late.

Earlier it was noted that there are two types of EIAs: a basic EIA; and a full scoping and EIA. The activities that trigger a basic EIA process are listed in government Notice No. R386 of 21 April 2006. Those that trigger a full scoping and EIA are in Government Notice No. R387 of 21 April 2006.

The different EIAs require a different process and would have different cost and time implications. A process flow diagram for each type of EIA is shown in Figures 2.1 and 2.2.

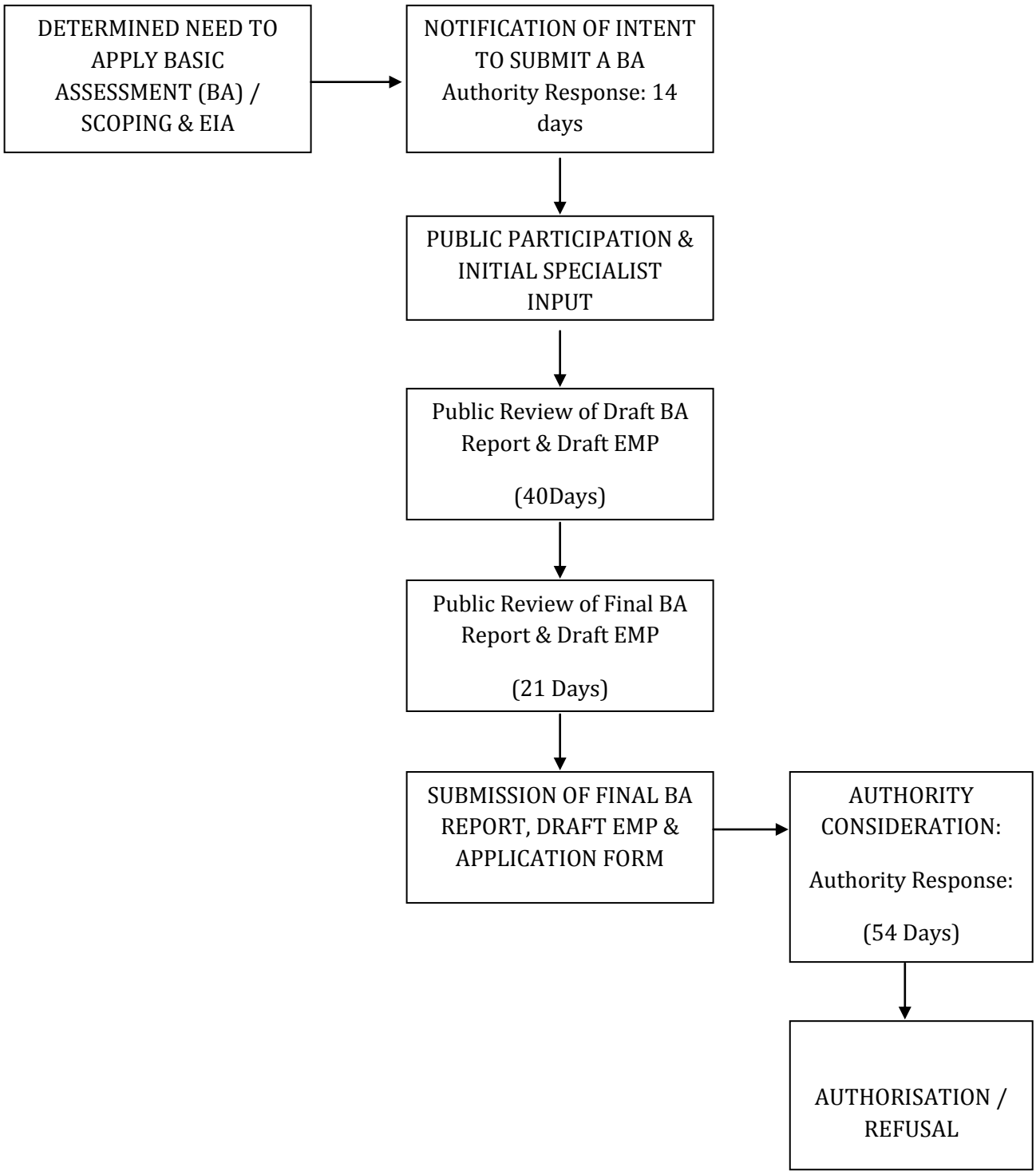


Figure 2.1: Basic EIA process flow Adapted from Chand & MEGA (2010)

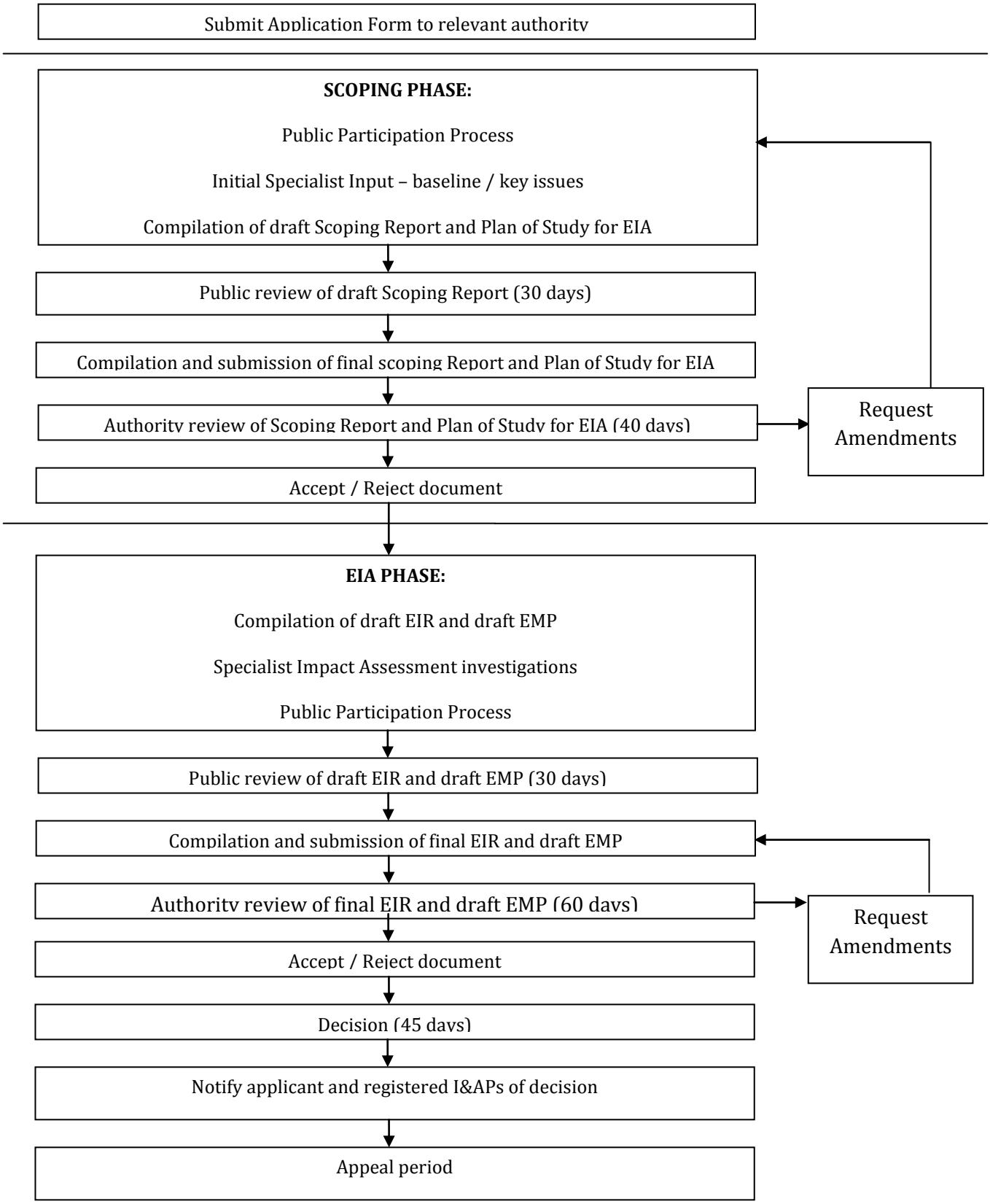


Figure 2.2: Full Scoping and EIA process flow Adapted from Chand & MEGA (2010)

2.4 Cost and Time Implications

To comply with the EIA framework, direct and indirect costs are incurred. Direct costs refer to measurable and quantifiable items that are incurred to comply with the legislation. These may include application for permits, licenses, submission fees, costs of hiring environmental specialists, public participation expenses, and preparation of reports. Indirect costs refer to all other cost incurred not related to the physical production and would include such considerations as loss of ecosystems and impact on quality of life (Wong et al. 2010). Such costs are difficult to calculate and in many cases cover a longer time frame (Morrison-Saunders & Retief, 2012). Further examples of indirect costs are associated with delays, lack of coordination and conflicting demands (Gilpin, 2000).

Retief and Chabalala (2009) say that surprisingly there is little research on the cost of EIA. They attribute this to difficult methodological challenges that this presents largely associated with what is meant by costs and that the research that has been conducted appears to relate to 'direct' costs. Given the challenges that South Africa as a country has with regards to being a developing nation, and the view that EIAs are "costly" and represent unjustified and unnecessary costs, it is important to understand what the costs are and if the benefits of an EIA do indeed outweigh the costs in this country.

The costs of an EIA are usually borne by a developer. They are typically presented as a percentage of the total project cost. A study conducted by Oosterhuis (2007) found s that these costs are typically less than 1% of overall investment of a project. Broad estimations have been developed for the European Union and concur with this percentage where most developed countries in Europe, fit within the range of 0.01% and 0.5% with very few examples of more than 1.0% being found. However, there were costs that exceeded 1% but these were seen as exceptional. In these cases, the higher costs were attributed to sensitive environments or as a result of good EIA practice not being followed.

Weaver et al. (2000) suggest that in South Africa, costs range between 0.02% and 4% (Republic of South Africa, 1998). Retief and Chabalala's (2009) research showed that the direct costs of an EIA were predominantly within the 1% category and concluded that direct costs generally could be considered as favourable in comparison to international standards.

Generally, the costs incurred by the developer relate to performing the EIA and possible delays. For the relevant authorities, the costs would be man hours in relation to managing and checking the process. There appears to be the view that developers of larger project are less concerned with costs in comparison to smaller projects. In South Africa, a number of EIAs are being conducted for small sized projects and hence a burden is placed on small and medium companies (Retief and Chabalala, 2009).

The legal framework in South Africa stipulates time frames for an EIA. The Basic Assessment EIA should take six months while the full scoping and EIA can take 12-18 months (refer to Figure 2.1 and 2.2). At present bureaucracy is encountered in EIA applications that lead to time delays that have a direct impact on a project. It has been estimated that compliance to EIA regulations costs South African business R 796 billion per annum which amounted to approximately 6.5% of annual Gross Domestic Product in 2003 (Morrison-Saunders & Retief, 2012). This amount is considered to be a substantial burden to the South African economy that it can ill afford in present times. There is no doubt that government is concerned about this cost as noted in comments attributed to Ministers. For example:

> *Government is concerned about any delay, costs and associated impacts on economic growth and development. This is why we need to improve efficiency and effectiveness without compromising basic environmental rights and quality*. (Van Schalkwyk, 2006 cited in Morrison-Saunders & Retief, 2012).

However, as noted earlier, research conducted in South Africa shows the costs of EIAs to be relatively small in relation to project costs and compare with

international norms and standards (Retief & Chabalala, 2009). Therefore, such widely divergent statements should be substantiated and explored further.

There is a well-respected and entrenched methodology for measuring cost and time in the project management discipline. Indeed, cost and time are considered as two of the three the cornerstones of measuring the success of a project and have been so for decades (Saputra & Ladamay, 2011). The cost, time and quality variables are commonly referred to as the iron triangle and represent the efficacy of a project (Atkinson, 1999).

The purpose of measurement is to provide prediction before a project commences as well as to anticipate any potential deviation once a project is underway. Indeed, measurement offers assessment of current performance against required goals with the aim of setting goals for improvement if required. This ensures that a project is managed and controlled. Ramirez (2002) argues that measurement is not an end in itself, but rather contributes to the successful achievement of the project. However, measurement offers the ability to monitor the feasibility and progress of a project.

Within the feasibility stage of a project, cost and time parameters are the principal defining elements in the approval or rejection of a proposal. As a first principle, estimate of the cost of the project and the time it will take is obtained before a project commences. This includes the time required to procure relevant approvals from all authorities.

In a practical sense, broad project costs, including all ancillary costs, are formulated by the Quantity Surveyors, Engineers and Project Managers. This results in an overall project cost estimate that is based on an elemental cost analysis using the most current rates in the industry extrapolated across the broad scope of activities defined within the project works. Typically, project managers simultaneously assess the time parameters, based on projects of similar scope and activities. To support this, they are likely to use one of a multitude of

programming packages, to formulate a broad estimated project programme. This project programme identifies and defines the "critical path" activities that will enable the project to progress efficiently (Schwalbe, 2012). Where EIA studies are required, these are without doubt one of the leading critical activities that require early resolution and approval for any given project to proceed beyond the feasibility phase (Munier, 2012).

With the time delays encountered and the costs associated with an EIA, it is useful to review the current situation with regard to cost and time in the EIA framework. Cost and time implications are important as they have a direct and relevant impact on the delivery of a project.

In concluding the literature review, the salient points that arise are that EIA theory and assessment is well entrenched across the world with South Africa being a leading developing nation with regards to this. While philosophical there is no debate that long term sustainability principles are essential for future generations, achieving the balance between economic development and the application of sustainability ideals is not an easy matter.

It is important to periodical review the state of EIAs given the considerable changes in legislation over the years and to ask if benefits are being derived. Central to this is to determine the efficacy of EIAs.

Efficacy in this context is limited to the cost and time of EIAs. Retief and Chabalala (2009) report that South African EIAs are comparable to international standards and say that costs are within the 1% category of project costs. Indeed their research would suggest that there is little need for growing concern regards the implementation of EIAs in South Africa. However, given that five years have passed since this research, it is of value to re-examine where we stand with regards to this subject given the considerable changes that South Africa has undergone in the last five years on all fronts: socio, economic and political etc.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

In this research, three recent developments in South Africa that undertook EIAs are reviewed. These developments took place across the spectrum of the development industry. They are presented as case studies and are described and evaluated with regard to the two variables of interest to this study: cost and time. These case studies are referred to as:

Case Study No.1 Pelican Park Low Cost Housing Project, Western Cape, South Africa
Case study No. 2 Kommetjie Mixed-Use Development, Western Cape, South Africa
Case Study No. 3. Wild Coast Sun Waterpark - Coastal Estuary Study - Eastern Cape South Africa

The development industries that the case studies come from are the public sector low cost housing, the private sector leisure resort and a commercial and residential project. This spread meant that it was possible to assess the impact on both large and small scale developers and thereby provide a representative result that takes into account the finding referenced in the literature review that the impact of EIAs on small developers with limited available cash flow for EIA processes and studies is severe in comparison to large companies with substantial cash flow and who can more easily afford the costs associated with the EIA process. The case studies span two South African provinces: Eastern and Western Cape.

3.2 Data Collection

The information used in this study was obtained by reviewing a number of relevant formal documents. These were:

1. Project Proposals

    - This provided a broad overview of the project location, scope of work and estimated capital cost.
    - The feasibility study supplied information on the timing of the project, the planned expenditure and importantly the anticipated return on investment based on achieving the budgeted capital cost within the programmed project delivery period.

2. Reports

    - To provide a preliminary review of environmental criteria specific to project from the Environmental Assessment Practitioners reports.
    - To identify full EIA scoping trigger points dictating size and scope of the EIA process and any specialist studies required and public participation processes.
    - To review zoning, planning authority and title deed criteria for environmentally sensitive trigger points.

3. Project plans

    - To assess the proposed project construction programme, the timing of the required EIA process with its impact on the project programme, and the costs associated with not meeting these projected deadlines.

4. Budgets

    - To assess the initial project cost estimates and their specific allowances for the anticipated EIA process, and any form of contingency to allow for possible overruns in both timing delays and direct financial costs as a result of the EIA process imposed on the project.

3.3 Data Analysis

The information obtained from the above was analysed in a factual way to provide detail on the variables (cost and time) relevant to the study. This involved understanding the data and extracting the following:

- Date of planned project vs. actual to define the implications with respect to project timing and delivery as a result of the relevant imposed EIA legislation and process required for these specific case studies. Any delays with respect to the proposed project commencement date as a result of any EIA assessment requirements were assessed and evaluated on the basis of both direct and indirect costs to the project and the direct correlation between lost time and financial cost to the project.

- Budget vs. actual cost was examined on each case study to determine any direct financial consequence as a result of imposed EIA legislation/processes on the project. These took the form of indirect costs associated with council inefficiencies and delays in approval and a direct financial burden with respect to extended specialist studies required, expanded public participation processes and the inevitable cost in escalation and loss of revenue incurred with any form of timing delay extrapolated from the above assessment. The determination of both direct and indirect financial consequences as a result of imposed EIA legislation and processes on the project was determined by the following:

    - Examination of the Project Cost Reports prepared by Quantity Surveyors for the Client / Developers where escalation provisions were estimated based on the original construction programme and whereby the burden of additional escalation on the project could be estimated once the delay was identified.

    - Examination of the initial feasibility studies done for these three case study projects, which indicated anticipated trading dates and

anticipated revenues for years one to five of the project, thus allowing the calculation of lost revenue due to delay by multiplying the delay by the anticipated monthly revenue.

- Additional direct costs to the project were defined by reviewing project minutes and correspondence relating to additional professional fees for further studies, extended management fees where projects were delayed, revised Architectural / Engineering design costs as well as other specialist consulting costs, such as QS and land surveying, as a result of the directives emanating from the EIA studies.

- Indirect costs with respect to reputational damage due to project delays cannot be financially adjudicated or defined, however they would be significant to any company, both large and small should these delays reflect against their integrity and capability of delivery, as was the case in both the Pelican park and Kommetjie case studies, and the reason that Sun International were prepared to expend additional capex on the Wild Coast project to meet their original deadlines.

3.4 Benefits of Research Methodology

Through this study, which is aimed at examining the cost and time implications of the EIA process in South Africa, in a quantifiable manner by reviewing three case studies, the following will be achieved:

- The research will add recent, objective data to the debate that currently manifests around the EIA process and its outcomes in South Africa,
- The research will benefit property developers primarily who need to take the cost and time implications of EIA into account, and
- The research will point to strategies and measures to address shortcomings the EIA system that can be remedied, given that they would have been overtly found and substantiated with evidence.

3.5 Limitations of Research Methodology

As noted in Chapter 1, case studies, while being a sound research methodology, do have some limitations. These are largely associated with the fact that they do not lend themselves to quantifiable analysis and can therefore not be used to produce widespread conclusions and generalisations.

CHAPTER 4: CASE STUDY DATA

4.1 Case Study No.1: Low Cost Housing Development on ERF 934, Pelican Park, Cape Town

4.1.1 Introduction

Pelican Park is an established residential suburb located in the southern portion of the City of Cape Town's District G: Cape Flats. Erf 934 is situated within the Pelican Park suburb and comprises 31 668 hectares of vacant grassy lands. Two significant non-urban structuring elements are located in close proximity to the vacant land: these are Zeekoevlei to the west which is a natural system as it forms part of the southern peninsula drainage system and provides recreational facilities to a large number of people and to the east the Philippi Horticulture area (NEMA & LFTEA Report, 2011).

This housing development project was initiated in 2010 by the Provincial Government of the Western Cape's Department of Human Settlements. The Department appointed Ariya Project Managers to initiate the project by putting together a professional design and town planning team to obtain the necessary development rights as well as to develop a preliminary design for a sustainable human settlement on the vacant land.

The project was initiated as a Greenfields development, ensuring that the surrounding communities would be integrated in line with the principles of the Comprehensive Plan for Sustainable Human Settlements as adopted by Cabinet in 2004 (NEMA & LFTEA Report, 2011). There were no constraints on the design of the settlement as there were no existing buildings on the vacant land. The vacant land was initially zoned for education purposes so the project team had to go through the process proscribed in the Less Formal Township Establishment Act No. 113 of 1991 (LFTEA) in order to get the land re-zoned and sub-divided. This process was completed by the project team and there was no objection from

the Provincial Government of the Western Cape and in particular the Education Department (WCED) to whom the land was designated, as they agreed that there were alternative sites that could be used for education purposes.

The housing development consists of 219 subsidised residential units that have been structured around ten open courtyards. There are three public open space areas and one community centre facility incorporated within the development. The development was designed to include all necessary infrastructure services such as water and electricity to every home, two electrical substations, sewerage links, internal roads and parking areas.

The subsidised residential houses have been partially allocated to a beneficiary group preselected by the department. This group is known as the Thembelihle Housing and Savings Group and consists of approximately 64 women, most of whom are employed as domestic workers in and around the southern suburbs of Cape Town and who were in discussions with the Department for ten years prior to this, requesting the department to secure land and subsidised housing for their members. Once the project was initiated, the department allocated the first number of homes to this group with the remainder of the units allocated to members of the community through the City of Cape Town's official housing allocation procedure.



Figure 4.1: Pelican Park Low Cost Housing Development Plan

(Source: Chand Environmental Consultants 2014)

4.1.2 Need and Desirability of the Proposed Housing Project

There is a critical demand for housing both nationally and locally, and the situation in the Western Cape has reached crisis proportions (Chand, 2012). The desperate plight for housing is common knowledge in South Africa with high levels of unemployment and significant numbers of homeless people. The demand for housing was evident in the overwhelming response during the public participation process and when word spread of a proposed development for the local community, many people tried to secure a house in the new Pelican Park development.

The surrounding area is mainly of a residential nature. While the land for the new development was originally for education purposes, after thorough studies of the area it was found that there was an ample supply of schools within a close radius of the development. More specifically, there are 27 schools within the immediate area of the development and two within 500 metres of the new development. Due to the surrounding area being mainly residential there was concern that educational facilities were not the priority. However, after the public participation process and careful examination of the schools in the area and their numbers it was clear that there was a greater need for residential housing rather than an additional school.

The housing backlog within the Cape's metropolitan and local area has been highlighted in the City of Cape Town's Integrated Development Plan 2007-2011 (Chand, 2012). This plan focuses on the acceleration of sustainable and integrated human settlements. The district that the new development was proposed for has the third highest percentage of informal dwellings in the city. The proposal for the new development argued that it would contribute to the alleviation of the housing backlog and the location of the development was identified to be positive and sustainable as the location is close to existing public transport routes, economic activity and community facilities. These factors strengthened the desirability of the proposed new housing development. Initially, three alternative options were considered for this land. The decision to proceed with the low cost Pelican Park housing development option was considered to be the Best Practicable Environmental Option (BPEO) for the following reasons:

- There are significant beneficiaries to the development, namely the Thembelihle woman's group and other informal settlers who will acquire a home;
- The development will increase the safety and security of the area as the vacant land was used for criminal activity;
- The design provides the least impact on the heritage, archaeological, visual and botanical environmental aspects of the site.

The nature of the vacant site is partly wetland and due to this, the need for an EIA was triggered. The application for the development rights therefore consisted of a combined process taking into account the statutory environment process (NEMA, 2009) as well as the town planning process (LFTEA, 1991).

Prior to the statutory Public Participation Process, the public had been extensively engaged during the participative design process which led to an agreed Public Participation Process in terms of a combined NEMA/LFTEA process all in terms of the EIA Regulations (NEMA & LFTEA, 2011).

4.1.3 Environmental Considerations

A number of issues on the site triggered the listed activities. These were related to the watercourse of the wetland situated on the site. In addition, both the routing of the water sewer, electrical reticulation infrastructure and the defined building line restrictions were required to be setback from the original schemes building footprint infrastructure and building setback. This required formal approval and authorisation from the environmental authorities, in this case the Department Environmental Affairs and Development Planning (DEA&DP).

A number of environmental specialist studies were required to be conducted for the Pelican Park development. These were the following:

- **Fauna** – The concern was the loss of natural habitat to the area. Once the study was conducted it was found that there were toads and reptile species inhabiting the land. However, it was recorded that the land had little or no long-term conservation value for such fauna (toads and reptiles) and there were accordingly no relevant constraints imposed on the development in this regard, but the above mentioned fauna were further studied in the specialist report and an impact on their habitat was registered.

- **Freshwater Ecology** – The concern was that the proposed development would cause the loss of an entire wetland and with it the fauna that inhabit

the wetland. The ecological study was considered alongside the faunal study. The results were that it was necessary to conserve the wetland, however, the study found that there would be a moderate impact on the aquatic ecosystem.

- **Botanical** - The concern was the loss of flora and in particular the loss of the natural vegetation of the critically endangered Cape Flats Sand Fynbos that grew naturally on the land. However, the study concluded there was not much of such vegetation left on this land and alien invasive grass and herbs had predominantly taken over. Due to this, the loss of flora did not pose a problem to the proposed development.

- **Historical and cultural** – The concerns here was the loss of historical value and importance. The existing site showed evidence of a substantial amount of disturbance to the land and therefore, it was concluded there was no significant historical value on the site. Furthermore, due to there being no buildings on the site there was no evidence that there would be negative social impacts imposed by the new development and thus no environmental trigger or impact on the proposed development was identified under this heading of the EIA.

- **Visual** – The concern here was the negative visual impact. In this study, it was found that this development of subsidised low cost housing would have a negative impact on the surroundings. This was because the development proposal was for double storey houses whereas in the surroundings only one-storey houses existed. This finding created a significant design problem for the developers who had to re-design and make considerable changes to remedy the visual finding.

A resource usage study was conducted to assess the current resources and the broader usage surrounding area. The exact use of scarce resources (water and electricity) was calculated and it was found that the development would be able to

connect to and make use of the current capacity in the municipality's sewage, water reticulation and electricity supply systems. The area of concern was in electricity supply where it was found that there would be incremental strain on the electrical supply to the area. The developer responded by absorbing the unforeseen costs of including a solar geyser for each unit to ease the load on the electrical supply, which in turn was a benefit in terms of the overall sustainability of the development.

Throughout the construction and development phase, it was known that there would be waste generation, dust, chemical spills and noise pollution. These were carefully considered and mitigated by including protocols within the Environmental Management Plan (EMP) to ensure that they were mitigated during the construction and development phase (Chand, 2012).

During the operational phase, the waste and effluent generated by the development and its impact on the area was considered. It was put forward that the development's infrastructure services could be connected into the municipal system and appropriately disposed of. This was considered to be acceptable to the authorities. Stormwater runoff of the new development was reviewed and it was found that the additional runoff would cause an increase in erosion. Fortunately, the developer had included an urban drainage system within the design to mitigate the problem.

The social environment of the development was also considered and it was found that this development would be positive for the community for the following reasons:

- Creates jobs for the local community through the need for construction workers
- Provides affordable, supplemented housing for the local community.

Through the thorough Public Participation Process (PPP) it was evident that the vacant land earmarked for development was perceived by the local community to be an unsafe environment. Therefore, the development was seen to be positive in this sense as it would then create a safe living environment (Morris, 2012).

As a result of the environmental considerations that were examined, the overall impacts associated with the proposed development were found to be acceptable. The proposed development supported the critical need for low cost housing, urban growth and densification in the local area. The design of the development evolved in a considered manner, involving the local community and members associated with the development. It was finally concluded that this development should definitely proceed as it would create a high quality, safe, public environment for the local community.

4.1.4 Environmental Impact Assessment

The Pelican Park low cost housing development project began in 2009. During the conceptual design phase a full EIA was triggered through the then current environmental legislation: The Environmental Conservation Act (ECA).

Although the ECA was not legally binding, the Environmental Assessment Practitioners (EAPs) believed that it was in best interest of the developers, the municipality of Cape Town and the surrounding communities to adhere to the guidelines outlined in the ECA document.

The full EIA process began with the statutory Public Participation Process to elicit comments and encourage public involvement in the development. Key stakeholders and Interested and Affected Parties (I&APs) within a 500m radius of the development were identified and invited to attend the inaugural public meeting. From the first meeting it was expressed that the need for housing in the area was great. The second meeting addressed the allocation of housing and how

the beneficiary group was selected and how the remainder of the houses would be allocated to the community (NEMA & LFTEA, 2011).

During the public participation process, which took 12 months to complete, the following issues were raised and highlighted by the parties involved:

- Concern regarding the sizes of the houses;
- Degradation of the urban environment over time as people expand their homes informally;
- Negative impact on current civil engineering services;
- Inappropriate land use;
- Need for community based services;
- Concern that the architecture of the development would not blend into the existing surroundings;
- Support for the development as it will create a safer space;
- Alternative designs were requested.

The developer and project team dealt with these issues by presenting to the concerned parties three alternative designs. However, due to the length of the Public Participation Process a major problem arose in the form of new legislation, namely the National Environmental Management Act (NEMA, 2009). This Act was passed into legislation in 2010 and became binding on all relevant parties. This caused major time and cost implications for the project because the Public Participation Process that had already been carried out was no longer valid and an assessment of the development under the new NEMA Act had to be reconsidered.

NEMA (2009) introduced the following obligations that had to be fulfilled by the developer in order to ensure that it was a socially, environmentally and economically sustainable development:

- Avoid or minimise disturbance of ecosystems and loss of biological diversity;

- Avoid or minimise pollution and degradation of the environment;
- Avoid or minimise the degradation of the surrounding landscape;
- Avoid the creation of waste and ensure all efforts to reuse and recycle any waste produced;
- Consider negative impacts on the environment and on the people's environmental rights and make sure all measures are in place to mitigate or minimised these impacts.

Through consideration of the NEMA Act it was found that a full EIA would not be necessary. However, in late 2010 when a wetland was discovered on the proposed site and the wetland specialists had further investigated the situation, a full EIA was triggered under the new NEMA Act (NEMA & LFTEA, 2011).

The entire Public Participation Process that was carried out in 2009 and 2010 needed to be completely redone. The implication was that the costs incurred in the previous year and the time it had taken was lost.

The project team tried to mitigate this delay and accelerate the development by running both the application for re-zoning of the land and the EIA process simultaneously. This caused time and cost issues as the specialist studies had to be conducted only once the land had been re-zoned for housing purposes. Due to this, the specialist studies for the land were put on hold until the land was re-zoned (Chand, 2012).

The re-zoning process took approximately six months, which was longer then the project team anticipated despite the need for housing being approved through the Public Participation Process conducted the previous year as well as the Municipality of Cape Town supporting the development and highlighting the critical need for low-cost housing developments.

During the re-zoning process of the land an entirely new Public Participation Process took place and the same issues in the previous study were again brought

up by the community. The developer and project team were able to address the issues that arose by presenting the following three alternatives designs for the development to those involved in the Public Participation Process:

Alternative 1: The No-go development option. It was explained that should this development not take place the current land zone use for education purposes would remain. This would allow other developers to apply for alternative usage including other housing developments. This was not seen to be the suitable option as the land was degraded and the community believed that the vacant land was where criminal activities took place. Furthermore, the urgent need for housing in the area highlighted the fact that the no-go option was not the most suitable alternative.

Alternative 2: This alternative was based on the linear road organization and it explored a large Public Open Space (POS) at the entrance to the development where the development is split into sections by one internal road. All the sites were proposed to be 100m² regardless of the shape and three different units were offered, a single storey unit, a double storey two-bedroom unit and a double storey one-bedroom unit with all units designed in increments of 40m². This layout allowed for 179 units on the property which equated to 56 units per hectare. This alternative was deemed undesirable for the following reasons:

- No community facilities were planned within the development to serve this community;
- The internal road layout was not conducive to a pedestrian friendly development;
- Building heights and unit layouts were not optimally sited visually which increased the bulk factor, given the larger unit sizes of 100m2 each;
- The internal vehicle reticulation and linear layout of the planned housing units was not in keeping with the Departments planning for the establishment of a sustainable human settlement;
- Infrastructure reticulation design had not adequately addressed and mitigated the wetland area of the site.

Alternative 3: This alternative proposed 219 housing units clustered around intimate multi-functional courtyards and one large site marked for a multi-purpose community facility. This alternative proposed a housing density of 69 houses per hectare which equated to the average erf size of 70m². This design provided for three Public Open Spaces and as well as courtyard, formal parks and urban agriculture. The creation of smaller communities through the courtyard design promoted the creation of safe places.

This third alternative design was seen as the most desirable and environmentally responsible option as it addressed the shortcomings identified in the previous Alternative 2 and complied with all necessary departmental and local authority planning requirements. These can be identified as follows:

- Provision was made for a site designated 'multi-purpose community facility' in the centre of the development with easy accessibility and visibility for the community;
- The entire design concept was based around the notion of houses around public spaces, rather than in a linear form along straight roads with connecting courtyards providing a sense of community within the development;
- Pedestrian priority was foremost in the design of the movement systems, with secondary access for vehicles to some of the areas at low speeds only;
- The sewer servitude running North – South through the centre of the development allowing only roads or public space to be developed above it, proved most efficient and did not encroach on the wetland areas;
- The development responded correctly in design to the vacant public open space adjacent to the new development in accordance with the requirements of the City of Cape Town who own the public open space;
- Housing types and heights had been properly sited to avoid visual and noise impacts and the smaller units had reduced the overall bulk to an acceptable level in line with City Planning parameters for the site;
- The units within the development have been optimally sited on the individual erven to accommodate future incremental growth.

Based on the findings and recommendations of these specialist studies and the mitigating measures imposed on the developer, the environmental approval application sought the approval of Alternative 3 above. This approval was subject to the inclusion of all the mitigation measures recommended by the specialist studies, and additional recommendations in the basic assessment report, with associated construction and operational phase Environmental Management Programmes (NEMA & LFTEA, 2011).

While the success of following due process with respect to the statutory environmental laws can be identified through the modification of the design to protect the existing wetland and the ecological nature of the area, the cost and time involved caused considerable challenges for the developer. By law the developer was forced to undertake the initial Basic Scoping report, which in turn identified the areas of possible impact to the environment. This then triggered the more detailed full EIA study including the necessary public participation process and commissioning of specialist studies. This had a direct cost implication on the project budget with the associated time implication in securing these necessary approvals, which had both direct and indirect consequences in the form of a reduced development and one year of loss of interest, loss of revenue, capitalized interest on the land cost during this period, council utility costs on the site for this period. Probably the biggest indirect cost to the developer was the change in market conditions in the intervening one year period of the EIA in which the housing and commercial market had slumped. These direct and indirect cost and time implications are further explored in the following section of this case study.

4.1.5 Project Time and Cost Impact

Direct and indirect cost and time implications to the developer with respect to the statutory EIA process been followed are shown in the tables below. These impacts arose from the following:

- Cost of the environmental study, including the environmental consultant cost (Chand, Environmental Consultants, 2014), public participation costs,

including having to duplicate the costly and timely public participation process on this project;

- Specialist studies and reports costs associated with heritage, archaeological, botanical, fauna, freshwater ecology, visual and socio-economic specialist studies dictated by the findings of the scoping report and feedback from the public participation process;
- Additional professional fees for the Architect, Civil Engineers, Quantity Surveyor, and Project Managers during the evolving and ongoing design development process through three alternative design iterations before the developer reached an acceptable proposal for submission to the environmental authorities for the necessary approval;
- Delay of nearly four years before the project could be implemented with consequential indirect costs of loss of interest, loss of profit, capitalized interest for the period, change in scope (size of the development was reduced), local council utility costs for the site during this delay and the negative change in the relevant market conditions during this period;
- Delay in tendering and appointment of contractor and project commencement incurred four years of escalation costs;
- In-house development costs incurred by the developer during the delayed process;
- An indirect cost of reputational damage caused to the developer due to the delays and costs incurred outside of their control.

Table 4.1: Environmental Costs of Adhering to Environmental Legislation for the Pelican Park Low Cost Housing Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	FINAL COST
Environmental Assessment Practitioner (EAP)	R 206 441.00	R 52 039.00	R 258 480.00
Environmental Lawyer fee	-	R 24 000.00	R 24 000.00
Specialist studies	-	R 25 000.00	R 25 000.00
TOTAL COSTS	**R 206 441.00**	**R 101 039.00**	**R 307 480.00**

The above table illustrates that an additional cost of R 101 039.00 was incurred through the unexpected expenses caused in the carrying out the necessary environmental legislative requirements.

The following table shows overall project costs. One of these indirect costs is escalation costs. The quantity surveyor appointed on the job will provide these escalation calculations using Z methods by following quarterly government gazetted indices. These indices are:

- CPAP or Cost Price Adjustment Provision indices
- BER Forecast or Bureau of Economic Research Indices.

Quantity Surveyor's generally prefer using the BER indices which provide a broad 12 month forecast of price increase percentile or escalation for the building industry rather than the more trade specific indices provided from the CPAP indices.

Table 4.2: Project Costs Incurred due to Adhering to Environmental Legislation for the Pelican Park Low Cost Housing Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	ADDITIONAL PROJECT COSTS	FINAL COST
Project Budget	R 3 000 000.00	-	-	R 3 000 000.00
Professional fees (Infrastructure)	R 360 000.00	-	R 45 000.00	R 405 000.00
EAP Fees	R 206 441.00	R 52 039.00	-	R 258 480.00
Environmental lawyer Fee	-	R 24 000.00		R 24 000.00
Specialist Studies	-	R 25 000.00	-	R 25 000.00
Acceleration Costs	-	-	-	-
Escalation costs	-	-	-	-
Additional Development Costs	-	-	R 32 800.00	R 32 800.00
TOTAL COSTS	**R 3 566 441.00**	**R 101 039.00**	**R 77 800.00**	**R 3 745 280.00**

Table 4.2 illustrates by adhering to the environmental legislation an additional Environmental cost of R 101 039.00 was incurred and furthermore an additional project cost of R 77 800.00 was incurred.

Table 4.3: Time Implication of Pelican Park Low Cost Housing EIA

PROJECT	TIMELINE
Original Project Development Programme	Mid June 2010 – Mid June 2013 (36 months)
Final programme to allow for all public participation and environmental studies to be fulfilled	Mid June 2010 – Mid June 2014 (48 months)
Final Time delay	**12 months**

Table 4.3 above illustrates that there was a 12 month delay in the development project programme due to the developer adhering to environmental legislation and completing the EIA process.

When the Provincial Government of the Western Cape initially appointed a professional team led by Ariya Project Managers to obtain the necessary development rights and develop a preliminary design for the establishment of a sustainable human settlement at Pelican Park in early 2010, they were not aware of the need for any form of EIA related process which was subsequently imposed on the process following the triggering of various listed activities under the NEMA regulations (Chand Environmental Consultants, 2012).

While the combined NEMA/LFTEA process was implemented with the expectation of a relatively simple six month due process undertaking, this became a protracted process owing to the changes in legislation during 2010 and the consequential applicability of the regulations as well as the opportunity on the project of combining the town planning and environmental land use applications into one process in terms of NEMA/LFTEA. These legislation changes informed the due process to provide for separate studies, including a variety of specialist

studies as a result of triggers identified during the public participation process as well as those found in the actual site conditions.

The commissioning of these specialist studies in the form of freshwater ecology, fauna and the like was a direct cost which was originally not budgeted for in the overall project and additional funds had to be approved for this in the project.

The initiation of the authorisation process delayed the intended commencement of the project initially by six months for the basic assessment and then by a further six months due to the legislative changes to the process that was already underway, in total a 12 month delay. During this period, the various specialist studies were commissioned, presented and feedback attained from the relevant statutory bodies. This delay in programme had an overall impact on the project completion date of 12 months. This delay could not be mitigated as it may well have been done in the commercial private sector negotiating acceleration costs with the preferred tenderer to ensure completion within the proposed timeframe. But this was a public sector project without the luxury of corporate cash flow and decision making ability to do so. This forced them to extend the completion date with consequential direct financial burden and indirect costs in terms of reputation and considerable hardships for the families waiting to be housed within the new low cost human settlement, to which a monetary cost cannot be adequately calculated.

This case study further highlights that not all costs are of a direct financial burden and emphasises the indirect costs associated with public sector initiatives and development, where additional finance is not readily available. Such burden of cost is carried by the ordinary public and those least able to afford it in the low cost housing sector.

The additional financial burden carried by the Provincial Government of the Western Cape Department of Human Settlements as a result of the process was approximately an additional 5% (i.e. R 150 000) of the original development cost estimated at R 3Million.

While this is a significant direct cost to absorb, the delay in delivery of these homes from 36 to 48 months has a far more “socially significant” indirect cost to those affected.

4.2 Case Study No.2: Kommetjie, The Western Cape Mixed-Use Development Study

4.2.1 Introduction

Kommetjie is a suburb of Cape Town in the Western Cape province of South Africa. It is situated approximately halfway down the west coast of the Cape Peninsula at the southern end of a beach that runs northwards towards Chapman’s Peak and Noordhoek (BAR, 2010).

Kommetjie, the Afrikaans word for "small basin" is a village situated around a small, natural and rocky inlet that resembles a basin. There is some evidence that this basin was used as a fish trap by prehistoric people and remains today a popular fishing village (BAR, 2010).

Kommetjie is a quiet and relaxing little town with a village atmosphere and hosts a variety of plant and animal species, many of which are endangered. The village is especially well known for its milkwood groves. Kommetjie is also part of the fynbos biome, which boasts the highest number of plant species per square kilometre in the world with some of the rarest and most sought after plants found in this biome, but which face threat from a variety of alien species, mostly Australian plants imported in the 1800s. Kommetjie supports a number of small business enterprises and restaurants, which pose a major threat to the plant life as the inevitable encroachment and expansion of commercial and residential development impacts them. Development plans in this suburb are required to undergo environmental approvals in the form of Basic Assessment Reports and full EIAs (BAR, 2010).



Figure 4.2: Kommetjie Mixed-Use Development Site Plan

(Source: Chand Environmental Consultants 2014)

4.2.2 Kommetjie Village Centre Mixed-Use Development

This development proposal entailed the construction of a mixed-use development comprising a residential and retail component on a vacant portion of land situated between Kommetjie Main Road and Teubes Road in the Kommetjie town centre. The site itself comprises a number of erven measuring 1.9 hectares in extent and falls within an area utilised for residential and retail purposes. The area falls under the jurisdiction of the city of Cape Town's South Peninsula Administration (Chand, 2009).

The developer applied to provide 31 residential units and a retail centre of approximately 1400m² on the already disturbed Western and Eastern portions of the site. The proposal identified that the proposed housing type had not been catered for previously in the area and would therefore provide opportunities for a

different market segment. The development would include associated infrastructure such as access and internal roads as well as the provision of civil engineering services, such as water, sewer, stormwater and electricity.

As part of the master plan development the existing road reserve that runs through the site required closure and the necessary application was made to the City of Cape Town Roads Department in this regard (Department of Environmental Affairs & Development Planning, 2010). The development proposal calls for electricity and water supply, as well as sewage treatment services to be provided by the City of Cape Town and a report confirming that sufficient capacity in the current bulk infrastructure to support this development was provided.

A number of the erven that comprise the development held existing rights and the proposal was to reconfigure these existing rights in a more appropriate manner so as to allow for the conservation of significant fynbos in an open space core and a boardwalk to provide controlled pedestrian access to the fynbos area. While the one portion of the site was zoned as private open space, the developer proposed to reconfigure the rights of the core area with significant vegetation to be rezoned to a public open space area (Chand, 2009).

4.2.3 Environmental Considerations

As set out in the Basic Assessment Report (BAR, 2010) a number of environmental considerations had to be accounted for in the assessment of this site, namely its botanical and faunal, heritage, archaeology, visual and freshwater ecology. In addition the report needed to also consider any socio-economic impacts associated with the proposed development, particularly job creation and a positive economic stimulus.
The developer commissioned a Basic Assessment Report (BAR) and to be read in conjunction with it, an Environmental Management Programme (EMP) for submission to the Department of Environmental Affairs and Development Planning for environmental approval and authorisation.

During the EIA process a number of substantive changes needed to be effected to take account of changes to botanical information in the area, where during the time that passed since the initial botanical assessment was undertaken and the time that the draft BAR was compiled, the fine scale mapping of the vegetation and inclusion of the site in the city of Cape Town's Biodiversity network (BIONET) in the Kommetjie area had changed. As such the botanical assessments in the report were updated to accommodate the necessary changes, which included a change in designation of the vegetation of the site, originally mapped as Cape Flats Dune Strandveld and subsequent fine-scale mapping interpreted the vegetation of the site to being transitional between Cape Flats Dune Strandveld and Peninsula Sandstone Fynbos. This change in interpretation necessitated the site's inclusion in the Biodiversity Network System (BIONET) as a Critical Ecological Support Area (CESA) owing to the presence of endangered vegetation types requiring conservation. This had a significant impact on the site to be developed and the developers were forced to plan three alternative design proposals to overcome this impact, which are described in detail later.

During the preparation of the EIA the report had to take account of and study the impact on traffic, infrastructure and service delivery, both water and electricity, as a result of the mixed use type of development proposed for the site.

In addition, and as a result of a number of comments from Interested and Affected Parties (I&AP's) during the public participation process of the EIA requesting further clarity on the socio-economic impacts of the development on the Kommetjie area, a socio-economic study had to be commissioned and undertaken during the final Basic Assessment stage (Chand, 2009).

Ongoing changes to planning approval documentation requirements by the Minister of Local Government, Environmental Affairs and Development Planning during the process required further modification and changes to the overall Site Development Plan (SDP) submission.

Finally, the original planned boardwalk that was proposed for the development through the conservation-worthy vegetation area needed to be relocated to the edge of the core area of the site so as not to split this area with significant vegetation into sections. This entailed substantial redesign of the layout of the proposed development application. This had direct consequences on both cost and time (Chand Environmental Consultants, 2014).

4.2.4 Environmental Impact Assessment

Given the environmental considerations outlined above, the EIA process advanced as an iterative process whereby the changes requiring consideration were catered for in various development layout alternatives to best suit the environmental issues. This iterative process was guided by the various specialist studies and findings as well as comments received during the initial public participation process. Incorporating the alternative proposals to best suit the site demonstrates the evolution of development alternatives. However, by so doing consequences were encountered by the developer of both a cost and time nature.

Seven specialist studies were undertaken as a result of the possible impacts identified in the original environmental scoping exercise and public participation process. These studies included, heritage, archaeological, botanical, fauna, freshwater ecology, visual and socio-economic assessments to determine the significance of each impact and how each needed to be remedied in terms of alternative development actions (Department of Environmental Affairs & Development Planning, 2010).

To address the impacts raised during the iterative process between the specialists and the design team as well as issues raised during the public participation process, three alternative development proposals were put forward for the project, which were:

Alternative 1: the originally proposed conceptual layout plan envisaged development across the entire site, with a mix of residential and commercial components comprising 74 two- storey apartments with the commercial component comprising two stories of office, retail and restaurant space with parking for 73 vehicles.

Due to botanical constraints on the development relating to the identification of sensitive terrestrial vegetation in the central portion of the site by the botanical specialist, alternative 1 was deemed to be unacceptable from an ecological perspective.

Alternative 2: a revised development proposal entailing no development on the central portion of the site where significant flora is located, with development restricted to the eastern and western portion of the site, a commercial node on the western portion and a residential node on the eastern portion. The proposed commercial development in this alternative however encroached on the existing wetland and as such was also not desirable from an ecological perspective.

Alternative 3: based on the freshwater specialist's recommendations the commercial component of the proposed development was reconfigured in a further revised layout plan so that the hard development footprint would not encroach into the wetland and would provide a buffer zone between the wetland and the development area. In addition a raised wooden deck for walking, viewing and restaurant seating was placed in the buffer zone of the wetland to maintain the ecological processes associated with the wetland. At the same time the residential component was reconfigured to provide for 31 units, a substantial reduction from the originally proposed 74 units.
These changes entailed both direct cost and time implications as well as indirect costs with regard to the feasibility of the reduced number of units in the development.

Based on the findings and recommendations of these specialist studies and the mitigating measures imposed on the developer, the environmental approval application sought the approval of alternative 3 above, subject to the inclusion of all the mitigation measures recommended by the specialist studies, and additional recommendations in the basic assessment report and associated construction and operational phase environmental management programmes (Chand, 2009).

The success of following due process with respect to the statutory environmental laws can be identified through the adaptation of the design to protect the existing wetland and ecological nature of the site. The cost and time involved caused considerable challenges for the developer. By law the developer was forced to undertake the initial Basic Scoping study which in turn identified the areas of possible impact to the environment which then triggered the more detailed basic environmental study including the necessary public participation process and commissioning of specialist studies. While this had a direct cost implication on the project budget, it had the following further cost implications: loss of interest, loss of revenue, capitalized interest on the land cost during this four year period, council utility costs on the site for this period and probably the biggest indirect cost to the developer was the change in market conditions in the intervening four year period of the EIA in which time, the housing and commercial market had slumped. These direct and indirect cost and time implications are further explored in the following section of this case study.

4.2.5 Project Time and Cost Impact

Direct and indirect time and cost implications to the developer with respect to the statutory EIA process been followed are shown in the tables below. These impacts arose from the following:

- Cost of the environmental study, including the environmental consultant cost (Chand Environmental Consultants), public participation costs, etc;
- Specialist studies and reports costs associated with heritage, archaeological, botanical, fauna, freshwater ecology, visual and socio-economic specialist studies dictated by the findings of the scoping report and feedback from the public participation process;
- Additional professional fees for the Architect, Civil Engineers, Quantity Surveyor, and Project Managers during the iterative, evolving and ongoing design development process via three alternative design iterations before the developer reached an acceptable development footprint for approval submission to the environmental authorities and associated change in scope (size of the development reduced);
- Delay of nearly four years before the project could be implemented with consequential indirect costs incurred of loss of interest, loss of profit, capitalized interest for the period, local council utility costs for the site during this delay and the negative change in the relevant market conditions during this period;
- Delay in the tendering and appointment of contractor and project commencement incurred four years of escalation costs on the final development cost;
- Development and administration costs incurred by the developer during the delayed process.

Table 4.4: Environmental Costs of Adhering to Environmental Legislation for the Kommetjie Mixed-Use Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	FINAL COST
Environmental Assessment Practitioner (EAP)	R 401 060.00	R 152 902.00	R 553 962.00
Environmental Lawyer fee	-	R 46 000.00	R 46 000.00
Specialist studies	-	R 218 000.00	R 218 000.00
TOTAL COSTS	**R 401 060.00**	**R 416 902.00**	**R 817 962.00**

Table 4.4 illustrates that an additional environmental cost of R 416 902.00 was incurred through the unexpected direct cost implications of undertaking the necessary environmental legislative requirements.

Table 4.5: Project Costs Incurred due to Adhering to Environmental Legislation for the Kommetjie Mixed-Use Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	ADDITIONAL PROJECT COSTS	FINAL COST
Project Budget	R 24 620 000.00	-	-	R 24 620 000.00
Professional fees (Infrastructure)	R 2 800 000.00	-	R 175 000.00	R 2 975 000.00
EAP Fees	R 401 060.00	R 152 902.00	-	R 553 962.00
Environmental Lawyer fee	-	R 46 000.00	-	R 46 000.00
Specialist Studies	-	R 218 000.00	-	R 218 000.00
Escalation costs (for 48 month delay period)	-	-	R 376 000.00	R 376 000.00
Developers' additional In-house management and administration costs	R 450 000.00	-	R 120 000.00	R 570 000.00
TOTAL COSTS	**R 28 271 060.00**	**R 416 902.00**	**R 671 000.00**	**R 29 358 962.00**

Table 4.5 illustrates that due to adhering to environmental legislation specific to the EIA process an additional cost of R 416 902.00 and an additional direct project cost of R 671 000.00 was also incurred and absorbed by the developer.

Table 4.6: Time implication of the EIA Kommetjie Mixed-Use Development Study

PROJECT	TIMELINE
Original Project Development Programme	Early February 2010 – Mid June 2011
Final Project Development programme to allow for all environmental studies to be fulfilled	Early February 2010 – March 2015
Final Time delay	**3 years and 9 months**

Table 4.6 illustrates that there was almost a four year delay in the total project development programme due to the adherence to the legislated environmental process and completing the basic assessment, specialist studies, public participation and Basic Assessment report in terms of the NEMA Environmental Impact Assessment Regulations.

Tables 4.4 and 4.5 above illustrate the direct costs, mainly the direct financial impact associated with the adherence to the legislated environmental process and the time delays incurred as a result thereof. The additional and unbudgeted amount of R 1 087 902.00 represents a 3.85% additional burden on the allocation of professional and development fees alone on the project and in some instances would be unsustainable, rendering the project as a loss (Chand Environmental Consultants, 2014).

Of greater concern in this particular case study is the time delay incurred of some three years and nine months which would have had a significant impact on the developer in terms of indirect costs related to market conditions assumptions and

the market reality after such substantial delay. In addition to this there may well be reputational damage to the developer as a result of matters completely out of their control (Chand Environmental Consultants, 2014).

Where financing is facilitated for a development, banks usually foreclose the finance on offer after a lengthy delay or at the very least alter the conditions of finance to far less favourable terms. They do this as the element of risk has increased significantly in line with the delay. The lengthy delay renders the proposed development at the mercy of the fluctuating economy and market conditions particularly in the volatile residential and commercial sector.

4.3 Case Study No.3: Wild Coast Sun Waterpark - Coastal Estuary Study

4.3.1 Introduction

The Wild Coast Sun is a hotel and casino resort owned and operated by Sun International. It is located in the northern part of the Eastern Cape approximately 165 kilometres south of Durban. Sun International is listed on the South African Stock Exchange and is a resort hotel and casino chain. The company was originally founded by Sol Kerzner, a prominent South African business man. Its roots can be traced back to 1969 when the Southern Sun Hotel Company was created by the partnership of South African Breweries and Sol Kerzner (Wild Coast Sun, 2013).

In 1983 South African Breweries split its hotel interests into two separate entities where Sun International was formed to become one of these entities headed by Sol Kerzner who retained the casino hotels located in the parts of South Africa that had been designated as “independent homelands”. At the end of apartheid, these homelands were reincorporated into South Africa. Sun International operates in the gaming and leisure resort and hotel industry. It is a company with a diverse portfolio of properties that today extend outside the borders of South Africa to other countries in Africa and to South America. The resorts include what

are considered some of the world's premier hotels and resorts such as the Royal Livingstone at the Victoria Falls, Zambia and The Palace of the Lost City, South Africa. It currently has operations in 27 destinations across 8 countries (Sun International, 2013).

Sun International regards itself as an organisation that conserves the world's natural resources and has record of all the environmental conditions during and after developments on all their resorts (Sun International, 2011).

The Wild Coast Sun is a development that has a hotel and a casino. The resort caters for 715 000 customers per year operating at annual occupancies of between 79% and 84%, generating revenue and Earnings Before Interest, Tax, Depreciation and Amortization (EBITDA) annually of between R 66 Million and R 389 Million (Sun International, 2013). The Wild Coast Sun is set on 750 hectares of natural bush between the Mtamvuna and Mzamba Rivers. It typically attracts customers for conference and leisure purposes with more emphasis on the latter as family entertainment, outdoor activities, swimming pools and golf are highly popular. The resort has accommodation of 396 hotel rooms of four star quality overlooking the Indian Ocean. The resort has conference facilities for 1000 delegates. Between 2009 and 2011, the Wild Coast Sun underwent a major refurbishment to improve the hotel accommodation and casino offering and added more restaurants and bars. It also developed a waterpark known as the Wild Waves waterpark (Sun International, 2011). This comprised outdoor adventure water slides and pools.

The Mzamba river flows through the Wild Coast property and into the Indian Ocean. It does so via the Mthentwa estuary. This estuary is of great environmental importance to South Africa and has been ranked 193rd out of 250 in terms of conservational concern (Turpie et al. 2002). The Mthentwa estuary is deemed to be a partially open system and under tidal influence. It has a sandy system with clear water and a thriving animal and fish habitat. In addition to the estuary, a

dune system with accompanying dune forest vegetation occurs to the south of the property (EIAR, 2011).

The site is located within the Oliver Tambo District Municipality, which is one of the five district municipalities in the Eastern Cape Province of South Africa, located in the north-eastern part of the province bordered by the Hibiscus Local Municipality in Kwa-Zulu Natal in the north (EIAR, 2011).

Environmental management and conservation is one of the license conditions of the Wild Coast Casino. It has been said that the design, construction, improvement, preventative maintenance, refurbishment and expansion at the Wild Coast Sun over the past 30 years, is one of South Africa's and Sun International's eco-success stories (Chand, 2012).

In 2003, The Wild Coast Sun management team conducted a preliminary assessment of the existing environmental management system. The findings reflected shortcomings in meeting the environmental objectives as set by the Sun International group. At the core of this was the necessity to develop an integrated management system that recognised and combined both health and safety and environmental matters under one single management system (EIAR, 2011).

This system was designed and fully implemented in 2004 by specialist Environmental Assessment Practitioners (EAPs) and ensured that the Wild Coast Sun's processes are identified and activities, products, services and facilities which may have an impact on the environment or risk to health and safety of employees and guests are managed and maintained to eliminate and control such environmental impacts. This internal system further ensures legal compliance (Sun International, 2011).

4.3.2 Wild Coast Sun Water Park

In 2010 the Wild Coast Sun embarked on an addition to the resort in the form of a world class water park and while being a new addition to the Wild Coast Sun, this form of development had already been tried and tested at Sun International's flagship resort at Sun City with their waterpark development known as the Valley of the Waves. The Wild Coast Sun's water park is called the Wild Waves Water Park and was developed within the established gardens of the old sports club and the old parking area terrain of the resort. This new development is in close proximity to both the ocean and adjacent to the environmentally sensitive Mthentwa estuary and dune forest (Sun International, 2011).

The Wild Coast Sun water park was designed by Whitewater West, a specialist wave park design and architectural firm based in the USA. The water park comprises high speed body slides, an action river, two high speed rollercoaster water cushion rides, adventure and interactive play structures for younger children, change rooms, restaurant facilities and parking for day visitors (Sun International, 2013).

The architects were made aware at the onset of their briefing of the sensitive nature of the area and allowed for a 100 metre buffer between the waterpark footprint and the estuary and the dunes. This design restriction was to ensure that impacts on these eco-systems were avoided during the construction and operational phase. In fact, the estuary and the dunes were classified as "no go" areas during the construction phase (Chand, 2012).

The construction of the waterpark and new building structure required the following:

- Alterations / demolition of existing works / clearing the site
- Earthworks and foundations
- Concrete, formwork and reinforcement
- Masonry brickwork

- Waterproofing
- Plumbing and drainage
- Plaster and paintwork
- Metal roof coverings

The water park specific requirements were as follows:

- Earthworks for the towers / slides footings
- Concrete, formwork and reinforcement
- Waterproofing
- Metalwork
- Plumbing and drainage
- Plaster and paintwork

The water slides were pre-manufactured off-site in the USA in units and were shipped from the USA. On delivery, the slides needed to be assembled on site. This procurement method reduced disruption on the site whereby simple structural foundation bases were cast and the slides were then craned into position. This avoided large scale on site storage and manufacturing. This meant that a comprehensive construction of the slides themselves was not required.

4.3.3 Environmental Considerations

Sun International identified the most likely environmental concerns and possible impacts the new water park would have on the site. These in broad terms as highlighted in the environmental impact assessment report were as follows:

- Potential damage to the environmentally sensitive coastal estuary and sand dunes due to proximity of the water park;
- Electrical supply to the water park would require the upgrade of the transformer serving the area and increase demand from Eskom. Seven diesel generators on site provided electricity and standby power

generation, however to promote better efficiency the installation of a 36 000 litre diesel tank on the site was required;

- The water supply requirements for the water park would alter and three options were proposed, each of which had particular environmental considerations:
    - Extracting freshwater from the on-site reservoir with the possible upgrade of the existing waterline;
    - Freshwater sourced from a borehole on site, stored in the reservoir and used as and when required;
    - Sea water abstraction.

While additional sewage requirements were investigated, the current on-site sewer reticulation was deemed sufficient to handle the increased demand. Similarly, the water waste and general waste disposal procedure of the current facility was deemed as sufficient to cope with the additional demand that the water park would present. The Wild Coast Sun has an extensive waste recycling programme catering for water, metals, plastics, tins, glass, paper and cardboards. Waste water is re-used for the surrounding gardens and golf course. Site waste is compacted on site and transported to the local municipal landfill site. No waste is deposited on site except garden refuse which is utilised for compost as part of a community project (EIAR, 2011).

Given the above potential impacts, the need for an EIA was required as regulated by the National Environmental Management Act of 2009 (NEMA). A Basic Assessment was undertaken by EAP specialists: Chand Environmental Assessment Practitioners. They concluded that a Basic Assessment would be sufficient and an application to the Department of Economic Affairs, Environment and Tourism would be required for approval of the water park project.

The EAPs conducted a **biophysical assessment** relating to the estuary and the dunes. It was noted that the site itself did not warrant detailed investigation into fauna and flora given that much of the vegetation on the site constitutes landscaping and as such has little ecological significance.

A **cultural assessment** was also completed and there was no predicted negative impact on any cultural, archaeological or paleontological resources as the site proposed for the waterpark had already been disturbed and developed.

A **social assessment** was completed and concluded that there was no predicted negative impact on the social fabric of the area.

Finally, a **visual assessment** was undertaken to ensure that no negative impact was predicted. The decision was made that there was no significant visual impact on the surrounding area because the site was developed and the hotel was fully operational.

4.3.4 Environmental Impact Assessment

Sun International, through their appointed EAP, followed the existing EIA framework in place in the Eastern Cape. The EIA was driven by the fact that the development of the waterpark was adjacent to the estuary and dunes and hence necessitated environmental authorisation. The estuary is defined as been tidal, and with the proposed development within 60m of the estuary, this necessitated the undertaking of an assessment in terms of R386 of NEMA under triggers two and six. The Mthetwa Estuary is an important aspect of the surrounding environment and with it being logged as an estuary by the Department of Water Affairs and Forestry (DWAF) the necessity to undertake an environmental authorization process was evident (EIAR, 2011).

Following legal and statutory advice from the Eastern Cape Economic Development and Environmental Affairs Department, Sun International in late 2010 commenced with the necessary specialist studies to formulate an environmental management plan for construction to commence in early 2011 accompanied by regular independent monitoring. This initiative was further underpinned by the fact the Wild Coast Sun already had an environmental management system in place which had promoted sound daily environmental management over many years (Sun International, 2011).

Sun International had made no budgetary allowance nor programmed any allocation of time to undertake an EIA process. They did however budget for a consultant EAP. Once the decision to pursue environmental authorisation had been made, the company had to make the appropriate adjustments to the budget and the expected time of completion of the project (Chand Environmental Consultants, 2014).

In preparation for the EIA, the Wild Coast Sun's management team identified a number of indirect issues that could be impacted by the development of the waterpark and commissioned specialist studies to investigate the following issues:

- The possible impact of flooding on the estuary as a result of change in land form;
- The impact of increased salinities in the estuary either as a result of the change in the open mouth status of the estuary or the possible dumping of material from the backwash process of the new facilities into the estuary;
- The impact of increased lighting (ELP) on both the estuarine and dune environment and ecological dynamics to the area that is in close proximity to the development;
- Potentially the social aspect requiring attention in terms of visitors 'perceptions' of the new development of an area associated with a 'rural coastal environment';
- Prepare responses in mitigation of development to the local objections around the coastal mining in the area;

- An estuarine functionality assessment to provide relevant data for the defence of any objections that may be made along ecological lines as well as preparing for responses to any concerns arising from the Department of Water Affairs relating to compliance under the National Water Act;
- An assessment of other legislation that may have a bearing on the development and counter argument and information that may be put forward under the National Water Act, the Integrated Coastal Management Act and the NEM Biodiversity Management Act.

In addition to the above, legal and statutory advice was sought in order to establish whether this type of development would be considered as an expansion to the existing building footprint. This was done primarily because legally if this was deemed to be the case then it was recognised that full-scoping and EIA would be required rather than a basic assessment. The former process requires a far more detailed process that entails lengthy public participation processes and other legal and statutory matters (Chand Environmental Consultants, 2014).

Following advice from attorneys (Edward Nathan Sonnenbergs) and the Eastern Cape Environmental Affairs Department, Sun International decided to undertake a basic EIA process given that the existing building footprint would not be altered by this new development. The company's intention was to develop a commercially viable and positive addition to the resort facilities, while recognising that it was in a sensitive area of the property. The company planned to work within a defined time period and aimed to open the water park prior to the peak holiday season in December 2011 (EIAR, 2011).

Sun International realised that the undertaking of an EIA for the waterpark would impact the resort in terms of both cost (loss in revenue and costs associated with the EIA) and time implications. They, however, wanted to avoid any negative impact on the estuarine environment within its property and sought to find a solution to solve both their commercial problem while complying with environmental statute and finding better alternative solutions to some of the

technical problems facing the waterpark development in terms of its impact on the environment.

Through the input from the specialist studies, the design team were able to re-orientate the overall layout of the waterpark to provide the least impact on the estuary, and were informed on fauna and flora that required retaining or transplanting. In particular, the specialist study findings led to the decision to have a "closed" waterpark infrastructure system, although it would be more costly, whereby no chemically treated water from the waterpark would be discharged into the estuarine system during the necessary 'backwash process' with all potable water been treated and recycled on site.

4.3.5 Project Cost and Time Impact

The cost and time impact of this specific EIA is shown in the tables below. These arose from:

- The cost of the environmental study, environmental consultant fees (Chand Environmental Consultants) and cost of specialist studies, visual, biophysical, etc.
- Legal costs for advice regarding the process to be followed and engagement with the local and national environmental bodies;
- Architect, Civil Engineer, Quantity Surveyor and Project Manager consulting fees in managing the design development process and the numerous design iterations required to comply with the specific location and layout of the water park in order to comply with the findings of the various environmental and specialist studies;
- Delay of approximately three months to comply with the environmental conditions caused knock-on delay in completion by three months and consequential loss of trade and profit;
- Delay in tendering and appointment of contractor incurred six months escalation cost to the project;

- Six month additional in-house costs for Sun International management and executive time required for the management of the water park project.

Table 4.7: Environmental Costs of Adhering to Environmental Legislation for the Wild Coast Sun Waterpark Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	FINAL COST
Environmental Assessment Practitioner (EAP)	R 190 814.00	R 75 930.00	R 266 744.00
Environmental Lawyer fee	-	R 83 000.00	R 83 000.00
Specialist studies	-	R 134 839.00	R 134 839.00
TOTAL COSTS	**R 190 814.00**	**R 293 769.00**	**R 484 583.00**

Table 4.7 illustrates that an additional cost of R 293 769.00 specific to the EIA study was incurred by Sun International by adhering to the environmental legislation.

Table 4.8: Project Costs Incurred due to Adhering to Environmental Legislation for the Wild Coast Sun Waterpark Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	ADDITIONAL PROJECT COSTS	FINAL COST
Project Budget	R 85 250 000.00	-	-	R 85 250 000.00
Professional fees (Infrastructure)	R 6 820 000.00	-	-	R 6 820 000.00
EAP Fees	R 190 814.00	R 75 930.00	-	R 266 744.00
Environmental Lawyer fee	-	R 83 000.00	-	R 83 000.00
Specialist Studies	-	R 134 839.00	-	R 134 839.00
Acceleration Costs (Construction)	-	-	R 850 000.00	R 850 000.00
Escalation costs	-	-	R 79 000.00	R 79 000.00
Sun International Development Costs	R 570 000.00	-	R 51 000.00	R 621 000.00
TOTAL COSTS	**R 92 830 814.00**	**R 293 769.00**	**R 980 000.00**	**R 94 104 583.00**

Table 4.8 illustrates that an additional cost of R 293 769.00 specific to the EIA study and additional direct project cost of R 980 000.00 was incurred by Sun International.

Table 4.9: Time implication of EIA for Wild Coast Sun Water Park

PROJECT	TIMELINE
Original Project Development Programme	Mid June 2010 – Mid June 2011
Final Project Development programme to allow for all environmental studies to be fulfilled	January 2011 – December 2011
Final Time delay	**6 months**

Table 4.9 illustrates that there was a six month delay in the project development programme due to Sun International's adhering to environmental legislation and completing the EIA process.

The commissioning of specialist studies was a direct cost which was originally not budgeted for in the project and additional funds had to be approved for this in the project.

The initiation of the authorisation process delayed the intended commencement of the waterpark by three months, during which the various specialist studies were commissioned, presented and feedback attained for the relevant statutory bodies (EIAR, 2011). This delay in programme had an impact on the project completion date. However, the delay was mitigated by negotiating acceleration costs with the preferred tenderer to ensure completion prior to the peak end of year season. This additional direct expense was absorbed by the company without there being an original budget for acceleration of works.

The Sun International management team argued that the risk of incurring serious indirect cost by not undertaking an EIA and obtaining the required authorisation outweighed the immediate direct financial cost to the company. They considered the possible degradation to the estuary and further possible loss of ecosystem and quality of wildlife, as well as reputational and brand damage, to be far worse than the financial cost. The project opened as planned.

This said, the additional costs of some R 1 273 769.00 or an additional 1.37% of the original costs estimated for professional fees alone, would probably have rendered the project as unfeasible on similar projects in the private commercial sector and almost certainly on all projects in the public sector. In assessing this additional financial burden of the project, Sun International, as a listed commercial entity, had to weigh up these costs against their loss of reputation and their brand promise of "a million thrills: one destination" should they have cancelled the project. Therefore it is apparent that the evaluation of these "indirect cost" and their consequences played a significant role in the decision to go ahead.

A further direct financial cost which has not been defined above but which certainly would have had an impact is the "loss of trade" during the six month delay incurred in the delivery of the project as a result of the EIA process been followed. These can easily be estimated by comparing the first six months income after the delayed opening and would be of the order of approximately R 4 million (Chand, 2012).

Another indirect cost which cannot be adequately quantified is the impact that these financial extras and time delays have on the overall feasibility of projects of this nature. These costs have an almost unavoidable impact on the returns of the project, particularly in the early phase after opening and may also decrease the possibility of achieving the "hurdle rate" of return which a company's board would be mandated to approve, rendering the project a loss leader from the outset based on the groups targeted returns.



Figure 4.3: Wild Coast Sun Waterpark

(Source: Sun International Annual Report 2012)

CHAPTER 5: CASE STUDY RESULTS AND DISCUSSION

5.1 Introduction

This research investigated the cost and time implications that environmental legislation has on development proposals in South Africa. Pelican Park Housing Development, Kommetjie Mixed-Use Development and the Wild Coast Sun Waterpark development were chosen as the specific South African case studies for the investigation. Although there may be a large number of potential obstacles that arise from environmental legislation, the cost and time obstacles are deemed to have the greatest impact on the overall development proposal and project.

Throughout this study every attempt has been made to remain objective so that the results are not biased in anyway and to ensure the results reflected from the study are a true reflection of the research question.

The principal method chosen to conduct this research report was the case study method. This method was chosen to allow for in-depth analysis of data obtained from formal documents. Data found through reviewing literature on the topic has also been utilised to increase the confidence in the results. The data analysis is depicted graphically in figure 5.1 below.

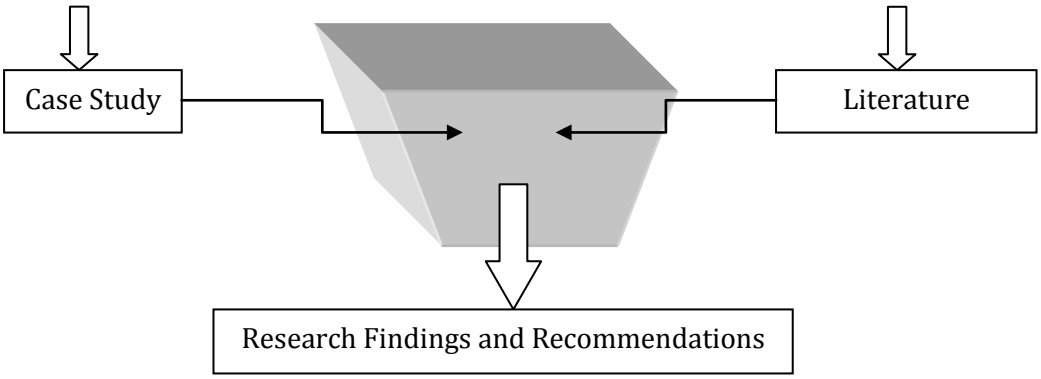


Figure 5.1: Schematic representation of Data Analysis (derived from Burke, 2007)

Within project management there are the nine knowledgeable areas which can be identified in figure 5.2. At the core of the diagram is the Time, Cost and Quality triangle which is referred to by Burke (2007) as the 'triple constraint'. Due to there being a 'triple constraint' it is understood that there is no universal answer on how to achieve all three of these constraints as each projects priorities will vary. If one were to focus on the time constraint of a project and, for example, wanted to accelerate the project, the cost of the project would then definitely increase and so the 'triple constraint' would not be balanced (Burke, 2007).

The case studies of this research aim to evaluate and quantify two of the 'triple constraints', namely the cost and time constraints.

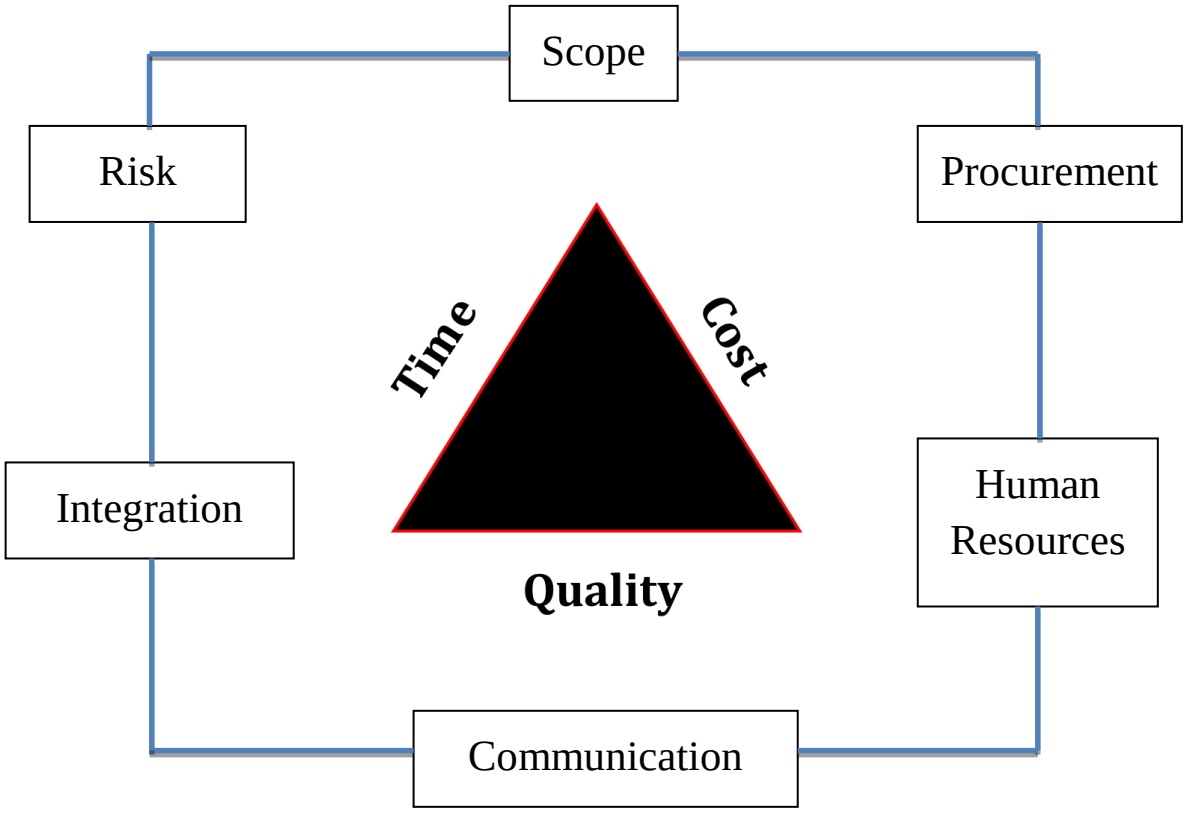


Figure 5.2: Project Management Knowledge Areas according to PMBOK (Derived from Burke, 2007)

This study sought to provide insight into how cost and time of projects are affected by complying with the process defined and enforced by the local South African environmental legislation. One of its objectives has been to provide developers, contractors and professionals in the construction industry with information that is easily accessible, purposeful, relevant and meaningful. This study further aimed to improve the project management of a project by assisting the relevant stakeholders to make informed and efficient decisions that could ultimately have a positive effect on the project.

5.2 Analysis of Results

The analytical method which has been utilised to deduce the following results is outlined in figure 5.1 and the analysis aims to identify and quantify the time and cost implications inherent in adhering to environmental legislation imposed on development proposals. These results as set out below aim to provide contractors, professional consulting teams and developers appropriate information of what these implications are so that they can plan the project and budget accordingly and more accurately make allowances to mitigate these findings for particular development proposals.

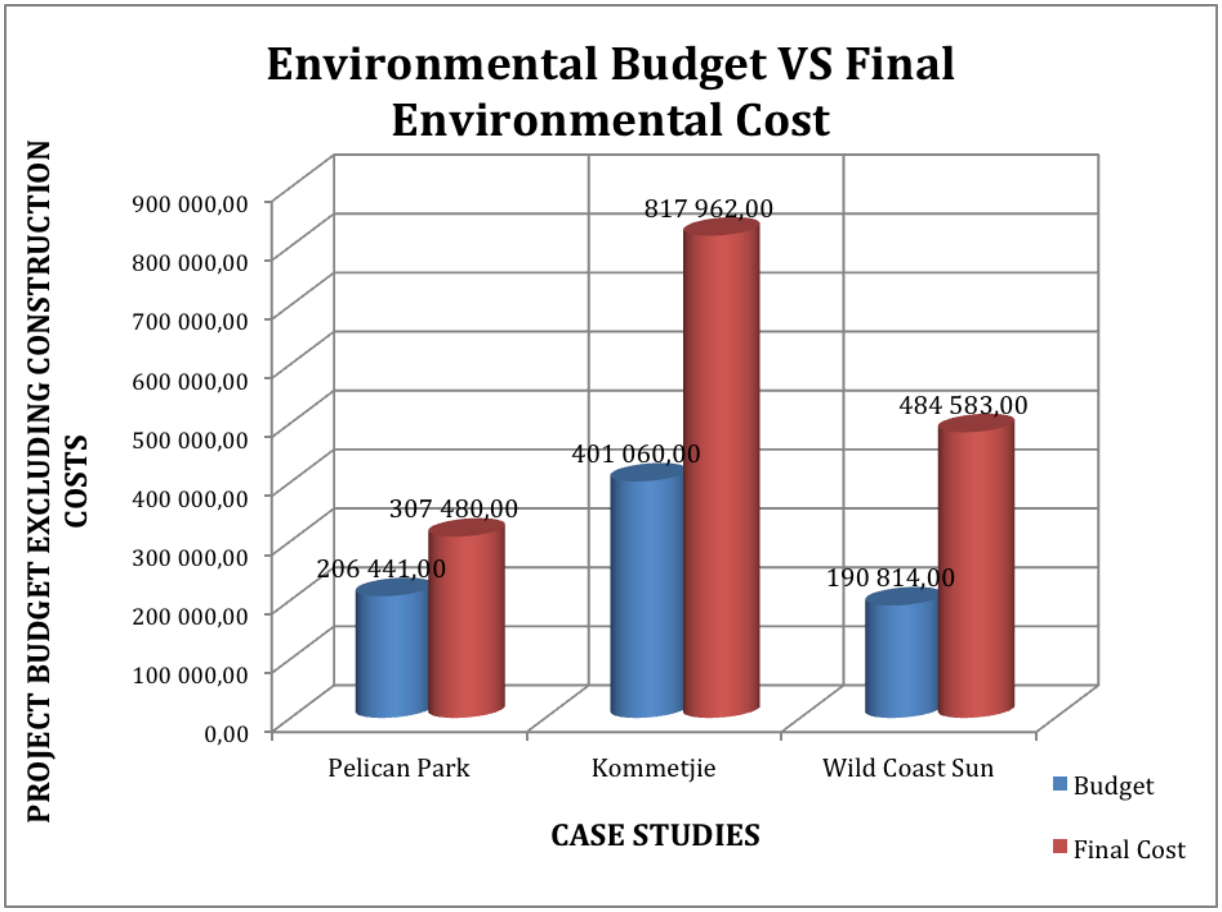


Figure 5.3: Graph illustrating the original environmental budget VS the final environmental cost to the project for all three case studies.

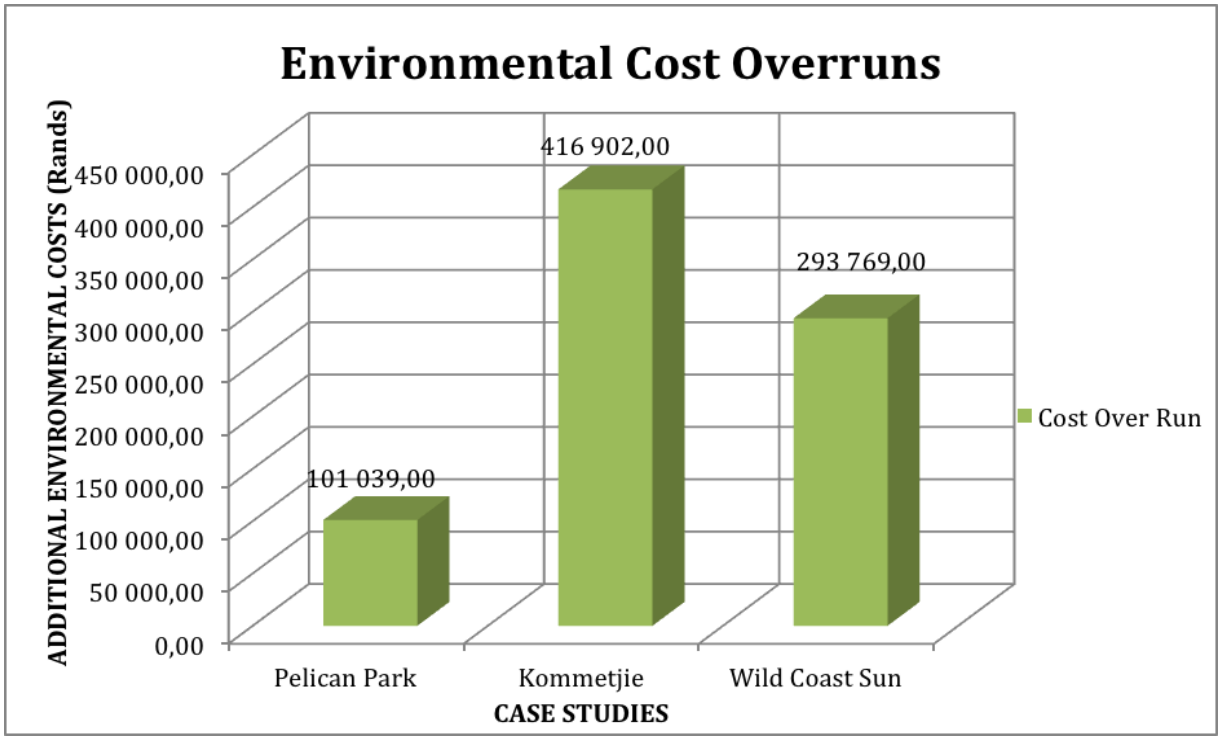


Figure 5.4: Graph illustrating the environmental cost overruns for each case study.

Table 5.1: Table illustrating the environmental cost overrun as a percentage of the original environmental budget.

Environmental Cost Overrun as a Percentage of the Original Environmental Budget

	Pelican Park	Kommetjie	Wild Coast Sun
Percentage	48.94%	103.95%	153.96%

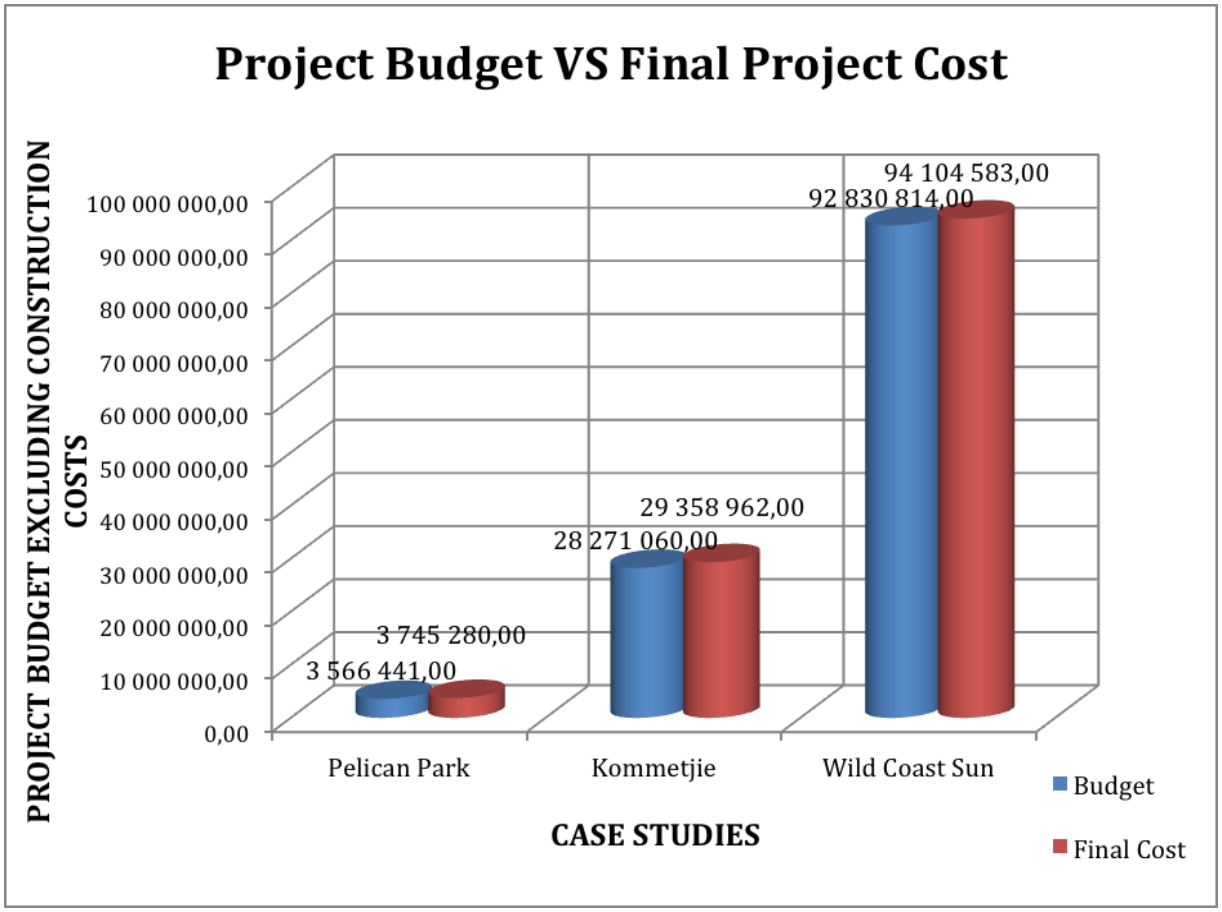


Figure 5.5: Graph illustrating the original project budget vs the final project cost for each case study.

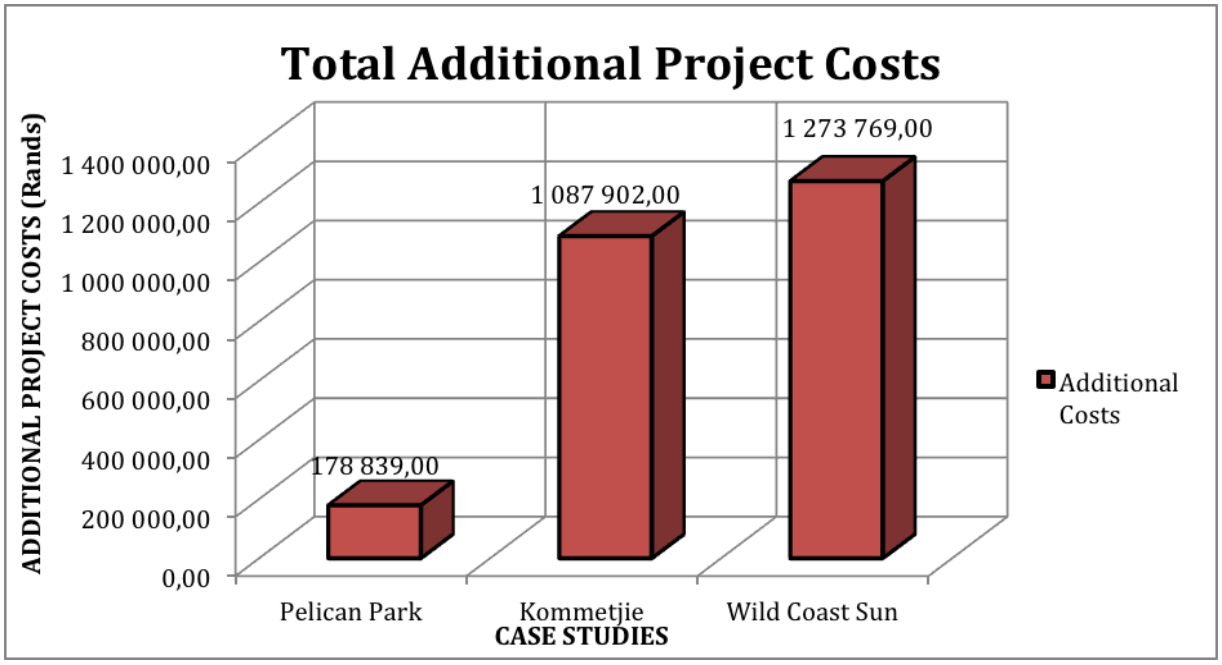


Figure 5.6: Graph illustrating the total additional project costs for each case study.

Table 5.2: Table illustrating the total project cost overrun as a percentage of the original budget.

Total Additional Project Costs as a Percentage of the Original Project Budget

	Pelican Park	Kommetjie	Wild Coast Sun
Percentage	5.01%	3.85%	1.37%

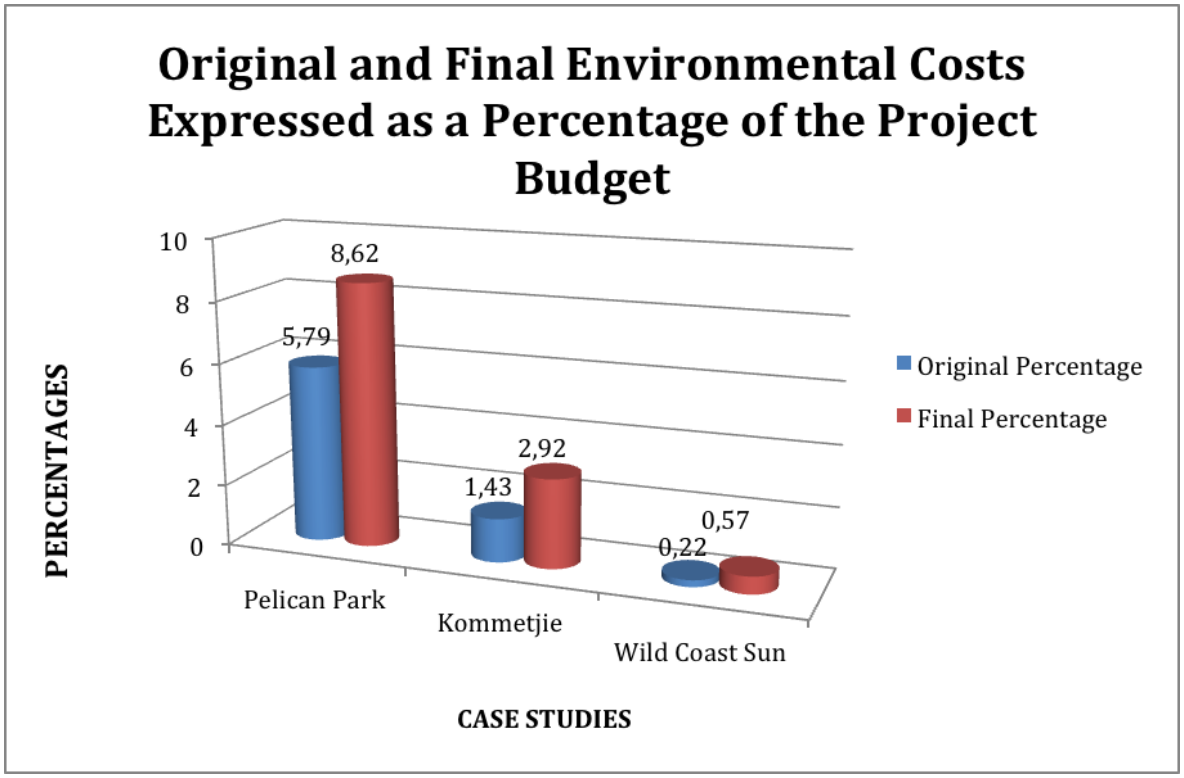


Figure 5.7: Graph illustrating the environmental costs expressed as a percentage of the project budget. This graph shows the increase in the percentage of the project budget due to time and cost implications caused by fulfilling the environmental legislation requirements for all three case studies.

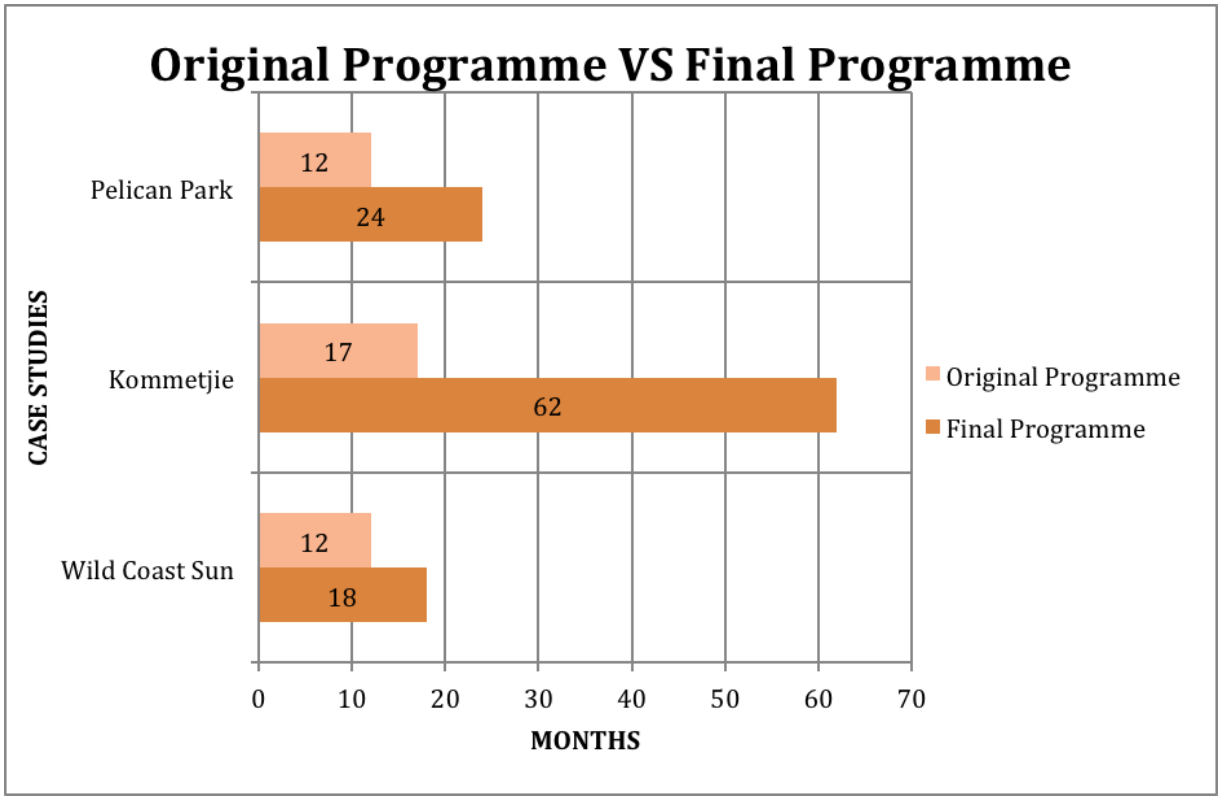


Figure 5.8: Graph illustrating the Original Programme VS the Final Programme.

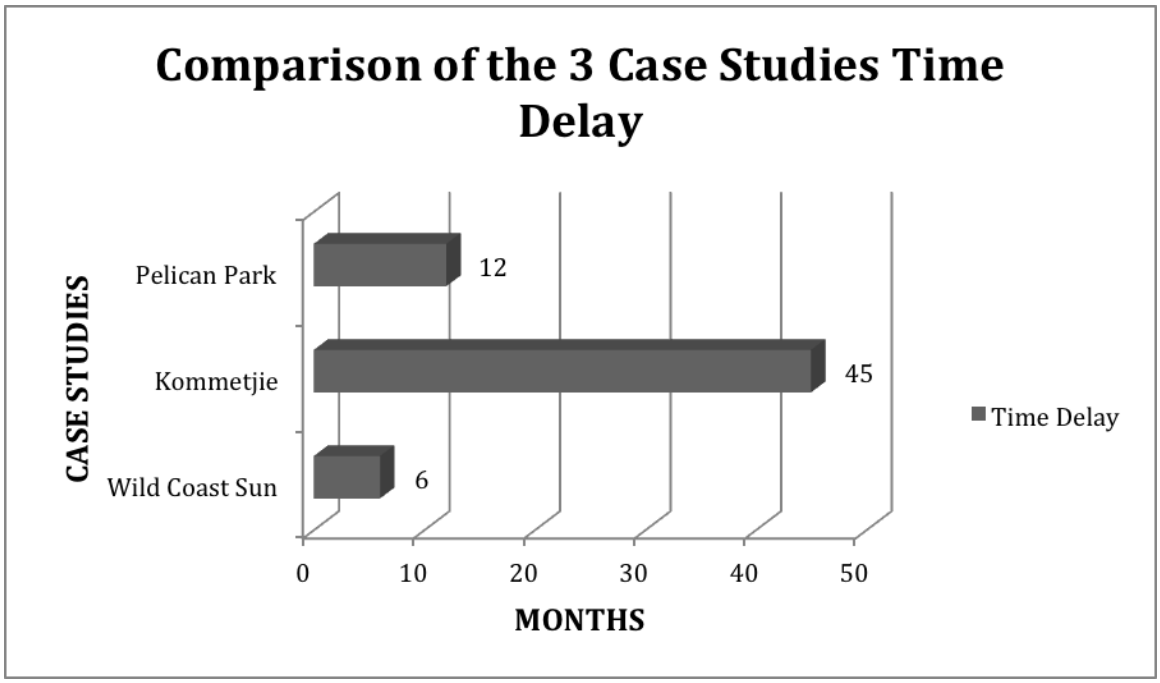


Figure 5.9: Graph illustrating a comparison of the time delays for each cast study.

Table 5.3: Table illustrating the time delay as a percentage of the original programme.

Time Delay as a Percentage of the Original Programme

	Pelican Park	Kommetjie	Wild Coast Sun
Percentage	100%	105.88%	50%

5.3 Summary of Case Study Results

This research has presented results of three case studies based on development project proposals, reports, project plans and budgets. The variables under review were the cost and time implications of the EIAs.

In terms of costs, two of the three case studies were within the range presented by the literature. In the literature review the "rule of thumb" is that while costs can vary, they tend in most cases to be below 1%. This is true of international and South African research. In the cases under review both The Wild Coast Sun and the Kommetjie development were within the "rule of thumb" parameters set out in the literature. However, the Pelican Park development exceeded the parameters.

In terms of time, the current legislative framework describes expected time frames for the various activities: six months for a basic assessment and 12-18 months for a full scoping and EIA. In the cases under review, both Pelican Park and Wild Coast Sun were within the time framework set out in the literature but Kommetjie exceeded the time framework as set out in the legislation.

A closer examination of the cost and time detail of each case study is outlined as follows:

Pelican Park:

The environmental budget for the project was set at 6.88% of the total project budget but during the course of the project this increased to 8.67%. The costs for environmental compliance were originally set at R 206 441.00 but these rose to R 307 480.00 which represents an increase of 1.79%. The cost implication of the EIA process was R 101 039.00.

The original project budget for the Pelican Park development was R 3 566 441.00 but the final cost at completion was R 3 745 280.00. Therefore, there was an increase of R 178 839.00 which is a 5.01% increase on the original project budget.

The time taken for the EIA studies and application to be completed was 12 months. This caused a delay on the project program of 12 months. The original project program was set for 12 months. However, due to the time delays of the EIA process the project took 24 months to complete.

Given that the project commenced during the "first regime" of NEMA legislation and that the EIA process had to begin again once the new legislation came into effect, these cost increases were not unreasonable in this context. The new legislation forced the project to follow a different process and in this case required a fully inclusive one that involved public participation by the local community. In addition, specialist studies were required to investigate the wetland on site, which all added substantially to the costs incurred.

Similarly, in terms of time, this project was delayed for reasons far beyond bureaucracy or incompetence but rather due to the complexities of the project and due to legislative changes that occurred in the middle of the proposal. If compared to the literature the project experienced a delay that is within acceptable

parameters. This delay was mainly caused by the lengthy public participation. An important issue brought up during the process from the local community was why a group was already designated to receive the houses. A large number of appeals from the local community was handed in, each and every one of which had to be addressed, which caused a considerably long public participation process.

Kommetjie:

The environmental budget for the project was set at 1.43% of the total project budget but during the course of the project increased to 2.92%. The environmental costs were originally set at R 401 060.00 but this rose to R 817 962.00 which represents an increase of 1.49%. The cost implication caused by the EIA process was R 416 902.00.

The original project budget for the Pelican Park development was R 28 271 060.00 but the final cost at completion was R 29 358 962.00. Therefore, there was an increase of R 1 087 902.00 which is a 3.85% increase on the original project budget.

The time taken for the EIA studies and application to be completed was 45 months. This caused a delay on the project program of 45 months. The original project program was set for 17 months. However, due to the time delays of the EIA process the project took 62 months to complete.

This project, like the Pelican Park development, was also caught up in the change in legislation. The project began while under the ECA Act and an EIA was not triggered. However, during the course of the project the NEMA Act was brought into legislation and this did trigger a full EIA process.

A large number of specialist studies were required to be completed which had both a time and cost implication on the project. Furthermore, a socio-economic study had to be completed and the EAPs were required to compile a report on the job creation and economic stimulus the development would have on the area.

Through the specialist study endangered vegetation types were found on the land marked for the development. This caused severe time and cost delays because due to this the project was forced back to design phase as this vegetation was originally planned to be removed. The design process had to start from scratch and three alternative designs incorporating the conservation of the endangered vegetation had to be completed. This caused a time delay due to the re-design and additional costs to be incurred as professional fees for the designers.

The public participation process had already begun before the change in legislation. Costs were incurred and time was spent in conducting the necessary workshop. However, due to the change in design required the public participation process had to once again start over as the new designs had to be presented to the public. This caused both time and cost implications.

Wild Coast Sun:

The environmental budget for the project was set at 0.22% of the total project budget but during the course of the project increased to 0.57%. The environmental costs were originally set at R 190 814.00 but this rose to R 484 583.00 which represents an increase of 0.35%. The cost implication caused by the EIA process was R 293 769.00.

The original project budget for the Pelican Park development was R 92 830 814.00 but the final cost at completion was R 94 104 853.00. Therefore, there was an increase of R 1 273 769.00 which is a 1.37% increase on the original project budget.

The time taken for the EIA studies and application to be completed was six months. This caused a delay on the project program of six months. The original project program was set for 12 months. However, due to the time delays of the EIA process the project took 18 months to complete.

The Basic Assessment EIA was triggered due to the waterpark being within 60m of a natural estuary and within 100m of the ocean. EAPs were appointed in order to carry out the EIA process. The principal studies for both the marine ecology and estuary study had to be completed by specialists who were called in. This caused both a time and cost implication.

The biggest time and cost implication factor for this case study was due to the fact that in the NEMA legislature there is nothing set out for waterpark developments. Although a basic EIA was already required there were certain grey areas during the EIA process. Environmental lawyers were appointed as consultants and were required to meet with the local municipality in order to resolve and agree on the grey areas in the legislation. The municipality caused significant delays to the project as they were concerned that the community would not benefit directly from the waterpark. The lawyers not only had to resolve the grey areas but also had to promote the waterpark to the municipality and the fact that it would create jobs for the local community. The environmental lawyers were critical for the completion of the project and prevented further problems being experienced as the project progressed. Their negotiations had to be completed before the EIA could be submitted to the municipality which caused a significant delay to the project.

The original program set out that the waterpark was required to be opened by December of 2011 as December was the most lucrative time for business for The Wild Coast Sun as it falls within the holiday season.

The EIA process would have caused there to be a six month delay to the project programme which would have not enabled Sun International to open the waterpark for the festive December period. Due to this and to prevent not opening

for the festive season, Sun International decided to incur acceleration costs in order to speed up the project program. This enabled the project to be completed according to the program the waterpark opened to the public for the festive season.

5.4 Case Study Conclusions

The results of this research supports recent literature that has found that EIAs are conducted in line with international EIA cost expectations but not that they are particularly lower than international experiences as suggested by Retief and Chabalala (2009). This study may suggest that EIA costs could be rising slightly as legislation becomes more demanding, but they are still within the acceptable guideline of between 0.02% and 4% of overall cost.

With regards to time, the indicative time frames as suggested by the legislation which have the purpose of protecting developers from excessive delays, are working. However, where exceptions occurred with respect to time, these were as a result of changing legislation within the middle of a project proposal. This as the case studies reveal in this research had significant impact and it suggests that perhaps a solution can be sought in the form of interim legislative protocols that could be implemented in the situation of a legislation change, which would work to protect both the developer and indeed the environment.

To elaborate on the point above, this research can quantify by modelling the cost and time of the project had they commenced during the current legislation. This can be done for all three case studies as the below tables show.

Specifically, if both the Kommetjie Mixed-Use development and the Pelican Park Housing Development did not encounter a change in legislation during the project, the following is a model of what additional costs and delays the projects may have incurred:

Table 5.4: Possible Time Implication if a Change in Legislation was not Encountered During The Kommetjie Mixed-Use Development

PROJECT	TIMELINE
Original Project Development Programme	Early February 2010 – Mid June 2011 (17 Months)
Estimated Final Project Development programme to allow for EIA to be completed. Excluding effects of change in legislation	Early February 2010 – Mid December 2011 (23 Months)
Final Time delay	**6 months**

Table 5.4 above denotes, a six month delay would have been encountered as opposed to the three year and nine month delay of the project.

Table 5.5: Possible Additional Project Costs if a Change in Legislation was not Encountered in The Kommetjie Mixed-Use Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	ADDITIONAL PROJECT COSTS	FINAL COST
Project Budget	R 24 620 000.00	-	-	R 24 620 000.00
Professional fees (Infrastructure)	R 2 800 000.00	-	R 23 333.00	R 2 823 333.00
EAP Fees	R 401 060.00	R 20 387.00	-	R 421 447.00
Environmental Lawyer fee	-	-	-	-
Specialist Studies	-	R 218 000.00	-	R 218 000.00
Escalation costs (for 48 month delay period)	-	-	R 52 000.00	R 52 000.00
Developers' additional In-house management and administration costs	R 450 000.00	-	R 16 000.00	R 466 000.00
TOTAL COSTS	**R 28 271 060.00**	**R 238 387.00**	**R 91 333.00**	**R 28 600 780.00**

Table 5.5 above denotes, instead of encountering additional environmental and project costs of R 416 902.00 and R 671 000.00 respectively, the environmental and project costs would have been R 238 387.00 and R 91 333.00. This would have a significant impact on the final cost of the project by R 758 182.00 from R 29 358 962.00 to R 28 600 780.00.

Table 5.6: Possible Time Implication if a Change in Legislation was not Encountered During The Pelican Park Housing Development

PROJECT	TIMELINE
Original Project Development Programme	Mid June 2010 – Mid June 2013 (36 months)
Estimated Final Project Development programme to allow for EIA to be completed. Excluding effects of change in legislation	Mid June 2010 – Mid November 2013 (41 months)
Final Time delay	**5 months**

Table 5.6 above suggests that a five month delay would have been encountered as opposed to the 12 month delay to the project programme.

Table 5.7: Possible Additional Project Costs if a Change in Legislation was not Encountered in The Pelican Park Housing Development

DESCRIPTION	BUDGET	ADDITIONAL ENVIRONMENTAL COSTS	ADDITIONAL PROJECT COSTS	FINAL COST
Project Budget	R 3 000 000.00	-	-	R 3 000 000.00
Professional fees (Infrastructure)	R 360 000.00	-	R 18 750.00	R 378 750.00
EAP Fees	R 206 441.00	R 52 039.00	-	R 258 480.00
Environmental lawyer Fee	-	-	-	-
Specialist Studies	-	R 25 000.00	-	R 25 000.00
Acceleration Costs	-	-	-	-
Escalation costs	-	-	-	-
Additional Development Costs	-	-	R 13 800.00	R 13 800.00
TOTAL COSTS	**R 3 566 441.00**	**R 77 039.00**	**R 32 550.00**	**R 3 676 030.00**

Table 5.7 above shows, for the Pelican Park Housing Development it is possible that additional environmental and project costs of R 77 039.00 and R 32 550.00 would have been incurred. This is as opposed to the actual costs incurred of R 101 039.00 and R 77 800.00. The total cost of the project would have reduced from R 3 745 280.00 to R 3 676 030.00 which is a possible of R 69 250.00.

It becomes evident from the from the above tables, that a strong case is built from a cost and time standpoint for interim legislation protocols when new legislation is being implemented such as in the case of when the ECA legislation changed to the NEMA legislation.

The research confirms that EIAs add value to sustainability principles by asking questions early in the decision making process to put into effect remedies to "protect the environment" in whatever type or form this meant. This is encouraging and suggests that those holding the view that sustainability principles are not being achieved are being challenged to some degree, albeit by evidence presented by these specific three case studies.

Of the two variables under review, it is apparent that the time delays to the projects were more significantly detrimental to the project. Time delays can have a catastrophic effect on a project and/or on a developer when matters such as loss of profit, loss of reputation and negative market fluctuations during the delay period are incurred that can result in the cancellation of a project or even bankruptcy. The importance of modelling various time scenarios is therefore a critical aspect of project planning as is using risk management techniques for time based costs (e.g. PMBOK).

The findings in this research show that problems encountered are not linked to a single issue but rather to a more complex set of requirements during the EIA process. Individually a single problem's impact may be limited on a specific project, but where multiple requirements are encountered this can lead to severe cumulative multiple effects.

Most of the identified causes of the negative impacts on cost and time are not new to the Environmental or Construction Development industry. However, it appears that lessons may not have been learnt from prior projects to avoid them or at least appear not as yet to have a "remedy" so as to be avoided.

The case studies of this research show that developers were largely committed to sound environmental principles. They accommodated and complied with the changes that were required in their projects to preserve the environment. However, they encountered changing legislation (i.e. Kommetjie Mixed-Use Development and Pelican Park Housing Development) which created added complexity and cost and time delays to the projects.

A final conclusion that this research reveals relates to risk management.

Theoretically, Royer (2002) notes that projects risks can be regarded as potential events or circumstances that threaten the planned execution of the project. A risk to the project is further explained as any uncertain event that is associated with a project (Kendrick, 2009).

There are many ways to characterise a risk, but a simple way to understand risk is put forward by the insurance industry. They characterise risk as a certain loss multiplied by the likelihood of the loss happening (Kendrick, 2009).

Kendrick (2009) explains that the literature on risks tends to focus on large-scale risk or 'Macro-Events'. For example risks that are associated to companies who can spread their risk over a large number of events. However, for a single development project this traditional approach may not be as useful as the focus needs to be on a single event or 'Micro-Event'. Within this context, a project always has a team leader and risk management should be factored into the requirements for the project, even as a single risk.

Through the implementation of an effective risk management programme, the project costs and "frustrations" caused by possible risks are lowered as well as the amount of rework that is required. Planning for potential project problems enables team leaders and teams to be aware of these and to work in ways that avoid these problems which ultimately will benefit the project by reducing the amount of possible risks (Kendrick, 2009).

It certainly is better to plan and prepare for possible project problems than to plan for none and deal with them as they arise during the project because this will have a negative effect in terms of both cost and time on the project (Royer, 2002).

The project team needs to understand that it is better to define a window for time and cost instead of having a single point objective. An acceptable range for both time and cost needs to be set and approved by the developer / client. A best case and worst case scenario for cost and time should be allowed and it must be understood that between these two points is what is most likely to happen (Kendrick, 2009).

For example a budget of R 5 Million and a contingency of
R 500 000.00 highlights that best case scenario the project will cost R 5 Million and worst case scenario the project will cost R 5.5 million. The same applies for time a programme of 12 months with a contingency of two months shows that best case scenario the project will take 12 months and the worst case scenario 14 months. The developer / client needs to be aware of these extremes and must understand that the project cost and time will most likely fall between these scenarios.

The risk planning process for a project is described by Royer (2002) as a two-step process after a project team has been established. The process is as follows:

1. Establish the project team / risk management team
2. Design a risk plan by completing the following:
    - Identify possible risks
    - Categorize risks in terms of likelihood and severity
    - Prioritise risks
    - Develop risk mitigation strategies
    - Establish risk contingency plans

The last point in the two-step process is highly important. In project viability studies, contingencies are always allowed for by the quantity surveyor. However, in this contingency no specific contingency for the environmental risks is allowed for. It is merely just a general project contingency.

In the past years, where there was no stringent environmental legislation on development projects, developers were able to avoid making allowance for environment costs in their viabilities. However, from the case studies put forward in this study, it is evident that due to the improved environmental legislation being enforced, it is now important to allow for a contingency for environmental costs.

From the case studies we can develop "best case" and "worst case" scenarios with regards to environmental risks. These can be described as follows:

- Best case scenario is that no EIA is required for the project or any compliance to the environmental legislation. Therefore 0% of total project costs should be allowed for as a contingency for environmental costs and no additional time contingency will be required.
- Worst case scenario is that a full EIA is required and that there may be a change in legislation during the course of the project and thus will cost the developer up to 1% of total project costs and an additional 12 months to the project programme.

From this we infer that the most likely scenario is that there will be additional costs between zero and one percent of the total project costs and additional time implications of between zero and 12 months. Therefore, if we allowed for 1% of the total project costs for environmental risks and added this to the general contingency, the environmental risks to a project will be adequately allowed for as well as applying a 12 month time contingency to the programme.

By including this contingency in the viability stage of the project it will improve the accuracy of the study and enable the client / developer to make a more well informed decision as to whether or not the project is viable.

This is an important allowance that developers and clients need to take into consideration during viability stage as it could ultimately sway their decision as to whether or not the project goes ahead.

5.5 Case Study Recommendations

This research has identified some problems that relate to efficacy of EIAs rests with public institutions who are the regulators. This report cannot provide the solutions to these problems. However, major developers together with their smaller industry counterparts should lobby government and the EIA regulators directly to intervene and remedy the identified problems.

This research has provided some significant data of at least a starting point that can be presented to Government to show the effects that these problems have on small and large developers in both the private and public sectors. Importantly, it should be shown and relayed how these problems impact on the South African economy. While this research has largely been confined to individual developers who have, at times, had to contest their individual cases legally, a collective response would provide a body of evidence that could not be ignored. As always, additional research to substantiate the findings of this research would be a good idea.

As already noted above, interim legislative protocols should be instituted when legislation changes as they would go a long way to prevent the additional layers of both cost and time delays evident in the case studies in this research.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

In the literature review, it was established that environmental legislation and controls have been utilised and implemented around the world for almost three decades. They are considered as one of the most successful policy innovations of the 20th Century.

Notwithstanding this, a significant number of lingering issues associated with the imposition of environmental legislation have been identified through studies over the last three decades that have suggested that economic competitiveness has been compromised. Ambiguous legislative requirements have left uncertainty which has adversely impacted developers. The impact has had direct and indirect cost consequences on their business strategies.

Studies have also identified that wealthy large multi-national organisations with substantial cash flows dominate evidence on the positive effects of environmental legislation. In contrast, small companies and developers with limited cash flow dominate reporting on the negative impacts of the environmental legislation. Such smaller companies have been significantly impacted and in some instances have gone out of business due to the burden of this legislation.

Whilst many studies over the years have attempted to measure the effectiveness of the imposed EIA legislation, both in terms of the long term sustainability objectives of the project and the short term impacts on both cost and time, this research report has focused specifically on the EIA process and the impact it has on development proposals.

This research report has specifically chosen three case studies which represent development proposals across a spectrum of the development industry in both the private and public sector. These identified case studies cover the low cost housing market (Pelican Park) in the public sector, the residential and commercial market (Kommetjie Mixed-Use) and the hotel and leisure industry

(Wild Coast Sun Waterpark) in the private sector. Two of the case studies are located in the Western Cape (Pelican Park and Kommetjie Mixed-Use) and one is in the Eastern Cape (Wild Coast Sun Waterpark).

The choice of case studies added variety as they included a large private listed developer with substantial cash flow (Wild Coast Sun Waterpark) as well as a smaller private sector developer with limited cash flow (Kommetjie Mixed-Use). The research does show that larger companies with more cash flow can expend substantial money to EIA remedies and still make their anticipated project deadlines as was done by Sun International who instituted accelerated construction methods to ensure the project opened in time for the festive season. The research suggests therefore that the impact of EIA legislation and process is minimal on the larger sized corporations while being greater for smaller sized developers. However, and highly significantly, all projects proceeded. This importantly suggests that the smaller sized developer was able to manage the impact associated with the EIA process.

The results of the case studies correlate with the findings of studies done over the past that record that costs are within international norms, but this research suggests that costs may in fact be reflecting an increase in the cost trend.

Legislative changes in the midst of a project proposal had dire consequences for developers resulting in excessive delays. It has been suggested that interim legislative protocols should be instituted to manage this unfortunate consequence. By modelling the scenarios of the case studies under the current legislation, significant cost savings and reduced time delays would have been encountered.

Importantly, it has been found that risk management as a discipline needs to be incorporated into project proposals in a formalised manner. This would shift the current situation where risks are managed in a reactive way and accounted for in general terms. It would appear that the way forward is for proactive management of environmental risks and in fact specifically the likelihood of them occurring.

A method in terms of "best case" and "worst case" scenarios was put forward as a way to accomplish this.

The findings of this research report make a strong case for the collective lobbying of developers, both large and small and from both the private and public sector, to government on the impact that the legislation is having on the local and broader economies of the country, particularly in the event of changes.

When one considers that government is the biggest client of major infrastructure projects and is also responsible for promulgating and enforcing environmental regulations and legislation, it is in government's best interest to act towards improving efficiency.

Generally, the sentiment towards EIA is overwhelmingly positive and it is was found that developers were highly committed to sustainability and agreed willingly to remedies deemed to be essential for the South African environment.

6.1 Recommendations for Future Research

The following directions are recommended for future study:

1. The direct and indirect effect of inconsistent EIA legislation application and inconsistent interpretation of the environmental regulations and law across South Africa.

2. The effect that the lack of institutional and local government competence and excessive bureaucracy plays in the process.

3. A converse of this study is suggested. This would entail researching the impact of the inefficiencies of the EIA process as identified in this research on the natural environment itself. For example, in the Kommetjie case study the delay of almost four years had detrimental environmental consequences on the land during this stagnant phase of the process where illegal dumping and land degradation occurred.

4. Comparative studies on project proposals that incorporate the risk management discipline and philosophies to those who do not.

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