PUBLIC PARTICIPATION IN ENVIRONMENTAL IMPACT ASSESSMENT: AN EFFECTIVE TOOL FOR SUSTAINABLE DEVELOPMENT

A South African perspective (Gautrain)

by

MARYAM TITILAYO AREGBESHOLA

Submitted in fulfilment of the requirements for the degree of

MASTER OF SCIENCE

in the subject

ENVIRONMENTAL MANAGEMENT

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: MR KF MEARNS

MARCH 2009

Acknowledgements

Alhamdu lillahi to the almighty Allah for giving me the wisdom, knowledge and all the support I needed to complete this study. I would also like to express my sincere appreciation to my supervisor, Mr KF Mearns, for his time, enthusiasm and encouragement from the beginning to the final stages of this dissertation.

Furthermore, I am very grateful to my late father, Mr RD Ogunjobi, my mother Mrs FA Ogunjobi, my aunt Ms Agnes Adegbuyi, and my brothers and sisters for their unconditional love, support and motivation throughout my academic and professional journey through life.

My deep and unending gratitude goes to my husband, Mr RA Aregbeshola, for his continued love, patience, support and encouragement; thank you for believing in me and for financing my studies. I also thank my children, Abdul Hameed and Abdul Rahman, for their love and for understanding that I was not able to spend much time with them while I was studying.

My unreserved appreciation goes to the Ogunjobis, Aregbesholas, Adeleyes, Adegbuyis, Durowojus and Adegboyegas families for their care, support and love.

I acknowledge the effort of my subject librarian, Ms Brown, for providing me with some valuable information used during the study. Thank you too to Ms Hellen Muller and Mr OV Kilpert for reading through the statistical data and making the necessary contributions. My appreciation also goes to Ms Bronwyn Gay for her painstaking efforts to read this dissertation.

I also thank all the respondents to my questionnaires for their willingness to complete the questionnaires; without them, this research would not have been possible.

Finally, I thank all my lecturers at the Department of Environmental Sciences, my colleagues and friends for their interest, courage, jokes and support. I thank you all!

Declaration

I declare that "Public participation in environmental impact assessment: an effective tool for sustainable development, a South African perspective (Gautrain)" is my own work and that all sources that I have used or quoted have been indicated and acknowledge by means of complete references.

Signature	Date
Mrs MT Aregbeshola	

Abstract

The need for public participation in the development of policies, programmes or actions has been widely accepted by both government and private sectors because of the benefits of such involvement. Involving the public in the development of any policy, programme or action is, however, a daunting task. Public involvement in the development of a policy or action often leads to protest, legal litigation, criticism and delay in carrying out the project. The main objectives of this research are to examine the process of public participation in the Gautrain project and to interrogate how public involvement in the decision-making processes of environmental concerns can be improved.

A quantitative study was conducted to describe and explore the process of public participation in the Gautrain environmental impact assessment procedure. The purposive sampling method was used. Thereafter, the data generated was analysed using statistical tools such as charts, tables and the Wilcoxon Mann Whitney U test to examine the similarities and differences in the response patterns of the public and the project proponent. Cronbach alpha statistical methodology was also used to test the reliability of the measurement.

The findings are discussed in relation to the objectives of the study and research hypotheses. The results indicate that (1) the public were not involved early enough during the project planning and design phases; (2) adequate information was not provided to the public; and (3) public input does not have much impact on decision-making processes. The study does, however, indicate that the process has enhanced the participants' learning and that the process of participation has improved in recent time as compared to the 2002-2003 periods. The study concludes by providing relevant solutions and recommendations.

Key words: public participation, environmental impact assessment, sustainable development, integrated environmental management (IEM) South Africa

Abbreviations and acronyms

AAPSA	Alliance Against the Park Street Alignment
BID	Background Information Document
CBA	Cost Benefit Analysis
CBD	Central Business District
CLF	Community Liaison Forum
CONNEPP	Consultative National Environmental Policy Process
CO_2	Carbon dioxide
GDACEL	Gauteng Department of Agriculture, Conservation, Environment and Land affairs (Gauteng)
DEAT	Department of Environmental Affairs and Tourism
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMU	Electric Multiple Unit
Gautrans	Gauteng Department of Public Transport and Work
GDP	Gross Domestic Product
IAIA	International Association for Impact Assessment
I&AP	Interested and Affected Parties
IEM	Integrated Environmental Management
IMF	International Monetary Fund

MLPORA	Muckleneuk/Lukasrand Property Owners and Resident Association
NEMA	National Environmental Management Act
NEPA	National Environmental Protection Act
NGO	Non-Governmental Organisation
RSA	Republic of South Africa
RoD	Record of decision
SDI	Spatial Development Initiative
SPSS	Statistical Packages for the Social Sciences
TBM	Tunnel Boring Machine
UN	United Nations
UNCED	United Nations Commission on the Environment and Development
WB	World Bank
WCED	World Commission on Environment and Development

Table of contents

Content

Page

List of figures

List of tables

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

In recent years, the concern for environmental quality and environmental management has been growing. Numerous conferences, workshops and symposia have been organised to highlight the need to incorporate environmental management into public policy. Today, most world governments, international organisations and non-governmental organisations require the public to participate in environmental programmes.

In 1969, an environmental law was passed in the United States of America called the National Environmental Policy Act (hereinafter referred to as NEPA). This led to the development of a new field called environmental evaluation and/or environmental management. This Act is primarily concerned with environmental protection in the United States and mandates federal agencies to conduct environmental impact assessments for major proposed projects.

In South Africa, the most important and comprehensive environmental legislation at the national level are the South African Constitution of 1996 (Act 108 of 1996) and the National Environmental Management Act (hereinafter referred to as NEMA) of 1998, which repeals most of the provisions in the Environment Conservation Act (Act 100 of 1989).

According to Gilpin (1995:4), environmental impact assessment can be defined as “the official appraisal of the likely effects of a proposed policy, programme or project on the environment; alternatives to the proposal; and measures to be adopted to protect the environment." In South Africa, the process is called integrated environmental management (IEM).

The assessment of impact and the completion of environmental reports or environmental impact statements (EIS) are essential components of the IEM. According to the Act, this process is hoped to help project proponents to make a

more environmentally sound decision if they are aware of the adverse or likely impact of a project on the environment. Public input (public participation) during this process is an essential ingredient. The public is expected to participate during (1) scoping, (2) reviewing the draft report and (3) the court processes.

Some of the reasons put forward in the literature for the inclusion of public participation in IEM include the following: (1) it is viewed as fair conduct in a democratic system for the public to be involved in issues that affect them (Gelhorn, 1971; Fox, 1979; Shepherd & Bowler, 1997); (2) it allow people to feel that their views and values are heard and are then incorporated into a programme or project (Brown, 1972; Buchy & Race, 2001); (3) it improves the quality, efficiency and effectiveness of the project (Enserink & Monnikhof, 2003); (4) the public are less hostile and more actively involved in the project (Knaap, Matier & Olshansky, 1998); and (5) the local community is better able to understand its environment and intervene in environmental problems by applying past experiences (Lane & McDonald, 2005).

In South Africa, the National Environmental Management Act (Act 107 of 1998) states as follows in chapter 1 (section 4f):

> The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.

Despite these provisions and their associated benefits, public participation in environmental assessment appears to be minimal. Even, it sometimes results in protest and litigations as is the case in Gautrain, in which public outcry ensured in some of the EIAs. Some of the reasons given for the lack of public participation include the following:

- It would appear that experts, such as engineers, are reluctant to allow lay people to provide input and/or to generate alternative solutions to problems (Fischhoff, Slovic & Lichtenstein, 1981; Krimsky & Plough, 1988; Enserink & Monnikhof, 2003).

- It is easier, quicker and more cost-effective to exclude the public from environmental impact assessments (Shepherd & Bowler, 1997).
- Resource and time constraints inhibit public participation. Project proponents are generally in a hurry to implement their projects and many hold the belief that public participation will alter their schedules or force them to revise project modalities (O'Riordan & Stoll-Kleemann, 2002).

Given that public participation has become an institutionalised process, it is imperative that public input should constitute a critical part of the project process. It would be erroneous to see it as a mere privilege, but rather, as means to an end (Enserink & Monnikhof, 2003). The South African Constitution (Act 108 of 1996, section 24), furthermore, states as follows:

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

The implementation of the National Environmental Management Act (Act 107 of 1998) is a legislative measure which enforces section 24 (b) of the South African Constitution. The Act (NEMA) also provides that all stakeholders have the right to be consulted in terms of the environmental impact assessment of every project which may affect them, in whichever dimension (social, economic and/or environmental) before any decisions are made (section 2 and chapter 4 of the Act).

In line with the above, this study will investigate the impact and effectiveness of the information supplied to those parties interested in and affected by the Gautrain project, and how this impacts on the processes and procedures followed in the Gautrain project.

1.2 The Gautrain

The Gautrain is a rapid rail transport project that is intended to link Pretoria, Johannesburg and the OR Tambo International Airport (formerly known as Johannesburg International Airport). This project is being undertaken by Gautrans (Gauteng Department of Public Transport and Work) to ease traffic congestion along Pretoria and Johannesburg highways, especially during peak hour periods. The project, which is largely aimed at private car owners, is expected to increase the use of public transport. The Gautrain project covers approximately 80km of railway lines, but this may be extended in future as the need arises. The train will travel at estimated speeds of between 160 and 180 km/h (Donaldson, 2005).

The Gautrain project is located in Gauteng, South Africa's primary business province. This province covers about 1,4% of the land surface area of South Africa and is home to nearly 8 million people (Gauteng Companies, 2007). According to Statistics South Africa (2006), Gauteng contributes about 33, 7% to the country's GDP. It contributes 60% of the country's revenue and is home to 70% of the country's workforce (Shilowa, 2001). As a result of its strategic importance to the national economy, one of the biggest challenges facing this province, however, is traffic congestion as a result of an increase in private car ownership. The Gautrain rapid rail project is intended to ameliorate or resolve this problem.

It is estimated that the project will create both direct and indirect employment, which, in turn, will increase Gauteng's GDP. Directly, it is estimated that about 43 000 jobs will be created during the construction phase and about 1 200 people will be employed to operate and maintain the system upon completion. Indirectly, it is estimated that the project will create an additional 40 000 job opportunities as a result of other activities in and around the rail stations (Shilowa, 2001).

In addition, the Gautrain rapid rail link is said to have environmental benefits since it will reduce the amount of carbon dioxide released into the atmosphere by motor vehicles. Despite the envisioned advantages, the project is not immune to inherent environmental impacts that generally characterise the railway transport system. Railway projects are amongst the listed activities in terms of EIA regulations, in which full compliance with the process of EIA is incumbent upon project executors

before the commencement of such projects (Environment Conservation Act 73 of 1998, section 21).

According to the Act, the public must be fully consulted on the impact that the Gautrain will have on the environment. This necessitates the need for a review of the literature to evaluate the impact of such a project on the environment and the influence of public participation thereof.

1.3 Preliminary literature review: a conceptual overview

Numerous studies relating to public participation in environmental impact assessments have been carried out. For the purpose of this research, the following concepts need to be investigated in other to gain clearer insight into the significance of public participation in environmental impact assessments in general and into the Gautrain project in particular.

1.3.1 Sustainable development

The term "sustainable" is a complex concept with various meanings and numerous situational applications. To this end, it will be expedient to consider various authoritative opinions in order to establish a reasonable conceptual basis.

Fowke and Prasad (1996) (in Williams & Millington, 2004) have identified more than 80 different, often competing, and sometimes contradictory definitions of sustainable development. The best and most used definition of "sustainable development", however, is the one offered by the World Commission on Environment and Development (WCED 1997:43). This organisation defines it as a kind of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

It is clear from this definition that resources must be used in a way that ensures present successes without reducing future generation's access to the same level and quality of resources. This poses an environmental challenge to society as a whole.

Miller (2004:4) observes that an environmentally sustainable society is one that "satisfies the basic needs of its people for food, clean water, clean air, and shelter in

continuums; avoids depleting or degrading the earth's natural resource; and does not prevent current and future generations of humans and other species from meeting their basic needs."

Since the Gautrain project is intended to improve quality of life, it is expected to use resources efficiently and sustainably. In order to ensure the sustainability of the project, however, public input and involvement are of paramount importance.

1.3.2 Integrated environmental management

The Environment Impact Assessment Committee set up by the Council of the Environment in 1985 was charged with the responsibility of designing a workable environmental impact assessment (EIA) procedure for South Africa. The Committee came up with a document entitled "Integrated Environmental Management". The term "integrated environmental management" (or IEM) is used to indicate an approach that integrates environmental considerations into all stages of the planning and development cycle for policies, programmes, plans and projects (Sowman, Fuggle & Preston, 1995).

Margerum (1995) argues that integrated environmental management is a holistic and goal-oriented approach to environmental management that addresses interconnections through a strategic approach. Garlauskas (1975) concurs with this viewpoint, but adds that the process is systematic in nature as it integrates all components of nature, irrespective of their human value.

From the forgoing definitions, it may be argued that impact assessment should be viewed as follows:

- *A holistic approach*. This means that multidisciplinary or interdisciplinary knowledge is relevant for the understanding and implementation of the environmental impact assessment process. This requires both scientific and non-scientific (public input) opinions and contributions.
- *Goal oriented*. The environmental impact assessment process should be directed to achieve a goal.

- *It should enhance interconnection through a strategic approach*. Pearce and Robinson (2003:4) define strategic management as "a set of decisions and actions that result in the formulation and implementation of plans designed to achieve specific objectives/goals."

According to Garlauskas (1975), the essence of environmental management is that it allows human beings to continue to evolve their technology without profoundly altering natural ecosystems through a systematic analysis, understanding and control. Since the environment itself is centred on the relationship between human beings and the environment, integrated environmental management needs to take cognisance of the existence of such interactions.

Garlauskas (1975) further argues that the following four fundamental functions must be effectively accomplished for environmental management to be effective and systematic:

1 Visualise all processes (both natural and artificial) in total perspective.

2 Recognise and understand any processes or problems in the structure and its component interrelationships.

3 Manipulate or otherwise deal with the interdependencies characterising the process or operation of the whole IEM.

4 Design, build, and operate the management system, which would serve as a means to manage the entire system.

1.3.3 Theoretical framework for public participation

This study will focus on public participation in integrated environmental management in South Africa, particularly as it applies to the ongoing Gautrain project. More specifically, this study aims to evaluate empirical approaches applied in more advanced countries (as suggested by literature) as a benchmark to evaluate the effectiveness of the one applied in this peculiar circumstance (Gautrain project).

Although there are numerous empirical evaluation approaches and models used to assess public participation in environmental impact assessments/integrated environmental management, most of these theories either lack empirical validity in

social science theory or hold little philosophical argument for their assertion (Prophet, 1990).

For the purpose of this research, theoretical approaches would be sought within public participation and democratic theory models. Also, criteria proposed by the International Association for Impact Assessment (IAIA) will be employed to buttress the validity of the research findings.

1.4 Motivation for the study

The earlier research carried out by Coetzee (2003) on the Gautrain focused on the impact of public participation on the decision-making processes of the project, that is, how public participation influenced the route of the rapid train. This research, however, will focus on the impact of public participation on the project after 2002 and will investigate the adequacy of information given to the interested and affected parties, their level of awareness to judiciously utilise the information provided and their willingness to participate in shaping the course of the project.

As mentioned earlier, the contribution of public input to impact assessment is not only to identify or assess impact and alternatives, but also to help decision makers to arrive at acceptable solutions with regard to environmental issues and developmental projects.

Environmental impact assessment (EIA) has been recognised by international institutions, governments, non-governmental organisations and other agencies as an essential tool that can be used to achieve sustainable development. According to WCED (1987), EIA is potentially an important instrument for furthering sustainability in public and private decision making. Furthermore, public participation is generally recognised as an important instrument used in facilitating the sustainability of projects (Doelle & Sinclair, 2006).

Despite this, public participation has been criticised by participants as ineffective, as costly and time consuming by proponents, and as inefficient by governments (Petts, 2001; Doelle & Sinclair, 2006). Such criticism should be regarded as valid; so too should the argument that public participation is an essential tool in the process of

making sound environmental decisions.

Public participation in the environmental impact assessment of the Gautrain project has, however, led to an increase in the initial cost of the project from R7bn in 2002 to R23bn in 2006 (Lubisi, Ngobeni & Mahlangu, 2006). Three possible explanations can be given for this: (1) the public may not be involved early enough in the project process; (2) the process of engaging the public may be deficient and ineffective; and (3) the public had inadequate access to information. This study will investigate these three issues.

1.5 Formulation of the problem and hypothesis

1.5.1 Statement of the problem

The importance of public participation in environmental impact assessments or integrated environmental management (as is the case in South Africa) is crucial. The closeness of the public or community to the environmental effects of these projects shows that their contribution needs to be more functional and effective. It is hoped that such an initiative will facilitate the process of realising the goal of environmental sustainability.

The effectiveness of public participation is, of course, of paramount importance to the project proponent because such participation will reduce unnecessary delays, which, in turn, could substantially increase the cost of the project or programme (as is the case with the Gautrain).

The fact that the initial costs associated with this project were reviewed many times and are still likely to be reviewed again, poses some critical questions. What went wrong during the deliberation and negotiation process? Have the project benefits been established to outweigh the current and potential effects (as far as environmental management of the project is concerned)? Do the public have adequate information and resources to participate efficiently and effectively? This research will attempt to answer these questions and other ones that may be deemed necessary.

1.5.2 Aim of the research

The aim of this research is to examine the effectiveness of the procedural approach used during the public participation in the IEM process. It is aimed at evaluating the effectiveness and functionality of public participation as it relates to timing, reliable information, response patterns and other related variables of the IEM process.

1.5.3 Objectives of the study

The objectives of this study are as follows:

1 To measure the efficiency with which the provided information was utilised by the interested and affected parties, considering their socioeconomic status and awareness levels.

2 To examine the adequacy of information given to interested and affected parties.

3 To evaluate the effectiveness of the public participation process.

4 To examine public participation trends in the Gautrain project from 2002 to 2008.

1.5.4 Research hypotheses

The following hypotheses will be investigated:

1 Adequate information was provided to interested and affected parties during the Gautrain EIA.

2 The response pattern of the public (interested and affected parties) does have an impact on the decision-making.

3 The process of public participation in the Gautrain project has been improved in recent times as compared to the 2002 period.

4 The process of participation in the Gautrain EIA enhances participant learning

1.6 Study area

Due to time and financial constraints, the study will be limited to the Pretoria section of the project (from the Centurion station to the Hatfield station, including the Pretoria CBD station), as depicted in the diagram below:

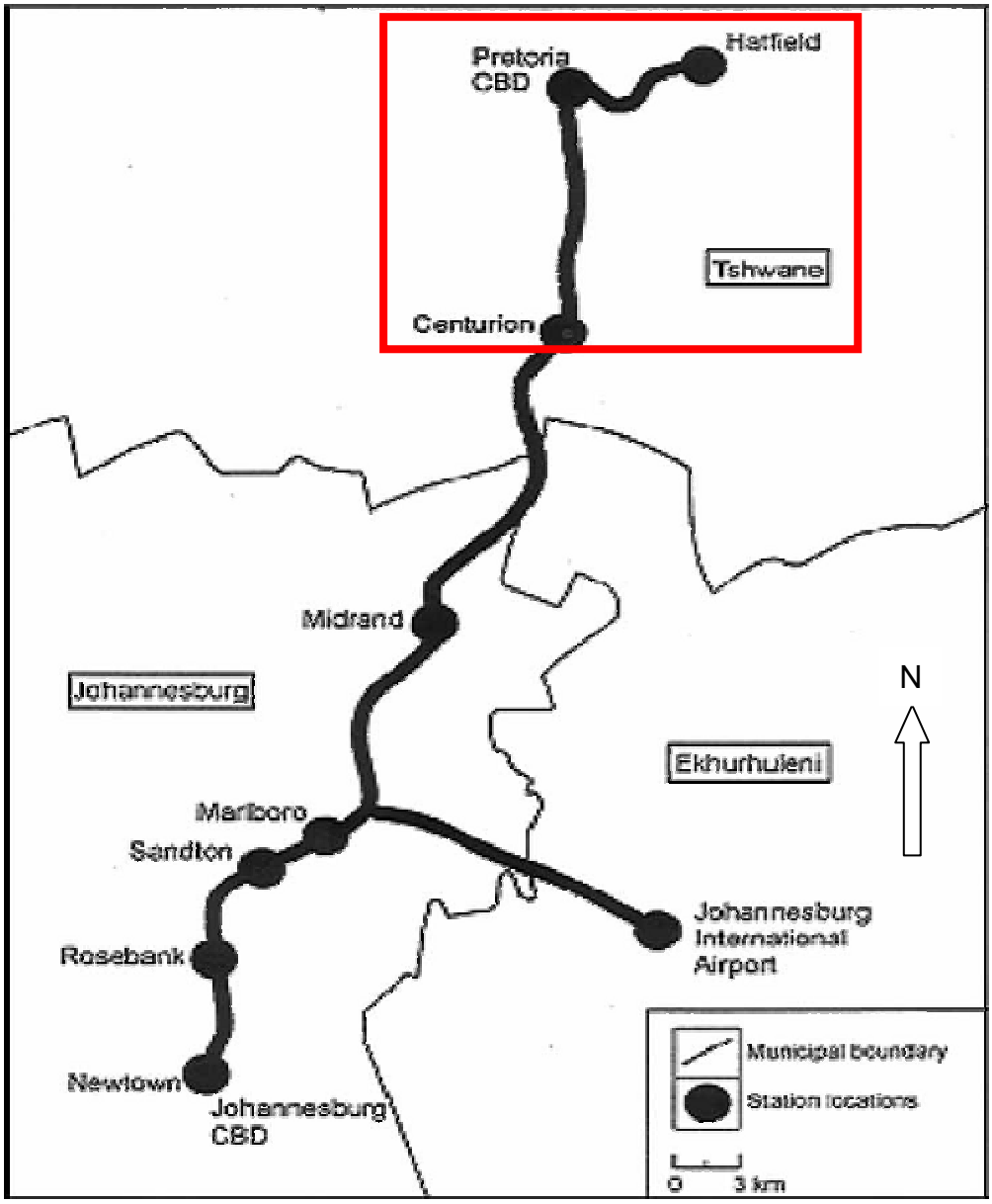


Figure 1: Outline of the study area

Source: Van der Westhuizen (2007:337).

1.7 Research design and methodology

For the purposes of this research, both qualitative and quantitative research methods will be employed. The use of qualitative research will yield information that provides an understanding of the subjects concerns, values and perceptions (Morgan, Fischhoff, Bostrom, Lave & Atman, 1992). Quantitative methods, in contrast, can reduce public participation to variables that are easier to quantify (Bamberger, 1990), such as level of awareness, willingness to participate, the quality of information supplied, opportunities, and so on. These two approaches are often used jointly in research because they are interrelated (Chess, 2000).

1.7.1 Research methodology

In order to evaluate the four stated objectives, this research study will utilise both primary and secondary sources of information.

The primary information will be elicited through the field survey. Two in-depth questionnaires (one for selected interested and affected parties and the other for project environmental consultants or public participation consultants) will be used to generate the primary information.

The secondary information will be elicited through a review of the relevant literature. This aspect will consider the views and opinions of various researchers, authors and scholars on the subject matter. Secondary sources of information include publications, journals, texts and other relevant academic documents/materials on the subject matter.

1.7.2 Population

Public participation involves ongoing communication between the project proponent and the local community (including interested and affected parties) with the aim of improving decision making during the planning, designing and monitoring phases (Sinclair & Diduck, 1995; Shepherd & Bowler, 1997; Mathabatha & Naidoo, 2004). The population for this study, therefore, includes those who have participated in the Gautrain EIA meetings during the period of investigation.

1.7.3 Sampling procedure

For the purposes of this research study, the researcher will make use of purposive sampling technique (i.e. non-probability sampling). According to Reinard (2006:32), purposive sampling "involves collecting sample composed of subjects selected deliberately (on purpose) by researchers, usually because they think certain characteristics are typical or representative of the population." The researcher employed purposive sampling to examine the entire process of public participation (i.e. from planning through to implementation and the monitoring stages); those members of the public who only participated during the planning stage of the Gautrain EIA process do not fulfil all the objectives of the study.

1.7.4 Administration of questionnaire

The purpose of the study is to provide quantitative information on the effectiveness of the communication procedure used during public participation in EIA, as it applies to the Gautrain project.

The questionnaire will be designed to generate primary information, and will include a variety of multiple questions, ranked along five Likert-scales. It will be structured to cover, in detail, the objectives of the proposed study in order to help test the research hypotheses. The questionnaires will be self-administered to enhance the validity and reliability of the survey by providing possible guidance to respondents. More so, it is hoped that this method will facilitate the respondents' ability to handle the questionnaires carefully and respond promptly.

The researcher will try to remain neutral to suppress any kind of biases that may arise so that the data can speak for itself through statistical analysis. It is also assumed that the researcher does not have any control over the response pattern of the respondents. In addition, the respondents are absolutely free to respond to the questions given that their responses will be treated with utmost confidentiality.

1.7.5 Data analysis

The Mann-Whitney U test technique will be employed together with computer-aided software called Statistical Package for the Social Sciences (SPSS) to analyse the

primary data. Statistical measures of presentation like charts, tables and graphs will also be employed during the analysis to make the data more meaningful and easy to interpret.

1.8 Chapter framework

The research will be structured according to the chapters below:

Chapter 1: Introduction and background to the study

This chapter will provide an introduction and background to the study, a preliminary literature review, information on integrated environmental management, a theoretical framework for public participation, a motivation for the study, a formulation of the problem and research hypothesis, and a framework for the research design and methodology.

Chapter 2: Literature review

This chapter will deal in detail with the theoretical frameworks and practices of EIA/IEM in general and the Gautrain project in particular.

Chapter 3: The Gautrain project

This chapter will deal with the objectives of the Gautrain project and will provide an overview of the environmental impact assessment process and other relevant information.

Chapter 4: Research methodology

This chapter will deal with design technique, questionnaire design, survey groups and the collection of data.

Chapter 5: Data analysis and findings

This chapter will deal with the interpretation of various analyses, and the effectiveness of the communication procedure employed during the identification of impact and alternatives.

Chapter 6: Summary of findings, recommendations and conclusion

This chapter will briefly state the findings of the research and identified problems, and recommend possible solutions to the identified problems.

1.9 Chapter summary

This chapter provided an introduction to and background for the study. It provided a motivation for the study, the research problem and hypotheses as well as the research design and methodology. The next chapter will look at the relevant literature.

CHAPTER 2
THE THEORETICAL CONNOTATION AND PRACTICAL APPLICATION OF PUBLIC PARTICIPATION

2.1 Introduction

> Those directly affected by an environmental matter should always have the accepted right to make their views known before a decision is taken about it. Giving them that opportunity is also likely to improve the quality of decisions; drawing on a wider pool of knowledge and understanding (lay as well as professional) can give warning of obstacles that, unless removed or avoided, would impede effective implementation of a particular decision (Irwin, 2001: 2).

There is an increasing realisation of the importance of public participation in decision-making processes. In the early days of environmental impact assessments, participation was just a means to exchange information, that is, a platform to inform the public of the likely impacts of a project on their environment.

This form of participation is referred to as technocratic or top-down approach, during which scientists try to solicit the support of the general public by informing them of the impact of the project. This form of participation has been criticised due to increasing levels of pollution and environmental degradation. Since science has failed to deliver, attention has now shifted to increasing citizen involvement in project deliberation and decision-making processes (Clark, 1983).

Several seminars, workshops and conferences are now being championed by non-governmental organisations, the private and public sectors, the business community, and international institutions such as the International Monetary Fund, the World Bank and the United Nations Commission on Environment and Development (UNCED). This move is directed at trying to influence governments to entrench public participation in decision-making processes.

The Rio Summit's Principle 17, for example, specifically demands that EIA should be undertaken for proposed activities which are likely to have a significant effect on the environment (UNCED, 1992). UNCED also recognises the significance of public participation in sustainable development and therefore calls for broad-based public

participation in policy making in order to achieve the goal of sustainable development (UNCED, 1992).

In recent time, increased globalisation, telecommunications technology, the media, improved infrastructure and the internet all have made the exchange of information possible. People are now more aware of their rights. Today, public participation has become an indicator of good governance, accountability and empowerment (Morrisey, 2000). Governments now tend to be more transparent and are aware that they need to empower people by giving them the skills, information and knowledge necessary to use the available resources in a sustainable manner.

In an attempt to keep pace with these developments, studies have been carried out on public participation in EIA and in other related fields. Models/paradigms have been developed in different fields which are helpful to environmental managers to facilitate the processes of their complex assignments.

The sections below deal with public participation and environmental impact assessments (meaning and purpose). These sections also provide an overview of environmental assessment in South Africa, the public participation process in South Africa's IEMs, sustainable development and conceptual framework of public participation.

2.2 Conceptual overview of public participation

2.2.1 Definition of public participation

There is no universally acceptable definition of public participation. It is a concept that means different things to different people. Even the word "public" is a vague term (DEAT, 2000), which prompted some institutions (such as DEAT) to replace it with the term "stakeholder involvement". Nevertheless, some of the cited definitions of public participation in the literature can be grouped into three categories: (1) in terms of collaboration and improved decision making; (2) degrees of participation; and (3) information exchange.

2.2.1.1 Collaboration and improved decision making

Mathabatha and Naidoo (2004:i) define public participation as "the ongoing process of interaction between service providers or project implementers and the community with the aim of improving decision making during the planning, design, implementation and evaluation phases of the project". These authors see participation as a means of defending one's claims as well as an opportunity to challenge other people's claims. The process can also be utilised to ask for further clarification so as to arrive at socially acceptable decisions (Webler & Tuler, 2000).

2.2.1.2 Degree of participation

Selman (2004) defines participation as the full engagement of communities in the management process that generally devolves a leadership role and concedes a substantial degree of ownership over the results. According to the World Bank (1996), participation is regarded as a process through which stakeholders influence and share control over development initiatives and the decisions and resources that affect them.

Shedding more light on the differences between participation and consultation, Chenoweth, Ewing and Bird (2002) argue that consultation and participation should not be regarded as synonyms. For them, consultation is seen as a form of participation during which authorities listen to the stakeholders, while participation is a more engaging process where people share, negotiate and take active control in decision-making processes in conjunction with relevant authorities.

2.2.1.3 Information exchange

Brynard (1996) suggests that public participation in the EIA context is a two-way communication process between the project team and the targeted or affected people. Chenoweth *et al* (2002), however, believe that public participation is a more complex procedure that transcends the two-way exchange of information. This is because it involves the genuine exchange of information and responsibility between government authorities, community groups and the community at large.

2.3 Rationale for public participation

There are numerous rationales for public participation in programmes, plans, projects and other actions that affect people and their immediate environments. These reasons can be categorised as follows:

1 *Normative/democratic sovereignty perspective.* It is believed that in any democratic society, the citizen has the right to participate in the decision-making process (Fiorino, 1990; Pretty, 1995; Leeuwis, 2000; Rowe, Horlick-Jones, Walls & Pidgeon, 2005). This means that the public must be given the opportunity to participate in decision-making processes of any project that affects their lives if they choose to do so (Brynard, 1996).

2 *Instrumental perspective*. This perspective is based on the notion that public involvement in developmental projects will aid the outcome of such a decision-making process (Morissey, 2000). It is believed that this will help to build the confidence, trust, legitimacy, credibility and acceptability of the project or the decision-making process (Fiorino, 1990; Pretty, 1995; Leeuwis, 2000; Charnely & Engelber, 2005; Chilvers, 2008).

3 *Substantive/source of information*. It is believed that the public hold valuable knowledge and experience which can be used to supplement technical judgement (Mitchell, 2002; Charneley & Engelber, 2005), particularly when it comes to identifying significant alternatives and other problems that relate to the identified project (Artini, 2002).

4 *Learning perspective*. This perspective views participation as a means of learning about the environment. During participation, the participant learns more about environmental assessment (Brynard, 1996). Knowledge acquired may be applied to other problems or daily issues.

5 *Political perspective*. This perspective views participation as a means to emancipate and empower less privileged individuals/groups in society.

Participation is also used to garner votes and/or gain political popularity during elections (Sewell & Phillips, 1979).

6 *Improved decision perspective*. Participation is viewed as a process through which information is exchanged; it also allows the public to monitor the implementation of the decisions made and to determine the effectiveness, efficiency and efficacy of the mitigation measures (Sinclair & Diduck, 1995).

7 *Conflict resolution perspective.* Participation is viewed as a means to resolve conflict between interested and affected parties, and to garner support for final decisions (Sewell & Phillips, 1979; Sinclair & Diduck, 1995).

8 *Procedural perspectives*. Participation is seen as a means to generate approval for actions taken. The public are urged to participate in order to conform to the legislative/procedural requirements (Cornwall, 2003).

9 *Empowerment perspective.* Here participation is viewed as a means of equipping the public with the skills, values, attitudes and knowledge necessary for them to take control of their lives. Participation, therefore, is regarded as both an end in itself and as a means to self-development (Morrissey, 2000). Davids, Theron and Maphunye (2005) further differentiate between participation as a means (passive) and participation as an end (active). These scenarios are depicted in the table below:

Table 2.1: The comparative analysis of participation

Participation as a means	Participation as an end
Implies the use of participation to achieve some predetermined goal or objective	Attempts to empower people to participate in their own development more meaningfully
Attempts to utilise existing resources in order to achieve the objectives of programmes/projects	Attempts to ensure the increase role of people in development initiatives
Emphasises achieving the objective rather than the act of participation itself	Focuses on improving the ability of the people to participate rather than just achieve the predetermined objectives of the project
More common in government programmes, where the main concern is to mobilise the community and involve them in improving the efficiency of the delivery system	Finds relatively less favour with government agencies. NGOs agree with this viewpoint in principle
Participation is generally short-term	Participation is a long-term process
Participation as a means appears to be a passive form of participation	Participation as an end is relatively more active and dynamic than participation as a means

Source: Davids *et al* (2005:117)

It may be deduced from the above table that there are numerous rationales for public participation in decision-making processes, which may take the form of tokenism (procedural, information eliciting) or the form that is directed towards empowerment. In the following section, the different forms that participation takes will be examined.

2.4 Types and techniques of participation

Many participation techniques can be identified in the literature, by using different nomenclatures to denote such activities as systematic information collection,

information dissemination to interested and affected parties, consultation and participation (MacKay, 1998; Chenoweth *et al*, 2002). Such participation can be modest or status quo-oriented. They may also be useful in informing far reaching changes in decision making system (Atkinson, 1992).

It is generally accepted, however, that a specific participatory mechanism must be detailed enough to suit a particular political, socio-economic and/ or cultural considerations (Palerm, 2000). Ananda (2007) states that different techniques should be employed in different situations, as one technique is not a panacea to all problems. The following techniques are among the major ones identified in the literature:

1 *Manipulation.* Participation is conducted merely for the sake of conforming to formality/procedures, or as a cover-up with little form of well-intended public participation (Arstein, 1969). The participants are informed about the project, what the proponents intend to do or what they have already done (Pretty, 1995). It is one way for project proponents and the public to exchange information relating to the project (Davids *et al,* 2005).

2 *Informing/information feedback.* Participation is facilitated by answering questions either via a mailed questionnaire or via a telephone interview in order to solicit information from the public (Davids *et al*, 2005). This type of information exchange is a one-way process (Keen, Brown & Dyball, 2005).

3 *Consultation.* Participation is facilitated by means of consultation. This process allows participants to express their views and concerns, and to share their knowledge with the project proponents. This type of participation also facilitates reactions to proposed alternatives offered by project management teams (Sewell & Phillips, 1979). This type of participation may give rise to a dialogue between participants (Pretty, 1995). The authority (often the government), however, maintains the power to evaluate the information gathered, thereby deciding on the "most suitable" course of action (Keen *et al*, 2005).

4 Enticing/material incentives. People participate because of what they can benefit from such a process; participation, in other words, allows them to seek financial benefits or support from different institutions (Pretty, 1995).

Participants share information and jointly consider issues, but one party usually has a greater degree of control, which is used to entice other parties to act through incentives (Selman, 2004; Keen et al, 2005).

5 *Joint participation*. The participant and the authority share the initiatives, as well as ideas and information. They also have equal power with regard to decisions made (Sewell & Phillips, 1979). It involves the use of interdisciplinary methods and structured learning processes (Selman, 2004).

6 *Learning perspective.* This perspective views participation as a means of learning about the environment (Brynard, 1996). Knowledge acquired may be applied to other problems or daily issues.

7 *Partnership/collaborative*. Participants are able to negotiate and engage in trade-offs with those in power, although one of the partners may arrogate or exercise more power or may be more actively involved than the other (Arnstein, 1969); here, decisions are reached through consensus (Mitchell, 2002).

8 *Delegated power*. This involves the transfer of responsibility usually from the government to the public (Sewell & Phillips, 1979). It allows the public to use their knowledge and skills to gain greater control over the planning and decision-making processes (Arnstein, 1969).

9 *Citizen control/self-mobilisation*. Participants come up with their own ideas, initiate projects and act on their own decisions with little external or authority influence (Arnstein, 1969; Sewell & Phillips, 1979; Selman, 2004). Finance or aid might, however, be obtained by participants from external organisations (Pretty, 1995).

2.5 Importance of public participation

Some of the major significance of public participation, as identified by some authors, are presented below:

1. It upholds/strengthens democratic principle – public participation is an essential tool to complement the rule of law as it imbibes culture of check and balance in the technocrats' decision-making process (Mantzara, 1998).

2. It improves the quality of decision-making – public participation can improve the predictive quality of environmental assessment because it involves diverse stakeholders and the process makes use of multi-year information, and quality baseline data (Hughes, 1998).

3. Accountability and good governance – public participation helps to promote accountability because decision-makers have to state the information used in the decision making, the impact of the decision on the people (George and Kirkpatrick, 2007) as well as the last resort (the court of appeal) for interested parties to challenge the final decision- thus contributing to good governance and accountability (Sinclair and Diduck, 1995).

4. Empowerment – public participation helps the people to develop the necessary skills, knowledge and values that are needed to take control of their lives, to communicates meaningfully, and also to create the enabling conditions for functioning as responsible citizens in decision-making (Mantzara, 1998).

5. Conflict resolution/reduction - public input is vital for resolving or reducing environmental disputes (Nanda and Pring, 2003; Barrow, 2006).

6. Political stability – public participation allows government to increase its popularity which in turn may facilitate social; and political stability (Mantzara, 1998).

7. Social responsiveness – broad-based participation and scrutiny allows authority to make decisions that are responsive to the need of the community (Sinclair and Diduck, 1995; Burby, 2003).

8. Sense of belonging – participation in decision-making widens social development principle because the participants experience a sort of fulfilment which in turn increases the sense of belonging; this makes decision to be more reflective of community needs and values (Hughes, 1998; Mathabatha and Naidoo, 2004; Enserink and Koppenjan, 2007)).

9. Financial aid - Public participation in the decision-making process may result in a democratic perception capable of eliciting a wider support (financial and moral) for the project, from both national and international institutions (Mantzara, 1998).

10. Government responsiveness – it allows authority and project proponent to understand the people's fear, concerns, values, and conflicting interests; it thus allows consensus to be reached so that better decisions can be made (Mantzara, 1998; Nanda & Pring 2003).

2.6 Factors that can hinder public participation

1 *Limited access to information.* Public participation is limited if there is insufficient information provided to the people (Barrow, 2006). In research conducted by McEwan (2003) on local governance and gender participation in South Africa, it was found that black women would participate more effectively in decision-making process if they had greater access to adequate information upon which to make informed decisions.

2 *Equity.* A great number of participatory researches show lopsidedness in representation of people in the public participation processes, as some groups are more represented in decision-making than others, thereby rendering the process unjust (Lane & McDonald, 2005). The process of participation is often dominated or ruled by the more influential individuals or groups at the expense of the less privileged (Sewell & Coppock, 1977; Nanda & Pring, 2003).

3. Transparency. Participation may be limited if the process is not transparent (Barrow, 2006). Openness and participation process helps to improve project standard, reduce corruption (Brynard, 1996), and promote trust and open governance (Selman, 2004).

4 *Time and financial constraints.* One major problem of environmental evaluation is that it is often constrained by time, financial resources and project cycle schedules; this, in turn, leads to snapshot data collection that can be deceptive and inaccurate (Hughes, 1998; Nanda & Pring, 2003).

5 *Limited awareness.* Planning has remained intangible because of inadequate public awareness (Melnick, McNeely, Navarro, Schmidt-Traub & Sears, 2005).

6 *Undermine goals.* Participation can be frustrated if the targeted goals (e.g. needs, beliefs, values and interest) are not incorporated in the final decision-making process (Nanda & Pring, 2003).

7 *Late consultation.* Late public participation often results in project delays and this sometimes leads to protest action or legal proceedings (Thomas & Elliott, 2005).

8 *Internal and external constraints.* Participation can be reduced if the authorities are unwilling to share power with the public, due to institutional motive (internal) or their relationship with powerful economic forces (Connelly, 2006).

9 *Education.* A lack of literacy or the technical nature of the project can hinder public participation (Hughes, 1998).

2.7 Environmental impact assessment (EIA)

There is no universally accepted definition of EIA. The following definitions show how perspectives and opinions vary in relation to the definition of EIA.

Selman (2004) defines environmental impact assessment as a systematic procedure for considering the likely impact of a project on the environment before decisions are taken by the capable authority on whether to accept or reject the project proposal.

Sadler (1996), as cited in Glazewski (2005), defines environmental assessment as a systematic process of evaluating and documenting information on the potentials, capacities, and functions of natural systems and resources in order to facilitate sustainable development planning and decision making in general, and to anticipate and manage the adverse effects and consequences of proposed undertakings in particular.

According to the Department of Environmental Affairs and Tourism (South Africa) (2000), an EIA is a process of gathering and evaluating environmental information in order to provide sufficient supporting arguments to evaluate the overall impact, consider alternative options, and make a value judgement in choosing one development alternative instead of another.

Munn (1979), cited in Wathern (1988:6), defines environmental impact assessment as "a process for identifying the likely consequences for the bio-geographical environment and for man's health and welfare of implementing particular activities and for conveying this information, at a stage when it can materially affect their decisions to those responsible for sanctioning proposals."

Nanda and Pring (2003:136) state that EIA is a formal process for studying a major project, programme, plan or other action with potentially significant environmental impacts in order to:

- predict and evaluate environmental effects (and possibly social and economic impacts as well)
- examine alternative approaches that may be environmentally preferable, and to
- plan measures to avoid or mitigate impacts

From the above, it can be deduced that definitions of EIA vary considerably. Curi (1983) argues that these variations are partly due to (1) the use of terms such as "environment" and "impact/effect" without providing the meaning of those terms; and (2) the nature of the subject (i.e. EIA). As such, EIA is not purely a scientific exercise or an art, but rather a combination of the two.

From the above definitions, EIA may be defined as the systematic process of gathering, investigating and assessing the likely impacts of the proposed project on the wellbeing of living and non-living objects (e.g. cultural heritage) prior to a decision being taken on whether to accept or reject the proposed project or action. In the section below, the need for EIA will be examined.

2.8 The purpose of EIA

Before 1970, project assessment was based on the traditional technocratic methods of feasibility studies and cost benefit analyses (CBA) (Clark, 1983). The inadequacy of these approaches gave birth to the new method of assessment, that is, EIA where environmental effects and economic, social and technical considerations are taken into account before decisions are made (Clark, 1983). Other reasons for EIA can be categorised as follows:

- *It enables decision makers to make more informed decisions*. EIA provides decision makers with quality and comprehensive information on the environmental consequences of a proposed action (Bisset, 1983; DEAT, 2000).
- *To identify the likely impacts of the project.* EIA helps to assess the likely physical, biological, socioeconomic and health effects of a proposed project, policy or actions, both positive and negative (Clark, 1983; Devuyst, 1993; Hirji, Johnson, Maro & Chivta, 2002).
- *To preserve the quality of life.* In the face of competing demands for economic and social developments, EIA helps to preserve the quality of life by assessing the effects of the proposed action and providing alternative options (Wiesner, 1995; Weston, 2004).

In addition to the above-mentioned reasons, EIA enables public input to be incorporated into decision-making processes, since members of the public are able to express their concerns, fears and needs during the EIA process. Below are some cited purposes of EIA:

Table 2.2: The purposes of EIA

- EIA assists in decision making by providing comprehensive and detailed information on the environmental consequences of a development (DEAT, 2000).
- EIA is the critical appraisal of the likely ecological effects of a proposed project, activity or policy, both positive and negative (Hirji *et al*, 2002).
- EIA helps to determine the potential environmental, social and health effects of a proposed action (Devuyst, 1993).
- EIA helps to improve decisions on development by increasing the quality and scope of information on likely impacts presented to decision makers and members of the public (Bisset, 1983).
- EIA is a systematic process for considering the possible impact of a proposal prior to decision being taken on whether or not a proposal should be given approval to proceed (Jay; Jones; Slinn, & Wood, 2007).
- EIA assesses the physical, biological, and socio-economic effects in a form that permits a logical and rational decision to be made (Clark, 1983).

2.9 An over view of environmental impact assessment in South Africa

Environmental awareness and conservation can be traced back to the early European settlers in the Cape (Fuggle & Rabie, 2005) and to the indigenous local South African people around the country (Sowman *et al*, 1995). The main focus then was on the protection of fauna and flora. In 1926, the first national legislature on nature conservation called the National Parks Act (Act 57 of 1976) was promulgated. In order to make way for the implementation of this Act, some land was expropriated (Wiseman & Rossouw, 2004).

In the late 1960s, environmental awareness gained momentum as different organisations, international institutions, professionals, and private and public institutions engaged government to incorporate environmental concerns in its decision-making processes. The first environmental legislature, the National Environmental Protection Act (1969), was enacted in the United States. Other countries (both developed and developing) have since followed suit; it took South Africa two decades before promulgating such an Act (Fuggle & Rabie, 2005).

Furthermore, in 1972, a non-statutory South African Committee of Environment was established to advice the Cabinet Committee on environmental matters. This non-statutory committee was renamed the Council for the Environment in 1975. In 1976, the Council submitted a report entitled "Bepaling en evaluering van invloede van ontwikkelings projekte op die omgewing" (Identification and Evaluation of the Effects of Development Projects on the Environment). The report deals with how to identify impacts and suggest procedures for environmental assessment in South Africa (Sowman *et al*, 1995).

In an attempt to further integrate environmental assessment into national policy, a White Paper on National Policy Regarding Environmental Conservation was published in 1980 to aid decision makers on all environmental affairs. It is important to note that the White Paper (Republic of South Africa 1997a) was just a declaration of intent and was not legally binding until it was enacted as the Environmental Conservation Act (Act 100 of 1982) (Rabie, 1990; Sowman *et al*, 1995).

In 1982, the President requested the President's Council to investigate and propose appropriate principles for environmental management in South Africa. This led to the publication of two reports (PC 2/1984 and PC 5/1984) which recommend that EIA should be made compulsory in terms of development actions, with the policy to guide its implementation.

Another important development was the drafting of the Integrated Environmental Management (IEM) policy document and the enactment of the new Environment Conservation Act (Act 73 of 1989) which replaced Act 100 of 1982. The Act was promulgated to give IEM full statutory backing. According to Duthie (2001), there were no procedures or mechanisms to galvanise the EIA process at any level of government, despite the enabling clauses in the Environmental Conservation Act of 1989.

To further strengthen the effectiveness of environmental management in South Africa, the Integrated Environmental Management policy document was published by the Council for the Environment with the aim of institutionalising EIA into decision-making. The term "integrated environmental managements" was chosen over "environmental impact assessment", because it was felt that the term was too limited in scope. IEM, in contrast, is all encompassing because it integrates environmental considerations into all stages of planning and development, and includes monitoring and management mechanisms in the process (Fuggle & Rabie 2005; Sowman *et al*, 1995).

According to the South Africa Department of Environmental Affairs (1992), IEM was designed to ensure that the likely environmental effects of development proposal are understood and adequately taken into consideration. Despite the publication of IEM, EIA was regarded as a voluntary requirement in South Africa (Duthie, 2001), a move that necessitated the promulgation of a more stringent enactment.

Thus, in 1995, a national conference attended by numerous stakeholders was held under the auspices of the Consultative National Environmental Policy Process (CONNEPP). At the end of the conference, a discussion document was published which allowed further comments to be made. In 1996, a Green Paper was published, which led to the publication of the White Paper (RSA, 1997a). Subsequently, the

National Environmental Management Act (Act 107 of 1998) was promulgated. This Act makes the process of EIA compulsory in all projects that are perceived to have effects on the environment. See figure 2.1 for the IEM procedure.

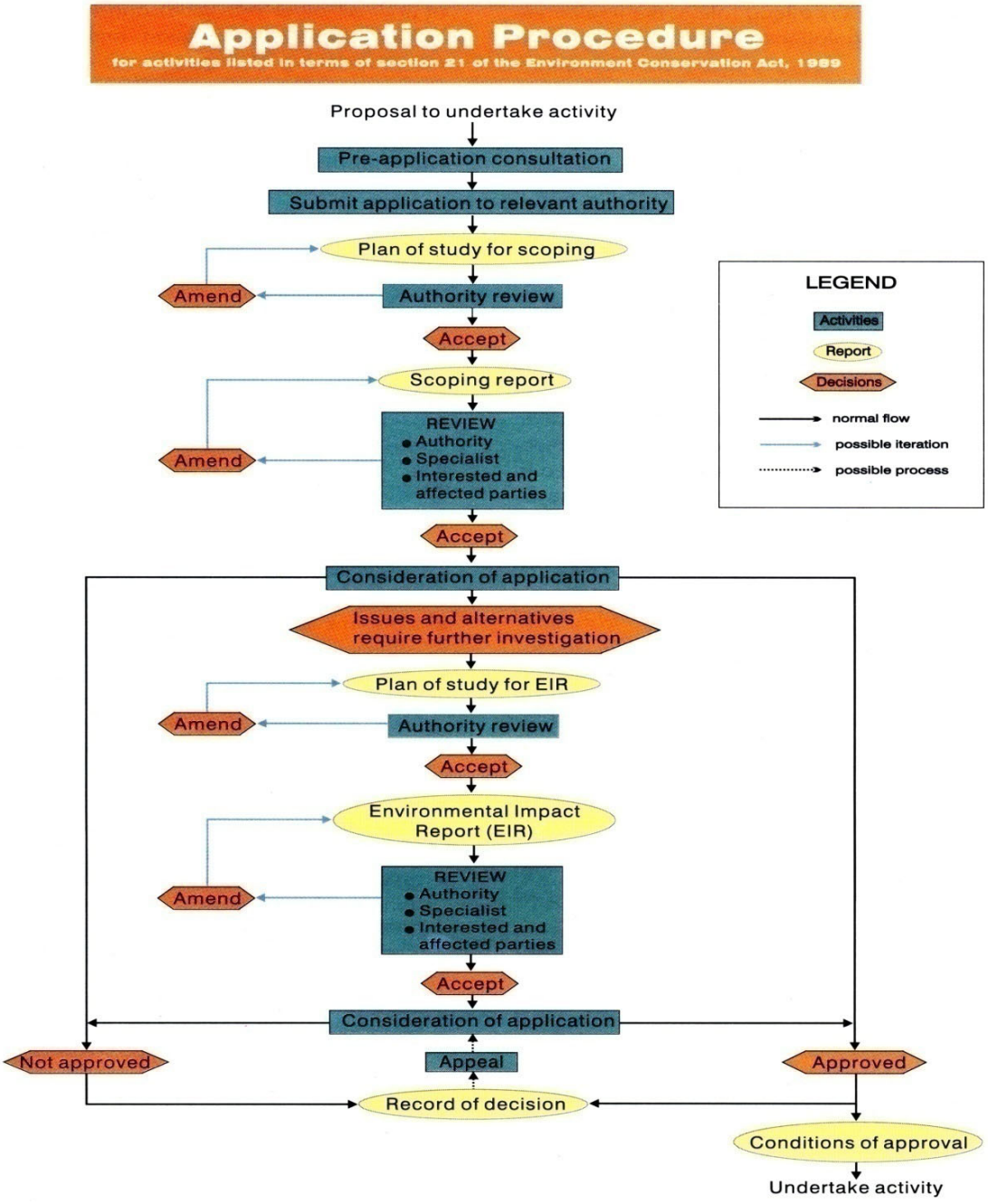


Figure 2.1: The Integrated Environmental Management procedure

Source: Department of Environment Affairs and Tourism (1998:18)

The IEM procedure, as depicted in figure 2.1, will be discussed briefly below:

2.9.1 Application for authorisation to undertake activity

(a) Pre-application consultation between relevant authority and applicant – During this stage it is essential that the applicant consult with relevant authority to:

- determine whether the proposed activity needs to comply with the regulations if the applicant is not certain whether the proposed activity falls within the description of the activity identified;
- determine the specific contact person on provincial authority level;
- obtained an application form;
- obtained general guidelines on the procedures, information and reports required;
- determine whether the application for authorising the undertaking of an identified activity should comply with the legislative requirements in terms of the Environmental Conservation Act, 1989;
- determine whether the application should be submitted to the Minister of Environmental Affairs and Tourism for consideration; and
- determine whether other authorities are involved.

Plan of study for scoping

(a) Submission of plan of study for scoping – after submitting the application to the relevant authority, the applicant may be requested to submit a Plan of Study for Scoping or a Scoping Report. The Plan of Study for Scoping must include the following:

- description of activity – this may include name of the applicant and address; nature of the activity; description of the activity or development; description of site, design, size, scale and all relevant phases of the proposed development and any important environmental features (e.g. rivers).

- description of the tasks to be performed – this may include the preparation of a Plan of Study for Scoping (outline of the scope); discussion with relevant authorities and key interested parties, in order to collate available information and identify information gaps; identification of issues and alternatives; the evaluation of concerns in order to assign priority to the more important issue; developing a strategy for addressing and resolving each key issues; providing feedbacks on the way comments have been incorporated; and preparing a Scoping Report.
- time-table of tasks – a timetable setting out when the above-mentioned tasks will be completed.

(b) Authority Review – the relevant authority will in writing accept the Plan of Study for Scoping and request the applicant to submit a Scoping Report or request the applicant to provide additional information before accepting the Plan of Study for Scoping.

Submission of Scoping Report

After the Plan of Study has been approved by relevant authority, the applicant will be requested to submit a Scoping Report.

(a) Review of Scoping Report – the Scoping Report must be reviewed by interested and affected parties (public), by specialists and all relevant authorities. Reports should therefore be easily accessible to all.

(b) Decision – the relevant authority must accept the information and the Scoping Report before it may decide to:

- Issue an authorisation to undertake the activity with or without conditions;
- that the information contained in the Scoping Report should be supplemented by an EIR; or
- decline the application

If the application is approved or rejected, a Record of Decision must be issued by relevant authority to the applicant. This Record of Decision should be made available on request to any interested parties

(c) Appeal – the applicant or an interested party may lodge an appeal against the decision made by the relevant authority.

Plan of Study for EIA

(a) If the relevant authority decides that the information contained in the Scoping Report should be supplemented by an EIR, the applicant must submit a Plan of Study for EIA. The content of the plan of study should indicate the following:

- Description of the environmental issues identified during scoping;
- a description of feasible alternatives and other additional information;
- method of identifying impacts;
- method of assessing the significant impacts; and
- project phases (pre-construction, construction, operational and decommissioning phases)

(b) Authority review of Plan of Study for EIA - the Plan of Study for an EIA must be reviewed and accepted by the relevant authority before the applicant commences work on the specialist studies and before submission of environmental impact report.

Submission of Environmental Impact Report

After the relevant authority has accepted the Plan of Study for EIA, an Environmental Impact Report (EIR) must be finalised.

Review of Environmental Impact Report (EIR)

(a) The Environmental Impact Report should be reviewed by the relevant authority, with the assistance of other authorities involved, specialists, all interested and affected parties and the public.

(b) Decision – the relevant authority will decide to either accept or reject the application. The conditions for approval or rejection should be stated in the Record of Decision.

(c) Appeal - the applicant, an interested party or any member of the public may lodge an appeal against the decision made by the relevant authority. The appeal must be done in writing within 30 days on which the Record of Decision was issued.

From the above process it can be concluded that the EIA was characterised by a strong emphasis on public participation during Scoping Report and Environmental Impact Report as well as opportunity to lodge an appeal against the decision made by the relevant authority. The next section looks at public participation in South Africa

2.10 Public participation in South Africa

During the apartheid regime, the black community suffered land expropriation through colonisation, the expansion of settlements and the establishment of game reserves, which resulted in negative perceptions about environmental issues (Khan, 1998). Environmental policies during this period were also established by white people; programmes were often designed to create inequalities and powerlessness among black communities (Hamann, Booth & O'Riordan, 2000).

According to Khan (2002), environmental awareness among black communities increased in the 1980s. There were a series of "greening projects" which took the form of environmental conservatism and indigenous community parks. These activities, along with the establishment of new conservation organisations (e.g. the Earthlife Africa), engendered a greater participation in environmental issues among the black communities.

After political emancipation in 1994, the Constitution of the Republic of South Africa was amended to cater for a series of human rights that were hitherto discounted by the previous regime. The new constitution was called the Constitution of Republic of South Africa (Act 108 of 1996). The Constitution gives all citizens equal rights,

including environmental rights. Section 24 of the Constitution provides that everyone has the right to:

> (a) an environment that is not harmful to their health or well-being; and
>
> (b) have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures.

The National Environmental Management Act (NEMA) was put in place to protect the environment and to strengthen public participation in decision making. Section 2 (4) (f) of the Act states as follows:

> The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation and participation by the vulnerable and disadvantage persons must be ensured.

In addition, the Department of Environmental Affairs and Tourism (1998:15) describes the responsibilities of interested and affected parties during EIA as follows:

- Provide input and comments during various stages of the EIA process. It is suggested that the input and comments of the interested parties be obtained during the following stages:
  - the scoping stage (identify the issues and alternatives to be considered);
  - assessing and mitigating impacts;
  - review of the environmental impact report; and
  - implementation and monitoring.
- Provide their inputs and comments within the specific time-frames as specified by applicant/consultant and relevant authority.

Furthermore, the Department of Environmental Affairs and Tourism (DEAT) published a series of overview information reports on the techniques, tools and processes for environmental assessment and management. These reports can be divided into five main stages of EIA, namely, screening, scoping, specialities studies, environmental reporting and decision-making processes. The document also has some other substages and processes within the main stage. According to the DEAT (2002), the significance of the reports is to enhance the participation of interested and affected people directly or by keeping them informed.

Despite this, McEwan (2003) observes that there is low participation of women in development projects in South Africa due to a lack of information.

Lindeque and Cloete (2005) carried out a study on the impact of socioeconomic status on public participation in South Africa. The study shows that higher socioeconomic areas tend to be more concerned with the impact of the project on their areas and their properties than lower socioeconomic areas which tend to be more concerned about the prospect of the project on their lives (e.g. employment opportunities).

Khan (1998) also argues that black communities' participation is hindered by the socioeconomic legacy of the past, the continued use of inappropriate participation techniques and widespread illiteracy.

2.11 How to improve public participation

The following paragraphs allude to the possible processes that may be undertaken to improve public participation in EIA:

1. Provision of incentives – in order to encourage participation, the public needs to be given some incentives; the absence of which may discourage participation, thereby militating against the credibility of the exercise. (Sewell & Coppock, 1977). Mantzara (1998) suggests that to make the process effective, refreshments (such as coffee-breaks, lunches, a glass of wine or juice and so on) and an enabling environment (such as short walk, fresh air, joke and planned amusement) should be incorporated in order to bring the people closer and to reduce tension.
2. Access to adequate information - an ignorant person cannot make a well-informed decision about a project (Lohani, Evans, Ludwig, Everitt, Carpenter & Tu, 1997); whereas a fully informed person will insist on better delivery from the decision-makers; this insistence will force the authority to settle for a more rational, equitable and environmentally sustainable decisions (Melnick *et al*, 2005). The information should be understandable to the participants. The information should be sufficient and accurate, with less technical jargons (Kenyon & Edward-Jones, 1998).

3. Early participation - public participation must take place early in decision making process, when pollution and violation of people's environmental right can be averted (Martens, 2006), as well as opportunity for consideration of alternatives (Palerm & Aceves, 2004).
4. Broad-based participation – public participation must be broad, by encompassing different stakeholders: including the disadvantaged and minority (Palerm & Aceves, 2004). There is a growing consensus that timely and broad-based participation are essential tools for effective environmental planning and resource management (Hughes, 1998).
5. Promote dialogue - public participation must be a two-way exchange of information, where dialogue is initiated in order to reach a consensus (if possible) between the project proponents and the participants (Palerm & Aceves, 2004).
6. Empowerment – public participation should be directed to equip the participants with the necessary skills, knowledge, and values needed for them to change their own situations (Davids *et al*, 2005).
7. Access to justice – there should be opportunity for the people to change the focus of the decision-makers, as well as the opportunity to seek legal redress (Palerm & Aceves, 2004).
8. Social learning – participation should be directed towards mutual learning, where the participants will be able to understand other people claims (Webler, Kastenholz & Renn, 1995; Lane & McDonald, 2005).

2.12 Sustainable development

The term "sustainable development" is a broad concept which can be interpreted in different ways. The following are some of the definitions offered in literature:

According to Afgan, Bogdan and Duić (2004:14), sustainable development is defined as "a process of change in which the exploitation of resource, the direction of investments, the orientation of technological development and the institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations."

Dalal-Clayton (2000) defines sustainable development as "economic and social development that meets the needs of the current generation without undermining the ability of future generations to meet their own needs."

It is widely accepted that sustainable development involves harmonising social, economic and environmental concerns in project planning, and the application of precautionary principle (Cashmore, 2007). He maintains that for the project to be sustainable, the community needs to be involved early on in terms of planning, designing, implementing and evaluating (monitoring). Iyer-Raniga and Treloar (2000) concur with this view and argue that public participation needs to be integrated into planning if a sustainable path to the future is to be achieved.

According to Láng (1993:15), sustainable development requires the “opportunity for wellbeing and satisfaction of human needs and it also includes such factors in its system like the right to education, and health or the protection of clean air and water, as well as natural beauty”. Also, Agyeman and Angus (2003: 349) are of the opinion that a sustainable community is one “where wider questions of social needs, welfare and economic opportunities are integrally related to environmental limits”.

In line with the above argument, Mantzara (1998) notes that broad-based participation of interested and affected parties is usually considered to be the guarantee for stability and sustainability, because it allows consensus to be reached. To this effect, Melnick *et al* (2005) suggest that if the authorities are more transparent and sensitive to needs of the public, participation can improve the quality of environmental decisions, therefore increasing long-term sustainability.

McEwan (2003) maintains that if members of the public are not involved in the decision-making processes relating to service delivery, it is likely that the programmes will fail to better the lives of those it aims to serve. This sentiment is shared by Doelle and Sinclair (2006), as they argue that it is the consensus of the interested and affected parties that provides the best indicator to measure the project sustainability rather than the use of predetermined rules or goals.

2.13 Effectiveness of the public participation process

There is no universally acceptable definition of the word "effectiveness" in the literature. The condition which causes a process to be effective in one society or situation may not be applicable in another. In Sadler's (1996:37) opinion, however, effectiveness is defined as "something which works as intended and meets the purpose for which it is designed." According to Jain, Urban, Stacey and Balbach (1993), effective public participation involves providing the community with adequate and timely information, providing equal access to decision-making processes (i.e. the public must be involved in problem identification and other discussions) and should provide members of the public with implementation powers (i.e. the final decision should reflect the objectives of the project proponent and those of the public).

Connelly (2006:12) asserts that effective public action needs to be strategic and should involve alliances with state actors. Daniels and Walker (1996) support this sentiment, as they argue that effective participation must be about more than just involving the public in good communication or discourse. Studies have shown, however, that for public participation to be effective, certain criteria must be met. These conditions include: early participation, representativeness/inclusion, access to information, improved decision-making processes, educative, negotiation and support to the participant (Petts, 2001; André, Enserink, Connor & Croal, 2006; Palerm & Aceves, 2004; Rowe *et al*, 2005; Chilvers, 2008).

2.13.1 Early participation

The public should be consulted during all stages of the process (Petts, 2001; André *et al*, 2004). This is based on the premise that early participation allows the public to add to, amend or reject the stated problem and geographical demarcation of the problem area (Enserink & Monnikhof, 2003). This enables the public to make changes to reflect their needs, thereby affording them the opportunity for co-production of the RoD and, a real influence on the project (Kontic, 2000). André *et al* (2006) support the notion that early participation will build trust, save time, improve the environmental assessment stages (screening, scoping and decision-making), reduce rumours and improve the image of the proponents.

However, Shepherd and Bowler (1997) point out that project proponents sometimes tend to carry out minimum consultation with the belief that increased public consultation might lead to delays or opposition to the project. They argue that when the public suspects or perceives that the project proponents are trampling on their rights, they quickly instigate legal actions against the project proponents --- a situation that is likely to strain the expected good relationship between these parties.

2.13.2 Representation and access

The interested and affected parties should be highly involved (Moote, McClaran & Chickering 1997; Petts, 2001; Buchy & Race, 2001; Agger & Löfgen, 2008). All participants, including the vulnerable and less privileged, should be given equal opportunities to participate (NEMA, 1998). Shepherd and Bowler (1997) observe that the public becomes sceptical about a project in the absence of a broad-based participation, and once they begin to lose trust in the project proponent, it becomes difficult, or totally impossible to regain it. Furthermore, the time and the venue of the meetings should be accessible and convenient to the participants. Webler and Tuler (2000) emphasise that interested and affected parties should not be systematically deprived from participating because of time or venue of the meetings.

2.13.3 Information

Information should be adequate and accessible to the general public (Innes, 2004; Palerm & Aceves, 2004). The information given to the participants should be less voluminous and largely avoid the use of technical terms; information should thus be simple to understand (Kenyon & Edward-Jones, 1999; André et al, 2004). Communication should also be interactive (two-way exchange of information) (Palerm & Aceves, 2004). A well-informed public will be able to contribute meaningfully and effectively during the public participation process (McEwan, 2003; Charnley & Engelbert, 2005). Moote *et al*, (1997) point out that inadequate information exchange has been the chief cause of polarisation and adversarial positions of the interested and affected parties that participates in the EIA of any project.

2.13.4 Improved decision making

Public input during the EIA process should be incorporated into the final decision (Buchy & Race, 2001). Petts (2001) suggests that the decision should be of benefit to the public and should encourage the public to participate in future. It is also suggested that public concerns should be heard, fostered, encouraged and incorporated into the project selection, designs and other decisions (Doelle & Sinclair, 2006).

2.13.5 Education

Opportunity to participate should allow the public to understand each other, their values, interests, rights, obligations and claims (Webler *et al*, 1995; Daniels & Walker, 1996) and educate the public about the project and its likely impacts on their lives (Kenyon & Jones, 1998). All participants are also expected to acquire and share information, thereby promoting collective learning (Moote *et al*, 1997); owing to the fact that education is an important component of public participation (Sinclair & Diduck, 1995). A well-informed participant will insist on better performance, which will culminate in a more rational, equitable and environmentally sustainable practice (Melnick, *et al,* 2005) for the benefit of all the stakeholders.

2.13.6 Negotiation

Participation process should reduce conflict among participants, and thereby promote collaboration, convergence of all affected parties and consensus among participants (*André et al,* 2006; Innes, 2004; Chilvers, 2008). In addition, the participants should be given the opportunity to express their concerns, defend their assertions and challenge other people's assertion as well (Moote *et al*, 1997; Webler & Tuler, 2000; Petts, 2001). This will afford the participants the opportunity to review and, if necessary, refine their own values and interest (Moote *et al*, 1997). Project proponents should listen to the public, be open-minded to accommodate conflicting opinions, and be sensitive to feedback from the public whose perspectives, value system and experience differ from theirs (Kontic, 2000).

2.14 Chapter summary

This chapter looked at the meaning of participation, at the rationale for participation, at the types and techniques of participation, the importance of participation, the factors that can hinder public participation, the meaning of environmental impact assessment (EIA), the reasons for EIA, an overview of EIA in South Africa, public participation in South Africa, public participation in the Gautrain project, and the general conceptual framework of public participation. The next chapter (chapter three) will look at the Gautrain project.

CHAPTER 3

THE GAUTRAIN PROJECT

3.1 Introduction

Gauteng is the economic hub of South Africa, generating more than 36% of the country's Gross Domestic Product (GDP), while covering less than 2% of the country's total surface area. Gauteng is the seat of power and houses over 20% of the national population (Gauteng Companies, 2007). Gauteng therefore plays a vital role in the national economy. Due to its economic activities and inadequate land use and planning during the apartheid regime, however, the province is faced with urban sprawl and congestion along its major conurbation centres.

The Gautrain rail link is one of ten Spatial Development Initiative (SDI) projects geared towards stimulating economic growth, development and employment opportunities in Gauteng. Other objectives of this project include the:

- strengthening of existing development nodes in Gauteng
- promotion of urban restructuring and redevelopment
- facilitation of the revitalisation of the Johannesburg and Tshwane central business districts
- improvement of accessibility and mobility in the Johannesburg and Pretoria corridor (Gautrain objectives, 2007).

3.2 Positive project impact

The objective of the Gautrain project is to alleviate traffic congestion on existing roads between Johannesburg and Pretoria. It is the Provincial Government's policy to promote public transport as an alternative to the private car, by ensuring the provision of adequate public transport infrastructure, facilities and services. In addition, the following benefits are also projected to be derived from the Gautrain project:

3.2.1 Economic growth

It is estimated that the GDP of Gauteng will increase by about R5bn during the construction period. It is also projected that the project will benefit (both directly and indirectly) many local industries, especially Broad Based Black Economic Empowered (BBBEE) Companies (Citizen, 2006). Furthermore, the Gautrain project is expected to have a huge spin-off for businesses and property values in and around the train station (Wilson, 2007; Muller, 2007). In summary, the proposed high-speed rail link is expected to enhance the economic competitiveness of the Pretoria-Johannesburg corridor (Project impact, 2002).

3.2.2 Job creation

As mentioned earlier, the Gautrain project is projected to create about 43 000 job opportunities during the construction period. The operation and maintenance of the facility itself will create approximately 1 220 jobs per annum; it is estimated that about 40 000 job opportunities per annum will be created through the secondary benefits of the Gautrain project in terms of economy growth (Project impact, 2002).

3.2.3 Air quality

The Gautrain project is aimed at discouraging the use of private cars by promoting public transportation. It is estimated that the project will be able to attract a large number of private car users. This, in turn, will reduce the carbon dioxide (CO_2) emission by private cars along the Pretoria-Johannesburg road and Johannesburg corridor by about 70 000 ton per annum (Citizen, 2006).

3.2.4 Road users cost

The journey between Pretoria and Johannesburg usually takes about two hours during peak periods. It is estimated that about 933 million work hours are lost annually through work time spent along the Pretoria and Johannesburg highway (Citizen, 2006). The Gautrain rapid rail link is expected to cover this trip within 45 minutes; this will save time, fuel and vehicle wear-and-tear, will reduce road rehabilitation and maintenance costs (Project impact, 2002).

Furthermore, the development of the Gautrain will lead to a decrease in the number of road accidents (the annual accident compensation costs the government about R15m) (Citizen, 2006), reduce medical costs and fatigue often associated with long periods of time behind the wheel (Project impact, 2002).

3.2.5 Traffic volumes

The Ben Schoeman highway currently carries the highest traffic volumes in South Africa, with more than 150 000 vehicles using the road per day. There is also a projected yearly increase of about 21 000 cars (Van der Westhuizen, 2007). The Gautrain rapid rail link aims to provide an alternative public transport mode, which will attract private car users and help alleviate congestion on the roads between Pretoria and Johannesburg (Project impact, 2002).

3.2.6 Urban sprawl

Urban sprawl will not be curtailed unless an efficient mass transport system is introduced into the Pretoria-Johannesburg corridor. Without an attractive public transport alternative, road traffic growth and the need to build additional road infrastructure will continue to dominate urban planning. The Gautrain hopes to solve these problems.

3.3 Overview of the EIA process of the Gautrain project

The Gautrain project emanated from the speech of the Gauteng Premier, Sam Shilowa in February 2000, where he highlighted the proposed benefits and likely challenges of the project. Being a mega project, one statutory requirement was the adoption of an EIA process. A Bohlweki Environmental consultant was appointed by Gautrans to undertake the environmental impact assessment studies.

Before the appointment of the Bohlweki Environmental consultant, however, Gautrans had already carried out a number of investigations and pre-feasibility studies to determine the feasibility of the rail link, using both local and international consultants (Khuthele Projects, ARCUS GIBB and Lebone Engineering). After submitting their report, a project team was appointed early in 2000 to further ascertain the feasibility of the rail link. This culminated in a feasibility report which

was published in July 2001 and submitted to the Public Private Partnership (PPP)-Unit of National Treasury.

The environmental impact assessment commenced in 2002. The process purportedly gave the Interested and Affected Parties (I&APs) the opportunity to raise their concerns about the project route alignment and the impact of the project on their lives. Environmental concerns were also raised and alternative suggestions were made. To reach out to the public, notices were placed in national and local newspapers, and included as part of television and community radio programmes. A website (www.gautraineia.co.za) was also developed to provide information on the EIA process. The website also allowed interested and affected to register their interest in the project and the EIA, to ask questions and to provide comments on the project.

In order to address the public concerns and fears, to provide additional information and to accommodate possible alternatives, five open days were held from 28 January to 2 February 2002 (Coetzee, 2003) at different places and at different times (in Johannesburg, Sandton, Midrand, Centurion and Pretoria). In addition, a Background Information Document (BID) was made available at the open days to interested and affected parties (see figure 3.1 below):

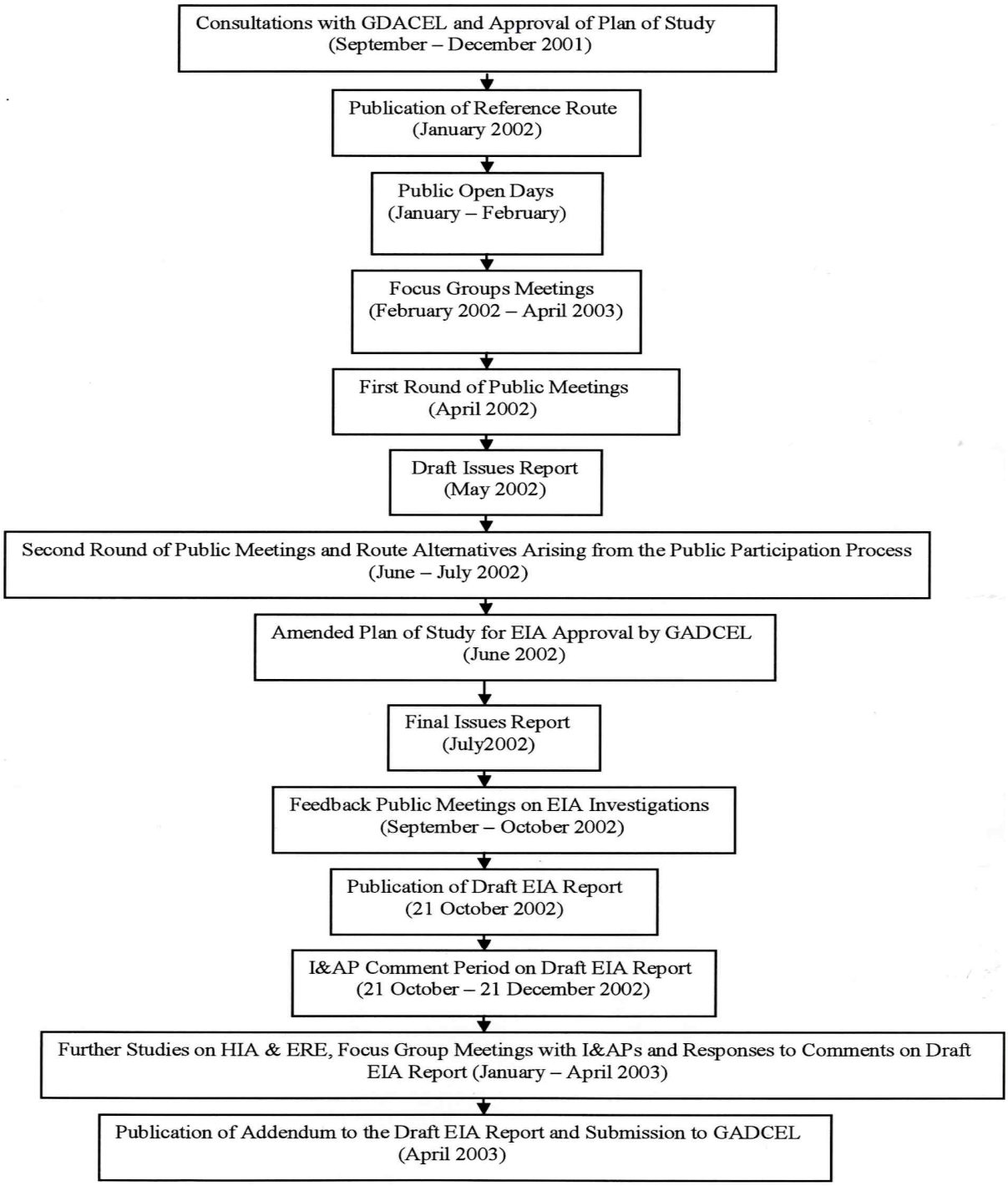


Figure 3.1: The Gautrain EIA process

Source: Bohlweki (2002)

The project proponents were able to compile background information (i.e. public concerns) on the project during the open days and through the established website.

A series of initial public meetings were held between 10 and 23 April 2002 at key centres along the proposed Gautrain route. At these meetings, all interested and affected parties (I&APs) were able to raise their concerns and fears, and made suggestions pertaining to possible route alignment alternatives. Minutes of the meetings were compiled and distributed to I&APs. The meetings allowed Bohlweki to provide additional information to the public regarding the project and to provide feedback on issues raised.

Formal meetings (focus group meetings) with key stakeholders, formal associations and affected interest groups were conducted shortly after the open days. These focus group meetings continued throughout the duration of the EIA until the submission of this addendum to the Gauteng Department of Agriculture, Conservation, Environment and Land Affairs (GDACEL). Based on the series of meetings held, a draft report was compiled by the project proponent, which was made available for public review and comments in July 2002.

This led to another series of public meetings (i.e. second round of public meetings), which were intended to inform stakeholders of possible alternative route alignments. Feedback meetings were also held to provide information on the findings of the EIA and possible options. The following table summarises the total number of focus groups and public meetings held during the course of the EIA:

Table 3.1: Total number of group meetings held with interested and affected parties during the EIA process

Section of route	No of focus group meetings	No of public meetings	Total
Johannesburg-Sandton	14	3	17
Sandton-Marlboro	17	3	20
Marlboro-Midrand	2*	-	2
Midrand-Centurion	9	2	11
Centurion-Pretoria	8	4	12
Pretoria-Hatfield	46	3	49
Marlboro-JIA	11*	2	13
Total	107	17	124

* One joint meeting involving stakeholders in the Marlboro, Midrand and JIA sections of the route was held.

Source: Freeman (2004)

In 2003, the Gauteng Department of Agriculture, Conservation, Environment and Land Affairs (GDACEL) approved the EIA and a Record of Decision (RoD). This led to a series of criticisms from the general public, which necessitated the withdrawal of the RoD. An amended RoD was reissued on 26 April 2004 (Amended Record of Decision, 2004). This decision did not rest well with the various stakeholders. In 2004, for example, the Muckleneuk/Lukasrand Property Owners and Residents' Association (MLPORA) instituted legal proceedings (Case No 28192/04) against the project proponents and another urgent application was launched by MLPORA in August 2006 before the High Court of South Africa. The court ruled in favour of the project proponents.

In Centurion, an association called WeCARE also protested against the decision of the project proponents based on aesthetic grounds (Benjamin & Lourens, 2006). WeCARE won the case in March 2006. Also in 2006, AECI threatened to file a legal suit against the project proponents, claiming that the route would cut through its property. The issue was settled out of court by the parties.

3.4 Issues raised during the EIA

3.4.1. Project impact

The interested and affected parties were able to raise their fears, views and concerns, such as the impact of the project on the biophysical environment (including land use, topography, geology, soils, fauna and flora, ground and surface water and air quality) and the social and socioeconomic environments (including noise and vibration, traffic impacts, visual impacts, property impacts, safety and security, sites of cultural or historic interest etc). Each issue was then rated as low, medium or high, and described as positive, negative or neutral through specialists employed by Bohlweki.

3.4.2 Proposed route

The proposed Gautrain route consists of two spines: the north-south spine and the east-west spine. In the north-south spine (the link between Pretoria and Johannesburg), the train line travels 6km north through a tunnel to Rosebank station. The line then proceeds underground for 5km to Sandton. Thereafter, the line surfaces and travels about 4km through the M1 highway to Marlboro station. The line passes the N3 highway and runs along the Jukskei River for 13km to Midrand. It then runs to the Centurion CBD, north of Centurion Lake and travels about 11km to Pretoria. This section will partly run on the surface and on bridges. The line runs east for 6km, within the existing rail reserve, to Hatfield from where it links the Tshwane Ring Rail System.

The east-west spine (the link between Sandton and OR Tambo International Airport) starts at Sandton station, passes through Marlboro, turns east and continues for 15km to the East Rand at Rhodesfield in Kempton Park. It then runs to OR Tambo International Airport through the R24 highway to a station situated underneath the airport (Clark, 2002) (See appendix 1 for the proposed route).

During the EIA, the public were able to suggest alternative routes which were examined and investigated by Bohlweki (see appendix 3 for the investigated route).

After completing the environmental impact assessment, the following route was recommended:

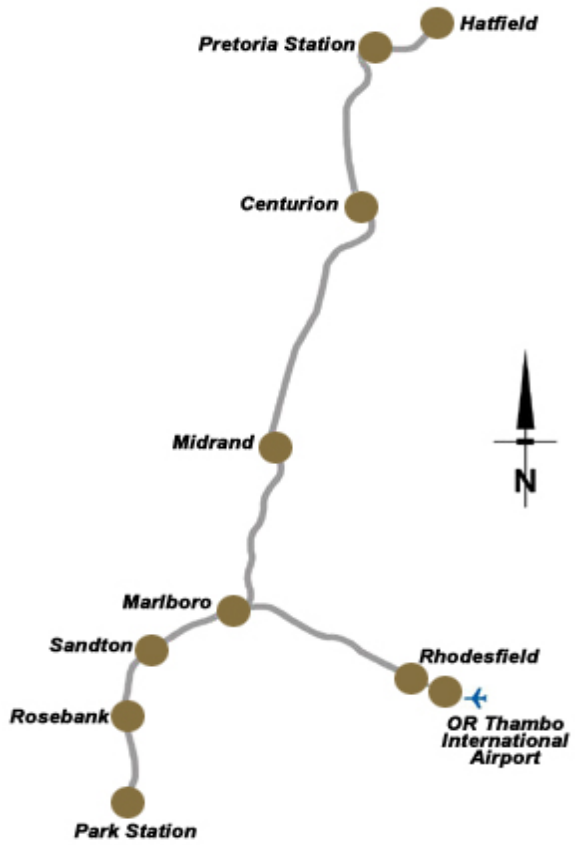


Figure 3.2 Recommended Routes

Source: (Gautrain recommended route, 2004)

The south-north corridor (the south-north route) begins at the Park station precinct in central Johannesburg and proceeds north underground for 6km beneath Parktown Ridge and Oxford Road to Rosebank station. From Rosebank station, the line continues underground for a further 5km beneath Dunkeld, Hyde Park, Inanda Ext 1 and Rivonia Road to Sandton station within the Sandton business district. After Sandton station, the route remains underground and passes beneath Sandown, Strathavon, the M1 and Marlboro Drive before coming above ground at Marlboro, approximately 4km from Sandton.

From Marlboro station, adjacent to the Marlboro Drive/N3 interchange, the route heads further north, running to the east of Buccleuch until it reaches Midrand station next to Grand Central Airport. After Midrand station, the route largely tracks the Old

Pretoria-Johannesburg Road (past Glen Austin and Randjesfontein) and the N1 before it stops at the Centurion station in Centurion's central business district, just north of Centurion Lake. Thereafter, the route runs to the west of the Ben Schoeman highway from the Jean Avenue interchange, down the Snake Valley and East of Salvokop into Pretoria.

Pretoria station is the next stop, 11 kilometres from Centurion, and it will be situated adjacent to the existing Pretoria Railway station. Here, the Gautrain will be able to link to other rail services. The line will then run east for 6km, largely using the existing South Africa Rail Commuter Corporation rail corridor to Hatfield station.

The west-east Corridor (the west-east route) will take passengers from Sandton station, via Marlboro, to Rhodesfield station in Kempton Park. From there, it will connect to a station built within the airport terminal complex at OR Tambo International Airport. The route from Sandton to Marlboro is the same as for the south-north route. After Marlboro station, the west-east route crosses the northern boundary of the Linbro Park landfill, past the Linbro Park Agricultural Holdings and crosses the Modderfontein property before connecting to the existing rail corridor, serving the Kelvin power station and the Spartan/Isando industrial area, into Rhodesfield.

3.5 Train and rail infrastructure

The Gautrain will be powered by electricity, because electrical power is an environmentally clean form of traction, and electric trains are quieter than diesel trains. Power for the train will be supplied by Eskom, with a municipal electrical supply to the train stations. Electric Multiple Units (EMUs) will be used for the train, with power distributed throughout the train via motorised axles. Cooling fans will be used to cool the motors and for the air-conditioning system.

A driver's cab will be located at either end of the train set. The trains will be coupled in multiple configurations of 3 or 4-car units, with seating space for 80 passengers per car, standing space for 20 passengers per car on the commuter services, and seating space for 50 passengers per car on the airline passenger service.

To serve the expected number of passengers using the system in its early years, between 20 and 25 train sets will be required, with additional rolling stock being procured during the life of the project to serve growing passenger numbers. The rolling stock will be fitted with axle-mounted disc brakes and not the typical cast iron brake shoes used on Metrorail car units. Trains in South Africa are operated on rail tracks using the Cape Gauge (1065 mm width).

Most rapid rail systems in the world use the international Standard Gauge (1435 mm width), which is preferable because it can accommodate regular and safe train services for speeds up to 160 km/h and higher (130 km/h is considered to be the maximum practical and safe speed attainable on the Cape Gauge). As a stand-alone rapid rail system, the Gautrain will be constructed on the Standard Gauge. Train station platforms will be located on straight-line sections, between 250m and 300m in length, to accommodate longer train sets when the system is operating at capacity.

3.6 Park and ride services

In order to integrate Gautrain with other transport systems, bus feeder and park and ride services will be provided. In all, there will be 36 feeder and distribution services that are expected to serve 9 stations (excluding OR Tambo International Airport). In addition, a fleet of close to 150 air-conditioned buses will operate from 06:00 to 21:00. They are expected to depart at intervals of 12 minutes during peak periods. In addition, an integrating ticket system will be employed; commuters will only need one ticket for the train, bus and park and ride facilities.

3.7 Public-private partnerships

The Gautrain is considered a turnkey project whereby the private sector partner is expected to partially fund, design, build and operate the rail system under a concession contract with the Gauteng Provincial Government for a period of 15 years – Public Private Partnerships (PPPs). The Gauteng Provincial Government will contribute to the capital infrastructure costs. The private sector known as Bombela consortium[1] consists of the following members: Bombardier; French civil contractor

[1] Loliwe Rail Express is a partnership of some South African companies, and it controls 50 percent equity stake in Bombela

Bouygues Travaux Publics; RATP Développement, a major French rail and bus operating company; South African civil contractor (Murray & Roberts); and Loliwe Rail Express, the consortium's black economic empowerment component (Star, 2006).

3.8 The construction work

Construction work began on 28 September, 2006 (Mudzuli, 2006). The construction work of the train is tailored along its unique dynamics. With the expectation that the train will serve stations in Hatfield, Pretoria, Centurion, Midrand, Marlboro, Sandton, Rosebank and Park station in Johannesburg's Central Business District (CBD), its underground facilities in Sandton, Rosebank and Park station are constructed on the geological and land condition analysis of these routes. The underground stations will be constructed at a depth of between 15m and 45m (Mudzuli, 2006).

A modular approach is applied to the construction process. The construction work is expected to be completed in two phases (modules). The first phase, the network between Sandton, Midrand and OR Tambo international airport, will be built within 45 months. This phase will be completed in time for the 2010 World Cup. The second phase, the network from Sandton to Johannesburg and the network from Midrand to Hatfield, is expected to be completed by March 2011 (Williams, 2007).

Three tunnels will be constructed from Marlboro to Park station with underground stations at Sandton, Rosebank and at Park station itself. Tunnelled sections will be constructed either by means of tunnel boring machines (TBMs) or by a drill and blast method, depending on the underlying geology and ground conditions. Seven emergency shafts will be built along the 15km tunnel between Sandton, Rosebank and Park station (Sapa, 2007).

The tunnel will be constructed in accordance with international safety standards (e.g. fire doors and access corridors between tunnels every 0, 25 and 0,5km, with provision for water mains and smoke control systems). Ventilation shafts reaching to the surface, up to a maximum diameter of 18m, will be spaced at approximately 1km intervals on the tunnelled sections to allow for air circulation through the tunnels and for emergency evacuations via stairwells to the surface. Where the train tracks are

on the surface, the lines will pass beneath roads or above them on bridge structures, depending on the local topography. Deep valleys will be crossed on structures.

A Tunnel Boring Machine (TBM) will be used from shaft E2 to Rosebank station. The TBM will be used to construct the tunnel within areas of soft rock and water logged soil where conventional tunnel methods are not possible. As excavation proceeds, a precast concrete lining will be erected within the shield of the TBM to provide support for the excavation (Construction technology and machines, 2008).

3.9 The train depot

The train depot is located near Allandale road between Buccleuch and the N1. This depot is made up of a 5km test track, which will allow the train to reach its full speed and the functioning of the electronic signals before leaving the depot. The maintenance depot is about 350km by 750km in dimension. The depot will accommodate and service a fleet of 150 buses that will operate in a 15km radius in order to serve the 9 stations (Sapa, 2007).

The depot will typically comprise a shed containing approximately three tracks for the maintenance and cleaning of train sets, tracks for open parking of train sets, an administration block, training facilities, a staff canteen and facilities for the storage of safety equipment.

3.10 The community liaison forum

The community liaison forum is expected to generate a double-loop communication process between the project proponents and the general public. An active public participation process gives affected communities the opportunity to become involved in the development of the project, from the planning stage through to the implementation and mitigation stages.

As the Gautrain Project is expected to impact some communities, key requirements of the Environmental Management Plan and for the approval of the project's RoD are contingent on continuous interaction between the project proponents and the affected communities. Open days and regular community liaison forums have

therefore been developed. Community liaison forums also enable interested and affected parties to be updated with regard to the following:

- Timeous information related to project activities
- The opportunity to comment on proposed management and mitigation measures
- Regular feedback on project progress and environmental performance

During open days, visual aesthetic designs of the project are presented by Bombela to the interested and affected parties. While community liaison forums enable the public to be updated with the construction work, the process also interrogates the effect of the project on the affected communities, and the possibility of considering mitigation measures. Currently, community liaison forums take place in the following areas: Park station, Rosebank, Sandton, Marlboro, Midrand, Rhodesfield, Centurion, Pretoria (Salvokop) and Pretoria-Hatfield.

3.11 Chapter summary

This chapter dealt with the justifications for embarking on the Gautrain project, the projected benefits of the project, an overview of the Gautrain EIA process, issues raised during the public participation process of the EIA, the proposed route for the Gautrain and rail infrastructure. The chapter also examined the construction of the Gautrain and the benefits of a community liaison forum. The next chapter (chapter four) will deal with the research methodology.

CHAPTER 4
RESEARCH METHODOLOGY

4.1 Introduction

This chapter describes the research design, population sample, sampling technique, research instrument, validity and reliability of the research instrument, pilot study, data collection process, ethical considerations and constraints. It concludes with a chapter summary.

4.2 Research design

Parahoo (2006:183) defines research design as “a plan that describes how, when and where data are to be collected”. Quantitative and descriptive data collection techniques were used for this study. An exploratory design was also used to explore and answer the research questions.

- *Quantitative research design.* This method is used to generate data for the study. Bless and Higson-Smith (2001:26) describe quantitative research as “a formal, objective systematic process in which numerical data is used to obtain information about the world”. This research method was used in order to describe variables, examine relationships between variables, and determine the cause-and-effect interaction between variables.
- *Correlational research design*. Burns and Grove (2001:30) describe correlation as “the systematic investigation of relationships between or among two or more variables that have been identified in theories or observed in practice or both. Its primary intent is to explain the nature of relationships and not to determine cause and effect”.
- Walliman and Baiche (2001:92) identify the following three advantages of correlation:
    1 It allows for the measurement of a number of characteristics (i.e. variables) and their relationships simultaneously.
    2 It produces a measure of the amount of relationship between variables being studies.

3 It gives an estimation of the probable accuracy of the predictions made.

This research method was used in order to compare the response pattern of the general public to that of the project proponents/environmental consultants.

- *Exploratory research design*. Bless and Higson-Smith (2000:154) describe exploratory design as "a method which explores certain phenomenon with the primary aim of formulating more specific research questions or hypotheses relating to that phenomenon". Wisker (2008:72) believes that exploratory design is commonly used when "new knowledge is sought, or when certain behaviour and the causes for the presentation of symptoms, actions or events need to be discovered".

4.3 Population

Brynard and Hanekom (2006:57) describe a population as "a group in the universe which possesses specific characteristic. The universe refers to all subjects who possess the attributes in which the research is interested". The population for this study includes all the people who participated in the Gautrain EIA process (i.e. the interested and affected people, as well as the project and/or the environmentalist consultants). According to Bless and Higson-Smith (2000:84), a population is seen as "the entire set of objects or people that form the focus of the research on which the researcher intends to determine some characteristics".

4.3.1 Sample and sampling technique

Bless and Higson-Smith (2000:84) define sampling as "the subset of the whole population which is actually investigated by a researcher and whose characteristics will be generalised to the entire population". For the purpose of this study, purposeful sampling technique was used to select the interested and affected parties and the project proponents/environmental consultants.

A decision was made to use purposive sampling because of time and financial constraints, and because of the large number of participants in the public participation process of the Gautrain project. Since the research primarily focuses on

the Pretoria area, only those people who participated in the Gautrain meetings, in the target area and within the window period, were sampled.

A total of 52 respondents were drawn from the total sample population (21 from Centurion and 32 from the Pretoria-Hatfield area). The decision to sample these participants was based on the level of participation generated by the project in these areas. The literature reveals that more public consultations were held in the Pretoria/Hatfield area than anywhere else (see table 3.1). This justifies the researcher's interest in this research area. The number of protests and legal cases brought against the project and its proponents in the Centurion area also stimulated the researcher's interest in the area. This research therefore focuses on the Pretoria/Hatfield and Centurion corridor of the Gautrain project.

The literature also supports the use of purposive sampling, on the basis that this method is based on the judgement of the researcher (Bless & Higson-Smith, 2000; McBurney & White, 2007). It allows the researcher to select participants who are particularly knowledgeable, influential and understand the phenomenon being studied (Robson, 2007).

4.4 Research instrument

Two structured questionnaires were used to collect primary data for this study. All the questionnaires were self-administered. The design of each questionnaire was based on outcome of the literature review and the objective of the study. One questionnaire was constructed for the general public and the other for the project proponents/environmental consultants. Each questionnaire was divided into four parts (A, B, C and D) to cover the set objectives of the study (see appendix 4).

The first part of the questionnaire (Part A) dealt with the demographic and socioeconomic status of the participants. The questions looked at the gender, age, contact information, level of qualifications, area of residence, duration of residence and period of involvement in the Gautrain public participation process. The purpose

of eliciting the above information was to examine the descriptive profile of the participants and to address the first research objective.

The second part (Part B) of the questionnaire contained sections B1, B2, B3 and B4. Questions in sections B1 to B3 were specifically designed to examine the effectiveness of the public participation process of the Gautrain project, that is, to achieve the second objective of this research and to test the first research hypothesis.

The questions in Part C were used to evaluate the transformative learning process of the Gautrain project (research objective four, and the second research hypothesis). Sections B3 and B4 were designed to interrogate the third hypothesis, while sections B3 and C1 were designed to achieve the third research objective.

The last part, question D, contained open-ended questions that looked at the participants' opinions on how the current public participation process can be improved. McBurney and White (2007) have identified the following two advantages of open-ended questions:

1 Open-ended questions permit the respondents to answer more completely and to reveal the reasoning behind their answers.
2 Researchers are more likely through open-ended questions to discover something that was not anticipated by its design.

4.5 Validity and reliability of the research instrument

4.5.1 Validity

Jackson (2006) defines validity as a whether the instrument actually measures what its intended to measure, that is, whether the instrument measures what it claims to evaluate. Wisker (2008:323) argues that "validity is entirely central to the whole issue of the cohesion in research study between conceptual framework methods, questions and findings". The author further observes that if the methods, approaches and techniques really fit with and measure the issues that are intended to be probed, the findings are expected to be valid.

Different types of validity were taken into consideration. These include content validity, face validity, criterion validity and construct validity.

4.5.1.1 Content validity

According to Jackson (2006:62), content validity refers to “the extent to which a measuring instrument covers a representative sample of the domain of behaviours to be measured. In other words, it measures the extent to which the instrument satisfactorily measures the content being examined”.

4.5.1.2 Face validity

Bless and Higson-Smith (2000) argue that face validity is concerned with the way the instrument appears to the participant. They argue that the face validity of an instrument might be influenced by the level of complexity of the research instrument. They suggest that the instrument should be tailored to the need of the subject for which it is intended.

4.5.1.3 Criterion validity

Jackson (2006:63) states that criterion validity is “the extent to which a measuring instrument accurately predicts behaviour or ability in a given area”.

4.5.1.4 Construct validity

Bless and Higson-Smith (2000) describe construct validity as a process whereby the measurement technique is closely linked to known theory in the area and with the other related concepts. According to Delport (2005), construct validity is concerned with the meaning of the instrument, that is, what it is measuring and how and why it operates the way it does. It involves not only validation of the instrument itself, but also of the theory underlying it. In summary, when we ask how valid an instrument is, we are really posing three questions:

1 How well does this instrument measure what we want it to measure (content validity)?

2 How well does this instrument compare with one or more external criteria purporting to measure the same thing (criterion validity)?
3 What does this instrument mean? What is it measuring and how and why does it operate the way it does (construct validity)?

4.5.2 Reliability

Reliability refers to the degree to which the measuring instrument produces the same results for repeated trial (Bless & Higson-Smith, 2000). Delport (2005) argues that reliability means the ability of the measuring instrument to yield consistent numerical result each time it is applied; in other words, it does not fluctuate unless there are variations in the variable being measured. He acknowledges that perfect reliability is rare and suggests, therefore, that the following steps be used to improve the reliability of a measurement instrument:

- *Clearly conceptualise all construct.* This means developing an unambiguous, clearly theoretical definition for each construct and then making sure that each measure indicates only one specific concept.
- *Increase the level of measurement.* Indicators at higher or more precise levels of measurement are more likely to be reliable than less precise measures, because the latter picks up less detailed information.
- *Use multiple indicators of a variable.* Use two or more indicators (eg two or more questions in a questionnaire) to measure each aspect of a variable.
- *Use pre-test, pilot studies and reapplications.* Develop a draft or drafts or preliminary versions of a measure and test these before applying the final version in the hypothesis-testing situation.

Several measures were undertaken by the researcher to measure the validity and the reliability of the instrument used in this research. To test the validity of the instrument, the different parts of the questionnaire were well structured to obtain the required information (data) with regard to the research title, objectives and research hypotheses. The researcher conducted an extensive literature review before designing the instrument. The instrument was also designed to compare the

response patterns of both the general public and those of the proponents/environmental consultants.

In terms of the reliability of the instrument, the researcher used multiple variables to elicit information on the research objective and hypothesis to be tested. In addition, a five-point Likert scale was used to enlarge the number of options available to the respondents. Some participants took their questionnaire with them to complete it in their own time; others, however, asked that they be allowed to email or fax their completed questionnaire back to the researcher for the sake of convenience and/or privacy. The questionnaire was distributed during community liaison forum meetings and open days.

4.5.3 Pilot study

Bless and Higson-Smith (2000:155) describe a pilot study as “a small study conducted prior to a larger piece of research to determine whether the methodology, sampling, instruments, and analysis are adequate and appropriate”. Walliman and Baiche (2001) suggest that the instrument should be tested on people with similar characteristics to those of the intended sample so as to identify problems of comprehension or other sources of confusion.

Hall and Hall (2004) highlight two advantages of a pilot study. Firstly, it helps to establish whether or not respondents understand the research questions and if the response categories provided cover the full range of responses. Secondly, it helps to determine if the questionnaire is too long or complex to sustain the respondents’ interest.

To assess the reliability of the instrument, the initial draft of the questionnaire was pre-tested with eight voluntary participants (educated and semi-educated volunteers, as well as volunteers with no formal education). The reason for this selection was that the targeted population in this research was expected to comprise people of diverse educational status. The participants' suggestions were incorporated into the final questionnaire.

4.6 Data collection procedure

The questionnaire was administered by the researcher. This method was employed in order to restrict the sample size to only active participants in the Gautrain public participation process. The window period for the data collection was fixed at 18 weeks (from May to September) to allow the researcher to gather substantive responses.

4.7 Ethical considerations

Each instrument started with an introductory section containing information about the name of the researcher, institution of study and reason's for the research. The instrument does require respondents to include their names. Although the participants were requested to include their contact addresses, this was only used for reference purposes. The participants were also informed that their participation was voluntary and that their responses would be treated with the utmost confidentiality.

4.8 Constraints

A few constraints were encountered during the empirical survey. The primary constraints were time and finances. A secondary constraint was that some people were reluctant to participate due to inertia. A third constraint was that some people mistook the public participation process for a community liaison and consequently refused to participate in the research.

4.9 Chapter summary

This chapter looked at the research method and design. It also looked at research validity and the reliability of the research instrument. The ethical considerations and constraints faced during the investigation were also discussed. The next chapter will deal with the data analysis.

CHAPTER 5

DATA ANALYSIS AND INTERPRETATION

5. 1 Introduction

Chapter 4 dealt with the research design and methodology. This chapter will present the findings of the field survey in which both the proponent and the public participants were interrogated on the EIA process of the Gautrain project. The findings of each group will be presented separately according to the stated objectives. In addition, the similarities/differences in the information supplied by these groups as they relate to the hypotheses of this research will be examined.

5.2 Data and method of analysis applied

As stated in chapter 4, each questionnaire was divided into four parts: Part A, Part B, Part C and Part D. Part A dealt with the demography and socioeconomic status of the respondents, while Parts B, C and D investigated the process of participating in the Gautrain EIA. Five-point Likert scales were used to guide the respondents (see section 4.5.2). Statistical frequency tables, charts and graphs will be used to analyse the data. In addition, the Wilcoxon Mann-Whitney U test technique will be used to examine the similarities/differences in the information supplied by both the proponent and the public.

5.3 Presentation of findings

The information supplied by the public respondents will be analysed first. This will be followed by an analysis of the responses generated from the project proponents. Each will be presented according to the stated objectives: (1) to measure the efficiency with which the provided information was utilised by the interested and affected parties, considering their socioeconomic status and awareness levels; (2) to examine the adequacy of information given to interested and affected parties; (3) to evaluate the effectiveness of the public participation process; and (4) to examine the trend of public participation in the Gautrain project from 2002 to 2008.

Subsequently, the responses of the two groups will be compressed so as to test the research hypotheses: (1) adequate information was provided to interested and affected parties during the Gautrain EIA; (2) the response pattern of the public (interested and affected parties) does have an impact on the decision-making process; (3) the process of public participation in the Gautrain project has improved in recent times; and (4) the process of participation in the Gautrain EIA enhances participant learning. Here the similarities/differences in the information supplied by these groups as they relate to the hypotheses stated above will be examined.

5.4 An analysis of the public respondents' questionnaire

As stated in chapter 4, 34 public responses were generated (one of the questionnaires was regarded as invalid because of the incompleteness of the information supplied by the respondent). The analysis of the remaining 33 responses will be presented according to the stated objectives below:

5.4.1 The efficiency with which the provided information was utilised by the interested and affected parties, considering their socioeconomic status and awareness levels.

Part A of the questionnaire examines the demographic data and socioeconomic status of the respondents, while questions B1 (a), B1 (b) and B2 deal with the public's awareness of the project (see appendix 4).

(A) Demographic data of the public respondents

Table 5.1: Demographic data

		Frequency	Percentage
Gender	Male	24	72,7
	Female	9	27,3
	Total	33	100
Age	16-25 years	-	-
	26-35 years	2	6,1
	36-45 years	5	15,2
	46-55 years	10	30,3
	56-65 years	9	27,3
	Above 65 years	7	21,2
	Total	33	100

Table 5.1 shows that 72, 7% of the respondents (24) are male while 27, 3 % are female. In relation to the age of the respondents, 78, 8% of the respondents are above the age of 35; no respondents fall within the 16 to 25 age category. This means that all the respondents are adults. People below the age of 25 years, therefore, did not attend the EIA meetings during the investigation period.

(B) Educational status of the respondents

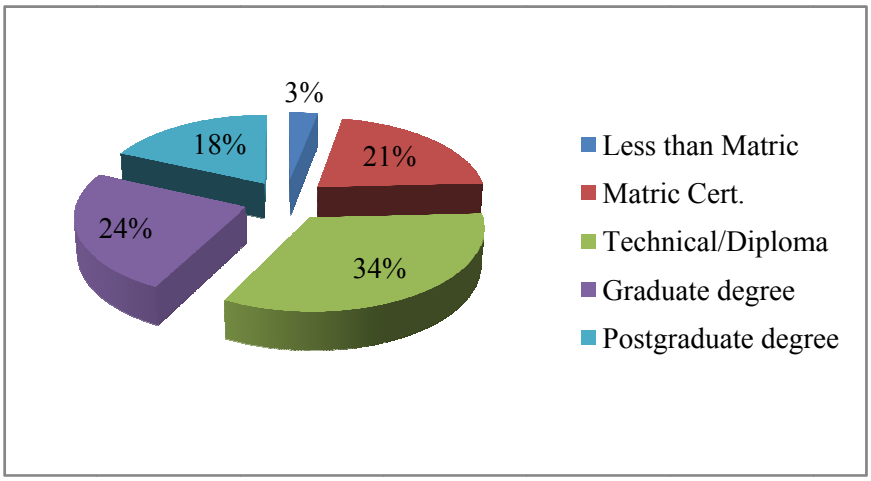


Figure 5.1: Qualifications of public respondents

In terms of the educational qualifications of the respondents, only 3% of the respondents have less than a matric certificate. Most of the respondents have a technical diploma or degree. Figure 5.1 further illustrates that more than 95 % of the respondents have some level of formal education and 76% of the respondents having higher certificates (above matric). This means that the respondents should be able to interpret the information provided to them.

(C) Area of residence and awareness of the Gautrain project

Table 5.2: Area of residence, duration of residence and period of involvement in Gautrain EIA

Questions 5a, 5b, 5c and 6		Frequency	Percentage
Area of residence	Pretoria	8	24, 2
	Muckleneuk/Lukasrand	2	6,1
	Hatfield	12	36, 4
	Centurion	9	27, 3
	Others (Please specify)	2	6, 1
	Total	33	100
Duration of residency	0-2 years	-	-
	3-5 years	4	12,1
	6-8 years	5	15,2
	9-11 years	3	9,1
	Above 11 years	21	63,6
	Total	33	100
Why are you involved in the project if not residing in (5a) above?		2	6,1
Period of participation in Gautrain EIA	Since 2002	18	54,6
	2003	3	9,1
	2004	1	3,0
	2005	1	3,0
	2006 to date	10	30,3
	Total	33	100

Table 5.2 shows that most of the respondents reside in the Hatfield, Centurion and Pretoria areas (36, 4%, 27, 3% & 24, 2% respectively). In addition, 63, 6% of the respondents have been residing in those areas for more than 11 years. One of the respondents indicated, however, that she is involved because her husband works with the project construction team. Another respondent specified that she had a personal interest in the project. This table shows that 63, 7% of the respondents have been involved in the EIA process since 2002/2003; a total of 36, 3% of the respondents started participating after 2003 and are still involved in the process.

These respondents have been involved during the planning process, and the implementation (construction of the project) and monitoring stages. They have therefore been able to enforce or suggest some measures as the need has arisen.

Table 5.3: Method of public involvement in the Gautrain EIA process

Questions B1(a), B1(b) and B2		Frequency	Percentage
(B1a) Where did you first hear about the Gautrain?	Newspaper	14	42,4
	Radio	5	15,2
	T.V	4	12,1
	Internet	2	6,1
	Others (Please specify)	8	24,2
	Total	33	100
(B1b) How did you get involved and/or informed about the Gautrain EIA?			
Through:	Newspaper	17	54,5
	Radio	3	9,1
	T.V	1	3,0
	Pamphlets	4	12,1
	Website	5	15,2
	Other (Please specify)	3	9,1
	Total	33	100
(B1c) Which of the above methods of communication do you prefer?			
	Newspaper	9	27,3
	Radio	1	3,0
	T.V	1	3,0
	Pamphlets	3	9,1
	Website	5	15,2
	Other (Please specify)	15	45,4
	Total	33	100

Most of the respondents indicated that they first heard about the Gautrain project from various newspapers, radio stations, the television and the internet (42, 4%, 15, 2%, 12, 1% & 6,1% respectively). Others indicated that they had heard about the project via "word of mouth"; some indicated a combination of two or more options. In addition, most of the respondents indicated that they got involved and/or informed about the Gautrain EIA through newspapers, the internet and pamphlets (54, 5%,

15,2% & 12,1% respectively). Others indicated the *Record*[2] and through their position in the community.

Regarding the preferred method of involvement, newspapers was the option of choice, followed by a website (27,3% & 15,2% respectively). Others specified SMSs and a combination of two or more options (newspapers, television, radio, the website and/or SMSs).

The simple explanation here is that most of the respondents heard about the Gautrain project through the media. This shows that the Gautrain project was well publicised in the media. This could be due to the huge costs involved and/or the impacts of the project on the community and the environment. Most of the respondents specified that they were involved and/or informed about the project through advertisements in the media and on the internet. This confirms that the project proponents did invite the public to the EIA meetings through the newspapers.

5.4.2 Adequacy of information given to interested and affected parties

Questions B3 (a) (1, 2, 3 & 4) investigated the adequacy of information given to the public by the project proponent. This question interrogates the second objective.

[2] The *Record* is a community periodical.

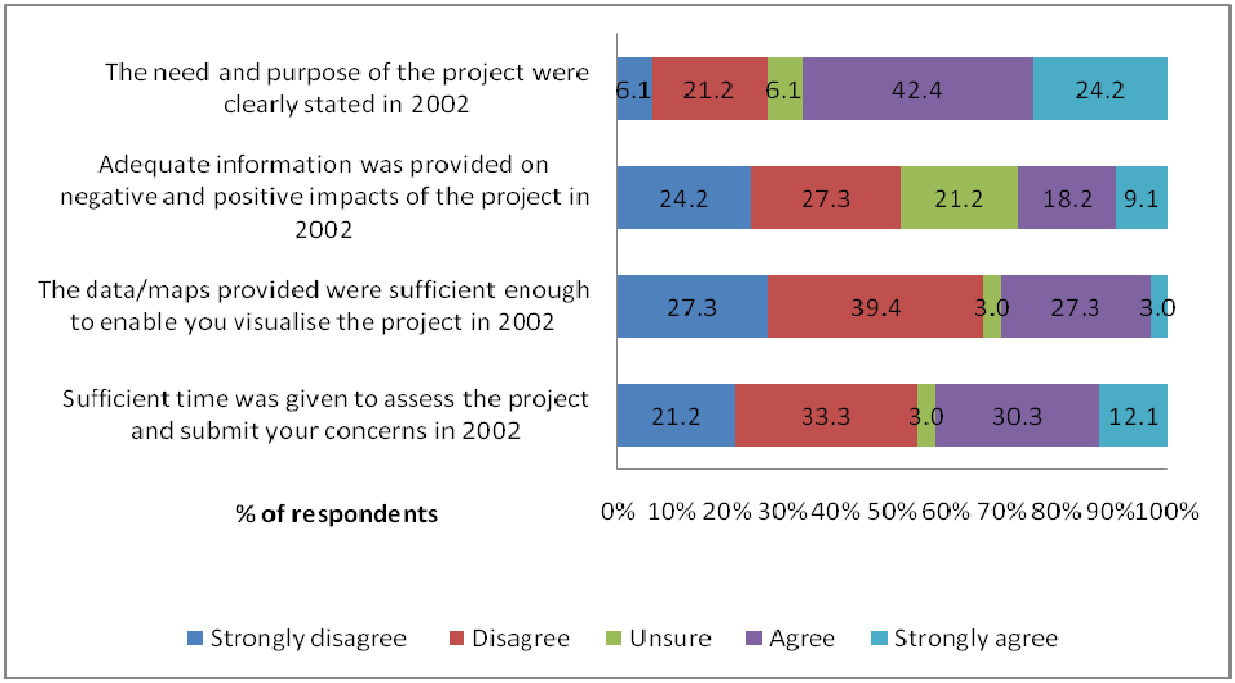


Figure 5.2: Provision of adequate information

From figure 5.2, it is clear that 66,6% of the respondents (both agree and strongly agree) indicated that the need for and purpose of the project was clearly stated in 2002. A total of 27,3% disagreed (strongly disagree and disagree), while 6,1% were unsure. In terms of the adequate provision of information relating to the negative and positive impacts of the project, 27,3% agreed with the statement, 21,2% were unsure and approximately 51,5% disagreed with the statement. This means that most of the respondents felt that adequate information was not provided on the positive and negative impacts of the project.

With regard to the provision of sufficient data/maps to enable the participants to visualise the project, a total of 30,3% agreed with the statement, 3% were unsure and 66,7% disagreed with the statement. Most of the respondents, therefore, indicated that the data/maps provided did not adequately enhance their visual interpretation of the project. Figure 5.2 also illustrates that 42, 4% of the respondents were satisfied with the time allowed to assess the project and submit their concerns; just over half (54, 5%) were dissatisfied, while 3% were neutral.

This figure examines the public's level of satisfaction with the issue discussed under question B3a. From the responses generated, the respondents agreed that the need and purpose of the Gautrain project was clearly set out in 2002.

Nevertheless, the respondents argue that they are dissatisfied with all other issues raised, including adequate information on the negative and positive impacts of the project, the provision of adequate data/maps to enable them visualise the project in 2002, sufficient time to assess the project and submit their concerns, and early consultation during the project planning and design phases.

5.4.3 The effectiveness of public participation in the Gautrain EIA process

Questions B3 (a) (5), B3 (b), B4 and B5 probe the effectiveness of the Gautrain EIA process. These questions examine the third research objective. According to the reviewed literature (see section 2.13), some criteria must be met for the public participation process to be effective. These include the following: the public must be involved early during the planning and the design stages, there must be representation and access to information, there must be adequate information/information exchange, the decision-making process must be improved, and the process must also be educative and engender negotiation. These criteria will be investigated below:

5.4.3.1 Early participation

Question B3 (a): The public was consulted early during the project planning and design phase.

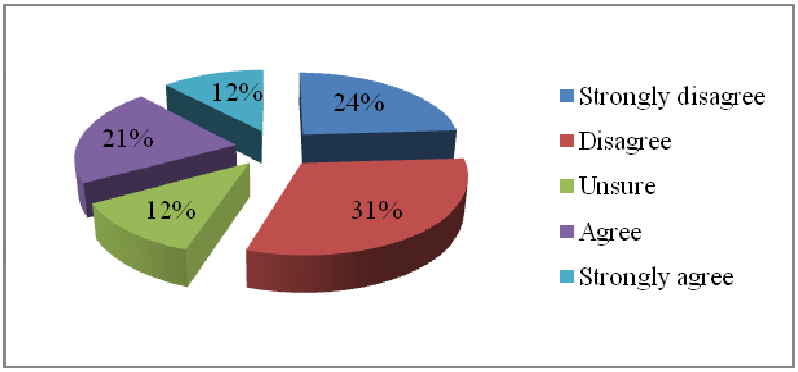


Figure 5.3: Early participation in the project planning and design phase

This figure shows that 33% of the respondent stated that they were involved early on during the project planning and design phases. A total of 55% disagreed with the statement, while 12% were unsure.

The data generated indicates that the public were not involved early enough during the project planning and design phases. The literature shows that early participation will build trust, save time and improve decision making. The literature also indicates that when the public believes that the project proponent is trampling on their rights, they quickly instigate legal action against the project proponent. This partly explains why there were protest actions and legal proceedings brought against the project.

5.4.3.2 Representation and access

Questions B3 (b) 1, 2, 3, 4 and 5 deal with the issue of representation and access to the Gautrain EIA process.

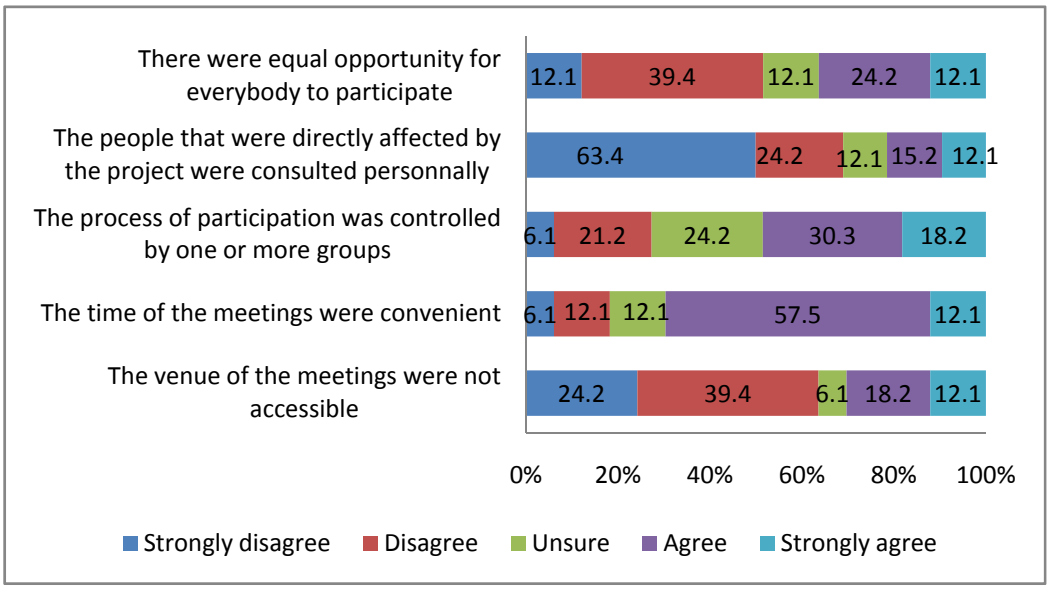


Figure 5.4: Representation and access

Figure 5.4 shows that 36, 3% of the respondents felt that everybody had equal opportunities to participate. A total of 51, 5% disagreed and 12, 1% were unsure. Regarding the direct consultation of those affected by the project, the findings show that those directly affected by the project were not contacted personally. However,

27, 3% of the respondents indicated that those affected were consulted personally, while 12, 1% were unsure.

The data also shows that the process of participation was controlled by one or more groups (48, 5% agreed, 27, 3% disagreed and 24, 2% were unsure). With regard to the time of the meetings, most respondents (69, 6%) indicated that the meeting times were convenient; 18, 2% disagreed with the statement and 12, 1% were neutral. Regarding the venue of the meetings, 30, 3% agreed that the venue was not accessible. A total of 63, 6% disagreed with the statement and 6, 1% were unsure.

This figure illustrates that not everyone had the same opportunities to participate in the process; the participation process was controlled by one or more groups. This could partly be due to the techniques/methods of involvement employed by Bohlweki consultant (i.e. the use of more focus groups meetings than public meetings) (see section 3.3). It also shows that those directly affected by the project were not contacted personally. There is a need to consult those who will be directly affected by the project in terms of their properties, values and lifestyles, and those living along or near to the proposed route alignment. This and other factors might have contributed to the increase in the cost of the Gautrain project.

Regarding the issue of access, most of the respondents indicated that the meeting venues were accessible and that the time of the meetings was convenient. However, for those who felt the time and venue were not convenient, their reasons might have included a lack of public transport, work issues, domestic chores, and so on.

5.4.3.3 Negotiation and dialogue

Questions B3 (b) 6 and 7 examine the issue of dialogue and negotiation among affected parties.

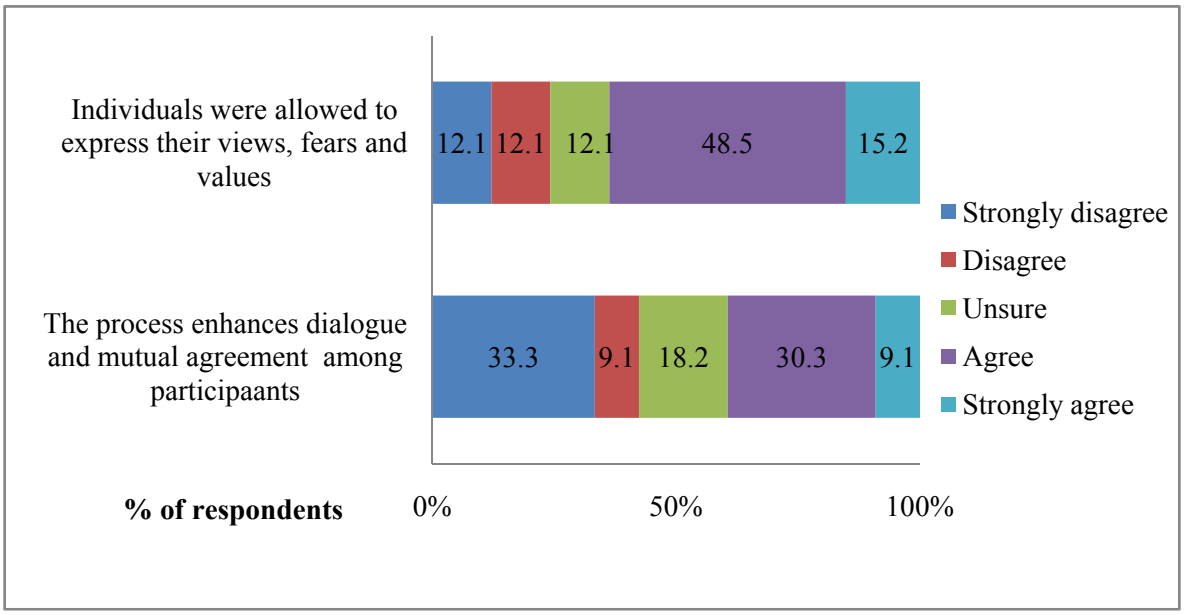


Figure 5.5: Negotiation and dialogue

From figure 5.5, it is clear that a number of respondents felt free to express their views, fears and concerns pertaining to the project. A total of 63,7% agreed with the statement, 24,2% disagreed with the statement and 12,1% were unsure. Looking at how conflicting issues and concerns were settled among interested and affected parties (opposing parties), the data indicates that 42,4% of the respondents disagreed with the statement, 39,4% agreed with the statement and 12,1% were unsure.

The data generated above shows that there was freedom of expression during the Gautrain EIA process. Despite this, though, just on 50% of the respondents indicated that the process did not encourage dialogue. This concurs with the finding of Donaldson (2005:60) that two community associations were at loggerheads over route alignment: the Alliance against the Park Street Alignment (AAPSA) and the Muckleneuk/Luksrand Property Owners and Residents' Association (MLPORA). The Alliance against the Park Street Alignment objected to the resolution proposed by the MLPORA on the basis that not all affected parties were consulted before tabling the

decision in the EIA meeting. It may be suggested that the process was free from coercion, but did not facilitate dialogue among participants.

5.4.3.4 Adequate information/information exchange

Questions B4 (1, 2, 3 & 4) and B 5 (1) examine the exchange of information between the public and the project proponent.

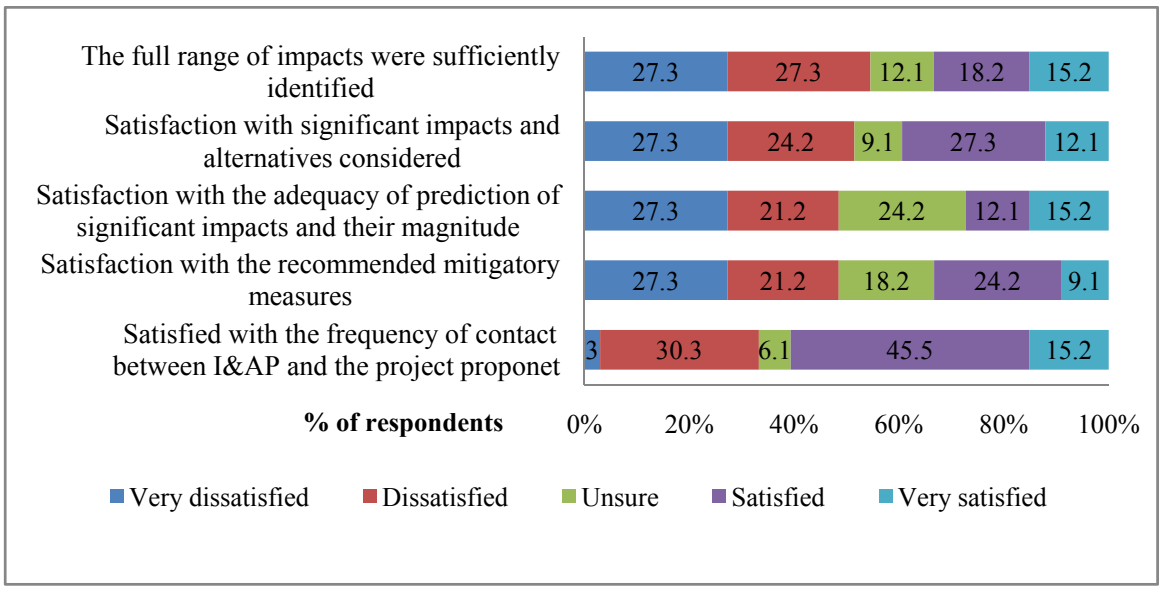


Figure 5.6: Information

It is clear from figure 5.6 that 54,6% of the respondents indicated that they were not satisfied with the range of impacts identified; a total of 33,4% were satisfied while 12,1% were unsure. Regarding the predictions of significant impacts and alternatives, the responses show that 39,4% of the respondents were satisfied, 51,5 % were dissatisfied and 9,1% were unsure.

It also reveals that most of the respondents (48,5%) were not satisfied with how significant impacts and their magnitude were predicted. A total of 27,3% of the respondents were satisfied, while 24,2% were unsure. In terms of the recommended mitigating measures, 48,5% were unsatisfied, 33,3% were satisfied and 18,2% remained unsure. On the other hand, 60,7% of the respondents were satisfied with the frequency of contact between the interested and affected parties and the project proponent; a total of 33,3% disagreed with the statement and 6,1% were unsure.

This figure illustrates that most of the respondents were not satisfied with the process of identifying significant impacts, alternatives and mitigating measures. This might have been due to the fact that some of the issues were unresolved before the record of decision was issued. The public were not, for example, given the opportunity to express their views and concerns on the design of the Gautrain project, because the project bid had been sealed.

The condition of approval issued by the Gauteng Department of Agriculture, Conservation and Environment, however, stipulates that the architectural aesthetics of the station precincts and the visual impact mitigation measures needed to be discussed with the affected communities, interested and affected parties, the department and the City of Tshwane before the bid was concluded. At that stage, the input of the public was minimal.

It is important to note that most of the respondents indicated that there was a two-way exchange of information between the project proponents and the public. Although some of the respondents disagreed with this statement, this might be attributed to their lack of access to internet services, cell phones, and so on (the main means of communication used by the Gautrain project proponents).

5.4.3.5 Improved decision making

Question B5 (2, 3 and 4) investigates the public's satisfaction with the impact of information feedback on management decisions.

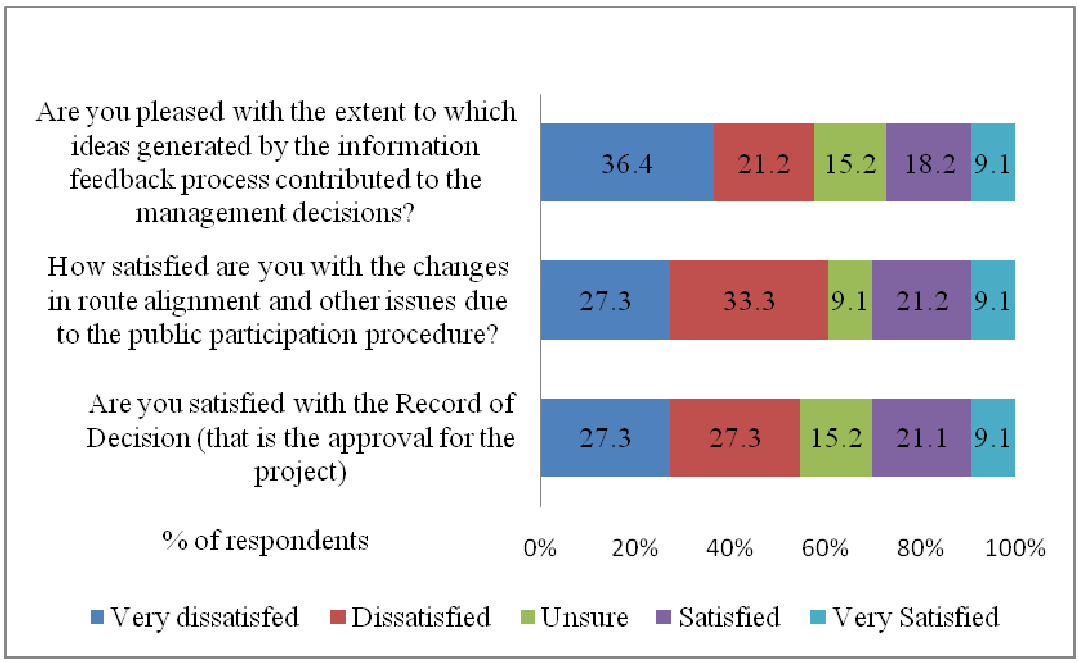


Figure 5.7: Satisfaction with management's decisions

Figure 5.7 indicates that 57,6% of the respondents were not pleased with the extent to which ideas generated by the information feedback process contributed to management decisions. A total of 27,3% of the respondents were satisfied, while the remaining 15,2% were neutral. Regarding their satisfaction with route alignment, the table reveals that 30,3% of the respondents were satisfied, 60,6% were dissatisfied and the remaining 9,1% were unsure. Furthermore, just over half of the respondents (54,6%) stated that they were dissatisfied with the record of decision; a total of 30,3% were satisfied and 15,1% were unsure.

An analysis of this data shows that the information generated does not have a significant impact on the decision-making process. This result confirms the findings of the previous research carried out by Coetzee (2003) and Donaldson (2005). Donaldson (2005:61) states that "the endless meetings, community mobilisation and counterproposals in the end resulted in a slightly modified version of the original alignment."

5.4.3.6 Educative

Question C 3 (1, 2, 3, 4 & 5) investigates how the process of participation has enhanced the participant's learning.

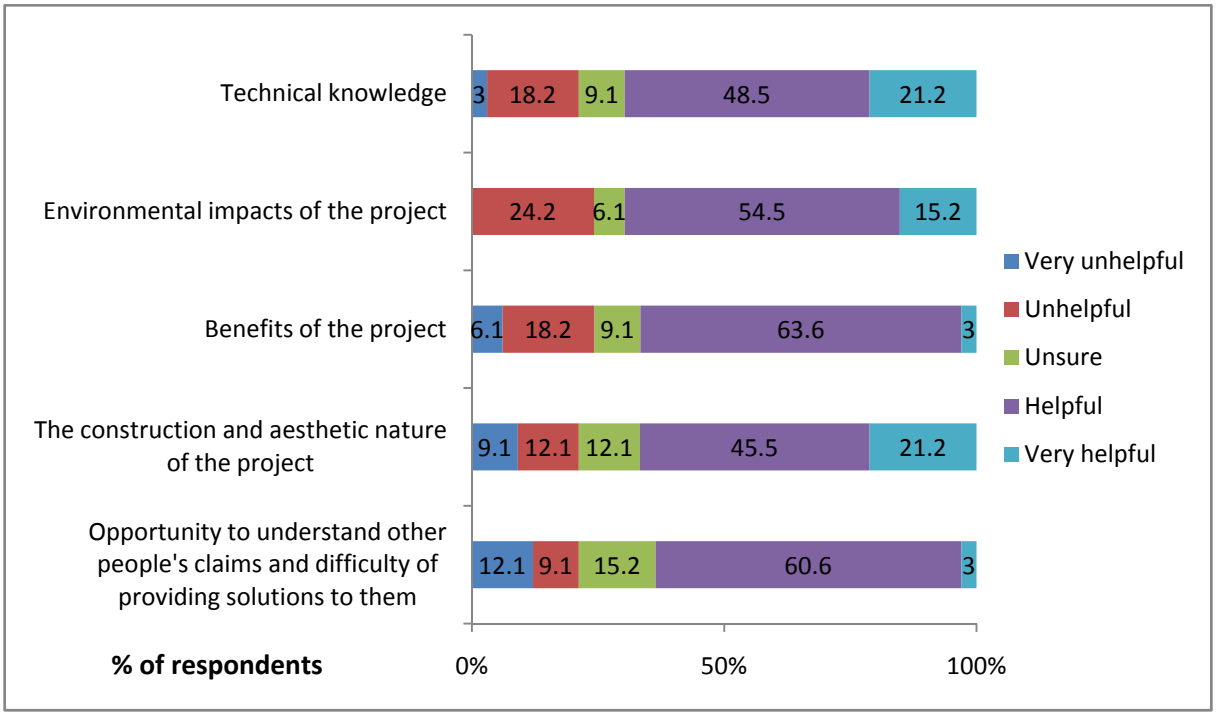


Figure 5.8: Learning enhancement

Figure 5.8 shows how the process of participation has enhanced the technical knowledge of the respondents. A total of 69,7% of the respondents felt that the process had been helpful, 21,2% indicated that it was unhelpful, while 9,1% were unsure.

With regard to knowledge of the environmental impacts of the project, 69,7% rated the process as helpful, 24,2% as unhelpful and 6,1% were unsure. Regarding the benefits of the project, 66,6% of the respondents viewed it as helpful and 24,3% as unhelpful; a total of 9,1% were unsure. Looking at the construction and aesthetic nature of the project, the figures shows that 66,6% of the respondents rated the process as helpful and 21,2% as unhelpful; a total of 12,1% were unsure.

Regarding the opportunity to understand other people's claim, 63,6% of the respondents viewed the process as helpful and 21,2% as unhelpful; a total of 15,2% were unsure. The last option (Other please specify) was not included in the analysis, because the option was not chosen by any of the respondents.

Most of the respondents indicated that the process had been very helpful. The technical knowledge and environmental impacts of the project were rated high

(69,7% & 69,7% respectively). It is important to note that the benefit of the project was ranked third. This could be due to the fierce criticism levelled against the project from opposing parties. Opportunity to understand other people's claims and difficulty of providing solutions was the least favoured; this should be linked to the previous findings that the process did not facilitate dialogue among participants.

In terms of the effectiveness of the public participation process, the data generated shows that the process was ineffective. One should not generalise, however, and view the entire process as ineffective; not all the items discussed under each criterion was viewed in a negative light. The data shows, for example, that the purpose of the project was clearly stated. Individuals were allowed to express their views and concerns via a two-way exchange of information. The process also enhanced their learning.

Nevertheless, the data did indicate that the public were not involved early enough in the design phases of the project. This limited the public's input in the Gautrain project. The respondents argued that the information provided by the project proponent was also inadequate.

In support of this point, Shepherd and Bowler (1997) maintain that if the public perceive their rights to have been violated, they often resort to protest action and legal proceedings against the project proponent.

Most of the respondents indicated that the process of participation was controlled by one or more groups, which meant that not everybody had equal opportunities to participate. The literature shows that if the public is underrepresented, they tend to lose trust in the project proponent; once members of the public lose confidence in the project proponent, it is virtually impossible to win that confidence back (Shepherd & Bowler, 1997; Thomas & Elliott, 2005).

In addition, the results show that the information generated did not have a significant impact on the decision-making process. According to the literature reviewed, if members of the public feel that their input is not considered when decisions are made, they view the process as a mere formality (procedural process) rather than a process of real co-production (substantive process). This results in feelings of

frustration and they may hesitate to participate in similar processes in future (Petts, 2001; Nanda & Pring, 2003). Most of the respondents also pointed out that they were not satisfied with the route alignment. The process of involving the public in the Gautrain EIA was, therefore, rather ineffective.

5.4.4 The trend of public participation in the Gautrain project from 2002 to 2008

5.4.4.1 Participate in the Gautrain meetings after approval

Questions C1 (a) and C1 (b) investigated public participation in Gautrain meetings after the project approval. These questions examine the fourth objective.

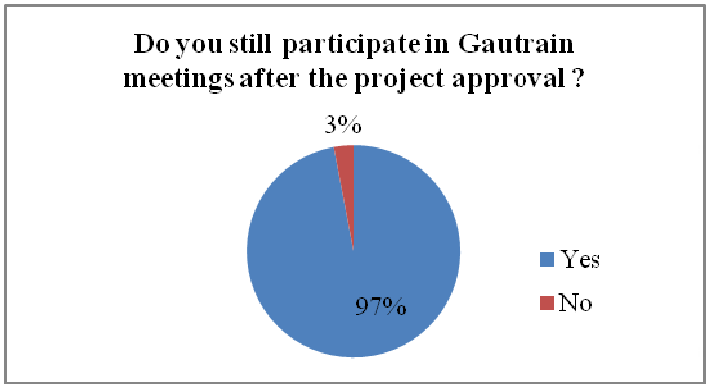


Figure 5.9: Participation after approval

Figure 5.9 shows that all of the respondents (97,0%), with the exception of one respondent, still attended meetings after the project had been approved. One of the respondents (3,0%) stated that the time of the meetings was inconvenient.

5.4.4.2 The trend of public participation in the Gautrain project from 2002 to 2008

Question C1 (c) (1, 2, 3, 4, 5, 6, and 7) interrogates the process of participation from 2002 to 2008. This question aims to investigate the fourth objective.

According to table 5.4, just over half of the respondents (57,6%) indicated that everybody had equal opportunities to participate. A total of 24,3% disagreed with the statement and 18,2% were unsure. With regard to the control of the public participation process, 66,7% of the respondents agreed that the process was not

controlled by any group. A total of 15,2% disagreed with the statement and 18,2% were unsure. After investigating the time of the meetings, 57,5% agreed that the scheduled times were convenient, but 30,3% disagreed and 12,2% were unsure.

After examining the venue of the meeting, 51,5% of the respondents confirmed that the scheduled venue was accessible. A total of 39,4% disagreed with the statement and 9,1% were unsure. The data shows that most of the respondents (72,7%) agreed that individuals were allowed to express their views, fears and concerns, but 12,2% disagreed with the statement and 15,2% were unsure. In terms of keeping the interested and affected parties updated on the development of the project, most of the respondents (75,7%) indicated that they regularly received updates on the project, while 18,2% disagreed with the statement and 6,1% were unsure. In terms of the frequency of contact between the project proponent and the public, 75,7% of the respondents believed that there was regular contact between the interested and affected parties and the project proponent. A total of 24,2% of the respondents disagreed with the statement and 6,1% were unsure.

Table 5.4: Trend of events between 2002 and 2008

Frequency	**(SD)**	**(D)**	**(U)**	**(A)**	**(SA)**	**Total**
There were equal opportunities for everybody to participate (unlike before)	3 9,1	5 15,2	6 18,2	15 45,5	4 12,1	33 100
The process of participation was not controlled by one or more groups/parties (unlike before)	1 3,0	4 12,1	6 18,2	17 51,5	5 15,2	33 100
The meetings times were not convenient (unlike before)	8 24,2	11 33,3	4 12,1	7 21,2	3 9,1	33 100
The meeting venues were accessible (unlike before)	1 3,0	12 36,4	3 9,1	11 33,3	6 18,2	33 100
Individuals were allowed to express their views, fears and values (unlike before)	3 9,1	1 3,0	5 15,2	18 54,5	6 18,2	33 100
Interested and affected parties were regularly kept informed about the development of the project	2 6,1	4 12,1	2 6,1	18 54,5	7 21,2	33 100
There was regular liaison with the interested and affected parties	6 18,2	2 6,1	2 6,1	14 42,4	9 27,3	33 100

Table 5.4 summarises the process of consultation after the approval of the project. The data shows that the process of participation had improved from the 2002/2003 period. Some of the respondents argued, however, that the scheduled times and venues were not accessible and convenient, unlike before. This could be due to time and venue changes. The community liaison forums were usually fixed for 18:00 or 19:00, which might have been too early for full-time employees. The open days were scheduled to take place between 16:00 and 18:00. Some of the participants who also worked full time considered it to be more convenient to attend open days on their way home from work, rather than first having to go home and then attending meetings later in the evening.

5.4.4.3 The public rating of the whole Gautrain EIA process

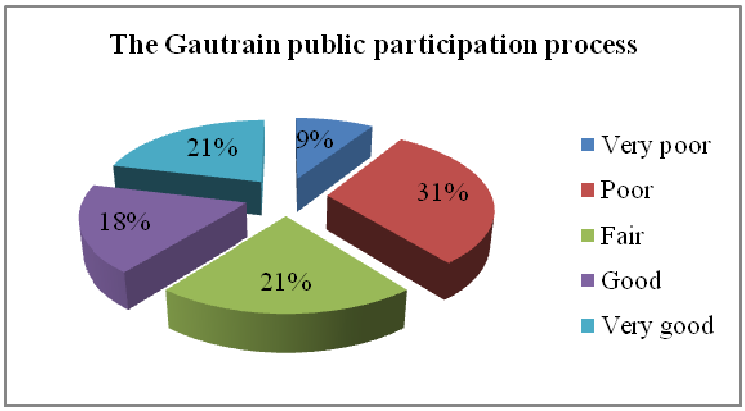


Figure 5.10: Rating of the Gautrain public participation process

Figure 5.10 outlines the respondents' rating of the entire Gautrain EIA process. A total of 40% of the respondents rated the process as poor, while 39% rated it as good and 21% as fair.

5.4.4.4 How the public participation process could be improved

Question D: In your own opinion, how could the public participation process have been improved?

Only three (9,1%) responses were generated from this question. Two of the respondents pointed out that there was a need to incorporate public concerns more in the decision-making process. One of the respondents indicated that there was a need to encourage more people to participate.

5.5 Proponent's response

Part A of the questionnaire looked at demographic data and at the socioeconomic status of the respondents. Questions B1 and B2 dealt with the method used to involve the public in the Gautrain EIA process (see appendix 4). These questions investigate the first research objective.

5.5.1 Demography data of the project proponents

According to table 5.5, 83,3% of the respondents were male and 16,7% were female. This shows that males were more involved than their female counterparts. It also shows that most of the respondents fell within the age categories of 25 to 35 years, 36 to 45 years and 46 to 55 years.

Table 5.5: Proponent demographic data

		Frequency	Percent
Gender	Male	15	83,3
	Female	3	16,7
	Total	18	100
Age	16-25 years	1	5,6
	26-35 years	5	27,8
	36-45 years	5	27,8
	46-55 years	4	22,2
	56-65 years	3	16,7
	Above 65 years	-	-
	Total	18	100

5.5.1.1 Educational status of the project proponent

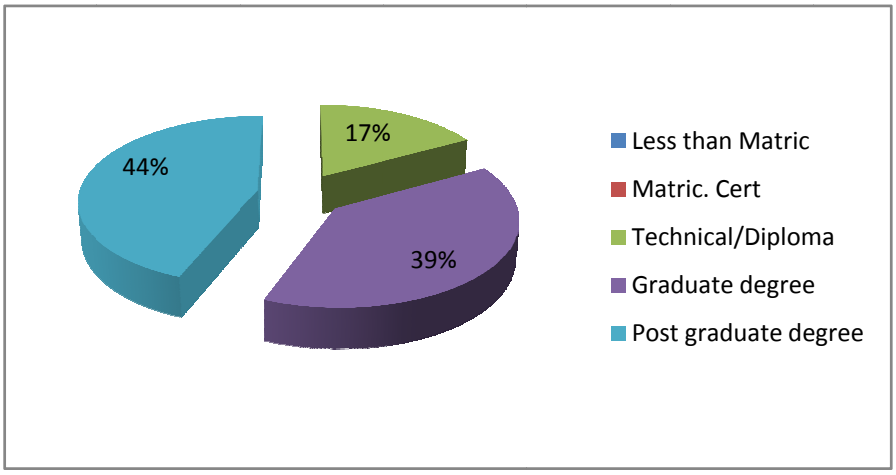


Figure 5.11: Qualifications of the project proponent

This figure indicates that all the respondents had some degree of formal education. Most of them were graduates and some also held postgraduate degrees (39% & 44% respectively).

5.5.1.2 Period of involvement in the Gautrain EIA process

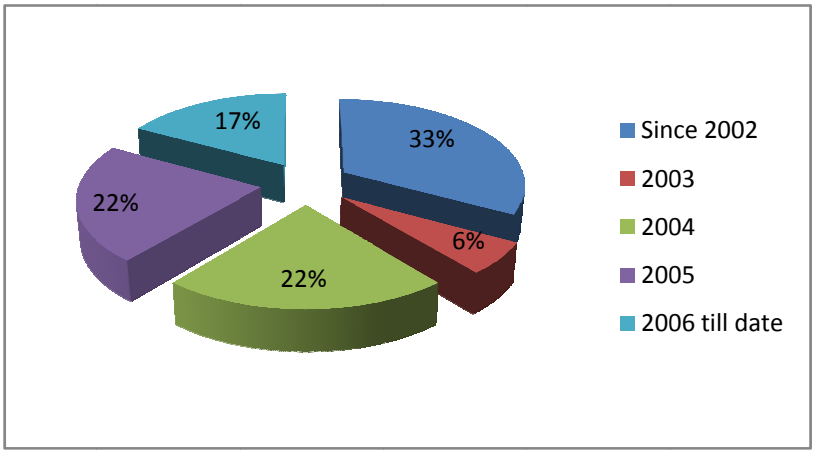


Figure 5.12: Period of involvement in the Gautrain EIA

Figure 5.12 shows that 33% of the respondents had been involved in the project since 2002. A total of 6% had been involved since 2003 and the rest after 2003. This means that a good number of the respondents had been involved since the start of the project.

5.5.1.3 Method of getting the public involved and/or informed about the Gautrain EIA process

Table 5.6: Mode of involving participants in the Gautrain EIA process

Question B1(a), B1(b) and B2		Frequency	Percentage
How did you get interested and affected parties involved and/or informed about the Gautrain EIA? Through:			
	Newspaper	6	33,3
	Radio	-	-
	TV	-	-
	Pamphlets	-	-
	Website	2	11,1
	Others (Pls specify)	10	55,6
	Total	18	100
Which of the above methods do you prefer?	Newspaper	1	5,6
	Radio	-	-
	TV	2	11,1
	Pamphlets	-	-
	Website	5	27,8
	Others (Please specify)	10	55,6
	Total	18	100

It is clear from table 5.6 that most of the respondents were informed and/or got involved in the process through information provided in newspapers (33,3%), through the website (11,1%); a total of 55,6% of the respondents ticked two or more options. Looking at the preferred method of involvement, some of the respondents (27,8%) indicated that the website was their preferred option, while others ticked two or more options.

5.5.2 Adequacy of information given to interested and affected parties

Question B3 (a) (1, 2, 3 and 4) investigates the adequacy of information given to the public by the project proponent. This question interrogates the second objective.

From figure 5.13 below, it is clear that most of the respondents (about 78%) indicated that the need and purpose of the project was clearly stated during the Gautrain EIA; 17% were unsure and 5% disagreed with the statement. With regard to the adequacy of information provided on the negative and positive impacts of the project, 56% agreed that sufficient information had been provided. A total of 11% of the respondents disagree with the statement and 33% were unsure. In addition, 61% of the respondents felt that the data/maps given to the public were adequate for them to visualise the project; 6% of the respondents disagreed with the statement and 33% were unsure. In terms of the time allocated for the submission of complains and concerns, 67% indicated that the time was sufficient, 5% believed it was insufficient and 28% were unsure.

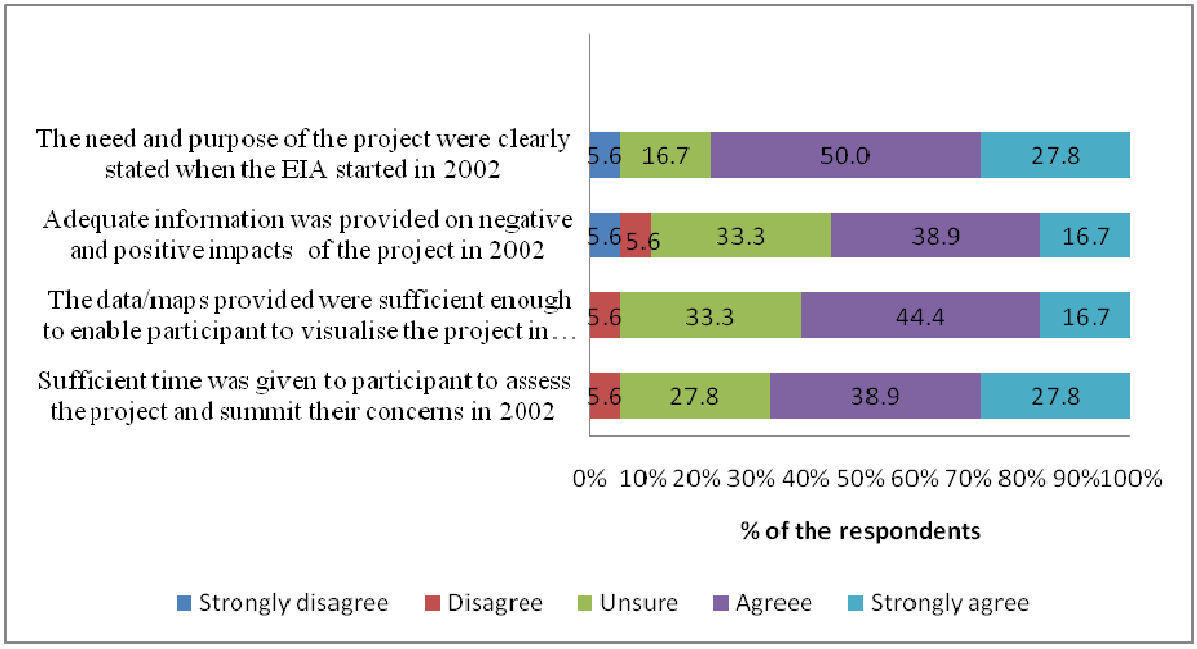


Figure 5.13: Provision of adequate information

It is clear from the data generated that adequate information was supplied to the participants during the EIA period. The proponents rated most of the questions above 60%, with the exception of the question relating to the degree of information provided on the negative and positive impacts (this question rated 55,6%). This might be due to the level of uncertainty that generally characterises a mega project of this nature.

5.5.3 The effectiveness of public participation in the Gautrain EIA process

Questions B3 (a), B3 (b), B4 and B5 probed the effectiveness of the Gautrain EIA process. These questions examined the third objective: For public participation to be effective the following criteria must be satisfied:

5.5.3.1 Early participation

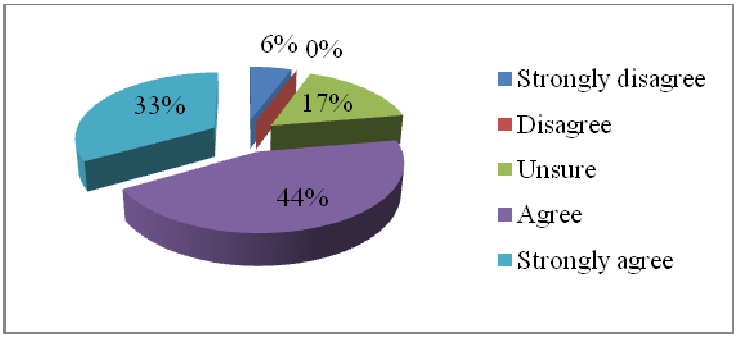


Figure 5.14: Early participation

A total of 78% of the respondents felt that the public were consulted early enough, but 5% disagreed with the statement and 17% were unsure.

5.5.3.2 Representation and access

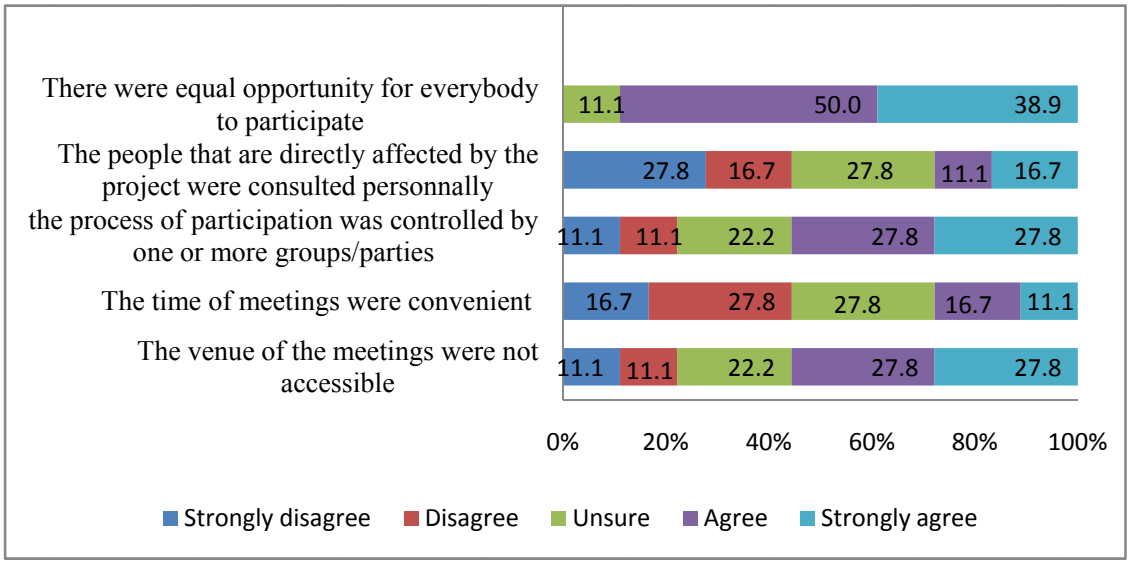


Figure 5.15: Representation and access

Most of the respondents (88,9%) indicated that all the participants had equal opportunities, while 11,1% were neutral. Regarding the consultation of those directly affected by the project, just under half of the respondents (44,5%) indicated that those affected by the project were not directly consulted. A total of 27,8% of the respondents agreed with the statement, while 27,8% were unsure.

A total of 55,6% of the respondents felt that the process of participation was controlled by one or more groups; 22,2% disagreed with this statement and 22,2% were unsure. In terms of the scheduled times for meetings, just under half of the respondents (44,5%) indicated that the scheduled times were not convenient; 27,8% agreed that the scheduled times were convenient, while 27,8% were unsure. The responses generated shows that the venues were not accessible.

5.5.3.3 Negotiation

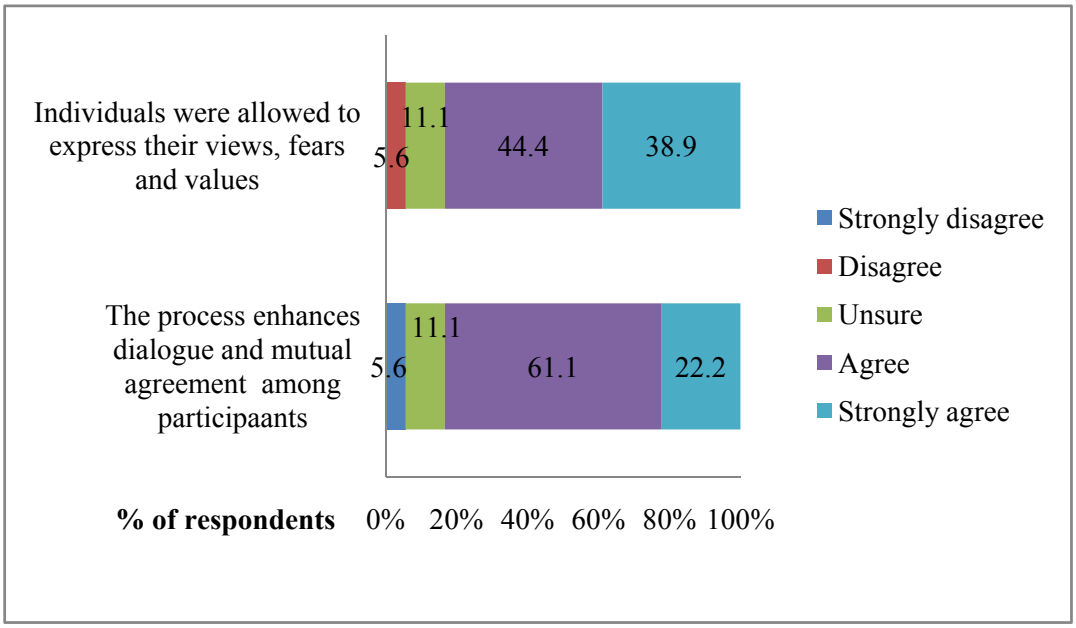


Figure 5.16: Negotiation and dialogue

Figure 5.16 summarises the participants' views with regard to the opportunities given to them to express their views and concerns. A total of 83,3% agreed that individuals were allowed to express their views and concerns about the project. Just more than 80% (83,3%) of the respondents agreed that the process enhanced dialogue between the participants; a total of 5,6% of the respondents disagreed with this statement.

From the issues investigated above, the response pattern of the respondents was very positive. The exception was the time and venue of the meetings. Most of the issues were rated above 80%, which shows that the process of involving the public in the Gautrain EIA process was generally effective. Some of the respondents (56%), however, indicated that the process was controlled by one or more groups, which means that there was limited freedom of expression.

5.5.3.4 Adequate information/information exchange

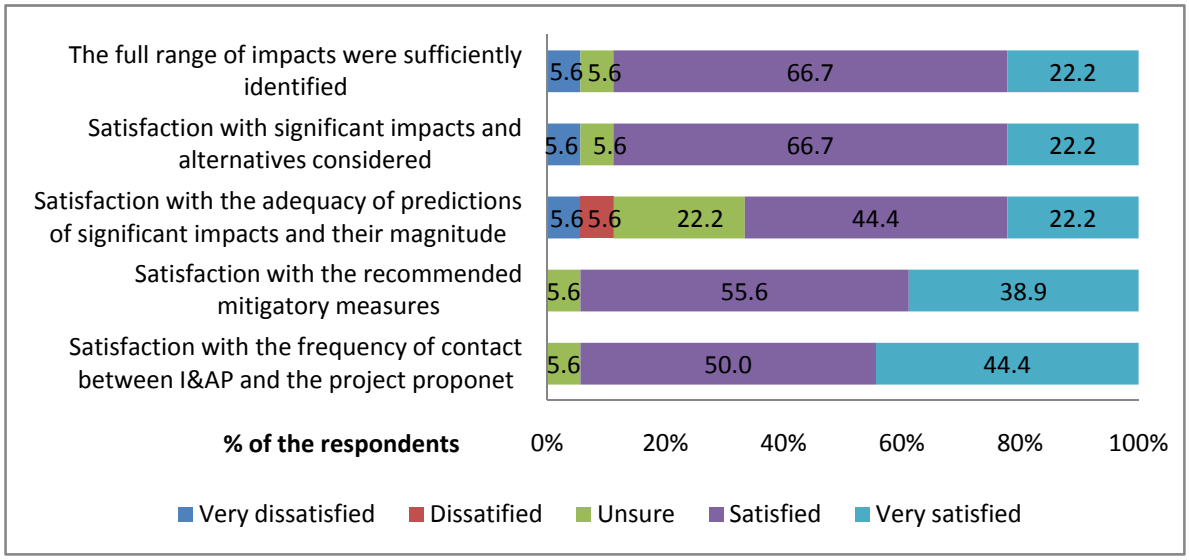


Figure 5.17: Access to information

It is clear from figure 5.17 that 88,9% of the respondents were satisfied that the possible impacts of the project were identified and considered during the EIA process. A total of 5,6% of the participants were dissatisfied, while the remaining participants were neutral (5,5%). In terms of the significant impacts and alternatives, 88,9% of the respondents indicated that they were satisfied.

Regarding the prediction of significant impacts and their magnitude, 66,6% of the respondents were satisfied, 11,2% were dissatisfied and 22,2% were unsure. The figure also illustrates that more than 90% (94,4%) of the respondents were very pleased with the mitigatory measures and the frequency of contact between the project proponents and the public.

5.5.3.5 Improved decision making

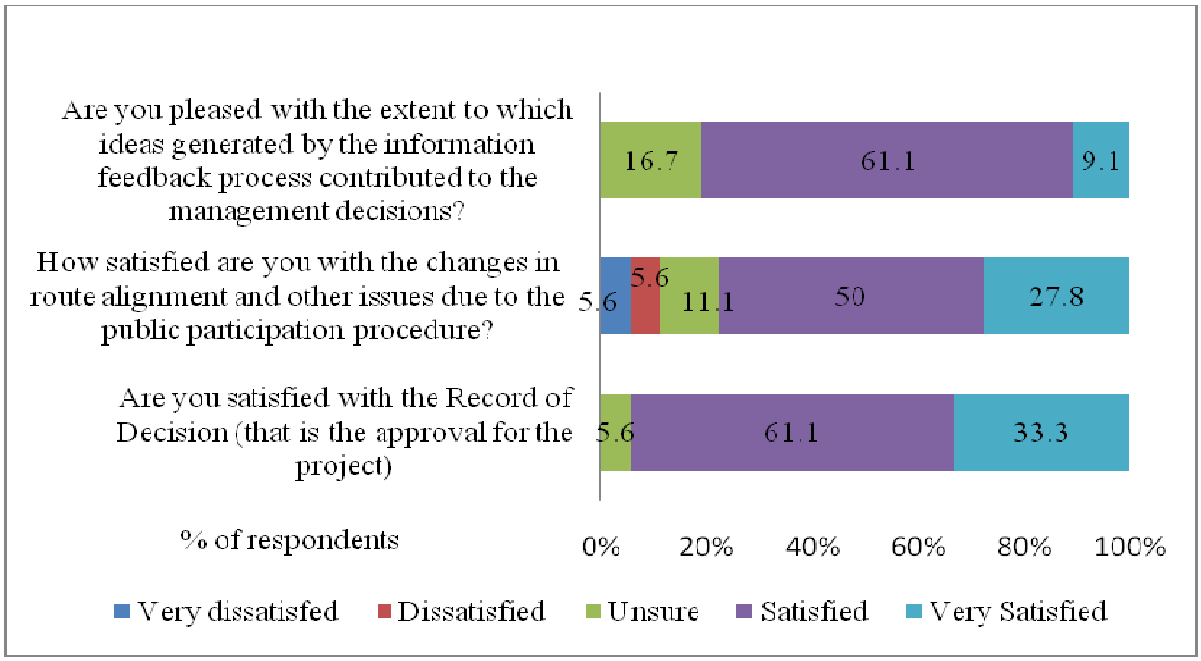


Figure 5.18: Satisfaction with management decisions

Figure 5.18 shows that 83,3% of the respondents were satisfied with the degree to which their feedback had contributed to management decisions; 16,7% of the respondents were unsure. A total of 77,8% of the respondents were pleased with the changes in the route alignment; 11,1% were unhappy with the changes and 11,1% were uncertain. The table also illustrates that 94,4% of the respondents were pleased with the record of decision issued for the approval of the Gautrain project.

5.5.3.6 Educative

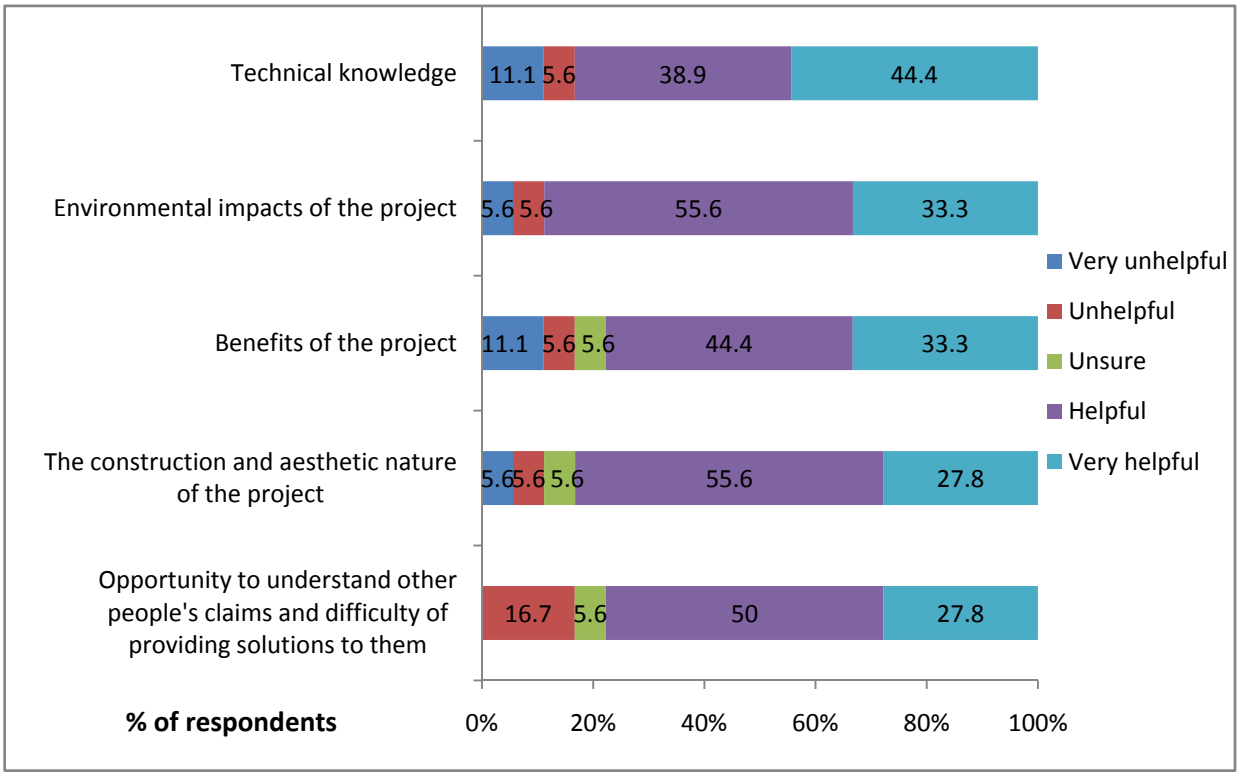


Figure 5.19: Educative

It is clear from figure 5.19 that 83,3% of the respondents believed that the process had improved their technical knowledge of the project. Looking at the environmental impacts of the project, an overwhelming number of the respondents (88,9%) acknowledged that the process had been very helpful.

Furthermore, most of the respondents (88,9%) argued that the process of participating in the Gautrain EIA had increased their knowledge of the project's benefits. Most of the respondents (83,4%) indicated that their knowledge of the aesthetic nature of the project had been enhanced due to their involvement in the Gautrain EIA process. Regarding the opportunity to understand other people's concerns and the difficulty of providing solutions to these problems, 77,8% of the respondents indicated that the process had been very helpful.

5.5.4 The trend of public participation in the Gautrain project from 2002 to 2008

Questions C1 and C2 investigate the trend of public participation and related issues from 2002 to 2008. These questions examine the fourth objective.

Table 5.7: Trends of events

Frequency	(SD)	(D)	(U)	(A)	(SA)	Total
There were equal opportunities for everybody to participate (unlike before)	2 11,1	3 16,7	2 11,1	7 38,9	4 22,2	18 100
The process of participation was not controlled by one or more groups/parties (unlike before)	3 16,7	3 16,7	3 16,7	6 33,3	3 16,7	18 100
The scheduled meeting times were not convenient (unlike before)	1 5,6	4 22,2	4 22,2	6 33,3	3 16,7	18 100
The venues for the meetings were accessible (unlike before)	1 5,6	3 16,7	6 33,3	4 22,2	4 22,2	18 100
Individuals were allowed to express their views, fears and values (unlike before)	2 11,1	1 5,6	5 27,8	6 33,3	4 22,2	18 100
Interested and affected parties were frequently kept updated with regard to the development of the project	1 5,6	1 5,6	3 16,7	6 33,3	7 38,9	18 100
There was regular liaison with interested and affected parties	2 11,1	1 5,6	2 11,1	5 27,8	8 44,4	18 100

A total of 61,1% of the respondents indicated that they had had equal opportunities to participate in the Gautrain EIA process; a total of 27,8% believed that they did not have equal opportunities to participate in the Gautrain EIA process and 11,1% were unsure. The table also shows that the process of participation was not controlled by one or more groups, especially when compared to the 2002/2003 period.

With regard to the time of the meetings, 50% of the respondents indicated that the scheduled times were inconvenient. A total of 27,8% disagreed with this statement, while 22,2% were unsure. With regard to the meeting venues, 44,4% of the respondents felt that the meeting venues were more accessible than those used during the 2002/2003; 22,2% of the respondents disagreed with this statement and 33,3% were unsure. Respondents also indicate that there is freedom of expression and interested and affected parties are kept abreast with the project development.

The data shows that there was an improvement in terms of participation from the 2002/2003 period. More than 70% of the respondents felt that the public had been updated about the project and other pressing issues. It is important to note that in August 2008, all interested and affected parties were requested to complete a questionnaire on how to improve the Gautrain website. This move was aimed at improving the communication network between the project proponents and the public. The process vindicated the assumption that the meetings were poorly structured as most of the respondents to the survey indicated that the scheduled times and venues for the meetings were not convenient.

5.5.4.1 The project proponent rating of the whole Gautrain EIA process

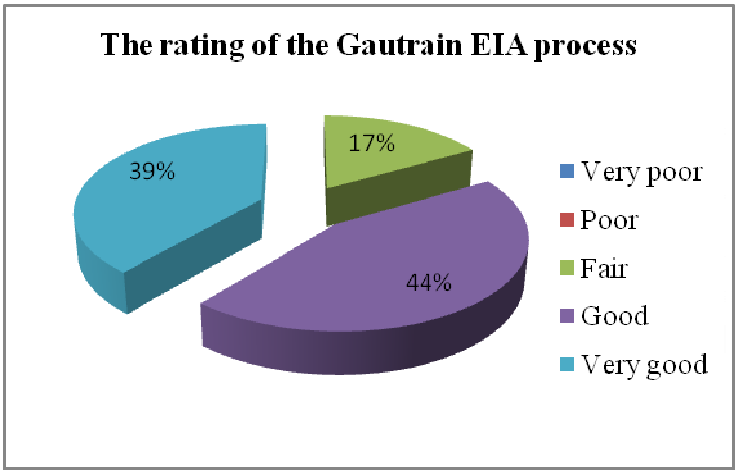


Figure 5.20: The rating of the Gautrain EIA process by the project proponent

It is clear from this figure that the respondents rated the process very highly. A total of 83% rated it as good, while 17% rated the process as fair.

5.5.4.2 How the process can be improved

One of the participants mentioned that there is a need to encourage interested and affected parties to participant more by attending public meetings. This participant asserted that although not everybody has access to the internet, this would be a good means of reaching out to all the interested and affected parties.

5.6 Testing of the hypotheses

The final stage of this chapter is to test the research hypotheses. The opinions expressed by the public respondents will be compared to those of the proponent with regard to the process of the Gautrain EIA. The responses generated will be compressed into combined contingency tables for easy data analysis.

The Mann-Whitney U test will also be used to analyse the data generated. A significant level of 0,05 (95% level of significant) or 0,01 (99% level of significant) will be employed. On a two-tailed test, alpha level of 0,05, the critical level for z is ± 1,96.

In analysing the data collected, the following rule holds: If the calculated Mann-Whitney U test is less than the critical value (asymptotic significance), then the hypothesis is accepted; in other words, if $p \leq 0,05$ then the null hypothesis will be accepted. However, if the $p \geq 0,05$ the null hypothesis will be rejected (ie $\mu \pm 1,96$).

Furthermore, Chronbach alpha will be used to determine the reliability of the measurement. According to Reinard (2006:121), Chronbach alpha is used to compute the consistency of items in an index. If the Chronbach alpha is greater than 0,70, then the test is said to be reliable; if it is less than 0,70, the test is deemed unreliable.

Hypothesis 1

$H_{o1:}$ adequate information was provided to interested and affected parties during the Gautrain EIA.

H_{a1}: adequate information was not provided to interested and affected parties during the Gautrain EIA.

The condensed table below, with the associated Mann-Whitney U test statistics, represents the combined responses of respondents with regard to their level of satisfaction with the information provided during the Gautrain EIA (Question B(3a) 1, 2, 3 & 4 and for both public and the project proponent).

Mann-Whitney Test

Table 5.8: Mean ranking

	Respondents	N	Mean Rank	Sum of Ranks
The need and purpose of the project were clearly stated in 2002	Proponent	18	28,28	509,00
	Public	33	24,76	817,00
	Total	51		
Adequate information was provided on positive and negative impacts of the project in 2002	Proponent	18	33,00	594,00
	Public	33	22,18	732,00
	Total	51		
The data/maps provided were sufficient enough to enable you visualise the project in 2002	Proponent	18	35,50	639,00
	Public	33	20,82	687,00
	Total	51		
Sufficient time was given to assess and summit your concerns	Proponent	18	33,28	599,00
	Public	33	22,03	727,00
	Total	51		

Table 5.8 shows the mean ranking of both the project proponent and the public in terms of the question relating to the provision of adequate information.

Table 5.9: Test statistics

	The need and purpose of the project were clearly stated in 2002	Adequate information was provided on positive and negative impacts of the project in 2002	The data/maps provided were sufficient enable you visualise the project in 2002 enough to	Sufficient time was given to assess and summit your concerns
Mann-Whitney U	256,000	171,000	126,000	166,000
Wilcoxon W	817,000	732,000	687,000	727,000
Z	-0,857	-2,545	-3,487	-2,662
Asymp. Sig. (2-tailed)	0,391	0,011	0,000	0,008

From table 5.9, it is clear that the probability value (2-tailed significant test) of ,391 is less than the typical alpha decision level set at (p ≤ ,05) that is .391 < 1,96. This indicates that the need and purpose of the project were clearly stated during the Gautrain EIA. Both the public and the project proponents agreed on this issue.

In terms of adequate information on positive and negative impacts of the project, the z-score is -2,545 and the critical value is ,011. Since the probability value is smaller than the typical decision level set, that is, -2,545 > -1,96, the statement must be rejected. Adequate information was therefore not provided on the positive and negative impacts of the project. Here, the perception of the project proponent and the public differs on the issue of adequate information.

With regard to the provision of adequate data/maps to visualise the project, the z-score is -3,487 and the critical value is ,000. Here, the probability value is smaller than the set alpha, that is, -3,487 > -1,96. Thus, the data/maps provided were not sufficient to enable the public to visualise the project. This means that the public and proponent's perceptions differ in terms of this statement.

In relation to time given to the public to submit their concerns about the project, the z-score is -2,662, which is lower than the set critical value. This means that sufficient time was not given to the public to submit their concerns to the project proponent. This public and proponent's perceptions thus differ with regard to the amount of time needed for the public to submit their queries and concerns.

With regard to the frequency of contact, the calculated z-score is -2,786 while the asymptotic significance is ,005. This indicates that the calculated z-score is less than the set critical value. This statement must therefore be rejected. This means that the public and project proponent's perceptions differ with regard to the frequency of contact.

In summary, the table shows that both the public and the proponent felt that the need and purpose of the project was clearly stated in 2002; their perceptions about the others issues raised, however, differed. The alternative hypothesis set is therefore accepted and the null hypothesis is rejected. It is therefore possible to conclude from the public's point of view that insufficient information was provided during the

Gautrain EIA process, a position that was negated by the project proponent. The reliability of these variables (reliability of the measurement) is specified in table 5.10

Reliability test

Table 5.10 Description of item-total statistics on adequacy of information provided

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's Alpha if item deleted
The need and purpose of the project were clearly stated in 2002.	12,6863	19,700	,497	,894
Adequate information was provided on positive and negative impacts of the project in 2002.	13,4510	16,653	,755	,836
The data/maps provided were sufficient enough to enable you visualise the project in 2002.	13,5294	15,974	,843	,813
Sufficient time was given to assess and summit your concerns.	13,2157	15,373	,853	,809

Reliability statistics

Cronbach's Alpha	No of items
,838	4

Table 5.10 shows the descriptive statistics for the assessment of information provided during the Gautrain public participation process. All the items in this table have a Chronbach's alphas of greater than 0,70, and an average alpha of ,875. This is indicative of a good reliability test.

Hypothesis 2

H_{o2}: the response pattern of the public (interested and affected parties) has an impact on decision making

H_{a2}: the response patterns of the public (interested and affected parties) do not have an impact on decision making.

The following condensed table (table 5.11), containing the associated Mann-Whitney test, represents responses generated from the combined questionnaires (question B5 [2, 3 and 4]) of both the project proponent and the public that interrogates the impact of information feedback on management decisions of the Gautrain project.

Mann-Whitney test

Table 5.11: Mean ranking

	Respondents	N	Mean Rank	Sum of Ranks
Impact of information feedback on management decisions	Proponent	18	36,58	658,50
	Public	33	20,23	667,50
	Total	51		
Route alignment and other issues	Proponent	18	34,94	629,00
	Public	33	21,12	697,00
	Total	51		
Record of Decision	Proponent	18	36,94	665,00
	Public	33	20,03	661,00
	Total	51		

Table 5.11 shows the mean raking of both the project proponent and the public in terms of the impact of public input on management decisions.

Table 5.12: Test statistics

	Impact of information feedback on management decisions	Route alignment and other issues	Record of decision
Mann-Whitney U	106,500	136,000	100,000
Wilcoxon W	667,500	697,000	661,000
Z	-3,870	-3,266	-4,012
Asymp. Sig. (2-tailed)	0,000	,001	,000

A grouping variable: respondents

Table 5.12 shows that the z-score value for impact of information feedback on management decision is -3,870, while the two-tail probability value is .000. The z-score value -3,870 is greater than -1,96, the set alpha. This means that the project proponent and the public have different perceptions with regard to satisfaction relating to the impact of information feedback on management decisions. This means that information feedback does not have a significant impact on management decision.

Looking at the route alignment and other issues, the z-score is -3,266 while the two-tail test is .001. The z-score is far away from the acceptance level: -3.266 is greater than -1.96 (alpha) which means that there is a difference in the two samples. The proponent and public therefore have different perceptions with regard to their satisfaction with the route alignment and other issues. In addition, the z-score for the record of decision is -4,012, while the two-tail probability is .000. This indicates that the z-score falls within the rejection level, that is, -4,012 > -1,96 (set alpha). The difference indicates that the project proponent and the public have different perceptions in terms of their satisfaction with the record of decision.

The data generated shows that the z-score for all the items interrogated falls within the rejection level. The difference is so great that it suggests the sample population differs in terms of their level of satisfaction with the impact of feedback on management decision, route alignment and the record of decision. Therefore, H_a is accepted and the null hypothesis (H_o) is rejected. The response patterns of the

public (interested and affected parties) do not have an impact on decision making. The reliability of the measurement is indicated in table 5.13

Reliability rest

Table 5.13: Description of item-total statistics

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's Alpha if item deleted
Impact of information feedback on management decisions	6,1569	7,015	,870	,867
Route alignment and other issues	6,1569	7,375	,802	,922
Record of decision	6,0000	7,120	,859	,876

Reliability statistics

Cronbach's Alpha	No of items
0,923	3

From table 5.13, the descriptive statistics of the assessment of impact of public participation on management decisions indicates that all the three items have Cronbach's alpha greater than 70 with an average alpha of ,923. Therefore, the test is very reliable.

Hypothesis 3

H_{o3}: the process of public participation in the Gautrain project has been improved in recent times, especially when compared to the 2002 period.

H_{a3}: the process of public participation in the Gautrain project has not been improved in recent times, especially when compared to the 2002 period.

The following condensed table (table 5.14), containing associated Mann-Whitney significant tests, represents responses generated from question C1 (c) of both the project proponent and the public's questionnaires. The two corresponding questions elicited information about the process of public participation in the Gautrain project for the period 2002 to 2008.

Mann-Whitney Test

Table 5.14: Mean ranking

	Respondents	N	Mean Rank	Sum of Ranks
Opportunity to participate unlike before	Proponent	18	26,31	473,50
	Public	33	25,83	852,50
	Total	51		
Control of participation by individuals or groups unlike before	Proponent	18	23,81	428,50
	Public	33	27,20	897,50
	Total	51		
Time of meetings are not convenient unlike before	Proponent	18	31,47	566,50
	Public	33	23,02	759,50
	Total	51		
Venues of meetings are not accessible unlike before	Proponent	18	26,97	485,50
	Public	33	25,47	840,50
	Total	51		
Freedom of expression unlike before	Proponent	18	24,33	438,00
	Public	33	26,91	888,00
	Total	51		
Frequent update of I&AP on development of the project	Proponent	18	28,08	505,50
	Public	33	24,86	820,50
	Total	51		
Frequent contact with I&AP	Proponent	18	28,61	515,00
	Public	33	24,58	811,00
	Total	51		

Table 5.14 illustrates the mean ranking of both the project proponent and the public with regard to event trends for the period 2002 to 2008.

Table 5.15: Test statistics

	Equal opportunity to participate unlike before	Control of participation by individuals or groups unlike before	Time of meetings not convenient unlike before	Venue of meetings are accessible unlike before	Freedom of expression unlike before	Frequent update of I&AP on development of the project	Frequency of contact with I&AP
Mann-Whitney U	291,500	257,500	198,500	279,500	267,000	259,500	250,000
Wilcoxon W	852,500	428,00	759,500	840,500	438,000	820,500	811,000
Z	-,122	-,889	-1,995	-,356	-,630	-,791	-,973
Asymp. Sig. (2-tailed)	,903	,374	,046	,721	,528	,429	,331

From table 5.15, the z-score for item (1) 'there is equal opportunity for everybody to participate unlike before' is -,122 while the probability value is ,903. This simply means that z-score is within the critical value set for the hypothesis i.e. -,122 is < -1,96 which means that the sample score (z) does not fall in the region of rejection. Thus, one can conclude that there is equal opportunity for everybody to participate now, as compared to before. This signifies that both the project proponent and the public agreed that in recent time, there is equal opportunity for everyone to participate in the process, as compared to 2002.

On the control of participation by individuals or groups, the z-score is -,889 whilst the probability value is .374. This means that sample score (-,889) falls within the set critical value (-,889 < -1,96) so the statement would be accepted; the process of participation in recent time, is not controlled by one or more groups, as compared to the 2002 period. Both the project proponent and the public agreed with the statement.

Regarding the time of the meetings, the calculated z-score is -1,995 while the probability value is ,046 i.e. -1,995 is greater than -1,96 the alpha level. This means that the sample score falls in the region of rejection. Hence, the time of the meetings was not convenient unlike before. The perception of both the project proponent and the public differs in relation to the time of the meetings. Some of the respondents felt

that the time of the meetings in 2002 was more continent than now whilst others have contrary views.

With regards to venue of meetings, the z-score is -,356 whilst the probability value is ,721. This means that the sample score falls within the set critical region (-1,96 and 1,96), so we accept the statement; that the venue of meetings are now more accessible unlike before. This means that both the project proponent and the public agreed that the venue of the meetings is more accessible in recent time, as compared to 2002.

Also, the table shows that the z-score for freedom of expression is -,630 whilst the probability value is ,528. This signifies that the sample score falls within the set critical region i.e. -,630 is less than -1,96, so the statement would be accepted. Both the project proponent and the public agreed that individuals are now allowed to express their views, fears and values in recent times compare to 2002.

On whether the interested and affected parties are frequently updated on development of the project, the z-score value is -,791 whilst the probability value is ,429. This signifies that the sample score is within the set critical region, thus the statement is accepted. The perception of the project proponent and the public do not differ in terms of keeping them updated with the project development.

On how often the project proponent liaised with interested and affected parties, the z-score value is -,973 whilst the probability value is ,331. This simply indicates that the sample score falls within the set critical region (-1,96 and 1,96) thus the statement is accepted. The opinion of the project proponent and the public do not differ on this statement. Both groups of respondents felt that interested and affected parties are being liaised with regularly.

In summary, the opinion of both the project proponent and the public do not differ on most of the issues, except on the time of meetings, which was regarded as ‘not convenient’ now as compared to the 2002 period. Both the project proponent and the public felt that the process of participation is now generally better than in 2002. This indicates that the process of participation has been improved. Thus, the null hypothesis is accepted whilst the alternative hypothesis is rejected - the process of

public participation in the Gautrain project has been improved in recent times as compared to the 2002 period. The reliability of the test measurement is illustrated in table 5.16.

Reliability test

Table 5.16: Description of Item-total statistics

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's Alpha if item deleted
Opportunity to participate unlike before	20,9020	31,050	,600	,852
Control of participation by individuals or groups unlike before.	20,7647	31,904	,592	,853
Time of meetings not convenient unlike before.	21,5686	31,810	,473	,871
Venue of meetings are not accessible unlike before	21,0980	29,770	,708	,837
Freedom of expression unlike before	20,7843	29,733	,760	,831
Frequent update of I&AP on development of the project	20,6078	30,923	,664	,843
Frequency of contact with I&AP	20,7451	28,114	,700	,838

Reliability Statistics

Cronbach's Alpha	N of Items
.866	7

From table 5.16, descriptive statistics indicates that all the items have Chronbach's alpha that is greater than .70 with an average alpha of .866. Thus, the test is very reliability.

Hypothesis 4

H_{o4}: the process of participation in the Gautrain EIA does enhances the participant learning

H_{a4}: the process of participation in the Gautrain EIA does not enhances the participant learning

The following condensed table (table 5.17) containing associated Mann-Whitney significant tests, represents responses generated from questions C3 of both the project proponent and the public. The two corresponding questions elicit information on how the process of public participation in Gautrain EIA has enhanced the participant's learning.

Mann-Whitney test

Table 5.17: Mean ranking

	Respondents	N	Mean Rank	Sum of Ranks
Technical knowledge	Proponent	18	30,14	542,50
	Public	33	23,74	783,50
	Total	51		
Environmental impacts of the project	Proponent	18	30,44	548,00
	Public	33	23,58	778,00
	Total	51		
Benefits of the project	Proponent	18	30,81	554,50
	Public	33	23,38	771,50
	Total	51		
Construction and aesthetic nature of the project before	Proponent	18	28,83	519,00
	Public	33	24,45	807,00
	Total	51		
Opportunity to understand other people's claims/difficulty of providing solutions to them	Proponent	18	30,97	557,50
	Public	33	23,29	768,50
	Total	51		

Table 5.17 shows the mean ranking of both the project proponent and the public on the helpfulness of the Gautrain EIA process to their learning dynamics.

Table 5.18: Test Statistics

	Technical knowledge	Environmental impacts of the project	Benefits of the project	Construction and aesthetic nature of the project	Opportunity to understand other people's claims/difficulty of providing solutions to them
Mann-Whitney U	222,500	217,000	210,500	246,000	207,500
Wilcoxon W	783,500	778,000	771,500	807,000	768,500
Z	-1,565	-1,742	-1,894	-1,079	-1,959
Asymp. Sig. (2-tailed)	,118	,081	,058	,280	,050

A Grouping Variable: respondents

Table 5.18 shows that the z-score value for technical knowledge of the project is -1,565 whilst the probability value is ,118. This indicates that the sample score is lower than the set critical value. This implies that the sample score falls in the region of acceptance. Thus, the process of participation does improve the knowledge of the participants in terms of the technicalities of the project. Both the project proponent and the public agreed that the process enhanced their technical knowledge.

Regarding the knowledge of the environmental impacts of the project, the z-score value is -1,742 whilst the probability value is ,081. This shows that the sample test score falls within the region of acceptance. As a result, both the project proponent and the public felt that the process had been very helpful in terms of the environmental impacts of the project.

On the benefits of the project, the z-score value is -1,894 whilst the probability value is .058. This indicates that the sample score falls within the region of acceptance because it is not far away from zero (-1,96 and 1,96). Therefore, the project

proponent and the public believed that the process of participation has improved their understanding of the project benefits.

As regards to the construction and aesthetic nature of the project; the z-score value is -1,079 whilst the probability value is ,280. This reveals that the sample score falls within the region of acceptance. As a result, the process of public participation does increase the knowledge of the participants in the EIA process, as regards the construction and aesthetic nature of the project. However, the perception of the project proponent and that of the public differ in relation to the added knowledge of the construction and aesthetic nature of the project.

In terms of the opportunity to understand other people's claims and difficulty of providing solutions to them, the calculated z-score value is -1,959 while the probability value is ,050. This demonstrates that the sample score falls within the acceptance region. Thus, the process of participation does improve the ability of the participants to understand other people's claims and difficulty of providing reasonable solution to them. In other words, both the project proponent and the public felt that the process does enhance their learning capability. Table 5.19 illustrates the reliability of the measurement.

Reliability

Table 5.19: Description of item-total statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Technical knowledge	14,8627	15,561	,870	,852
Environmental impacts of the project	14,8824	16,346	,707	,886
Benefits of the project	14,9412	15,456	,809	,864
Construction and aesthetic nature of the project	15,0196	16,340	,694	,889
Opportunity to understand other people's claims/difficulty of solution	15,1961	15,961	,686	,892

Reliability Statistics

Cronbach's Alpha	N of Items
.899	5

Table 5.19 contains descriptive statistics for how the process of public participation in Gautrain EIA has enhanced the participant's learning. All the criteria have Chronbach's alphas of greater than 0,70 and an average alpha of ,899 indicating a good reliability.

In summary, the perception of both the project proponent and the public do not differ in terms of the factors under consideration except on the construction and aesthetic nature of the project. This simply confirms the earlier finding (hypothesis 1) that the public were not consulted earlier on the planning and designing of the project.

However, both the project proponent and the public agreed on the other factors identified; thus the null hypothesis (H_{03}) is accepted. This illustrates that the process of public participation does enhance the participants' learning.

5.7 Chapter summary

This chapter dealt with the analysis of the research instrument in relation to the research objectives and hypotheses testing. It looks at the demographic and socio-economic data of the respondents in terms of sex, age qualification, area of residence, and so on. It also examines the effectiveness of public participation in the Gautrain EIA process.

Issues discussed in this chapter range from the adequacy of the information supplied to the public by the project proponents, through to early participation of the public in the EIA process, access to information and representation, identification of significant impacts, information feedback, the impact of the information generated on decision-making, and other related matters. The next chapter will deal with the summary of the findings, conclusion and recommendation.

CHAPTER 6
SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

The results of the questionnaires were presented in chapter 5. Responses generated from the questionnaires were analysed and interpreted to achieve the objectives of the study and to test the research hypotheses. This final chapter aims to present a summary of findings and then recommend the necessary measures to improve public participation in environmental decision making.

6.2 Findings of the research

The findings of the research will be summarised to enable the researcher to come to reliable conclusions and to make valuable recommendations. The main findings will be presented in the next section.

6.2.1 The empirical research

The results of the data generated through the questionnaire were analysed in chapter 5. The responses of the public and the project proponent were analysed separately before testing the similarities/dissimilarities in some of the response patterns. The research hypotheses were tested using the Wilcoxon Mann-Whitney U test. The Wilcoxon Mann-Whitney U test was deemed appropriate to reveal information on the ordinal scale and, more specifically, because of its level of reliability in examining the differences between the two groups.

6.2.2 Demographic and socioeconomic data

The findings show that the project proponent and many of the public participants hold some form of formal education. It is clear that men are more involved in the Gautrain EIA process than their female counterparts. All of the respondents are adults.

6.2.2.1 Implications

If women and youth are less involved in issues relating to their lives and their environment, then the sustainability of a mega project like the Gautrain may not be achieved. The youth are the leaders of tomorrow and women are our nation's builders. They need to be actively involved in issues that affect their lives and wellbeing.

6.2.2.2 Recommendations

Women and youth should be encouraged to participate in environmental decision making. They should be educated about such projects through the media, since the findings indicate that most of the respondents were informed about the project through the media (especially newspapers). Meetings should also take place at times which are generally regarded as being convenient, such as over weekends, so that school activities, work and home chores do not prevent them from participating.

6.2.3 Effectiveness of public participation

6.2.3.1 Early participation in planning and designing of the project

An analysis of the first hypothesis shows that the public were not consulted in the initial states of the planning and design stages. The public only became involved in the project once the problem and the geographical demarcation of the project had been decided on by the project proponent. The process of public participation appears to have taken place only to "rubber stamp" the decision and possibly to solicit additional information on the project (as indicated by the questionnaire).

Public consultation in terms of the design of the project only took place after the project had been approved. The public's input at this stage cannot therefore be regarded as significant, since some crucial decisions were made before consulting the public.

6.2.3.2 Implication

The general public did not participate in the early stages of the project. This means that the project may fail to appeal to the needs of the people, that is, the very people who are supposed to benefit from the project. This participatory inertia may culminate in a loss of interest in the governance, thereby exacerbating tension between the two parties.

6.2.3.3 Recommendation

The long-term sustainability of the project is dependent on the participation and support of the people for whom the project was designed. The public needs to be involved early on in a project so that they can voice their needs and concerns about a project. All stakeholders should try to arrive at a point of consensus in order to provide an efficient and effective solution to the identified problem.

6.2.4 The impact of public input on decision making

The second hypothesis was based on the impact of the responses of the public (interested and affected parties) on the decision-making process of the Gautrain project. The findings indicate that public input did not have a noticeable impact on management decisions. The variables tested include impact of information feedback on management decisions, route alignment and other issues, and the satisfaction of the public with the project's record of decision.

6.2.4.1 Implication

Little incorporation of public input in decision making could discourage the public from playing an active role in other public participation processes. In addition, if the public comes to the realisation that their input is disregarded, this may lead to legal proceedings being brought against the project proponent or event protest action (like the protests that occurred in the Centurion area during the EIA process in that area). Metro rails coaches that were recently set ablaze by angry commuters may not be totally unconnected to the lack of buy-in by the users (interactive discussion with the public). This may delay the implementation of the project and cause an escalation in the cost of the project.

6.2.4.2 Recommendation

The input of the public should be incorporated in the decision-making so that they could appreciate and support the project implementation, as well as its smooth running. To achieve this, the public needs to be involved early so that they could realistically make changes that would reflect their need, values and perspectives in the final decision.

6.2.5 The process of public participation in the Gautrain project has been improved in recent times

The data generated demonstrates that the process of public participation in the Gautrain EIA has improved since the 2002/2003 period. There is equal opportunity for everybody to participate, the process was not controlled by one or more groups, and interested and affected parties were often updated in terms of developments and other issues. The responses generated, however, clearly show that there has not been much improvement in terms of freedom of expression.

6.2.5.1 Implication

All the stakeholders should be allowed to express their views and concerns about a project of this nature. If the process was controlled by individuals or some influential groups, as it was in the case of the Gautrain project, that may result in other people being deprived of their rights.

6.2.5.2 Recommendation

All members of the public should be allowed to express their views and concerns. Crucial decisions should also be made by all the interested and affected parties, and not only by their representatives or community associations (since the combined views may not be a true reflection of individual yearnings and aspirations).

6.2.6 The process of participation enhances learning

Having indicated that the process of participation has been improved, the data generated illustrates that the process does enhance participant's learning. The

public's satisfaction in terms of knowledge of the construction and the aesthetic nature of the project was low, especially when compared to other factors. Also, the research illustrates that much knowledge was not acquired in relation to opportunity to understand other people's claim and difficulty of providing solutions to them.

6.2.6.1 Implication

The findings confirm that the public were not consulted early enough in terms of the project planning. This affected participant knowledge about the construction and aesthetic nature of the project. This may translate into little support and low public appreciation of the project. Moreover, if the process does not afford the participants the opportunity to understand other people's claim, then meaningful change cannot occur in terms of their diverse value system beliefs.

6.2.6.2 Recommendation

Members of the public should be involved early during the design of the project so that they can really influence the project design. The process should also allow for cooperation and mutual understanding.

6.3 Overall summary

The findings from this empirical study indicate that the public were not consulted early enough in the project planning and design phases of this project. It also confirms the previous research undertaken by Coetzee (2003) and Donaldson (2005) on the impact of public input in decision-making processes. The study also demonstrates that the process of public participation has improved in recent times (when compared to the 2002/2003 period). Furthermore, the process has generally enhanced participant knowledge about the project.

6.4 General recommendation

The survey found that for genuine and effective participation to take place, the public needed to be involved early. This will increase public trust and support for the project right. Should it prove necessary, the public could also serve as a "watchdog" to monitor the project.

Also, there is the need to provide adequate information to the public on the need and purpose of the project, and information on the negative and positive impacts of the project. The data/maps provided should enable the public to visualise the project and sufficient time should be given to the public in this regard (e.g. 45 days instead of the 30-day period that characterised the Gautrain project).

It has also been established that broad-based participation will allow more information to be generated. The process should afford interested and affected parties equal opportunities to participate, and the venue and time should be accessible and convenient for effective participation.

Furthermore, the public input should have a significant impact on the decision-making process, and the process should enhance the participants' knowledge about the project. The public needs to be informed (educated) about the benefits of their active participation in the environmental impact assessment process. There should be an intensive and ongoing direct media campaign on environmental issues both locally and globally.

The involvement of the public should go beyond the project approval stage and span through to the project implementation and monitoring stages of mitigatory measures. Such active involvement of the public may positively influence the project proponent to reduce or minimise the negative impacts of the project on the community, thereby ensuring the use of available resources in a more efficient and sustainable way. In addition, incentives and/or refreshments should be given to the participants during meetings. This might encourage them to participate more.

6.5 Further research

Further research could be carried out to determine whether there is difference in the perceptions of those who have been participating in the Gautrain EIA process since its inception, and those who recently got involved in the process (i.e. after the project approval).

Furthermore, this research shows that public participation is higher during open days than during community liaison forums. This may be attributed to the timing and the

refreshments that were provided during the open days. Further research could be carried out to shed more light on these and related issues.

6.6 Conclusion

Members of the public needs to be involved early on in a project if they are to participate effectively, as this allows them to influence a project. This is important for the sustainability of the project.

In addition, adequate information should be given to interested and affected parties, because an inadequately informed public is unable to make objective decisions on the impact of the project on their wellbeing, lifestyles and the environment. The information generated during the process of public participation should have a noticeable impact on the final decisions (RoD). The process should enhance participative learning. Through these factors, the process of public participation could enhance sustainable development.

LIST OF REFERENCES

Afgan, N. H., Bogdan, Z. and Duić, N. (eds) 2004. *Sustainable development of energy, water and environment systems.* The Netherlands: A.A. Balkema**.**

Agger, A. and Löfgren, K. 2008. Democratic assessment of collaborative planning process. *Planning Theory* 7(2): 145- 164.

Agyeman, J. and Angus, B. 2003. The role of civic environmentalism in the pursuit of sustainable communities. *Journal of Environmental Planning and Management* 46 (3): 345-363.

Amended Record of Decision, 2004. Available at http://www.gautraineia.co.za [accessed: 2008/03/15].

Ananda, J. 2007. Implementing participatory decision making in forest planning. *Environmental Management* 39(4): 535-544.

André, P., Enserink, B., Connor, D. and Croal, P. 2006. *Public participation international best practice principles*. Special publication series No 4. Fargo, USA: International Association for Impact Assessment. Available at http://www.iaia.org [accessed: 2008/01/21]

Arnstein, S.R. 1969. A ladder of citizen participation. *Journal of the American Planning Association*.35:216-224.

Artini, T. 2002. Partnerships and participation in environmental impact assessment. In B. Mitchell, (ed). *Resources and environmental management* 2nd edition. England: Pearson Education Limited.

Atkinson, D. 1992. *Let the people decide?: Public participation in urban planning.* Johannesburg, South Africa: Centre for Policy Studies.

Bamberger, M. 1990. Methodological issues in the evaluation of community participation projects. *Sociological Practice*: 208-225.

Barrow, C. J. 2006. *Environmental management: for sustainable development 2nd edition*. London: Routledge.

Benjamin, C. and Lourens, C. 2006. Protest over routes threaten Gautrain. *Business Day* June 12.

Bisset, R. 1983. Introduction to methods for environmental impact assessment. *In PADC Environmental impact assessment and planning unit (ed).* Environmental impact assessment. The Netherlands: Martinus Nijhoff Publishers.

Bless, C. and Higson-Smith, C. 2000. *Social research methods: an African perspective 3rd edition*. Cape Town: Juta Education Ltd.

Bohlweki, 2002. *Environmental impact assessment for the proposed Gautrain rapid rail link between Johannesburg, Pretoria and Johannesburg International Airport.* Volume 1: Executive Summary.

Bregman, J. I. 1999. *Environmental impact statements* 2nd edition. London: Lewis Publishers.

Brown, D. 1972. The management of advisory committees. *Public Administration Review* 32(4):334-342.

Brynard, D.J. 1996. Public participation in local government and administration: bridging the gap. *Politeia* 15(2): 39-51.

Brynard, P. A and Hanekom, S. X. 2006. *Introduction to research in management-related fields* 2nd edition. Pretoria: Van Schaik Publishers.

Buchy, M. and Race, D. 2001. The twists and turns of community participation in natural resource management in Australia: what is missing? *Journal of Environmental planning and management* 44 (3): 293-308.

Burby, R. J. 2003. Making plans that matter: citizen involvement and government action. *Journal of the American Planning Association* 69(1):33-49.

Burns, N. and Grove, S. K. 2001. *The practice of nursing research: conduct, critique and utilisation* 4th edition. Philadelphia: W.B Saunders.

Cashmore, M. 2007. The contribution of environmental assessment to sustainable development: toward a richer conceptual understanding. In C. George, and C. Kirkpatrick, (eds). *Impact assessment and sustainable development*. United Kingdom: Edward Elgar Publishing Ltd.

Charnley, S and Engelber, B. 2005. Evaluating public participation in environmental decision-making: EPA's superfund community involvement programme. *Journal of environmental management 77*:165-182.

Chenoweth, J. L., Ewing, S. A. and Bird, J. F. 2002. Procedures for ensuring community involvement in multi-jurisdictional river Basins: a comparison of the Murray-Darling and Mekong river basins. *Environmental management* 29(4):497-509.

Chess, C. 2000. Evaluating environmental public participation: methodological questions. *Journal of Environmental planning and Management* 43 (6): 769-784.

Chilvers, J. 2008. Deliberating competence: theoretical and practitioner perspectives on effective participatory appraisal practice. *Science Technology and Human Values* 33(2): 155-185.

Citizen 2006. Gautrain at a glance: Gautrain more than just a train. 31st October 2006.

Clark, B.D. 1983*. The aims and objectives of environmental impact assessment. In PADC Environmental impact assessment and planning unit (ed).* Environmental impact assessment. The Netherlands: Martinus Nijhoff Publishers.

Clark, N. 2002. Environmental impact of the Shilowa express. *Star* 15th January 2002.

Coetzee, N. 2003. *Die impak publieke deelname op groot projekte: die beoogde Johannesburg-Pretoria sneltrein*. Unpublished dissertation.

Connelly, S. 2006. Looking inside public involvement: how is it made so ineffective and can we change this? *Community Development Journal* 41(1):13-24.

Construction technology and machines. 2008. Available at www.gautrain.co.za[accessed 2008/09/20].

Cornwall, A. 2003. Whose voices? Whose choices? Reflections on Gender and participatory development. *World Development* 31(8): 1325-1342.

Curi, K. 1983. Environmental impact assessment from the point of a view of developing country. In PADC Environmental impact assessment and planning unit (ed). *Environmental impact assessment*. The Netherlands: Martinus Nijhoff Publishers.

Dalal-Clayton, B. 2000. Sustainable development: concepts and approaches. Available at http://www.nssd.net/references/SustDev.htm [accessed 2008/04/30].

Daniels, S. E. and Walker, G. B. 1996. Collaborative learning: improving public deliberation in ecosystem-based management. *Environmental Impact assessment Review* 16(2): 71-102.

Davids, I., Theron, F. and Maphunye, K. J. 2005. *Participatory development in South Africa: a development management perspective*. Pretoria: Van Schaik Publisher.

Delport, C. S. C. 2005. Quantitative data collection methods. 3rd edition. In A de Vos, H. Strydom, C. B. Fouché, and C. S. C. Delport (eds). *Research at grass roots: for the social sciences and human service professionals.* Pretoria: Van Schaik Publisher.

Department of Environmental Affairs. 1992. *The integrated environmental management procedure*. Documents 1 to 6, Pretoria: DEAT.

Department of Environmental Affairs and Tourism (DEAT). 1998. *Guideline document: EIA Regulations, Implementation* of Section 21, 22 and 26 of the Environment Conservation Act. Pretoria: DEAT.

Department of Environmental Affairs and Tourism (DEAT). 2000. *Environmental authorizations/Permits in terms of environmental legislation.* Pretoria: DEAT.

Department of Environmental Affairs and Tourism (DEAT) 2002. *Stakeholder engagement: integrated environmental management information series 3*. Pretoria: DEAT.

Devuyst, D. 1993. Environmental impact assessment. In B. Nath, L. Hens, and D. Devuyst (eds), *Environmental management: instrument for implementation* Vol 3. Brussels : VUB University Press

Doelle, M. and Sinclair, A. J. 2006. Time for new approach to public participation in EA: promoting cooperation and consensus for sustainability. *Environmental Impact Assessment Review* 26(2): 185-205.

Donaldson, R. (2005). Contesting the proposed rapid rail link in Gauteng. *Urban Forum* 16(1): 55-62.

Duthie, A. G. 2001. A review of provincial environmental impact assessment administrative capacity in South Africa. *Impact assessment and Project Appraisal* 19(3): 215-222.

Enserink, B. and Monnikhof, R. A. H. 2003. Information management for public participation in co-design process: evaluation of a Dutch example. *Journal of Environmental Planning and Management* 46 (3): 315-344.

Enserink, B. and Koppenjan, J. 2007. Public participation in China: sustainable urbanisation and governance. *Management of environmental Quality* 18(4): 459-474.

Fiorino, D. 1990. Citizen participation and environmental risk: a survey of institutional mechanisms. *Science, Technology, & Human Values* 15(2): 226-243.

Fischhoff, B., Slovic, P. and Lichtenstein, S. 1981. The public versus the experts: perceived versus actual disagreements about the risks of nuclear power. In V. T. Covello, W. G. Glamm, J. V. Rodricks, and Tardiff (eds). *The analysis of actual versus perceived risks*. New York: Plenum Press.

Fowke, R. and Prasad, D. 1996. Sustainable development, cities and local government. *Australian Planner* 33: 61-66.

Fox, D. 1979. *Public participation in the administrative process*. Ottawa, Law Reform Commission of Canada.

Freeman, M. 2004. Gautrain Environmental Impact Assessment. Available at www.gautrain.co.za/contents/presentations/gautrain_eia_mfreeman.pdf [accessed 2008/06/15].

Fuggle, R. F. and Rabie, M. A. 2005. *Environmental management in South Africa*. Cape Town: Juta & Co, Ltd.

Garlauskas, A. B. 1975. Conceptual framework of environmental management. *Journal of Environmental Management* 3(2): 185-203.

Gauteng Companies 2007: A business guide to Gauteng.

Gautrain recommended route. 2004. Available at http://www.gautrain.co.za [accessed 2008/10/29].

Gautrain objectives, 2007. Available at http://www.gautrain.co.za [accessed 2008/09/20].

Gelhorn, E. 1971. Public participation in administrative proceedings. *Yela Law Journal* 81:359-387.

George, C and Kirkpartrick, C. (eds) 2007. Impact assessment and sustainable development: an introduction. In C. George and C. Kirkpartrick, (eds). *Impact assessment and sustainable development: European practice and experience.* U.K: Edward Elgars Publishing Ltd.

Gilpin, A. 1995. *Environmental impact assessment (EIA): cutting edge for the twenty-first century*. Cambridge: Cambridge University Press.

Glazewski, J. 2005. *Environmental law in South Africa. 2nd edition*. Durban: Butterworths.

Hall, I. And Hall, D. 2004. *Evaluation and social research: introducing small-scale practice.* New York: Palgrave.

Hamann, R., Booth, L. and O'Riordan, T. 2000. South African environmental policy on the move. *South African Geographical Journal* 82(2): 11-22.

Hirji, R., Johnson, P., Maro, P. and Chivta, T. M. (eds) 2002. *Defining and mainstreaming environmental sustainability in water resource management in South Africa.* Washington DC: SADC, IUCN, SARDC, World Bank.

Hughes, R. 1998. Environmental impact assessment and stakeholder involvement. In: A. Dounelly, B. Dalal-Clayton, and R. Hughes, (eds). *A directory of impact assessment guidelines. 2nd edition.* Institute for Environment and Development (IIED).

Innes, J. E. 2004. Consensus building: clarification for the critics. *Planning Theory* 3(1): 5-20.

Irwin, A. 2001. Constructing the scientific citizen: science and democracy in the biosciences. *Public Understanding of Science* 10(1): 1-18.

Iyer-Raniga, U. and Treloar, G. 2000. A context for participation in sustainable development. *Environmental Management.* 26(4): 349-361.

Jackson, S.L. 2006. *Research methods and statistics: a critical thinking approach*. USA: Thomson Wadsworth.

Jackson, T. and Dixon, J. 2006. Applying strategic environmental assessment to land-use and resource-management plans in Scotland and New Zealand: a comparison. *Impact Assessment and Project Appraisal* 24 (2): 89-101.

Jain, R. K., Urban, L. V., Stacey, G. S. and Balbach, H. E. 1993. *Environmental assessment.* New York: McGraw-Hill, Inc.

Jay, S., Jones, C., Slinn, P. and Wood, C. 2007. Environmental impact assessment: retrospect and prospect. *Environmental Impact Assessment Review* 27(4): 287-300.

Keen, M., Brown, V. and Dyball, R. (eds) 2005. *Social learning in environmental management: towards a sustainable future*. London: Earthscan

Kenyon, W. and Edward-Jones, G. 1998. What level of information enables the public to act like experts when evaluating ecological goods? *Journal of Environmental Planning and Management.* 41 (4): 463-475.

Khan, F. 1998. Public participation and environmental decision making in South Africa – the Frankdale environmental health project. *South African Geographical journal* 80(2):73-80.

Khan, F. 2002. The roots of environmental racism and the rise of environmental justice in the 1990s. In D.A McDonald (ed). *Environmental justice in South Africa.* Cape Town: University of Cape Town Press.

Knaap, G. J., Matier, D. and Olshansky, R. 1998. Citizen advisory groups in remedial action planning: paper tiger or key success? *Journal of Environmental planning and management* 41 (3): 337-354.

Kontic, B. 2000. Why are some experts more credible than others? *Environmental Impact Assessment Review* 20(4): 427-434.

Krimsky, S. and Plough, A. 1988. *Environmental hazards: Communicating risks as a social process*. Dover, M A. Auburn House.

Lane, M. B. and McDonald, G. 2005. Community-based environmental planning: operational dilemmas, planning principles and possible remedies. *Journal of Environmental planning and management* 48 (5): 709-731.

Lάng, I. 1993. Environmental management and sustainable development. In B. Nath, L. Hens, and D. Devuyst (eds). *Environmental management: instruments for implementation.* Brussels: VUBPRESS.

Lawrence, D. P. 1997. Integrating sustainability and environmental impact assessment. *Environmental Management* 21(1): 23-42.

Leeuwis, C. 2000. Reconceptualising participation for sustainable rural development: towards negotiation approach. *Development and Change* 31 (5): 931-959.

Lindeque, A. S. and Cloete, C. E. 2005. Public participation in lower and higher socio-economic areas in South Africa. *Acta Stuctilia* 12(2):25-41.

Lohani, B., Evans, J. W., Ludwig, H., Everitt, R. R., Carpenter, R. A. and Tu, S. L. 1997. *Environmental impact assessment for developing countries in Asia Vol one overview.* Asia: Asian Development Bank.

Lubisi, D., wa ka Ngobeni, W., and Mahlangu, D. 2006. Bidder pushed up Gautrain's cost. *Sunday Times* 3rd December.

MacKay, A. 1998. *Concepts and process of public participation: conceptual briefing note.* In *Public participation in electric power projects (an emerging issue in Asia*). Bangkok: United Nations Economic and Social Commission for Asia and Pacific.

Mantzara, B. 1998. *Public participation: guidelines for the organisation of round table discussion.* Greece: Mediterranean information office for environment culture and sustainable development.

Margerum, R. D. 1995. Integrated environmental management moving from theory to practice. *Journal of Environmental Planning and Management* 38(3): 371-392.

Martens, S. 2006. Public participation with Chinese characteristics: citizen consumers in China's environmental management. *Environmental Politics* 15(2): 211-230.

Mathabatha, S. and Naidoo, D. 2004. *A review of public participation in the rural water and sanitation setting. Report to the Water Research Commission*. Gezina, South Africa: Water Research Commission.

McBurney, D. H. and White, T. L. 2007. *Research methods* 7th edition. USA: Thomson Wadsworth.

McEwan, C. 2003. Bringing government to the people': women, local governance and community participation in South Africa. *Geoforum* 34(4): 469 -481.

Melnick, D., McNeely, J., Navarro, Y. K., Schmidt-Traub, G. and Sears, R. R. 2005. *UN Millenium Project. Environment and human well-being: a practical strategy.* Report of the task force on Environmental Sustainability.

Miller, G. T. 2004. *Living in the environment* 13th edition. Belmont, California:Wadsworth.

Mitchell, B. 2002. *Resources and environmental management* 2nd edition. England: Pearson Education Limited.

Moote, M. A. and Mc Claran, M. P. 1997. Implications of participatory democracy for public land planning. *Journal of Range Management* 50(5): 473-480.

Moote, M. A., McClaran, M. P. and Chickering, D. K. 1997. Theory in practice: applying participatory democracy theory to public land planning. *Environmental management* 20(6): 877-889.

Moreyra, M. and Warner, J. 2007. Participating in watershed management: policy and practice in the Trahunco Watershed. In J. Warner (ed), *Multi-stakeholder platforms for integrated water management.* England: Ashgate Publishing Limited.

Morgan, M. G., Fischhoff, B., Bostrom, A., Lave, L. and Atman, C. J. 1992. Communicating Risk to the Public: First learn what people know and belief. *Environment Science and Technology* 26(11):2048-2056.

Morrisey, J. 2000. Indicators of citizen participation: lesson from learning teams in rural EZ/EC communities. *Community Development Journal* 35(1): 59-74.

Mudzuli, K. 2006. Gautrain on track. *Citizen* 29th September 2007.

Muller, J. 2007. Gautrain hikes Sandton CBD property values. *City Press* 10th June 2007.

Nanda, V. P. and Pring, G. 2003. *International environmental law and policy for the 21st century.* New York: Transnational Publishers, Inc.

O'Riordan, T. and Stoll-Kleemann, S. 2002. *Biodiversity, sustainability, and human communities: protecting beyond the protected.* Cambridge: Cambridge University Press.

Palerm, J. R. 2000. An empirical-theoretical analysis framework for public participation in environmental management. *Journal of Environmental Planning and Management* 43 (5): 581-600.

Palerm, J. and Aceves, C. 2004. Environmental impact assessment in Mexico: an analysis from a 'consolidating democracy' perspective. *Impact Assessment and Project Appraisal,* 22(2): 99-108.

Parahoo, K. 2006. *Nursing research: principles, process and issues* 2nd edition. New York: Palgrave Macmillan.

Pearce, J.A. and Robinson, R.B. 2003. *Strategic management formulation, implementation, and control. 8th edition.* New York: McGraw-Hill.

Petts, J. 2001. Evaluating the effectiveness of deliberative processes: waste management case-studies. *Journal of Environmental Planning and Management* 44(2): 207-226.

Pretty, J. N. 1995. Participatory learning for sustainable agriculture. *World Development* 23(8): 1247-1263.

Project impact. 2002. Available at www.gautraineia.co.za [accessed 2007/08/28].

Prophet, C. 1990. Public Participation, executive discretion and environmental assessment: confused norms, uncertain limit. Toronto: University of Toronto, *Faculty of law review* 278-303.

Rabie, A. 1990. A new deal for environmental conservation: aspects of the Environment Conservation Act 73 0f 1989. *Tydskrif vir Hedendaagse Romeins-Hollandse Reg* 39:40-65.

Reinard, J. C. 2006. *Communication research statistics*. California: Sage Publication.

Republic of South Africa, 1989. Environment Conservation Act (Act 73 of 1989). In *Government Gazette*, 288(11927). Pretoria: Government Printer.

Republic of South Africa, 1996. Constitution of the Republic of South Africa (Act 108 0f 1996). In *Government Gazette*, 378(17678). Pretoria: Government Printer.

Republic of South Africa, 1997a. White Paper on Environmental Management Policy for South Africa (Notice 1096 of 1997). In *Government Gazette*, 385(18164). Pretoria: Government Printer.

Republic of South Africa, 1998. National Environmental Management Act (Act 107 of 1998). In *Government Gazette*, 401(19519). Pretoria: Government Printer.

Robson, C. 2007. *How to do research project: a guide for undergraduate students*. Malden, MA: Blackwell Publishing.

Rowe, G., Horlick-Jones, T., Walls, J. and Pidgeon, N. 2005. Difficulties in evaluating public engagement initiatives: reflections on an evaluation of the UK GM Nation? Public debate about transgenic crops. *Public Understanding of Science* 14(4): 331-352.

Saarikoski, H. 2000. Environmental impact assessment (EIA) as collaborative learning process. *Environmental Impact Assessment Review* 20(6): 681- 700.

Sadler, B. 1996. *International study of the effectiveness of environmental assessment in a changing world: Evaluating practice to improve performance*. Canadian Environmental Assessment Agency and the International Association of Impact Assessors.

Sapa. 2007. Construction teams plumb depths for Gautrain tunnel. *Star*, 7th June 2007.

Selman, P. 2004. Community participation in the planning and management of cultural Landscapes. *Journal of Environmental Planning and Management* 47(3): 365-392.

Sewell, W. R. D. and Coppock, J. T. 1977. A perspective on public participation in planning. In W. R. D Sewell and J. T. Coppock (eds), *Public participation in plann*ing. London: John Wiley & Sons.

Sewell, W. R. D. and Phillips, S. D. 1979. Models for evaluation of public participation programmes. *Natural Resources Journal* 19(2): 337-358.

Shepherd, A. and Bowler, C. 1997. Beyond the requirements: improving public participation in EIA. *Journal of Environmental Planning and Management* 40 (6): 725-738.

Shilowa, M. 2001. Gautrain rapid rail link investor conference. Available at www.info.gov.za/speeches/2001/0109041145a1001.htm [Accessed: 2007/03/12].

Sinclair, J and Diduck, A. 1995. Public education: an undervalued component of the environmental assessment public involvement process. *Environmental Impact Assessment Review* 15(3):219-240.

Sowman, M., Fuggle, R. and Preston, G. 1995. A review of the evolution of environmental evaluation procedures in South Africa. *Environmental Impact Assessment Review* 15(1): 45- 67.

Star, 2006. Partnering for success on a PPP project. *Star*, 29th September 2006.

Statistics South Africa. 2006. The Gross National Product from 1999 – 2005.Available at www.statssa.gov.za [Accessed: 2007/29/08].

Thomas, I. and Elliott, M. 2005. *Environmental impact assessment in Australia: theory and practice 4th edition*. Australia: The Federation Press.

United Nations Conference on Environment and Development (UNCED). 1992. *Agenda 21: Report of the United Nation Division for Sustainable Development, 3-14 June.* Rio de Janeiro, Brazil. New York: Oceana Publications.

Van der Westhuizen, J. 2007. Glitz, Glamour and the Gautrain: Mega-Projects as Political Symbols. *Politikon*, 34 (3): 333-351.

Walliman, N. and Baiche, B. 2001. *Your research project: a step-by-step guide for the first-time researcher*. London: SAGE Publications.

Webler, T., Kastenholz, H. and Renn, O. 1995. Public participation in impact assessment: a social learning. *Environmental Impact Assessment Review* 15(5): 443-463.

Webler, T. and Tuler, S. 2000. Fairness and competence in citizen participation: theoretical reflections from a case study. *Administration and Society* 32(5): 566-595.

Weston, J. 2004. Environmental impact assessment in a risk society. *Journal of Environmental Planning and Management* 47(2): 313-325.

Wiesner, D. 1995. *The environmental impact assessment process: what it is and how to do one*. Britain: Prism Press.

Williams, C.C. and Millington, A.C. 2004. The diverse and contested meanings of sustainable development. *The Geographical Journal* 170 (2): 99-104.

Williams, D. 2007. Daily digging of 11m puts Gautrian on track so far. *Star*, 5th July 2007.

Wilson, N. 2007. Gautrain to drive growth in Sandton. *Business Day* 8th June 2007.

Wiseman, K and Roussouw, N. 2004. Learning from the implementation of environmental public policy instruments after the first ten years of democracy in South Africa. *Impact Assessment and Project Appraisal* 22(2):131-140.

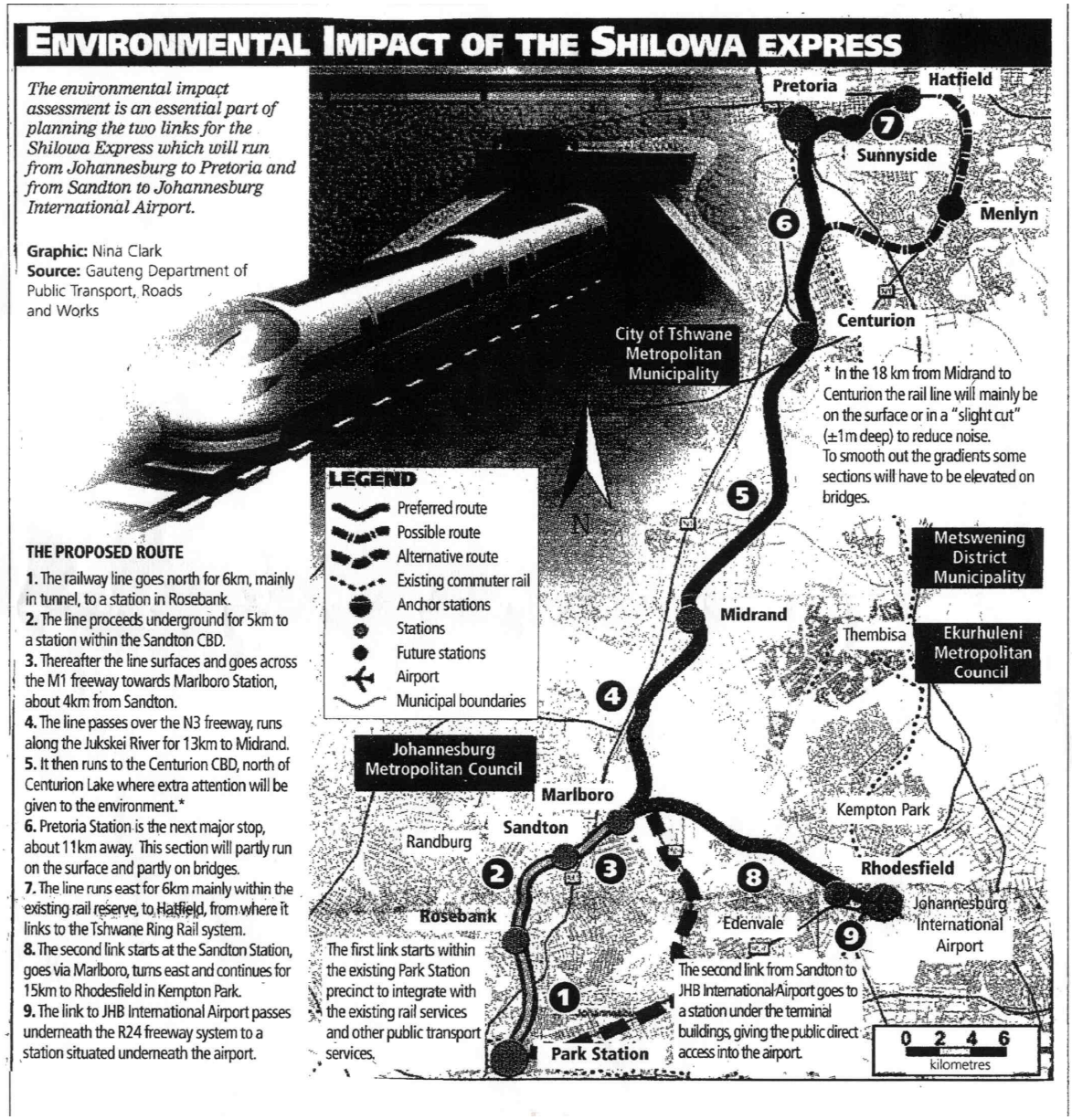
Wisker, G. 2008. *The post graduate research handbook 2nd edition.* New York: Palgrave Macmillan.

World Bank 1996. *The World Bank Participation Sourcebook.* Washington DC. Available at http://www.worldbank.org/wbi/sourcebook/sbhome.htm [accessed 2007/11/22].

World Commission on Environment and Development (WCED) 1987. *Our common future.* Oxford: Oxford University Press.

List of Appendices

Appendix 1: Proposed route



Proposed route (Clark, 2002:1)

Appendix Two: Proposed route alignment and alternatives

At the outset of the project it was determined most appropriate to develop the rail route based on a primary north-south spine between Johannesburg and Pretoria, and a secondary east-west spine between Johannesburg and JIA.

Station locations were evaluated in terms of pre-determined criteria such as existing land use and residential density, current and future growth potential, accessibility and road capacity, amongst other criteria. Ten critical nodes were ultimately decided upon for station locations for the Gautrain project as listed above. It is at station locations where the demand for travel is served and, therefore, the route alignment is largely dictated by proposed station locations. Based on the results of evaluations of various alignments, a baseline alignment has been selected.

Alternative alignment

Alternative alignments are being considered in the following areas:

- **Alternative Alignment at Randjiesfontein** -This alternative deviates from the baseline alignment just north of Grand Central Airport and runs along the K101 (old Pretoria-Johannesburg road). It joins the baseline alignment just north of the crossing with the Danie Joubert Freeway (N1) and John Vorster Drive.

- **Alternative Alignment at Centurion** - This alternative deviates from the baseline alignment just north of the crossing with John Vorster Drive, from where it runs in a westerly direction. It links up with the baseline alignment just north of the northern boundary of Centurion. This alignment avoids most of the residential developments in Lyttleton Manor and the Lyttleton Agricultural Holdings.

- **Park Street Alternative Alignment in Pretoria** -This alternative alignment begins north of Eeufees Road and proceeds north-west. It curves eastwards, tunnels underneath Salvokop and passes Pretoria Station north of Railway Road. The alignment proceeds from Pretoria Station in a north-easterly direction towards the crossing of Rissik Street and Nelson Mandela Drive.

After crossing Nelson Mandela Drive this proposed alignment continues to the north on the eastern side of Nelson Mandela Drive. After crossing Esselen Street, the alignment curves to the east to follow the alignment of Park Street to Hatfield Station.

Discarded Alignment

A number of other alternative alignments have been investigated. These have included a route via Melrose Arch and the Wanderers between Johannesburg and Sandton, an alternative via Bruma Lake to Marlboro, as well as a route along the Braamfontein Spruit between Marlboro and Johannesburg.

These alternatives have not been shown to be viable due to a number of factors.

These factors include, amongst others, economic and financial feasibility linked to potential lower levels of users, technical factors (e.g. gradient), environmental feasibility and infrastructure and operating costs.

The baseline alignment

The baseline alignment is also the preferred alignment at this stage. A corridor of approximately 1km in width has been selected to allow for refinements of the alignment based on the findings of the EIA.

However, there are certain sections of this alignment that are still under investigation, and that have not been finally proposed as yet.

Proposed Route

JOHANNESBURG-JIA SPINE

From Johannesburg to JIA the route follows the same alignment described above from Johannesburg Park Station to Marlboro Station. At Marlboro Station the proposed route turns towards the south-east, crosses the Marlboro Road interchange on the N3, and continues along the northern edge of both Modderfontein and the Linbro Park Agricultural Holdings.

It proceeds north of the Modderfontein Golf Course towards the southern edge of Esther Park. The route then passes between Spartan Ext. 1 and the Kelvin Power Station, and proceeds to the proposed Rhodesfield Station just south of Ventura Street in Rhodesfield Township before crossing beneath the R21 highway and into JIA.

JOHANNESBURG-PRETORIA SPINE

The rail link commences at Johannesburg Park Station and proceeds in a northerly direction towards Sandton. This entire section is tunnelled. It crosses beneath the M1 and continues under Oxford Road to Rosebank. North of Rosebank the route continues beneath Dunkeld and Hyde Park under Melville Road up to Rivonia Road. It then proceeds beneath Rivonia Road to Sandton.

From Sandton, the route will be above-ground as it passes through Sandown. It enters a tunnel again, passing underneath the M1 highway to Marlboro Station. From Marlboro Station the route is at ground level again. The proposed route then passes north of Alexandra and continues eastwards along Marlboro Road, before turning north towards Buccleuch. It continues towards the proposed Midrand Station west of Grand Central Airport.

From Midrand Station the route diagonally crosses Glen Austin Agricultural Holdings and proceeds east of the Randjiesfontein Training Centre. It enters the Centurion CBD via an open tract of land through Highveld Techno Park, crosses over the John Vorster interchange with the N1, and continues towards the northern side of Centurion Lake.

From Centurion Station, the proposed route runs through the residential areas of Lyttleton Manor and the Lyttleton Agricultural Holdings. The route joins the existing Spoornet railway alignment at Kloofsig Station. It then follows this existing railway alignment on its western side to Pretoria Station.

The last section of the proposed high speed rail link turns east from Pretoria Station towards Hatfield and follows the existing Spoornet rail alignment for most of the route. The route crosses the north eastern end of Muckleneuck and the northern end

of Magnolia Dell. From there the route follows the existing rail alignment to Hatfield Station.

Route Alternatives Selection

Johannesburg Park Station to Sandton Station (length 11 km)

The reference route alignment is proposed to commence in tunnel at the existing Johannesburg Park Station in the Johannesburg CBD, pass deep beneath the eastern side of the hill on which stands the Johannesburg Hospital, and then proceed in a northerly direction. The alignment is planned to remain in an underground tunnel for the entire length up to Sandton, passing Killarney and continuing beneath Oxford Road to Rosebank. North of Rosebank, the route is proposed to continue beneath Dunkeld, under Melville Road to Rivonia Road. It then proceeds beneath Rivonia Road to the proposed new Sandton Station located underneath Rivonia Road between Fifth Street and West Street, adjacent to the Sandton Library site.

Alternative routes along this section of the line, which emerged during the public participation process and which were included in the EIA, were:

- An alternative route under Fricker Road between Rosebank and Sandton; and
- An alternative route under Oxford Road between Rosebank and Sandton.

The EIA recommendation:

Studies undertaken as part of the EIA revealed no significant differences in the environmental impacts of the proposed alignments in the Rosebank to Sandton area and therefore no preferred alignment is recommended from an EIA perspective.

The noise and vibration specialist studies revealed no difference in impact among the three routes that were investigated, since the tunnel will be deep below ground along most of its length in this area and no noise or vibration will be heard or felt at the surface. The noise and vibration limits set for the Gautrain will not be exceeded. The reference route is the preferred from a technical point of view and therefore is

recommended as the preferred Gautrain alignment between Rosebank and Sandton. Loss of borehole water in the direct line of the tunnel should be compensated as part of the expropriation process. Careful placement and design of tunnel ventilation shafts will mitigate the localised impacts of these ancillary facilities. An important recommendation of the EIA for this section of the line was the placement of the parking and supporting infrastructure for Rosebank Station to the west of Oxford Road rather than to the east in Melrose. This will integrate these supporting facilities with the existing Rosebank commercial node.

Sandton Station to Marlboro Station (length 4 km)

From the proposed new Sandton Station, the reference route alignment remains in a tunnel below Rivonia Road and passes underneath Pretoria Road towards Mushroom Farm Park. The alignment surfaces for a short section through Mushroom Farm Park, and again returns into a tunnel before Linden Road. It tunnels to the east side of Katherine Street before surfacing again and crossing over Grayston Drive, and passing on a viaduct through Innisfree Park. It enters a tunnel once again to pass underneath the M1 Highway. It then surfaces at the proposed Marlboro Station on the sports grounds in Marlboro Gardens, between Islamabad Drive and Jumna Street.

Alternative routes proposed for evaluation in the EIA in the Sandton/Marlboro area included:

- an alignment running through Sandown and Strathavon, largely underground beneath Daisy Street and North Road - the route surfaces briefly to cross the Sandspruit;
- an alignment fully in tunnel to follow a straight line from Sandton Station to Marlboro Gardens;
- an alternative Marlboro Station location near the intersection of Marlboro Drive and the N3 Highway which links to the above two route alignments; and
- a refined reference route alignment able to link with the alternative Marlboro Station location and route alignment beneath Marlboro Drive.

The EIA recommendation:

In the Sandton/Marlboro area, the alternative straight line tunnel alignment from Sandton

Station to Marlboro Gardens is preferred because of fewer biophysical and social impacts on the environment. The alternative alignment beneath Marlboro Drive is also preferred, together with an alternative station location in Marlboro next to the N3 Highway, because of fewer social impacts in the Marlboro Gardens area, and potential train ridership benefits from car users of the N3 Highway who would have the opportunity to park and ride the train from this There are few biophysical impacts associated with the Sandton alignment since the Sandton route will be mainly underground. The EIA studies confirmed that noise and vibration would not be an issue in the areas where there is tunnelling during train operations. A mechanized tunneling method (e.g. by Tunnel Boring Machines), if possible, is preferred as it will reduce noise and vibration impacts during construction.

There could be a possible temporary impact on the groundwater table or boreholes in the direct line of the tunnel. Loss of borehole water should be compensated as part of the expropriation process. The EIA recommends that dust control measures should be adhered to during the construction period, and that ventilation shafts for tunnels should be placed away from residential areas as far as possible. Air quality around the shafts should also be monitored initially as a precautionary measure.

Marlboro Station to Midrand/Centurion border (25 km)

The entire section of the reference route between Marlboro and Midrand is above-ground. The route continues from Marlboro Station, turning north along the west bank of the Jukskei River towards Buccleuch. It crosses the N3 Highway in the vicinity of Buccleuch Drive and continues past the Jukskei Stone Quarry. The route passes east of the quarry, and continues towards the proposed new Midrand Station situated adjacent to the site of the proposed Zonk'Izizwe retail / office development west of Grand Central Airport, and east of the K101.

An alternative route evaluated in the EIA in the Buccleuch area was:

- An alignment running north of the Marlboro Drive/N3 Highway interchange onto undeveloped Modderfontein property and which skirts Buccleuch via the Modderfonteinspruit valley instead of cutting through Buccleuch via the Juskei River valley – the route then continues to Midrand and approaches the proposed Midrand Station a closer proximity to the K101 (the Old Pretoria – Johannesburg road);
- A refinement of the reference route alignment proposed by I&APs through Midrand was also evaluated in the EIA. The refinement runs immediately parallel to the K101 road reserve past Glen Austin and Randjesfontein, whereas the reference route runs about 100- 200 m east of the K101.

The EIA recommendation:

The EIA recommends that in the case of the Buccleuch area, the alternative route be chosen instead of the reference alignment. The alternative alignment bypasses Buccleuch via the Modderfonteinspruit valley, which will result in fewer social impacts. In the case of the Midrand area, the EIA supports the refinement instead of the initial reference alignment, because land-use and social impacts will be reduced.

The main impact will be on properties immediately east of the K101 as well as on parts of the horse trails in Randjesfontein. Predicted noise impacts on properties immediately adjacent to the line in Buccleuch, Glen Austin and Randjesfontein will require mitigation measures (such as walls/earth berms) to reduce the impacts. The proposed station position in Midrand will help strengthen the CBD spine envisaged for Midrand in terms of economic development and the potential to create job opportunities, and this position is therefore recommended from a socio-economic point of view.

Approach to Centurion Station (length 5 km)

The entire section of the reference route as it approaches Centurion is above-ground. The alignment proceeds northwards from Midrand and crosses Olievenhoutbosch Road and Brakfontein Road and continues past the K101 and Ben Schoeman Highway (N1) interchange. The alignment is then proposed to enter the Centurion CBD area, along a tract of land adjacent to the Highveld Techno Park,

passing under the N1 at the John Vorster Drive interchange. The route proceeds to the east of the Centurion Cricket Stadium towards the northern side of Centurion Lake, where Centurion Station is proposed to be located between Von Willich and West Streets.

An alternative route alignment in the final approach to the Centurion CBD proposed during the public participation process, and included in the EIA, was:

- An alignment running west of the Centurion Cricket Stadium with a slightly adjusted Centurion Station position on West Street.

The EIA recommendation:

The specialist investigations carried out for the EIA culminated in a preference for the alternative alignment to the west of the Centurion Cricket Stadium where this route approaches the Centurion CBD, because it has less social impact on existing developments and affects less sensitive land uses and proposed new developments.

In terms of impacts on the biophysical environment, the area around the Centurion CBD and the Hennops River is already disturbed and transformed, and the EIA studies indicate relatively minor impacts, which can be safely mitigated.

Centurion Station to Pretoria Station (length 11 km)

From the proposed Centurion Station, the reference route remains above ground and passes through a number of townhouse complexes and vacant properties in the Lyttleton Agricultural Holdings. The route proceeds along the north-eastern boundary of Lyttleton Manor and joins the existing Metrorail rail corridor near Kloofsig Station. The route then follows the existing railway alignment on its western side passing beneath Salvokop in a 600m long tunnel, to the proposed new Pretoria Station, which is planned to be located adjacent to the existing Pretoria Metrorail Station.

Consultations with I&APs in the Centurion area resulted in two alternative alignments for consideration in the EIA. These were:

- an alignment running through the military base to the east of the Ben Schoeman Highway; and
- an alternative alignment across military land to the west of the Ben Schoeman Highway.

The EIA recommendation:

In the case of the different route alignments proposed across the area to the north of Centurion, the EIA team indicated a preference for the alignment to the west of the Ben Schoeman Highway, since it offers fewer land-use and social impacts. In terms of noise and vibration, the impacts in the Centurion area are largely within acceptable limits, because much of the line will be in cut, but there may be a need for some mitigation at the Jean Avenue interchange with the Ben Schoeman Highway. As it approaches Pretoria, the EIA team advise that careful attention be given to the visual impact of the preferred rail alignment line and for it to hug the Ben Schoeman Highway as closely as possible.

Pretoria Station to Hatfield Station (length 6 km)

The section of the reference route in Pretoria commences at the Pretoria Station and follows the existing SARCC / Metrorail commuter rail corridor (part of the Tshwane Ring Rail system) for much of the route towards Hatfield Station. The alignment passes over Railway Street, Andries Street, Tulleken Street, Van der Walt Street, Nelson Mandela Drive and Joubert Street. East of Joubert Street, the alignment enters a cutting and crosses underneath the existing Metrorail railway line to enter Muckleneuk. The route continues in an open-cutting across the northeastern end of Muckleneuk and passes the northern end of Magnolia Dell. From here, the route closely follows the existing rail alignment. After crossing Lynnwood Road, Burnett Street, Festival Street and Hilda Street by means of bridge structures, the route ends at the proposed Hatfield Station site just west of Duncan Street.

A number of route alignment alternatives in the Pretoria area were proposed by I&APs for inclusion in the EIA, some of which were refined during the public participation process. In essence, though, the route alternatives follow one of two main corridors via Muckleneuk or Arcadia:

- A refined alignment through Muckleneuk which lies within the existing Metrorail rail reserve as far as possible; and
- A route via the inner city and Park Street, with variations of the route either above ground, in cut-and-cover beneath Park Street, or in tunnel – the possibility of an additional station on this alignment in Arcadia was also investigated.

The EIA recommendation:

The EIA specialist studies identified a preferred alignment from Fountains Valley and Pretoria Station which tunnelled underground in the Pretoria CBD and beneath Park Street, before surfacing at Hatfield east of Burnett Street and following the existing Metrorail corridor to the proposed new Hatfield Station. This route alignment had the least environmental and social impacts. The EIA team were of the opinion that the proposed station in Arcadia on Park Street carried some merit in terms of additional ridership and the regeneration of the inner city of Pretoria, but conceded that these benefits were undermined by significant additional costs and the aims for the Gautrain of acting as a regional high speed rail service. However, one of the most important considerations, which needed to be taken into account, was that the tunnelled option beneath Park Street is the most expensive solution and, according to the Gautrain technical team, escalates the costs to the extent that this section of the project is no longer feasible.

Given this situation, the EIA team concluded that the refined alignment via Muckleneuk, which includes a tunnel beneath Salvokop to reach Pretoria Station, and which follows the existing Metrorail corridor as closely as possible, could be considered as the preferred alternative, provided sufficient attention is given to mitigation measures which would reduce social, noise, land use and heritage impacts along this route. Further consultation involving the three spheres of Government and I&APs will be required in order to agree on the vertical alignment and detail of the mitigatory factors in Pretoria along this refined Muckleneuk route.

Marlboro Station to JIA (length 16 km)

The Sandton to Johannesburg International Airport (JIA) reference route separates from the north-south spine at Marlboro Station and then turns towards the south-east. It crosses over the Marlboro Drive Interchange on the N3 Highway, and continues through the northern edge of the Linbro Park Agricultural Holdings. The alignment continues past the southern side of the African Explosives and Chemical Industries (AECI) factory and passes north of the Modderfontein Golf Course before skirting the southern edge of Esther Park. It then runs adjacent to the existing railway line from the Kelvin Power Station, and continues underneath the SARCC railway line between Isando and Kempton Park Stations, to the proposed Rhodesfield Station just south of Ventura Street in Rhodesfield. The route crosses beneath Pretoria Road, as well as the R21 Highway interchange with the R24, and terminates at the proposed JIA Station beneath the terminal buildings. This last section is in tunnel.

During the public participation process, alternative route alignments on this section of the line were included in the EIA as follows:

- An alternative route to the north of the reference route alignment past Linbro Park on undeveloped Modderfontein property – this alternative was also adjusted during the consultation process to the south of the reference route alignment where the latter impacted on the Modderfontein factory's explosives storage area, and this refinement was compared with a refined alignment over part of the Modderfontein gold course; and
- An alternative Rhodesfield Station location adjusted southwards slightly to allow for an improved approach into JIA.

The EIA Recommendation:

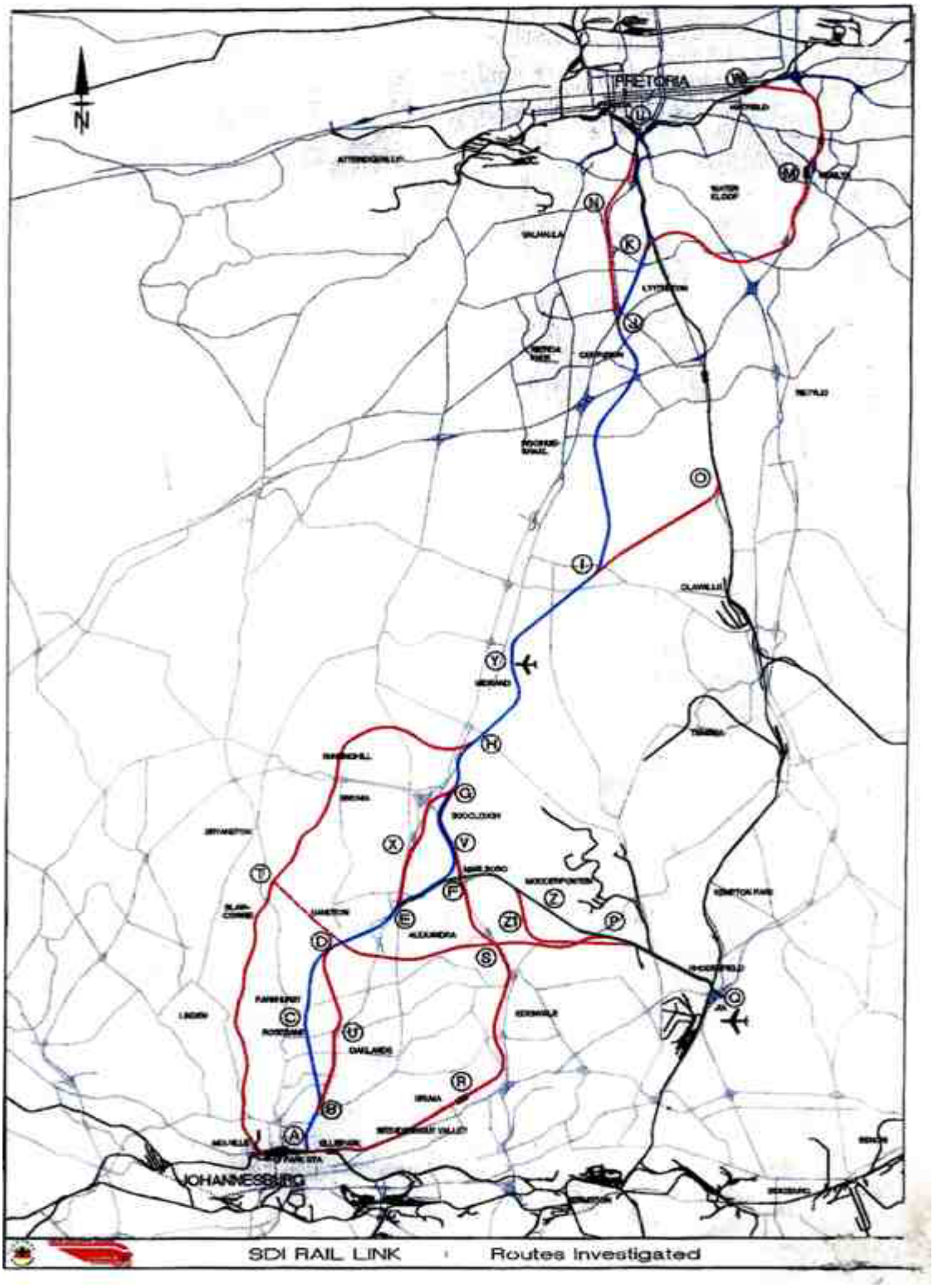
Based on studies undertaken as part of the EIA, it is recommended that the alternative routes be chosen instead of the reference alignment in both the Linbro Park and Rhodesfield areas. The alternative route near Linbro Park runs to the north of the reference alignment on undeveloped Modderfontein property. This alternative is also adjusted south of the reference route alignment further up the

Modderfonteinspruit valley to avoid a Modderfontein factory explosive storage area. The adjusted Rhodesfield Station position will mean that only the most southern part of Rhodesfield will be directly affected.

The alternative routes are more acceptable from technical, social and biophysical points of view. The alternative route alignment at Rhodesfield offers less of a social impact since, among other things; it is further away from the local school. The route is also more viable from a technical point of view as it offers better access to the Johannesburg International Airport. From a biophysical point of view, the alternative alignment that passes Linbro Park has less impact than the reference alignment, because it crosses the Modderfonteinspruit only once as opposed to three times on the reference alignment. Fewer properties in Linbro Park are also affected on the alternative route than on the reference route. Noise mitigation measures are recommended, however, where the line passes close to Linbro Park, Esther Park, Cresslawn and Rhodesfield

Source: (Gautrain recommended route, 2004)

Appendix Three: Investigated routes



Appendix Four: Public Questionnaire

University of South Africa

Department of Environmental Sciences

Questionnaire

I am Aregbeshola M T from University of South Africa (UNISA) currently carrying out a research on the public participation of the Rapid Rail Project of South Africa (Gautrain). As a part of the research work, it is essential to carry out a questionnaire survey.

I hereby solicit your kind support in this regard, as your opinion on the information supplied below is very curial to the quality of this research, and the validity of the outcome.

You are assured that the information supplied by you will be treated with utmost confidentiality.

I thank you for your anticipated cooperation and kind consideration.

Please mark the appropriate codes

PART A: Demography and Socio-economic Data

1 Contact Number ……email ……

2 Gender

Male	1
Female	2

3 Age

16 – 25 yrs	1
26 - 35 yrs	2
36 – 45 yrs	3
46 – 55 yrs	4
56 – 65 yrs	5
Above 65 yrs	6

4 Highest qualification achieved

Less than Matric. certificate	1
Matric. Certificate	2
Technical/Diploma	3
Graduate degree	4
Postgraduate degree	5

5 (a) Area of residence

Pretoria	1
Muckleneuk/Lukasrand	2
Hatfied	3
Centurion	4
Others (Pls. Specify)…….	5

5 (b) For how long have you been residing at 5(a)?

0 – 2yrs	1
3 – 5yrs	2
6 – 8 yrs	3
9 – 11 yrs	4
Above 11 yrs	5

5 (c) If you do not live in (5a) above why did you get involved in the Gautrain EIA?

……

6 For how long have you been participating in the Gautrain EIA process?

Since inception in 2002	1
2003	2
2004	3
2005	4
2006 till date	5

PART B Public participation

Please mark the appropriate code

B1 (a) Where did you first hear of Gautrain?

Newspaper	1
Radio	2
T.V	3
Internet	4
Others (Pls. Specify)……..	5

B1 (b) How did you get involved and/or informed about the Gautrain Environmental Impact Assessment process? Through:

Newspaper	1
Radio	2
T.V	3
Pamphlets	4
Website	5
Others (Pls. Specify)…….	6

B 2 Which of the above method of involvement do you prefer?

Newspaper	1
Radio	2
T.V	3
Pamphlets	4
Website	5
Others (Pls. Specify)…….	6

B3 (a) Please indicate your level of satisfaction with the information provide in B 2 above when the EIA started in 2002. (1= strongly disagree (SD); 2= disagree (D); 3=unsure (U); 4= agree (A); 5= strongly agree (SA))

	(SD)	(D)	(U)	(A)	(SA)
(1) The need and purpose of the project were clearly stated when the EIA started in 2002	1	2	3	4	5
(2) Adequate information was provided on negative and positive effects of the project	1	2	3	4	5
(3) The data/maps provided were sufficient enough to enable you visualise the project	1	2	3	4	5
(4) Sufficient time was given to assess the project and submit your concerns	1	2	3	4	5
(5) The public was consulted early during the project planning and designing	1	2	3	4	5

B3 (b) Please indicate your level of agreement with the following statements

	(SD)	(D)	(U)	(A)	(SA)
(1) There were equal opportunity for everybody to participate	1	2	3	4	5
(2) The people that were directly affected by the project were consulted personally	1	2	3	4	5
(3) The process of participation was controlled by one or more groups/parties	1	2	3	4	5
(4) The time of meetings were convenient	1	2	3	4	5
(5) The venue of the meetings were not accessible	1	2	3	4	5
(6) Individuals were allowed to express their views,	1	2	3	4	5

fears and values					
(7) The process enhances dialogue and mutual agreement among the participant	1	2	3	4	5

B4 Please rate your level of satisfaction regarding the process of identifying the significant impacts of the project, alternatives and mitigatory measures as indicated below (1= very dissatisfied (VD); 2= dissatisfied (D); 3=unsure (U); 4= satisfied (S); 5= very satisfied (VS))

	(VD)	(D)	(U)	(S)	(VS)
(1) The full range of impacts were sufficiently identified	1	2	3	4	5
(2) You were satisfied with the way in which the significant impacts and alternatives have been considered	1	2	3	4	5
(3) How satisfied are you with the adequacy of predictions of significant impacts and their magnitude?	1	2	3	4	5
(4) Are you satisfied with how the mitigation measures have been recommended?	1	2	3	4	5

B 5 Please indicate your satisfaction with the feedback process below (1= very dissatisfied (VD); 2= dissatisfied (D); 3=unsure (U); 4= satisfied (S); 5= very satisfied (VS))

	(VD)	(D)	(U)	(S)	(VS)
(1) Are you satisfied with the frequency of contact between the interested and affected parties and the project proponent?	1	2	3	4	5
(2) Are you pleased with the extent to which ideas	1	2	3	4	5

generated by the information feedback process contributed to the management decisions?					
(3) How satisfied are you with the changes in route alignment and other issues due to public participation procedure?	1	2	3	4	5
(4) Are you satisfied with the Record of Decision (that is the approval for the project)?	1	2	3	4	5

Part C

Public participation after Approval

C 1 (a) Do you still participate in Gautrain meetings after the project approval?

Yes	1
No	2

C 1 (b) If no, why did you decide to stop

……
……
……

C 1 (c) If yes, please indicate your satisfaction with the consultation process after the project approval below (1= strongly disagree (SD); 2= disagree (D); 3=unsure (U); 4= agree (A); 5= strongly agree (SA))

	(SD)	(D)	(U)	(A)	(SA)
(1) There are equal opportunity for everybody to participate now than before	1	2	3	4	5
(2) The process of participation is not controlled by one or more groups/parties unlike before	1	2	3	4	5

(3) The time of meetings were not convenient unlike before	1	2	3	4	5
(4) The venue of the meetings are accessible unlike before	1	2	3	4	5
(5) Individuals are allowed to express their views, fears and values unlike before	1	2	3	4	5
(6) Interested and affected parties are updated with the development of the project frequently	1	2	3	4	5
(7) Interested and affected parties are being liaised with frequently	1	2	3	4	5

C 2 Overall, how good, in your own opinion, is the whole Gautrain public participation process? (1= very poor; 2= poor; 3=fair; 4= good; 5= very good)

1	2	3	4	5

C 3 Rate the helpfulness of the following factors to your learning process (1=Very unhelpful (VU); 2=unhelpful (UH); 3=unsure (U); 4= helpful (H); 5= very helpful (VH))

	(VU)	(UH)	(U)	(H)	(VH)
(1) Technical Knowledge	1	2	3	4	5
(2) Environmental effects of the project	1	2	3	4	5
(3) Benefits of the project	1	2	3	4	5
(4) The construction and aesthetic nature of the project	1	2	3	4	5
(5) Opportunity to understand other people's claim and difficulty of providing solutions to them	1	2	3	4	5
(6) Others (Pls.Specify)……	1	2	3	4	5

D In your own opinion, how could the public participation process have been improved?

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

Thanks.

Appendix five: Questionnaire for Gautrain proponent

University of South Africa

Department of Environmental Sciences

I am Aregbeshola M T from University of South Africa (UNISA) currently carrying out a research on the public participation process of the Gautrain project in South Africa. As a part of the research work, it is essential to carry out a questionnaire survey.

I hereby solicit your kind support in this regard, as your opinion on the information supplied below is very curial to the quality of this research, and the validity of the outcome.

You are assured that the information supplied by you will be treated with utmost confidentiality.

I thank you for your anticipated cooperation and kind consideration.

Please mark the appropriate codes

PART A: Demography and Socio-economic Data

1 Contact Number……email……..

2 Gender

Male	1
Female	2

3 Age

16 – 25 yrs	1
26 - 35 yrs	2
36 – 45 yrs	3
46 – 55 yrs	4
56 – 65 yrs	5
Above 65 yrs	6

4 Highest qualification achieved

Less than Matric. certificate	1
Matric. certificate	2
Technical/Diploma	3
Graduate degree	4
Postgraduate degree	5
Other (pls. Specify)	6

5 For how long have you been participating in the Gautrain EIA process?

Since inception in 2002	1
2003	2
2004	3
2005	4
2006 till date	5

PART B Public participation

Please mark the appropriate code

B1 How did you get interested and affected parties involved and/or informed about the Gautrain Environmental Impact Assessment process? Through:

Newspaper	1
Radio	2
T.V	3
Pamphlets	4
Web site	5
Others (Pls. Specify)…….	6

B 2 Which of the above methods of involvement do you prefer?

Newspaper	1
Radio	2
T.V	3
Pamphlets	4
Web site	5
Others (Pls. Specify)…….	6

B3 (a) Please indicate your level of satisfaction with the information provided in B 2 above when the EIA started in 2002. (1= strongly disagree (SD); 2= disagree (D); 3=unsure (U); 4= agree (A); 5= strongly agree (SA))

	(SD)	(D)	(U)	(A)	(SA)
(1) The need and purpose of the project were clearly stated when the EIA started in 2002	1	2	3	4	5
(2) Adequate information was provided on negative and positive effects of the project in 2002	1	2	3	4	5
(3) The data/maps provided were sufficient enough to enable participant to visualise the project in 2002	1	2	3	4	5
(4) Sufficient time was given to participant to assess the project and summit their concerns	1	2	3	4	5
(5) The public were consulted early during the project planning and designing	1	2	3	4	5

B3 (b) Please indicate your level of agreement with the following statements

	(SD)	(D)	(U)	(A)	(SA)
(1) There were equal opportunity for everybody to participate	1	2	3	4	5
(2) The people that were directly affected by the project were consulted personally	1	2	3	4	5
(3) The process of participation was controlled by one or more groups/parties	1	2	3	4	5
(4) The time of meetings were convenient	1	2	3	4	5
(5) The venue of the meetings were not accessible	1	2	3	4	5
(6) Individuals were allowed to express their views, fears and values	1	2	3	4	5
(7) The process enhanced dialogue and mutual agreement among the participant	1	2	3	4	5

B4 Please rate your level of satisfaction regarding the process of identifying the project's impacts, route alignment and alternatives as indicated below (1= very dissatisfied (VD); 2= dissatisfied (D); 3=unsure (U); 4= satisfied (S); 5= very satisfied (VS))

	(VD)	(D)	(U)	(S)	(VS)
(1) The full range of impacts were sufficiently identified	1	2	3	4	5
(2) You were satisfied with the way in which the significant impacts and alternatives have been considered?	1	2	3	4	5
(3) How satisfied are you with the adequacy of	1	2	3	4	5

predictions of significant impacts and their magnitude					
(4) Are you satisfied with how the mitigation measures have been recommended?	1	2	3	4	5

B 5 Please indicate your satisfaction with the feedback process below (1= very dissatisfied (VD); 2= dissatisfied (D); 3=unsure (U); 4= satisfied (S); 5= very satisfied (VS))

	(VD)	(D)	(U)	(S)	(VS)
(1) Are you satisfied with the frequency of contact between the interested and affected parties and the project proponent?	1	2	3	4	5
(2) Are you pleased with the extent to which ideas generated by the information feedback process contributed to the management decisions?	1	2	3	4	5
(3) How satisfied are you with the changes in route alignment and other issues due to public participation procedure?	1	2	3	4	5
(4) Are you satisfied with the Record of Decision (that is the approval for the project)?	1	2	3	4	5

Part C Public participation after Approval

C1 Please indicate your satisfaction with the consultation process after the project approval below (1= strongly disagree (SD); 2= disagree (D); 3=unsure (U); 4= agree (A); 5= strongly agree (SA))

	(SD)	(D)	(U)	(A)	(SA)
(1) There is equal opportunity for everybody to participate now unlike before	1	2	3	4	5
(2) The process of participation is not controlled by one or more groups/parties unlike before	1	2	3	4	5
(3) The time of meetings were not convenient unlike before	1	2	3	4	5
(4) The venue of the meetings are accessible unlike before	1	2	3	4	5
(5) Individuals are allowed to express their views, fears and values unlike before	1	2	3	4	5
(6) Interested and affected parties are updated with the development of the project frequently	1	2	3	4	5
(7) Interested and affected parties are being liaised with more frequently	1	2	3	4	5

C 2 Overall, how good, in your own opinion, is the whole Gautrain public participation process? (1= very poor; 2= poor; 3=fair; 4= good; 5= very good)

1	2	3	4	5

C 3 Rate the helpfulness of the following factors to your learning process (1=Very unhelpful (VU); 2=unhelpful (UH); 3=unsure (U); 4= helpful (H); 5= very helpful (VH))

	(VU)	(UH)	(U)	(H)	(VH)
(1) Technical Knowledge	1	2	3	4	5
(2) Environmental effects of the project	1	2	3	4	5
(3) Benefits of the project	1	2	3	4	5
(4)The construction and aesthetic nature of the project	1	2	3	4	5
(5) opportunity to understand participant's claims and difficulty of providing solutions to them	1	2	3	4	5
(6) Others (Pls.Specify)……	1	2	3	4	5

D How do you think the public participation process can be improved?

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

Thanks.