THE INTEGRATION OF INDIGENOUS KNOWLEDGE SYSTEMS INTO THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS IN SOUTH AFRICA: PERSPECTIVES OF LOCAL COMMUNITIES IN MAPELA, LIMPOPO PROVINCE.

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A dissertation submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Master of Science.

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Declaration

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

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27th day of July 2012 in Master of Science

Abstract

The participation of indigenous communities and use of indigenous knowledge systems (IKS) in environmental governance is provided for in several international and national environmental legislation and policies. In South Africa, the National Environmental Management Act 107 of 1998 (NEMA) in Chapter 1, Principle 4g requires that decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge. This study investigated the Environmental Impact Assessment process (EIA) in mining developments in three rural communities in Limpopo Province, South Africa with regards to the effectiveness of public participation in fostering the incorporation of IKS. The qualitative research design used in this study employed several research methods through the utilisation of 3 villages as a case study. Semi-structured interviews, a focus group discussion and document analysis were used to collect information regarding the public participation process and the integration of IKS into EIAs. This report illustrates that IKS exists in rural communities and some of it is relevant to be incorporated in EIAs. This research study has shown that while expert knowledge dominates the EIA process, there is no indication that this is done deliberately to exclude IKS. This study has also revealed that the public participation process has a number of weaknesses such as in the selection and composition of community stakeholders and communication procedures. Suspicions also developed amongst the villagers of community representatives being bribed by the mine, and infighting started within community committees resulting in some community members losing trust in the committees. The disagreements with regards to the integrity of community committees created divisions and this negatively impacted on the public participation process. However, despite these weaknesses, if capacity building for both EIA experts and rural communities is done, the public participation process has potential as a tool to aid the integration of IKS into EIAs.

Dedication

In memory of my father

Kenas Mthobi
1940 - 1990

Who taught me that education is best inheritance a parent can give to a child.

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Abbreviations and Acronyms

AIDS: Acquired Immuno-Deficiency Syndrome

CBA: Cost Benefit Analysis

CBD: Convention on Biodiversity

CSIR: South African Council for Scientific and Industrial Research

DoA: Department of Agriculture

DAC: Department of Art and Culture

DEAT: Department of Environmental Affairs and Tourism

DoE: Department of Education

DoH: Department of Health

DST: Department of Science and Technology

DTI: Department of Trade and Industry

ECA: Environmental Conservation Act

ECA: Economic Commission for Africa

EIA: Environmental Impact Assessment

EMS: Environmental Management Systems

ERM: Environment Resources Management

GIS: Geographical Information Systems

HIV: Human Immune Virus

IAP: Interested and Affected Parties

ICSU: International Council for Science

IEM: Integrated Environmental Management

IKS: Indigenous Knowledge Systems

IKSSA: Indigenous Knowledge Systems of South Africa

NCS: National Curriculum Statement

NEMA: National Environmental Management Act

NGOs: Non-governmental Organisations

SAHRC: South African Human Rights Council

SAIEA: Southern African Institute for Environmental Assessment

SR: Scoping Report

TORs: Terms of Reference

UN: United Nations

UNCED: United Nations Conference on Environment and Development

UNEP: United Nations Environment Programme

UNESCO: United Nations Educational, Scientific and Cultural Organisation

WCED World Conference on Environment and Development

WIMSA: Working Group of Indigenous Minorities in Southern Africa

WIPO: World Intellectual Property Organisation

WSSD: World summit on Sustainable Development

Chapter 1.

Background to the Study

1.1 Introduction

This chapter describes in brief the history and growth of global environmental awareness since the nineteenth century as a background to this study, which looks at the recent integration of indigenous knowledge as an integral part of the EIA process in South Africa. This is followed by the explanation of the introduction of the sustainable development concept in the 1970s. The sustainable development concept led to the establishment of economic and environmentally sound principles that incorporated environmental concerns in economic and political activities. International and national institutional and legal frameworks that promoted the adoption of the environmental impact assessment process and the consideration of indigenous knowledge systems in EIAs are also described. Thereafter the response of South Africa to sustainable development is briefly highlighted. Finally, the problem statement, purpose statement and research questions are explained, followed by the significance of the study, the delineation of the study area and limitations to the study.

1.2 The history and growth of environmental awareness

Since the onset of the agricultural and industrial revolutions the natural environment has been exposed to increasingly strong external pressure from socio-economic development. The increasing demand for both social and economic resources and the expansion of technology throughout the world has accelerated economic development, excessive harvesting and utilisation of natural resources. These in turn have resulted in increased pollution and destruction and loss of natural resources such as water, land and air. The recognition of these environmental challenges

between the late nineteenth and early twentieth century has resulted in the rise of environmental concern and environmentalism. Environmental concern refers to public perception, attitudes, values and beliefs about the environment while environmentalism refers to the promotion and advocacy to protect the natural environment from pollution and destruction. During this time, national governments, non-governmental organisations and environmental pressure groups realised that there was a need to protect and conserve natural resources. Accordingly, environmental concern intensified in the late nineteenth century and the twentieth century. This is evidenced by the publication of environmental acts in different countries, created to regulate and manage the utilisation of natural resources (see Rabie and Fuggle, 1994, 11-19; Rabie, 1994, 99-119). The 1970s were seen as the dawn of a new environmental era. Thus Rabie and Fuggle (1994) claimed that the 1970s were regarded as the watershed years both internationally and nationally, because this is time when countries became aware of the effects of human activities on the natural environment. For instance the 1972 Stockholm conference held in Sweden led to the establishment of United Nations Environment Programme (UNEP) which initiated the concept of sustainable development. The deliberations from this conference marked a turning point in the human-environment relationship. Both developed and developing countries around the world established environmental organisations and acts, with mandates to regulate and oblige public bodies to consider environmental issues in their activities. For example the United States of America responded to the Stockholm conference deliberations by establishing the National Environmental Protection Act (NEPA) which provided for the consideration of environmental issues in developmental activities.

1.3 The concept of sustainable development

During the late 20th century and the 21st century public environmental concerns continued to intensify. This intensification resulted in research and policy responses from global conferences, and conventions assuming a new urgency in relation to

environmental pressures. The significance of incorporating environmental issues in socio-economic and political institutions and structures became a highly debated agenda in both developed and developing countries. Major World Conferences and Conventions on environment and development were held, such as the 1987 World Commission on Environment and Development (WCED) also called the Brundtland Commission; the 1992 United Nations Conference on Environment and Development (UNCED) and the most recent 2002 World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa. These brought about major changes in the attitudes and perceptions of policy makers to environmental issues and problems (Appiah-Opoku, 2000). Principles in these conventions and declarations underpin and confirm the importance of the concept of sustainable development as the reference point for all future environmental, economic, social and political activities (Parry-Davies, 2004; Convention on Biodiversity (CBD), 2004; Our Common Future, 1987).

Countries which are members or signatories to these conventions agreed to adopt the concept of sustainable development in all their activities since it is based on economically and environmentally sound principles that allow development to occur without compromising the environment. It is from these principles that the concept of EIA in planning, management and implementation of developmental projects was developed.

The EIA process is generally defined as a planning tool that is used firstly to identify, predict, and evaluate adverse environmental impacts of proposed developmental projects, and secondly for the suggestion of mitigation alternatives (Kemp, 2008; Li, 2008; Sowman, 2008; Barrow, 1999; O'faircheallaigh, 1999; Showers and Malahleha 1992). As stated in Principle number 22 of WSSD, and Chapter 23 of Agenda 21, the EIA process (as a decision-making tool, which is used to accomplish sustainable development) should be a participatory process (Middleton, 2003). The process should include various stakeholders such as the Government, Non-

Governmental Organisations (NGOs), Private EIA consultants as well as the local communities. However, the EIA process, despite being a participatory approach, usually employs technocratic and top down environmental management perspectives. Furthermore, the EIA process relies more on scientific or western knowledge than on other forms of knowledge such as indigenous knowledge (Geurts and Jolderma, 2001; Brown and Jacobs, 1996). This has resulted in wide contestations and debates about the concept of public participation as a dominant theme in EIA.

In order to understand how public participation could assist in bringing about real and meaningful participation at a grassroots level, as well as integrating indigenous knowledge systems in the EIA process, it is necessary to briefly describe the approaches, levels and purpose of public participation.

1.4 The concept of public participation

The concept of public participation is a highly debated one because of several levels, approaches and definitions associated with the concept. According to Choguill (1996, 433) in the 1960s Arnstein explained the concept of participation in the form of a “ladder of community participation”. According to Arnstein participation falls into eight different levels that indicate different degrees of public involvement. At the bottom of the ladder, where she asserts there is no participation at all, are the manipulation and therapy levels. The next rungs are informing, consultation and placation. These are grouped into a “tokenism type of participation” that however, illustrates different degrees of participation (Choguill, 1996, 433). Choguill (1996) explains that the group at the top of the ladder is where participation occurs with varying degrees of power control. Here, in order of importance in terms of effective participation are partnership, delegated power and power control levels. This concept will be dealt with in detail in the literature review.

However, some scholars (Bishop and Davis 2002; Choguill, 1996) have critiqued Arnstein's model of participation and suggested that participation should be viewed as a continuum model, i. e. a model with varying degrees of involvement, starting from meaningless or pseudo at the bottom of the ladder, to partial participation in the middle part, and to full participation at the top. However, they all agree with Arnstein that effective or meaningful public participation occurs where the public has full control of the policy issue at hand. Bishop and Davis (2002, 18) further assert that this approach acknowledges ambiguities in defining participation and makes "public participation not a single act, but a scale of possibilities."

The idea of participation as a continuum suggests a full range of participation approaches available for decision makers to choose from. Therefore O'faircheallaigh (2007) and Bishop and Davis (2002) emphasise that decision makers should clarify policy issues so as to identify appropriate participation approaches to use for each issue. Sometimes different participation approaches may be appropriate and be employed in a single policy issue depending on the degree of public involvement and the attribute of the core problem (O'faircheallaigh, 2007; Bishop and Davis, 2002; Tuler and Webler, 1999; Gagnon, Hirsch and Howitt, 1993). For instance some problems could require more involvement while others need less and some problems could use several approaches while others use one.

Bishop and Davis (2002) further assert that public participation is in the realm of the government because it is the government that initiates the participative process and the participation is shaped by the policy issue at hand. Their idea is in line with Qadeer's (1996) view that environmental impact assessments as participatory tools for environmental governance are planned and managed by the government and experts.

Despite the several perspectives of public participation, the process has been viewed as a valuable and democratic strategy for incorporating the concerns and

opinions of the public into environmental governance (Doelle and Sinclair, 2006; Hartley and Wood 2005; Geurts and Jolderma, 2001; Webler, Kastenholz and Ronn, 1995). Recently the idea of public participation has been impacted by the recognition of indigenous knowledge systems as valuable for environmental management. Public participation is essential for incorporating indigenous knowledge systems into the EIA process. According to O'faircheallaigh (2007) to facilitate effective indigenous participation, structures established by EIA consultants must give indigenous participants a real and substantial role in decision-making rather than merely offering them an advisory role. His ideas agree with what has been provided for in international declarations and the national EIA policy, acts and regulations of South Africa (DEAT, 2006; UNEP, 2002; Barrow, 1999). The public participation process in the EIA process serves to empower the marginalized groups by shifting the balance of power so that the marginalized can exercise significant influence in decision-making (O'faircheallaigh, 2010).

1.5 Indigenous knowledge systems (IKS)

According to Turner, Ignace and Ignace (2000) indigenous knowledge systems have received a lot of attention lately in research. Such recognition coupled with subsequent and growing use of IKS in environmental management has shown its fundamental importance and strength. IKS are defined as the total knowledge and skills that people in a particular geographical area possess, enabling them to live in harmony with the natural environment (Behera and Nath,2005; Masaga, 2005). Gibson (2003) agrees that the growing realization of limits of conventional science and technology in solving ecological problems has led to the pursuit of other forms of knowledge, leading to the consideration of indigenous knowledge. Indigenous knowledge systems are now acknowledged as one of the major sources of environmental knowledge that could be used with science in the environmental impact assessment process. The UNCED and Chapter 26 of Agenda 21 acknowledge the importance of indigenous knowledge systems and so have made

provisions for the participation of indigenous and local communities, as they have a vital role to play in environmental management and economic development (Southern African Institute for Environmental Assessment (SAIEA), 2005; Middleton, 2003; Barrow, 1999; UNCED, 1992). Indigenous communities possess vital knowledge of the environment and the traditional practices associated with it which could be used in environmental management (UNEP, 2002; Emery, 2000; Warren, 1999; Dewalt, 1999). Unlike the environmental management strategies of the 1970s, it is therefore evident that UNCED, WCED and WSSD principles provide for and promote the participation of indigenous communities through environmental management tools such as the EIAs. This kind of acknowledgement shows the significance of public participation of local communities and the integration of their indigenous knowledge in environmental management strategies for development projects that affect their livelihood.

1.6 Environmental impact assessment and indigenous knowledge

In identifying and predicting environmental impacts of a proposed project the EIA process relies on taxonomic, spatial, temporal and social frameworks (Chambers, 1991; Sallenave, 1994). These frameworks will be explained in detail in Chapter 3, Section 3.9. Some scholars (Mwaura, 2008; Dahl, 2002; Calamia, 1999; Sallenave, 1994) argue that genuine involvement by indigenous people in the EIA process would provide valuable knowledge about these four frames of reference. They argue that indigenous or local communities possess knowledge about the environment on biophysical events and processes which was acquired over generations of observation and experimentation. Local communities from their experience know more about the natural/seasonal changes that occur to the vegetation, breeding patterns of wild animals and birds as well as the general onset of the rainy or cold seasons. They further assert that this knowledge might improve the outcomes of the EIA process as well as the decision-making process. Local communities usually possess valuable environmental knowledge about names and types of flora and

fauna; and the significance of these to their locality. The locals also have knowledge about feeding and migratory patterns of different animal species, daily and seasonal changes in aggregation sites as well as reproductive and breeding cycles. A pilot project done by Huntington and Mymrin (1995) revealed that ecological knowledge of the local people was very useful in producing maps showing feeding and migratory patterns of the Beluga whales. This shows that the participation of local people in environmental impact assessments is likely to provide valuable knowledge which can be used by experts to predict and assess the environmental impacts of proposed development projects.

The local people also know more about sensitive areas such as traditional sacred sites, archaeological sites and burial grounds (Mwaura, 2008; O'faircheallaigh, 2008; Sallenave, 1994; Chambers, 1991). Chambers (1991) and Sallenave (1994) affirm that it is only through the participation of the local community that their conservation ethic, which is the way the locals perceive and use the environment, might be ascertained. Understanding local community's environmental perceptions would assist in suggesting mitigation measures for identified significant impacts. Accordingly, indigenous knowledge systems are viewed as another body of knowledge, not in competition with science, but able to inform science for better outcomes of the environmental impact assessment process (International Council for Science (ICSU) and United Nations Educational Scientific and Cultural Organisation (UNESCO), 2002).

Some scholars like Parry-Davies (2004), Usher (2000), Warren (1989) and Warren (1999) further assert that the use of both scientific and indigenous knowledge systems will establish a holistic framework. An EIA process framework effectively used will bring about that form of development that sustains the environment; looks after people and ensures that economic welfare can be maintained.

1.7 South Africa's response to sustainable development

South Africa, like many other developing countries, has adopted the environmental impact assessment process as an environmental management strategy. This country has a long history of environmental and natural resource management and conservation which dates back to the early 1970s. A lot of environmental acts to regulate the conservation of different natural resources were established in South Africa since 1970. Of significance with regards to the inclusion of indigenous knowledge systems into environmental impact assessment process are the Environmental Conservation Act 73 of 1989 (ECA) and the White Paper on Environmental Management Policy of 1998 for South Africa. National Environmental Management Act (NEMA) 107 of 1998 and the Integrated Environmental Management procedure (IEM) also play a critical role with regards to integrating indigenous knowledge into the EIA process. These acts and policies provide for the establishment of the environmental impact assessment process for proposed economic projects and for public participation in the EIA process (DEAT, 2009; De Villiers, 2008; Sowman, 2004; Brownlie and Wynberg, 2001; Preston, Robbins and Fuggle, 1994; DEAT, 1998a). The policies and acts were promulgated in accordance with the principles of UNCED, WCED and WSSD of sustainable development because South Africa is a committed member of these international bodies and declarations. Besides the reliance on international arrangements, the South African Constitution in clause 24 also provides for the basis for both environmental policy as a whole and legislation which deals with environmental management and protection (The Constitution of South Africa, 1996). As such, aspects of public participation and the use of indigenous knowledge are also enshrined in the ECA 73 of 1989, the White Paper on Environmental Management Policy, NEMA and the IEM. This is indicated by supporting objectives of goal 4 and goal 5 of the White Paper on Environmental Management Policy that state that the responsible authority should:

….develop public participation mechanisms and processes that are fair……and will promote participation of marginalized sectors of society……and encourage and

support involvement of special interest groups such as …, traditional healers and the elderly (DEAT, 1998a).

The Department of Science and Technology (DST) in South Africa is also working towards the incorporation of indigenous knowledge into development (DST, 2004). Although international and national policies provide for the integration of indigenous knowledge systems in EIAs through public participation of indigenous communities, research has shown that most of the Environmental Impact Assessments and Environmental Management Systems especially in developing countries are still largely expert oriented. Appiah-Opoku (2000) notes that efforts have been made to establish environmental impact assessment procedures not only in South Africa but also in Ghana, Zimbabwe, Mozambique, Nigeria and Kenya. However, the models adopted by these countries remain western oriented and so they do not fit well to the socio-economic and institutional structures of developing countries. According to Sidaway (2005) most of the environmental management policies and strategies such as EIAs are still employing top-down approaches that elevate scientific knowledge and opinions in dealing with environmental issues at the expense of local and indigenous knowledge systems. The reason for this is that indigenous knowledge systems in environmental impact assessments are usually regarded as 'obsolete and outdated' and incapable of meeting rapid economic growth and contemporary environmental issues (Rist and Dahdouh-Guebas, 2006). They further explain that as a result, indigenous or local people have been usually viewed as less important interested or affected parties who have nothing or very little to contribute towards the formulation of environmental management strategies such as EIA or Environmental Management Systems (EMS) for developmental projects and programmes. Berkes, Colding and Folke (2000) have suggested that it is for this reason that current environmental policies and strategies have proven inadequate to deal with environmental issues and problems. However, the lack of local community involvement or public participation in environmental decision-making that impacts on their lives tends to exclude the valuable indigenous and local knowledge that might

assist in dealing with environmental problems effectively.

Despite the observation that there is limited use of IKS in EIAs, some research conducted to investigate the participation of local communities in environmental impact assessment procedures in developed countries reveals that a lot of effort to include IKS through public participation is evident in recent years in countries such as Canada, Australia and Japan (White, Christensen, and Ehrlich, 2007; Berkes, *et.al*, 2000; O'faircheallaigh, 1999). Although studies in IKS and environmental management have been examined in developing countries, little research has been done on efforts for the inclusion of local knowledge or IKS in environmental decision-making process especially in Africa, for example in South Africa.

1.8 Problem statement

Environmental issues and problems have been on the rise since the 20th century as a result of increased socio-economic development and technology. The natural environment is degrading at an alarming rate due to exposure to high pollution and the excessive harvesting of natural resources. The intensification of environmental concern over the past thirty years has resulted in the formulation and publication of international, regional and national environmental treaties, reports and declarations that provide for the establishment of acts, policies, tools and strategies. These are largely scientifically oriented strategies to deal with environmental problems. As pointed out by Reid, Berkes, Wilbanks and Capistrano (2006) and Berkes *et al*. (2000) certain environmental management strategies such as the environmental impact assessment process that employ scientific knowledge and techniques in identifying and predicting environmental impacts have proved to be insufficient to adequately deal with environmental issues. Scientific knowledge is used as the major basis for many environmental impact assessment procedures, despite the provisions for the use of indigenous knowledge. As noted earlier, some of the principles in these international arrangements advocate for the elevation and

complementary use of indigenous knowledge systems with scientific knowledge in environmental management strategies. Consequently, even national acts and policies provide for the establishment of environmental management tools that embrace the sustainable development ethos of public participation. The South African national environmental management policies also embrace the use of 'other knowledges' and participation of traditional healers and community elders among other participants (DEAT, 1998a). This therefore provides for the use of indigenous knowledge systems in EIAs.

However, in developing countries authentic or genuine integration of indigenous knowledge in environmental impact assessment procedures is shown to be still fraught with political, cultural and legal obstacles (Dowling, 2004; O'faircheallaigh, 1999). Over reliance on scientific methods that employ top-down public participation strategies are usually blamed for limited effective participation of indigenous communities in environmental impact assessment process for development projects such as road construction or dam construction. Reid *et al*. (2006) point out that indigenous knowledge systems are usually dismissed as unsystematic, ulterior and marginalized by western science since indigenous people and their traditions are viewed as less progressive and not able to deal with contemporary environmental issues and problems. According to Rist and Dahdouh-Guebas (2006) this has resulted in the discrimination and exclusion of most indigenous groups of people and indigenous knowledge from planning and execution of development programmes and projects.

Some researchers (Rist and Dahdouh-Guebas, 2006) have observed on the one hand that western science has been successful in so far as in bringing different groups together to deal with environmental issues but not in dealing with environmental challenges on its own. On the other hand there has been growing recognition that the plurality of different forms of knowledge, world views and ethical values from different social and cultural groups is also essential for dealing with

contemporary environmental issues (O'faircheallaigh, 2010; Isakson, Richardson and Olsson, 2009). This perception is underpinned by the Agenda 21 principles that state that the link between scientific and indigenous forms of knowledge is fundamental to sustainable development (Rist and Dahdouh-Guebas, 2006) and consequently to the environmental impact assessment process as a tool for improving decision-making in order to promote sustainable development outcomes. However, in South Africa, especially in rural communities such as Mapela in the Limpopo Province the area in which this study was conducted, little evidence exists to show that indigenous knowledge systems are used in the environmental impact assessment process.

1.9 Purpose statement

In view of the problem established, that is, that despite the provision by environmental policies and acts for the use of indigenous knowledge systems in environmental impact assessments, little has been done to do so. Consequently, the purpose of this study is to investigate whether and how indigenous knowledge systems are integrated into EIA procedures conducted for rural development projects in South Africa. In this case, this study also examines the effectiveness of public participation in fostering the incorporation of indigenous knowledge systems into the EIA process. In addition, this study seeks to highlight the contribution or role of indigenous knowledge systems in identifying and predicting environmental impacts of proposed development projects, so as to achieve sustainable development, as well as in the suggesting mitigation measures. The emphasis is on whether EIA procedures require both indigenous knowledge and scientific knowledge to provide a framework to create a holistic assessment of environmental issues related to proposed rural developmental projects. This research study also seeks to highlight obstacles that are encountered by the government agencies, EIA consultants and indigenous communities during the incorporation of indigenous knowledge systems into EIAs. Finally this study aims to investigate what has been

done in the past and what is being currently done by relevant institutional structures to mitigate the identified obstacles.

1.10 Research questions

1. How has the carrying out of the EIA process for rural development projects in South Africa adapted to the requirements of including indigenous knowledge systems?
2. How inclusive was the public participation process in the villages of Armoede, Ga-Molekana and Sekuruwe in Limpopo Province, South Africa?
3. How are indigenous knowledge systems integrated into EIAs in the local context?
4. How are indigenous knowledge systems contributing to EIAs?

1.11 Significance of the study

It became the aim in countries around the world to adopt and ensure that sustainable development forms the reference point and basis for almost all economic, social, environmental and political activities. To pursue a sustainable development culture, South Africa established its own environmental impact assessment process. This allows for the consideration of environmental issues in proposed economic activities that are seen to have adverse impacts on the natural environment, and also to promote the participation of local communities whose livelihoods might be affected. Based on the fact that the principal goal of EIAs is to maximise benefits and minimise potentially detrimental impacts for all concerned as well as for the natural environment, it is therefore essential to investigate how local/ indigenous communities could use indigenous knowledge systems to achieve intended outcomes of EIAs.

The findings and recommendations of this research could be of value to EIA

consultants, the government of South Africa, local communities and even the global community as it brings to the fore an example of the advantages of integrating indigenous knowledge systems into the EIA process. This research study is significant in that, to a limited extent, it takes an advocacy stance which may lead to further investigations on a larger scale. Such larger scale investigations might lead to suggestions and recommendations that might necessitate the amendment and promulgation of environmental management policies, even in those countries where they do not yet exist. As such they may provide clauses and ways that explicitly make it law to integrate indigenous knowledge systems in contemporary environmental issues, where appropriate.

1.12 Delineation of the study area

Mapela rural community is located in Mkopane District of the Limpopo province of South Africa. The three images in Figure 1.1 show the general location of the study area in the context of South Africa. The detailed locations of the three villages that make up the study area within this community are illustrated in Chapter 4.

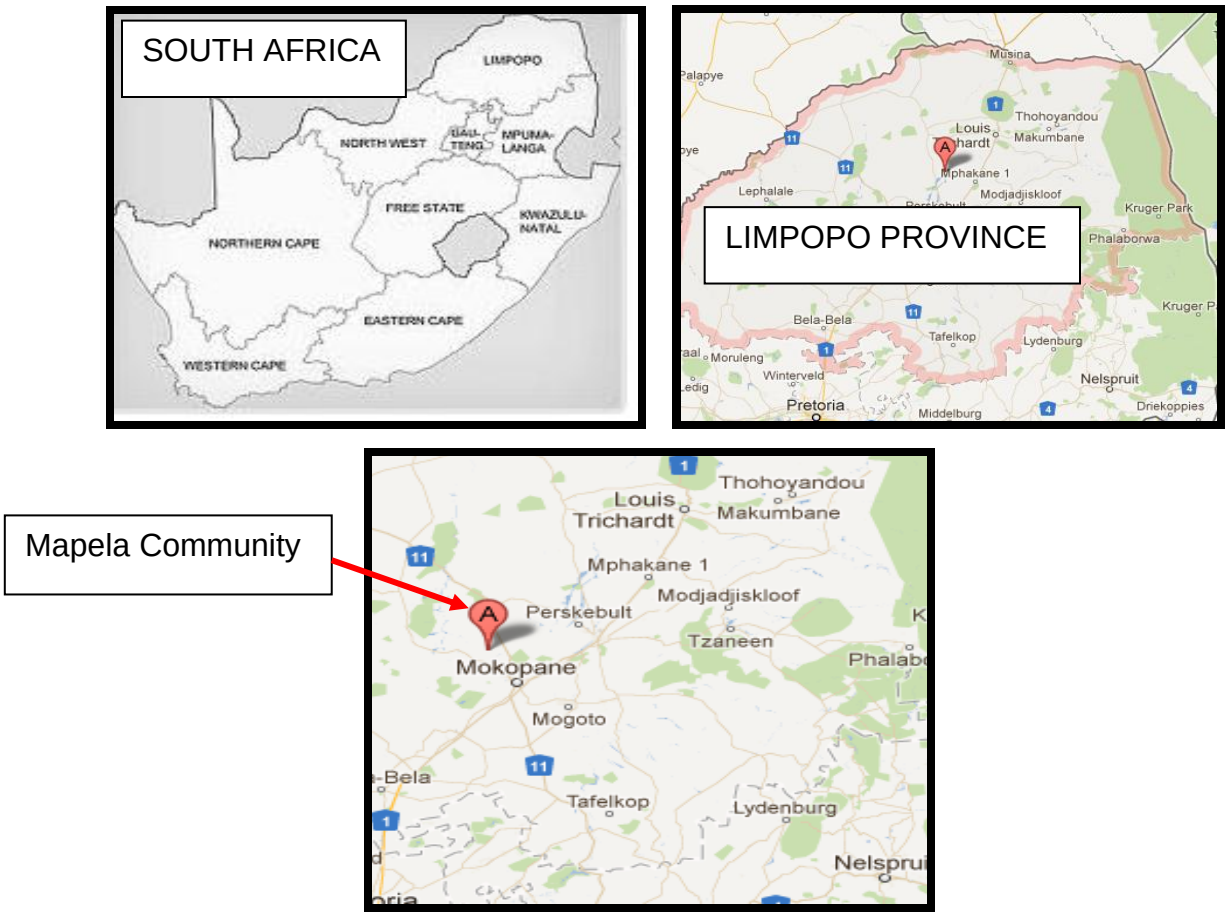

Figure 1. 1: General location of Mapela community[1]

This community is divided into seven villages namely Motlhotlo, Armoede, Sekuruwe, Ga-Molekana, Ga-Pila, Stenkwater and Skiming. The area is relatively developed as evidenced by the availability of socio-economic resources such as electricity, water and feeder roads of an average status. The entire community of Mapela is in a region which is rich in platinum resources. Of these Motlhotlo, Sekuruwe and Ga-Molekana lie over the richest and easily accessible platinum belt. These villages have been affected greatly by mining activities. Research relating to effects of mining has already been conducted, especially in Motlhotlo village, but to such an extent that the chief is reluctant to authorize any further research activity in the village. It is for this reason that though Motlhotlo was initially selected as the area

[1] www.maps.google.co.za/maps?ll

of study, it had to be left out. This study therefore concentrated on the three villages of Sekuruwe, Armoede and Ga-Molekana. The three villages provide a comparative study because Sekuruwe villagers were relocated in the early 1990s, to give space to expanding mining activities; Ga-Molekana villagers refused relocation, and Armoede villagers were more recently relocated in the late 2000s. In the mid 2000s, mining activities began extending into Sekuruwe village old burial site. Some community members were in support of the expanding mining activities and the exhumation of old graves, while others were against this. Such disagreements have resulted in divisions among the people within the villages as well as across the villages. Some villagers are up in arms against what they call exploitative and non-consultative mining development, while others support the developmental projects.

1.13 Limitations to the study

Language differences were a barrier in terms of communication since I did not understand the language of the participants and some of the participants did not understand English and isiZulu. A translator was used to translate the questions and answers and this disturbed the smooth flow of interviews. Some of the information intended for the interviewee and interviewer could have been lost during the translation process. However, thorough explanation and interpretation of questions as well as probing ensured the capturing of considerable amounts of relevant information.

More importantly, carrying out the interviews also became difficult because most participants had limited knowledge about the EIA process and that the issue of IKS and EIAs seemed too complicated for them, especially the elderly. As a result participants faced problems in answering questions on EIA and IKS issues. Questions were once again adjusted through explanations and probing to a level that could be understood by participants.

The division and conflicts that exist amongst villagers in these communities created difficulties of accessing other community members who belong to and support abandoned community committees. As such I was not able to interview too many people who were aligned with old community committees. I had to ask the chief to refer me to some of those villagers. Therefore the sample size was small to represent the whole community. For this reason, these findings cannot be generalised to the broader community based on this study. There is a need for further research relying on a large sample of rural communities and EIA experts for a fair representation and general conclusions.

1.14 The structure of the report

The rest of the report is structured as follows. The literature review is divided into two chapters. The first chapter outlines the development of environmental management strategies and describes the issues regarding environmental impact assessment and issues of public participation. The second chapter of the literature review outlines the politics of indigenous knowledge systems. This chapter also describes the factors pertaining to the suppression of IKS and developments leading to its recognition once again as a source of valuable knowledge. The research methodology is presented and data analysis techniques discussed. Next, the findings are presented and discussed. The presentation and discussion of results is also divided into two chapters: Chapters 5 and 6. Chapter 5 presents and discusses the results on the EIA process and public participation in Mapela, while Chapter 6 is on the EIA process and indigenous knowledge systems. The report concludes with a summary of major implications of findings, recommendations and areas for further research.

Chapter 2.

Literature Review: Environmental Impact Assessment

2.1 Introduction

The presentation of the literature review is divided into two areas i. e. this chapter deals with the EIA process and issues of public participation and Chapter 3 then with the EIA process and IKS.

This chapter begins with the historical background of EIA at both international and national level in South Africa, its evolution and development since the rise of environmentalism up to the time when EIAs were introduced and eventually used as tools for environmental management. The literature review also covers the description of international conventions and declarations as well as national policies and Acts that not only promote and encourage the implementation of EIAs but also show that public participation is increasingly emphasised in terms of its importance in environmental management. The concept of environmental impact assessment process and procedure(s) is thus discussed. This is followed by a description of the EIA system of South Africa including the legal and institutional frameworks, regulations and phases of the process. Furthermore, the discussion analyses the concept of public participation and illustrates how the process of public participation may be used as a way of integrating IKS into EIAs. The point of this is that while policies mandate for the inclusion of IKS, EIAs tend to be dominated by a technocratic approach using scientific tools and thinking. Examples are drawn from some countries such as Canada, Australia, Zimbabwe, British Colombia and Latin America to show how IKS can be incorporated into EIAs.

2.2 Evolution of 'environmental issues'

Indigenous communities around the world relied, and to some extent still rely directly

on natural resources for a living. Such communities have for centuries depended on the natural environment but always tried to keep it as natural as possible. However, Matshinge (2007) and Emery (1996) assert that indigenous communities used the natural environment with minimal impact not only through the use of traditional resource management practices, but also because human populations were low. As observed by Matshinge (2007) the use of indigenous knowledge systems that include traditional practices, beliefs and taboos to regulate and control the utilisation of natural resources was more effective then due to less exposure to modern technology and consumerism. However, the exponential increases in population in the past 40 years have ushered in a new pattern of resource utilisation. Therefore, some schools of thought (Reid, *et al.*, 2006; Oviedo, Gonzales and Maffi, 2004; United Nations, 2002; Grenier, 1998) explain that the increase in human population, coupled with the advent and world wide spread of the industrial and green revolutions, not only increased the demand for natural resources but also resulted in the degradation of the natural environment and disruption of traditional ways of natural resource conservation.

Escalating technological development in industry and agriculture resulted in increased consumption and destruction of natural resources, easy movement of raw materials and finished goods across countries and subsequently the production of large quantities of liquid, solid and gaseous waste products, which are deposited in the environment (Brownlie and Wynberg, 2001; McKinney and Schoch, 1998). In turn high exploitation of natural resources and high production of waste materials have resulted in the depletion and degradation of the natural environment support systems. The economic paradigm during this period shifted from consumption patterns of communal fellowship to a self-centred approach in pursuit of wealth accumulation (Beinart and Hughes, 2007; Reid *et al.*, 2006). The traditional wealth accumulation practices that observed the conservation of the environment, such as selective harvesting of natural resources and adherence to taboos, were abandoned for the adoption of practices that viewed the natural environment as an entity that

was to be exploited for the benefit of humankind. As observed by Appiah-Opoku (2000), it was during this period that the natural ecosystem as a self sustaining entity suffered adverse impacts and started to show signs of abuse.

As excessive exploitation began to endanger the basis on which the survival and continuity of economic development depends, reports of cases of desertification and health problems associated with waste dumping sites emerged (Beinart and Hughes, 2007). In addition, reports on issues of global warming and climatic change spreading around the world raised awareness of environmental problems (McKinney and Schoch, 1998). The evolution of awareness of environmental issues had begun.

2.3 Emergence and the rise of environmental concerns

The increase of adverse environmental impacts due to advances in technological and industrial development increased concerns about natural resource depletion and environmental degradation in different parts of the world, but especially in developed countries. In the 1950s, some environmental concerns were voiced as a result of incidences of sicknesses among people and deaths in wild creatures due to pollution (UNEP, 2002). These environmental concerns resulted in lamentations, protests and debates by several interest groups from developed countries (Sidaway, 2005; McKinney and Schoch, 1998). This kind of action from environmental groups has assisted in bringing environmental issues to the fore in the past four decades.

Environmental movements and environmental interest groups intensified the voice of environmental concern internationally in the late 1960s and early 1970s. Green movements and environmental pressure groups such as ‘Friends of the Earth’, ‘Environmental Action’, ‘Rainforest Alliance’ and ‘Earth First’ emerged, advocating for environmental protection (McKinney and Schoch, 1998). Such pressure groups advocated for a change of perceptions, values, and attitudes towards nature. The unifying stance taken by different movements and pressure groups was that the

natural environment should be viewed as a valuable and indispensable commodity where industrialists, agriculturalists and all forms of development should change from materialist and consumerist planning to more ecologically sound planning (Parry-Davies, 2004; McKinney and Schoch, 1998). The call was for a more environmentally concerned attitude, where economic development should be practised within the natural environment's carrying capacity to sustainable levels of development and absorption of waste products dumped into the environment.

In South Africa, some of the first environmental concerns were raised in the early 1970s and several bodies were formed in universities to co-ordinate and propagate responsible private sector environmental concerns (Rabie and Fuggle, 1994). The intensification of environmental concern was evidenced by the promulgation of several Acts regarding marine resources, soil conservation, water, air and noise pollution. Even though these Acts were not legally binding then, they promoted the protection and responsible exploitation of natural resources. The involvement of all South Africans in environmental matters was shown through environmental organisations such The African National Soil Conservation Association, Native Farmers Association and African Wildlife Society that also emerged in the late 1970s (Rabie and Fuggle, 1994). These organisations also advocated for the consideration of environmental issues in socio-economic activities.

2.4 Environmental conferences and frameworks

The concerns and activities of both international and national environmental pressure groups and movements became a foundation for the establishment of "environmental action". The 1970s were a watershed decade in the breakthrough to environmental action as many developed and developing countries became aware of the need to incorporate environmental considerations into economic development.

Eventually an international conference was held in 1972 in Stockholm, Sweden. The

UN conference on the Human Environment was the event that turned the environment into a major issue at international level, as well as serving in drawing together developed and developing countries on this issue (Middleton, 2003; UNEP, 2002).

A report produced at the Stockholm conference, called the United Nations Environmental Programme, became a reference point for economic development in the 1970s and early 1980s. Furthermore, the 1972 conference principles triggered changes in the attitudes and perceptions of policy makers, and development proponents, to environmental issues and challenges (Appiah-Opoku, 2000). The conference resulted in the establishment of initiatives for the protection of the environment and set the ball rolling for the introduction of the concept of sustainable development.

Several other environmental conventions were adopted following the Stockholm conference to help deal with environmental problems that were on the increase due to environmental destruction. From these, the concept adopted was that environmental issues need long term strategies and efforts, and integrated action and the participation of all countries and all members of the society (UNEP, 2002). It was believed that each country is responsible for adopting environmental management strategies that would integrate environmental and development objectives.

A major follow up international conference to the Stockholm conference was held in 1987 in Rio de Janeiro. The World Commission on Environment and Development (WCED) conference produced the Brundtland report (Our Common Future) which introduced the concept of sustainable development. Sustainable development is defined as ‘development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs’ (Kemp, 2008, 143; Middleton, 2003; Our Common Future, 1987). Countries attending the

Rio de Janeiro conference were then urged to adopt the ethos of sustainable development by considering environmental issues in development activities.

In 1992, another milestone on the environmental protection agenda was achieved when the United Nations Conference on Environment and Development (UNCED) reaffirmed the Rio de Janeiro principles on sustainable development. The UNCED, also known as the 'Earth Summit,' also produced a declaration on development and environmental principles called Agenda 21, which became the blueprint for sustainable development as it outlined the environmental management programme for the 21st century (Kemp, 2008; Middleton, 2003; UNEP, 2002). For the promotion of sustainable development, one of the principles in Agenda 21 emphasises the strengthening of environmental management by involving major groups, including women, children and youth, indigenous peoples and their communities in environmental and development issues (Mwaura, 2008; UNEP, 2002). The groups of people identified above were encouraged to participate in developmental projects that may have direct or indirect impact on their lives. The above mentioned major world conferences appear to agree and support the involvement of all members of society in dealing with environmental issues and problems. These agreements created platforms in which indigenous people would participate, hence facilitate the application of IKS in environment and development activities.

Several other environmental conventions both at regional and international levels were adopted by countries that had attended the UNCED of 1992 as a follow up to the Earth Summit. For example, the Convention on Biological Diversity (CBD) also urged the participation of indigenous communities and their knowledge in the conservation and sustainable use of biodiversity (CBD, 2004).

Ten years after the establishment of Agenda 21, a World Summit on Sustainable Development (WSSD) was held in Johannesburg in South Africa in 2002. The 2002 summit rekindled environmental interest and awareness as several countries and

groups of people within countries showed the willingness to work together for a common purpose (Barrow, 1999). The progress made on sustainable development was reviewed and the outcomes of WSSD still underscored the critical value of sustainable development in promoting environmental management.

The underlying principles from the 1987, 1992 and 2002 international deliberations emphasise that meeting the goals of sustainable development should be central to political, socio-economic and environmental activities. However, sustainable development is a highly debated concept associated with several interpretations, and thus meaning different things to different people. Kemp (2008) and Barrow (1999) explain that sustainable development is a multi-faceted people-centred concept, integrating a wide range of elements such as the expansion of the economy and the resolution of social issues. The Economic Commission for Africa (2005) and Qadeer (1996) add that sustainable development blends together economic development and environmental preservation. Despite its multi-faceted nature, the concept of sustainable development still ranks high as an invaluable tool used for the consideration of environmental issues in development initiatives.

Adopting sustainable development, calls for the establishment of environmental management tools and strategies that ensure the involvement of all members of society as provided for in the principles of the UNCED, WCED and WSSD. Consequently, environmental management should be a participatory activity. The Brundtland report calls not only for the participation of indigenous communities as affected parties in environmental management, but also for the need to protect indigenous people and their knowledge (O'faircheallaigh, 2007). In the same way in Agenda 21, Article 26, the importance of public involvement and participation in decision-making process is underscored. This forms the basis for the involvement of several stakeholders such as environmental specialists, NGOs and interested and affected parties (IAPs) may thus include the bearers of indigenous knowledge systems. Some authors (O'faircheallaigh and Corbett, 2005; Elias, 2000) also

believe that public participation is the key principle for the successful transition to sustainable development as this might be the platform to incorporate indigenous knowledge systems in environmental and development issues.

Although South Africa was not a member of the United Nations during the 1970s and early 1980s, most of the environmental management frameworks for this country fell within the precepts of the international management guidelines. Therefore, the concept of environmental management in South Africa dates back to the late 1970s where there was a lot of activity to investigate pollution. Then, in the early 1980s several national Acts were promulgated as frameworks to encourage and promote environmental conservation and protection. Among these developments, one of the important ones was the publication of the White Paper on a national policy regarding environmental conservation.

Then the first step to aid in implementing the objectives of the White Paper was the promulgation of the ECA 100 of 1982. In 1983 an EIA committee was set up to initiate research on and consultation about EIAs (Brownlie and Wynberg, 2001). In 1989, the IEM procedure and the ECA 73 of 1989 were promulgated. These environmental management frameworks were to provide for a democratic, proactive, participatory and holistic environmental management strategy and to extend the scope of environmental aspects regulated by the ECA 100 of 1982 respectively (Brownlie and Wynberg, 2001; Rabie, 1994; Preston *et al*, 1994). Sections 1, 5, and 6 of the ECA 73 of 1989 are legal provisions for the EIAs as they refer to the protection of biodiversity, control of activities with adverse impacts on the environment and regulations for environmental impact reports (Brownlie and Wynberg, 2001).

Brownlie and Wynberg (2001) and Rabie and Fuggle (1994) emphasise that despite the non-existence of EIA regulations and guidelines in the 1970s and 1980s, environmental impact assessment in South Africa was inherent in environmental

practices since the 1970s. Large scale projects considered environmental issues although there was no obligation to do so. Furthermore, Section 21 of ECA 73 of 1989 has provisions for identifying economic activities with adverse environmental impacts on the environment. These therefore are the provisions that later on governed and regulated the process of promulgating and adopting the EIA concept in South Africa (De Villiers, 2008).

The 1990s ushered in a more vigorous environmental management agenda in South Africa. South Africa strived to make EIAs effective and efficient through following international arrangements. The establishment of environmental management legislation and Acts provided for the EIA process (under institutional laws that were in line with the international community) to promote sustainable development. In 1994 the Environmental Policy White Paper was published, followed by the new NEMA 107 of 1998. NEMA of 1998 has an overarching legislative framework for environmental governance in South Africa, Section 24 especially, provides for the EIA process. This legislative framework has made it mandatory for project proponents with potentially environmentally detrimental projects to carry out EIAs for environmental management. NEMA gave effect not only to the White Paper Policy but also to the constitutional rights in Clause 24 which states that everyone has a right to

'An environment that is not harmful to their health and wellbeing and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures…..' (The Constitution of the Republic of South Africa, 2010, 11).

This section of the Constitution puts the government in charge of protecting the environment, for the benefit of present and future generations. The government is given the mandate to manage the environment by developing relevant organs of state and strategies for a holistic environmental management system (De Villiers, 2008; Brownlie and Wynberg, 2001).

So it is evident that parts of Section 21 and 26 of the ECA and NEMA and goals 2, 4, 5, 6 and 7 of the White Paper Policy on environmental management, and Clause 24 of the Constitution of South Africa, have all played a crucial role in the development of EIA regulations and guidelines. As provided for in the objectives of Sections 21, 22 and 26 of the ECA, the EIA guidelines encourage the promotion of sustainable development as the vehicle for dealing with environmental issues.

Sustainable development promotes that development should be both economically and environmentally sound so that the needs of the present generation are met without jeopardizing the ability of future generations to meet their own needs (Kemp, 2008, 143; McKinney and Schoch, 1998; Our Common Future, 1987). The developmental concept inherent in sustainable development is both people and environment oriented. Sustainable development advocates for the active involvement of all, including indigenous communities, the disadvantaged and the poor. As a multifaceted concept, sustainable development integrates a wide range of elements and encourages the use of local development strategies to meet local problems, thereby enhancing the chances of allowing development to occur without compromising the environment (Kemp, 2008). This is the major purpose of conducting environmental impact assessments.

In order to achieve sustainable development, the NEMA principles encourage the participation of all IAPs in environmental governance (Rosenburg, 2004). In fact, in South Africa, environmental regulations promote that all people must have the opportunity to effectively participate in environmental governance. The process of public participation is very important because it is through it that indigenous knowledge systems may be integrated into the EIA process.

2.5 The establishment of environmental management tools

The UNEP was established as a follow up from the Stockholm conference. UNEP's mandate was and is still to provide leadership and encourage environmental protection and the promotion of sustainable development (Dodds, 2000). Therefore under the leadership of UNEP and as a response to calls from international conferences and conventions to achieve sustainable development, several developed countries established environmental Acts and policies. These became institutional and legislative frameworks with provisions for the creation of environmental management tools and strategies. By 1972 some countries, such as The United States of America, had created environmental management tools.

Rabie and Fuggle (1994) assert that several other countries including South Africa, although not members of United Nations, had also started to establish environmental planning and management Acts by the 1970s. Some countries even produced national constitutions with provisions for the establishment of environmental policies and regulations as well as how to directly deal with environmental management (Starzewska, 1990). For example, in 1989 South Africa established the ECA 100 of 1989 which provided for the creation of environmental management strategies. In 1996 the South African constitution was developed and clause 23 makes environmental management a mandate for the national and provincial government of South Africa. Furthermore the NEMA of 1998 which replaced ECA 100 of 1989 provides for the formulation of guidelines and regulations for different environmental management strategies. However, some of the established policies and acts for environmental management were not legally binding.

It can be seen that environmental policies and acts regarding environmental management have evolved and are still evolving, and amendments have resulted in these becoming legally binding. They in turn become the benchmark for the establishment of legally binding environmental planning and management tools such as EIAs, EMS and Cost Benefit Analysis (CBA). Such environmental management

tools are now used in many countries around the world to promote sustainable development and to ensure the efficient use of natural resources, cleaner industrial production and production of less waste.

However, several writers (Patel, 2009; Geurts and Jolderma, 2001; Brown and Jacobs, 1996 and Sally, 1996) argue that environmental management practices depend on technocratic ways of dealing with environmental issues. Western science is seen to play a central role in environmental management. Despite the UNCED and WSSD and South African legislative framework provisions underpinning the significance of other knowledges in environmental management, environmental management practices still remain technocratic. In several countries around the world, including South Africa, environmentalists, governments and supporters of indigenous knowledge are lobbying for environmental management practices that are less technocratic and reactive, and more eco-centric and proactive, and which engage the grassroots people and their knowledge.

An example of an environmental management tool that seeks to use the bottom-up strategy of public participation is the EIA process. EIAs have been adopted and used across several countries around the world as an environmental planning and management tool for proposed development projects that are viewed as having significant adverse impact on the environment. An EIA should be participatory as provided for in Chapters 24 and 34 of Agenda 21. In South Africa, EIA regulations and guidelines also provide for public participation. People conducting EIAs are encouraged to:

'…engage major groups such as women, youth and indigenous people in environmental management practices' (Dodds, 2000).

2.6 The Environmental Impact Assessment process

The EIA process, because it is associated with several definitions and

interpretations, is as already noted, a concept that is highly debated. Some authors define the EIA process as an administrative and regulatory process by which environmental impacts are determined, although this definition varies from country to country (Preston *et al.,* 1996). Others, such as Sowman (2004), Showers and Malehleha (1992) and Wathern (1990a) define an EIA as a planning and management tool or instrument used for predicting, identifying, assessing/evaluating and mitigating the likely biophysical, social and other adverse impacts of proposed development projects. Others (Dowling *et al*, 2008; Erickson, 1994) add that an EIA is also a fundamental tool for improving decision-making in order to achieve sustainable development outcomes. Some authors (Barrow, 1999 and Wathern, 1990a) emphasise that although there is no universal definition of EIA and the concept is still widely debated, the concept has been widely accepted because of its central theme. The central theme is that the EIA seeks to combine administration, planning, analysis and public participation in pre-decision assessment of certain economic activities. In other words the EIA aims at improving development by prior assessment. It is believed that prior assessment ensures that environmental aspects are considered in socio-economic development and activities. Hence, Wathern (1990b) underscores that the EIA process is a preventive tool that seeks to anticipate and resolve in advance the potential environmental challenges caused by economic development.

Some authors (Patel, 2009; Wathern, 1990a) agree that the EIA process is a largely technocratic and scientific tool that relies mainly on technical aspects of appraisal and so engages experts and specialists to carry out the procedures. They claim the EIA process was and is still formulated by civil servants and other experts. Furthermore, the EIA process is carried out by expert consultants and specialists in ecology, botany, zoology and archaeology. In fact, the Terms of Reference (TORs), used in predicting, identifying and assessing environmental effects were and are still scientifically oriented. According to Woodburne (2005) TORs are a yardstick or a contractual document by which EIA consultants, specialists and other stakeholders

should operate. TORs are documents that spell the activities of individual teams in the EIA process as well as the time scale of the process (Woodburne, 2005, 10).The use of scientifically oriented TORs has been observed to be happening in several countries around the world.

However, as noted earlier on, the EIA process has remained technocratic and expert oriented despite the international and national environmental management declaration provisions that environmental management tools should be participatory by involving other knowledge systems. Even though the EIA process has changed over the years and extended in breadth with regards to developmental and environmental issues, it still remains in the hands of specialists. In some countries the credibility of the EIA process has and is being questioned because of the continued use of one form of knowledge. As a result some countries in the developed and developing world have established EIA regulations and guidelines that underscore the need to involve other stakeholders as well as indigenous communities and their knowledge. The stakeholders may include among others, the proponent/developer, provincial authority, local authority, specialists, consultants, IAPs and environmental NGOs (Dowling, 2004; Showers and Malehleha, 1992).

The roles played by each of these stakeholders in the EIA process ensure that the process provides sufficient, reliable and useful information for decision makers at each stage of the project planning cycle. For this to occur, Dowling (2004) reckons that the EIA process has to be transparent and systematic, providing opportunities to inform and involve the public whose inputs and concerns should be addressed explicitly in EIA reports and decision-making.

However, the literature reveals that there are different opinions about when the participation by the public begins and ends. While some authors (Patel, 2009; Sally, 1996) argue that public participation should begin at the conceptualisation of the proposed project and proceed through out all the stages of implementing, monitoring

and up to the final stage of decommissioning of the project, others argue that public participation should start well into the EIA process, i. e. at the scoping stage and stop well before the dissolution of the project (Wood, 1990). However, the latter argument has been rejected by recent development initiatives and voices that lobby for effective and genuine public participation. This could ensure the use of views and inputs of local community in the final decision-making process with regards to proposed projects. The EIA policy procedures and regulations demand a 'from the cradle to the grave' concept of public participation (see EIA regulations of South Africa).

Despite the fact that EIA public participation, procedures and approaches differ in this detail from country to country, the process of including public participation has been widely adopted by several countries for environmental management. Certain common stages, such as scoping, scoping report, impact assessment, suggestion of mitigation measures and environmental assessment report, are followed during the EIA process (DEAT, 1998a; Wathern, 1990a).

As noted earlier on, the EIA process was first adopted and used for environmental planning and management in developed countries in the early 1970s. Countries such as the USA, Canada and Australia were among the first to establish environmental policies and acts with provisions for formulating EIAs. Then during the late 20th century the adoption and use of EIAs as an environmental planning and management tool to achieve the goals of sustainable development spread to developing countries in the 1980s. Countries such as South Africa, Zimbabwe, and the Democratic Republic of Congo were among the first in Africa to establish environmental management policies with provisions for EIAs. However, the western models of the EIA process were employed. This implies that developing countries also privilege scientifically based EIAs despite international and national provisions for the inclusion of other forms of knowledge.

The adoption of EIA models that were developed in most industrialized countries implies that most of the EIAs used in developing countries are highly technocratic in nature. Writers including O'faircheallaigh (2008) and Appiah-Opoku (2000) argue that western models of the EIA process are therefore irrelevant in the developing nations, especially considering their level of development and culture. The suggestion is that the EIA processes in developing nations should involve indigenous communities throughout the process, i.e. their knowledge and practices as provided for in international environmental management principles and national environmental management policies and Acts. Incorporating indigenous knowledge systems into the EIA process may be facilitated through public participation.

2.7 The implementation of the EIA process in South Africa

Today South Africa has established a number of environmental management institutional and legal frameworks. These include the ECA 73 of 1998, the NEMA 107 of 1998 and the White Paper Policy on environmental management. These legislative and regulatory instruments have made provisions for the EIA process which is used as an environmental management strategy. In fact, the conceptual framework for the EIA process in South Africa is based on international conventions on environmental management and sustainable development as well as on the national constitution and policies. This means that the EIA process should be participatory in nature. The process should promote the participation of different stakeholders such as government officers, environmental NGOs, various environmental specialists, EIA experts; and IAPs. The public participation process (PPP) is defined in the EIA regulations as a process that enables IAPs to be given an opportunity to comment on and raise issues relevant to the proposed developmental project (Danelle and Kate, 2009; DEAT, 1998b). Qadeer (1996) adds that it is particularly through the participation of the grassroots people and their knowledge that the integration of IKS into EIAs may be facilitated.

The EIA process in South Africa has been carried out as per EIA guidelines and regulations provided for by ECA 73 of 1989, but since the streamlining and upgrading of the regulations the process is now governed in terms of NEMA regulations (Danelle and Kate, 2009; De Villiers, 2008; Dowling *et al.*, 2008). The new EIA regulations came into effect in 2006. The EIA regulations and guidelines require specific procedures to be followed and reports to be prepared for certain scheduled economic activities that have been identified as having potentially detrimental effects on the environment. These economic activities have been classified into nine thematic categories and two major groups, one dealing with activities that require basic assessment and the other with activities that require comprehensive scoping (DEAT.2006; Kirby and Sauer, 2006). However, these are not elaborated in this document as they do not contribute much to the main objectives of this research study.

The EIA process follows systematic steps or procedures that have to be undertaken by EIA experts and other specialist stakeholders, including botanists, archaeologists and ecologists as well as local/indigenous communities and traditional leaders. It should be noted that in South Africa the provincial government and the provincial department responsible for environmental issues is the relevant authority for managing the EIA process. DEAT has the responsibility for producing guidelines for implementing EIAs. Relevant provincial government authorities carry out their mandates of ensuring that proponents effectively implement the EIAs for all relevant economic developments.

2.8 Phases and procedure in the EIA process

The EIA regulations state that the developer or proponent is required to seek the services of an independent EIA consultant to undertake the EIA process (DEAT, 1998b). Regulation 56 in Chapter 26 of the EIA regulations provides for the public participation process, regulation 57 provides for a register of IAPs while regulation

58 and 59 are for IAPS to comment on the proposed project, and comments from IAPs to be recorded in reports respectively (DEAT, 2006). The regulations and guidelines also specify the stakeholders that should participate, at which stages they should participate and their roles in the EIA process. Stakeholders participating in the EIA process include those that were mentioned earlier as well as environmental groups and the general public. The concept of inclusivity in environmental management is embedded in the White Paper Policy on Environmental Management, as well as in Section 56 of the EIA guidelines. The environmental management process, in this case the EIA process, should consider the interests, needs, and values of all IAPs in decision-making and this should include recognising all forms of knowledge including traditional and ordinary knowledge (DEAT, 1998a).

The EIA process is undertaken through a number of stages that include screening, scoping, assessing and evaluating environmental impacts, suggesting mitigation measures, reporting, reviewing, and decision-making and the Environmental Management Plan (EMP). The screening is usually done by the EIA consultant to verify whether an EIA is needed or not. If the EIA process is needed, the EIA regulations require the contracted EIA consultant to notify other stakeholders about conducting all the EIA procedures that require public participation (DEAT, 1998b).

The EIA guidelines state that it is the duty of the proponent and EIA consultant to identify the stakeholders and IAPs, as well as to do the notification process about the EIA activities through a variety of notification forms. This includes the media by using different forms of advertising such as on-site advertising and press advertising in provincial and local newspapers (Kirby and Sauer, 2006; DEAT, 1998b). The notification should explicitly indicate the dates, times, venues and the reason for participation in each activity that will occur throughout the EIA process.

The first stage is the scoping stage which is a participatory one and involves stakeholders such as the public, local authorities, specialists and interest groups.

The scoping procedure is for identifying and predicting significant environmental issues and concerns. The identified environmental issues and concerns are then recorded in a Scoping Report (SR). The SR is used to develop the TORs that are used in assessing and evaluating any environmental impacts as well as suggesting mitigation measures (Brownlie and Wynberg, 2001; Barrow, 1999). The scoping report is then sent to the responsible authority for verification and should also be reviewed by all the stakeholders so as to find out whether their views are appropriately represented.

When the review of a SR is finished, then the TORs are used to identify and evaluate both positive and negative environmental impacts. The assessment is done to evaluate and determine the significance of environmental impacts, that is, to find out whether the impact is desirable/beneficial or adverse/undesirable (Erickson, 1994). Several methods such as mapping, matrix, checklists, overlays, and simulation and computer expert systems are used to identify and determine the spatial and temporal scales such as probability of occurrence, magnitude i.e. qualitative and quantitative estimates of size and extent and reversibility (DEAT, 1998a). Mitigation measures and alternatives are then suggested.

An Environmental Impact Statement (EIS) or an EIA report is produced which also has to be reviewed by all the stakeholders to check compliance with regulations and whether all interested parties' interests and concerns were addressed (DEAT, 1998b). The EIA report is then handed to the responsible authority that has to make the decision to approve or reject the implementation of the project depending on the contents of the report. According to the EIA regulations and NEMA principles decision-making at all stages of the process must include interests, needs and values of all IAPs as well as recognise all forms of knowledge including indigenous knowledge (Brownlie and Wynberg, 2001). As a result every stakeholder has the right to appeal if the decision of the responsible authority does not satisfy them.

The above discussions show that the EIA process is participatory in nature and therefore should promote the meaningful participation of different stakeholders. Public participation should use different participation ways which also enable IAPs, especially the grass roots people, to be given an opportunity to raise their views and opinions with regards to the proposed development project.

The next section discusses various ways of public participation and how each contributes to meaningful involvement of local/indigenous communities in environmental and developmental activities that affect their lives.

2.9 The concept of public participation

It is imperative to note that public participation is increasingly stressed in environmental management policies. Writers including Geurts and Jolderma (2001) and Sideway (2005) assert that the concept of public participation is enshrined in the ethos of sustainable development. Consequently, it has been actively debated in environmental planning. This has been so because international declarations from UNCED and WSSD provide for and underscore the need for public participation in sustainable development. In response to calls for sustainable development, several countries around the world have also promulgated environmental management policies and regulations that have provisions for public participation. Some countries have included in their environmental policies and guidelines provisions for the involvement of indigenous communities and their knowledge and practices in environmental issues that impact on their lives. It is important to note, however, that the provisions for public participation do not specify how and to what extent the public should be involved.

In order to understand how public participation may promote the integration of indigenous knowledge systems in EIAs, it is necessary to provide the background to different definitions, opinions and approaches related to this process. Some authors,

for example, O'faircheallaigh (2010), Duraiappah, Roddy and Parry (2005, 3) and Wagner (2004) define public participation as a process through which stakeholders influence and share control over priority setting and policy making. Greyling (2005, 2) adds that public participation is a process leading to a joint effort by stakeholders, specialists, the authorities, and the proponent to work together to produce better decisions than if they had worked independently. Public participation promotes the involvement of interested and concerned individuals in environmental issues that affect their lives. Different stakeholders are given a chance to air their views and contribute towards decision-making (Greyling, 2005; Bishop and Davis, 2002). The above definitions show that public participation should be a democratic process that allows people, especially local communities, to influence decisions regarding socio-economic activities that impact on their lives.

However, it is not clear from the different definitions how the process allows for the engagement of stakeholders in decision-making. As a result, some writers (O'faircheallaigh, 2010; O'faircheallaigh, 2007and Bishop and Davis, 2002) propose that public participation, though a complicated process, involves people in different ways, depending on purpose, approaches and procedures of conducting the public participation process. For example, Arnstein (in Choguill, 1996) defines public participation as a process that facilitates the re-distribution of power to enable the disadvantaged to be involved in matters that impact on their lives. She suggests that public participation should be viewed as a "ladder with rungs", where each of the eight rungs represent different types of public participation (Arnstein in Choguill, 1996). Figure 1 below illustrates the layout and the rungs representing the different types of public participation.

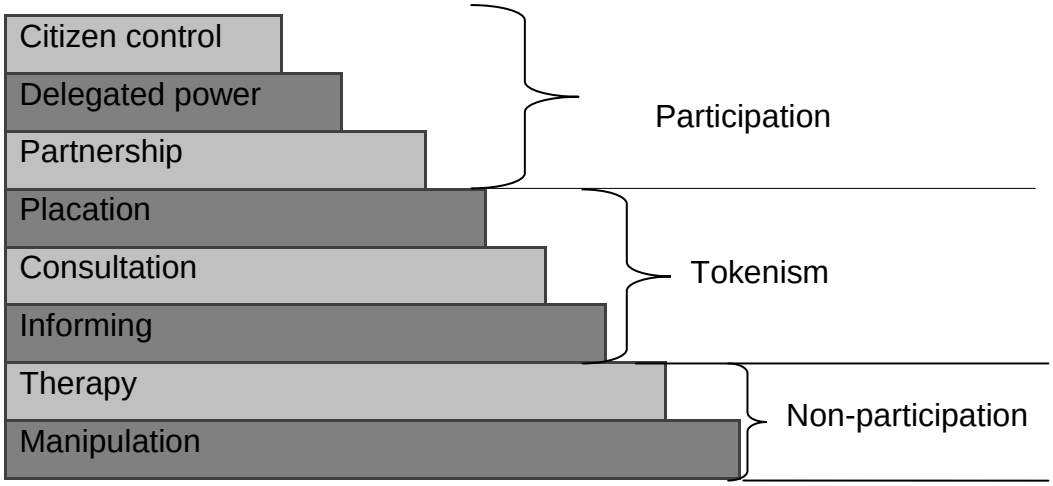

Figure 2. 1: The types of public participation[2]

At the bottom of the ladder, she proposes that there is no participation. The first two rungs represent manipulation and therapy methods of public participation. These methods are usually used where the government does not carry out development projects for the community, and if some development is done the community is not informed. The next three rungs include informing, consultation and placation. These participation techniques are collectively described as tokenism. In this case there is some consultation where experts and government often seek opinions from people just to win community approval for the project. There is limited assurance that people's opinions will be taken into account during decision-making. The top three rungs of the ladder represent varying degrees of community participation through partnerships, power delegation and citizen control (Choguill, 1996). It is at these levels where the local community is meaningfully involved and is able to control and influence decision-making.

Arnstein (in Choguill, 1996) thus views the concept of participation as the redistribution of power that enables the 'have not' citizens, presently excluded from political and economic processes, to be deliberately included in decision-making.

[2] Cited from Arnstein's ladder of participation in Choguill (1996,433)

Some authors (O'faircheallaigh, 2010; Wagner, 2004; Bishop and Davis, 2002; Choguill, 1996) have critically assessed Arnstein's idea of public participation with a view to developing and improving it. These authors suggest that instead of viewing public participation as distinct or discontinuous steps in a ladder, the process should be viewed as a continuum with varying degrees of public participation. The levels should rather be seen as different levels of participation which are connected to one another. Choguill (1996) for example also identifies 8 levels of community involvement for developing countries. According to Choguill (1996, 439-440), the scale of participation involves different levels ranging from people being neglected and rejected at levels of "self management" and "conspiracy", followed by manipulation at the levels of "informing", "diplomacy" and "dissimulation", and at the final level of support, where the government conciliates people through top-down approaches of consultation, "partnerships" are formed with stakeholders that also empower them.

Bishop and Davis (2002) further improve the understanding of the concept of public participation by explaining that the process is a continuum with varying degrees of movement towards democracy. Bishop and Davis (2002, 17) claim public participation could be "pseudo, partial or full". That is to say, public participation may range from just offering comfort of voice without substance, to rare instances where participation can influence outcomes.

Isakson *et al.*, (2009, 296) also agrees that public participation varies in degree of involvement as it begins with consultation and informing, which are weak forms of participation, through to stronger forms of delegation and "citizen control".

Whatever the idea, form, purpose and procedure of public participation, most authors agree that public participation should involve the sharing of power between the governed and the government. Meaningful participation of stakeholders occurs

only if formal decision-making, problem solving and action planning are shared and performed jointly by experts, government and other concerned and interested stakeholders (O'faircheallaigh, 2010; Bishop and Davis, 2002; Choguill, 1996). In this situation the local empowerment of communities would be promoted by using bottom-up strategies of public participation that encourage their meaningful participation.

Furthermore Bishop and Davis (2002, 18) clarify that,

"viewing public participation as a continuum does not only acknowledge ambiguities in defining public participation but it also makes the participation process a scale of possibilities that avails a full range of choices for decision makers".

In other words policy makers are exposed to different public participation approaches from which they may choose the appropriate approach. The public participation approach is selected depending on the extent of public involvement required, the purpose of participation, policy problems, resources available, and the nature of the activity in question among other things (Bishop and Davis, 2002). Tuler and Weber (1999) note that viewing public participation as a continuum means that participation approaches are not exclusive of one another. Therefore it is possible to use a combination of approaches such as informing, consultation and collaboration as ways of participation at different times, but in one activity or programme.

Having established that public participation is a complex process, it is imperative to highlight that the process is fundamental in providing an opportunity to several stakeholders to influence and share decision-making in development initiatives. Despite the fact that several writers agree that public participation in socio-economic initiatives, such as environmental management, can only be meaningful if there is fair distribution of power, the concept has been adopted in several countries.

On the one hand, O'faircheallaigh (2010) argues that in EIAs, the public participation process is used as a tool to get the marginalized, especially the indigenous

communities, involved in environmental planning and management. The process gives the locals the opportunity to influence the decisions made on environmental issues that impact on their lives. On the other hand, Bernard and Khumalo (2004) and Sibanda (2004) claim that in reality public participation does not offer meaningful participation of marginalised or indigenous communities because EIAs are still at the realm of government, policy makers and EIA experts. Patel (2009) adds that in EIAs the scope of assessment is still limited to scientific knowledge collected and assessed by experts. The government and EIA experts are still the ones who decide when, where and how public participation should be used. Even the TORs of EIAs in some countries such as South Africa are still scientifically oriented, engaging mainly technocratic personnel such as EIA experts, botany and archaeology specialists.

Wel (2006) also clarifies that different specialists carry out their various activities of predicting, identifying and assessing environmental impacts without asking for contributions from the local communities. Usually local communities are involved only in informative meetings where they are told how the proposed development project may affect their socio-economic activities. According to Patel (2009) the EIAs still fall short of adequately involving the locals as they are usually consulted only after final decisions have been made. This then does not give the local communities the opportunity to shape the solution. During such meetings, the proponent aim is getting buy-in from the locals and consequently dwells more on development positives rather than on possible negatives.

Despite all other contestations and debates about the technocratic nature of public participation, bureaucracy across many areas of public policy with regards to the concept of public participation make the process fall short of meaningful participation of indigenous and disadvantaged communities (Sidaway, 2005). The process is still, however, a valuable tool for engaging other stakeholders in issues that affect their lives, though in a weak sense. Tuler and Weber (1999) assert that if well executed,

public participation could lead to informed and collaborative dialogue between stakeholders holding diverse interests and values about the economy, local community, resources and the natural environment. Thus the process becomes an appropriate and valuable platform for incorporating indigenous communities and their knowledge into EIAs. As stated earlier on, O'faircheallaigh (2010) and White, Christensen, and Ehrlich (2007) assert that some research studies in Canada have shown that public participation has promoted the use of indigenous knowledge systems as a valuable source of ecological knowledge and skills. This, they claim, has often improved the outcomes of EIAs.

The next section discusses and highlights general aspects of the public participation process in the context of South African environmental management frameworks and strategies.

2.10 Public participation in the EIA process in South Africa

NEMA principles explicitly provide for effective public participation and the EIA guidelines also specify the stakeholders and their roles in the EIA process. This indicates that the public participation process is a legal and mandatory procedure for any developer who conducts the EIA process in South Africa.

It is the duty of the proponent and the engaged EIA consultant to ensure that there is effective public participation throughout all the relevant stages of the EIA. To ensure effective participation the EIA regulations and guidelines on public participation specify that the consultant has to consult extensively with IAPs, keep a record of IAPs and record and submit comments from IAPs (Kirby and Sauer, 2006). Notifications about consultation have to be accessible to all stakeholders, in terms of both proximity and understandability.

Despite these requirements by EIA regulations on notification about activities being

carried out for each stage of the EIA process, be it scoping, review of the scoping report, impact assessment and review of EIA report, the process is still expert oriented in all the stages. Ndaba (2009) explains that NEMA and EIA guidelines require developers to do public participation, yet there is nothing on paper, which provides check list to monitor that there was adequate consultation and for example, what mining companies need to do to be granted a licence. A further example comes from the study of EIA processes for different economic development projects by Brownlie and Wynberg (2001) which revealed that the public participation process was not adequately addressed. In some reports there was no mention of the involvement of locals, let alone the inclusion of indigenous knowledge. This indicates that the public participation process in the EIA process in South Africa still lacks meaningful involvement in terms of indigenous or local communities.

2.11 Conclusion

This chapter has outlined the literature which shows that while there are many international and national policies that require developers in South Africa to practise meaningful public participation of indigenous communities, it appears that compliance with these requirements is still a challenge. Since the focus of this research study is how the public participation process in South Africa can assist in integrating indigenous knowledge into EIAs, the next chapter deals with various aspects of IKS that can be seen to be critical to the process of public participation in EIAs in South Africa.

Chapter 3.

Literature Review: The Politics of Indigenous Knowledge Systems

3.1 Introduction

This chapter discusses the various definitions of IKS, its characteristics, use, storage and transmission. Next, issues leading to the suppression of IKS and loss of its value and use are highlighted. This chapter also highlights the factors that have led to the recognition of IKS as a valuable source of knowledge in several countries around the world, especially in developing countries that still have indigenous or traditional communities. To conclude this chapter, 3 frames of using IKS in EIAs are discussed and examples of case studies from different countries where IKS has been successfully used in EIAs are outlined.

3.2 Definitions of Indigenous Knowledge Systems

IKS are not only receiving great attention as a source for valuable knowledge but also as a highly a debated concept. IKS is defined differently in different areas and by different interested parties, with several meanings being attached to it. The variations in the concept of IKS are a result of the differences in the way indigenous communities interact with each other and the natural environment and some in the way that different researchers interpret this interaction. Some authors including Behera and Nath (2005, 210); Lawes *et al.* (2004) and Mascarenhas (2004) define IKS as the total knowledge and skills that people in a particular geographical area possess, enabling them to live in harmony with the natural environment. Other authors Gadzirayi, Mutandwa, Chihiya and Chikosha (2006), Rahman (2004) and Odora Hoppers (2002) assert that IKS are rooted in ancient traditions that relate to culture, physical survival and environmental management.

There seems to be common agreement that IKS comprise a body of knowledge produced over many centuries through long periods of interaction with the natural environment (Dondolo, 2005; Du Toit, 2005). This knowledge has been developed through generations of observation of behaviour of both living and non-living components of the natural environment, through experimentation and innovations encompassing plants, varieties of trees, animal species and habitats as well as relations among them (Beinart and Hughes, 2007; Maila, 2007; Reid *et al.*, 2006; Isaac, 1996; Showers and Malahleha, 1992). Hart and Vorster (2006) and Grenier (1998) add that this knowledge has been tried and tested over generations. IKS developed through the close relationship and interaction existing between human beings and their natural environment.

Before proceeding, it is important to highlight that researchers and others in different locations around the world use varying terms such as “traditional ecological knowledge” (Berkes, 1993, 5; Johannes, 1993, 35), “traditional knowledge” (Lawes *et al.*, 2004, 494), “indigenous knowledge” (Dondolo, 2004, 10), and “indigenous knowledge systems” (Berkes *et al.*, 2000) to refer to the body of knowledge, skills and technology, here referred to as IKS. Despite the several definitions and terms, the central theme that indigenous knowledge systems consists of a set of knowledge, values, skills and technologies that are part of the relations between people and the natural environment cuts across all definitions and terms. For this research study the term ‘IKS’ will be used, rather than the terms given above because according to Lawes *et al.* (2004) and Berkes *et al.* (2000) it is broader in scope or more inclusive. It incorporates all aspects of indigenous people’s knowledge including several aspects of knowledge related to agricultural, medicinal and food gathering as well as ecological knowledge (Grenier, 1998). According to Gibson (2003) these definitions and terms reveal certain similar characteristics of this knowledge such as the spiritual aspects and cultural contexts in which it finds its meaning. Behera and Nath (2005), Dondolo (2005), Masaga (2005), Mokuku (2004) and Grenier (1998) add that all IKS is adaptable, dynamic in nature and cumulative.

They assert that this body of knowledge is continuously changing due to both internal and external influences; hence it is able to address contemporary environmental issues.

According to Gadzirayi *et al.* (2006), Angayuqaq and Kawagley (2005), O'faircheallaigh and Corbett (2005), Snively and Corsigilia (2000), and Berkes (1993) IKS is holistic in nature as bearers and users of this body of knowledge view the natural environment as a connected whole and human beings are seen as an integral part of nature. This means that indigenous ways of natural resource conservation and management consider the use and conservation of one component of the environment in relation to the entire ecosystem. The IKS that could be used in socio-economic and political development are therefore enshrined in traditional ceremonies and practices, customs, spiritual beliefs, rites, rituals, taboos, religion, values and culture of indigenous communities. Environmental and ecological knowledge embedded in IKS has been used for generations by indigenous communities around the world for sustainable utilisation of the natural environment (Lawes *et al.*, 2004). Following the above stated characteristics, Behera and Nath (2005) and Lawes *et al.* (2004) claim that IKS provide practical and operational knowledge which is always up to date as long as is being used.

Lawes *et al.* (2004) and Berkes *et al.* (2000) describe IKS as having temporal and spatial dimensions i. e. IKS may vary from time frame to time frame and among communities and members of the same community. Maila (2007) also asserts that IKS is unique, contextually bound and is embedded in a cultural web. This makes IKS a valuable source of ecological/environmental knowledge (botany, ecology and zoology) for resource management, agricultural systems, breeding methods, migratory patterns, harvesting methods and techniques, fishing and hunting techniques, climatic knowledge and political and social institutions for specific geographical areas in specific time frames (Gadzirayi *et al.*, 2006; Hamwey, 2004; Lawes *et al.*, 2004; Odora Hoppers, 2002; Chambers, 1991).

3.3 Transmission and storage of IKS

IKS are traditionally stored in the social memory of the community members, especially traditional leaders, elders and herbalists. Aubel (2006) asserts that traditional leaders and traditional healers used to, and still play, an overwhelming role as custodians and transmitters of IKS. He explains that traditional leaders and healers as custodians of IKS were and continue to be cornerstones for the continuity and perpetuation of this knowledge across generations. IKS are traditionally transmitted from generation to generation through word of mouth, instructions and demonstrations (Reid *et al.*, 2006; Dondolo, 2005; Hamwey, 2004). According to Gadzirayi *et al.* (2006) and Rahman (2004) IKS is expressed in the form of taboos, folklore, beliefs, traditional practices and cultural values and norms. These traditional practices and beliefs are imbued with cultural, political and ecological knowledge and codes of behaviour (Gadzirayi e*t al.,* 2006; Reid *et al.,* 2006). However, the means of IKS storage and transmission have been criticized because this body of knowledge is susceptible to loss when the custodians die and as people are absorbed into and absorb other cultures.

3.4 The suppression of IKS

IKS has been the main source of knowledge and understanding used for political, social, economic and environmental governance since time immemorial by indigenous communities around the world. However, in South Africa as in several other African countries, colonisation, Christianisation and education, forced occupation, invasion, servitude, apartheid and ethnic cleansing, have all resulted in the suppression of IKS (Ochalla, 2007; Comaroff and Comaroff, 1991).

Comaroff and Comaroff (1991) assert that the colonisers made efforts to gain control over the practices of their subjects by introducing, and in some instances imposing,

new lifestyles on the colonised. Indigenous South Africans, as with other indigenous communities in the developing world, were exposed to new forms of dress, agriculture and architecture, religion and education. According to Comaroff and Comaroff (1991) by introducing these new lifestyles, the colonizers wanted to colonise the consciousness of people and reconstruct their way of life with a foreign culture. Some people succumbed and took up this new culture silently and effortlessly while others resisted to this new form of being.

During the pre- colonial era chiefs and elders were the custodians of tradition. They ensured that every day activities of the community, the social relations and exploitation of natural resources for different uses or in political matters followed specific guidelines, all of which then constituted the culture of the people. However, several authors, including Mpofu, Miruka and Ogutu, (2009), Aubel (2006), Gadzirayi *et al.* (2006), Turner *et al.* (2000) and Comaroff and Comaroff (1991) assert that during the colonial period the banning and destruction of traditional institutions, especially chieftaincies, weakened the traditional community leadership. Beinart and Hughes (2007) and Maryam (1995) also explain that when indigenous social controls were eroded, local social political structures lost their power. Consequently, traditional leaders no longer had power to enforce traditional regulations. Ochalla (2007, 3) also explains that with reduced enforcement of traditional regulations, colonial powers eventually "illegitimised and illegalised IKS". The loss of social cohesion and political authority resulted in loss of control by traditional leaders over the local communities' everyday life activities and practices, contributing to the suppression and abandonment of the use of IKS (Aubel, 2006; Gadzirayi *et al.*, 2006; Lawes *et al.*, 2004; Oviedo *et al*., 2004). However, though the colonial government reduced the powers of traditional leaders, they did not completely ban the structures of traditional leadership. According to George (2011), Khunou (2009) and Matloa (2008) traditional leadership structures were co-opted into the colonial administrative structures through the policy of indirect rule. This policy was to ensure that the system of colonial rule be permanent and progressive, the traditional leaders

were to be used as agents to control traditional communities. Despite the fact that the traditional leadership structure was disrupted, the policy of indirect rule ensured the survival of this structure throughout the colonial period hence the survival of some indigenous knowledge systems.

Comaroff and Comaroff's (1991) view is that missionaries who brought Christianity to Africa worked with political colonisers to suppress the African culture. They assert that Christianity was used to impose on Africans a new and particular way of seeing and being (1991). This new religion brought in notions and beliefs that suppressed indigenous traditional practices and knowledge. The Christian perception was, and is still, that engaging in certain traditional practices and believing in taboos and myths and in traditional medicine, is barbaric and satanic: Ochalla (2007) explains that denigrating certain traditional practices as primitive, backward, pagan and barbaric contributed to the suppression of IKS. He adds that stigmatising and viewing people who kept on engaging in traditional life styles resulted in some people abandoning their tradition. People adopted Christian values and a western world view so that they could be seen as civilised. This adoption of new values reduced the chances for elders who possessed IKS about different social, economic, ecological and climatic issues to pass it on to the other community members and the younger generation, thereby creating a "generation that does not understand, recognise and appreciate the value and use of IKS" (Ochalla, 2007, 3). Hamwey (2004, 345) supports this idea by asserting that the transmission of traditional knowledge to future generation is failing due to global communications and mobility of younger generations to a diverse set of "non-traditional livelihoods". The loss of IKS transmission has contributed to the suppression of IKS.

However, Tim (2005, 473) argues against this view, saying that by "making Christianity largely responsible for suppressing IKS indicates the failure to appreciate other catalysts of cultural change." He asserts that traditional religion and Christianity affect each other. He asserts that Christianity has also been Africanised,

that is, has been made environmentally and culturally understandable (Tim, 2005). This africanisation of Christianity may be the reason why some people continue to practise both traditional religion and Christianity.

Turner *et al.* (2000) and Warren (1999) assert that western education systems also introduced attitudes that were based on western models. Mapedza (2007), Reid *et al.* (2006), Lawes *et al.* (2004) and Ntuli (2002) further explain that in education, as in Christianity, whenever reference was made to IKS, it was derogatory, and IKS was denigrated as outdated and containing concepts that are just magical and superstitious with no meaning. As a result certain people among indigenous communities began to disregard IKS as being of little or no value, for example certain aspects of traditional medicine and certain taboos regulating the harvesting of natural resources were abandoned. Grenier (998) asserts that indigenous knowledge is naturally lost as techniques and tools are modified or fall out of use. Domfeh (2007) further explains that indigenous principles and values have been considerably altered with the advent not only of formal schooling; but of the modern state, increased modernization of local economies, and development of modern infrastructure and communication facilities. This means that globalisation impacts in terms of changes in land use and resource use patterns that replaced traditional systems and the breakdown of social structures have contributed to the suppression of IKS (Oviedo *et al*., 2004). These developments have resulted in certain aspects of IKS being irrelevant to contemporary socio-economic, political and environmental issues. For example, as far as medicine is concerned, some positive aspects of IKS have been incorporated into western medicine.

Mashelkar (2002) and Ntuli (2002) point out that the use of foreign language in the education system also contributed to the suppression of IKS. Interpretations resulted in distortions or weakened versions of IKS and sometimes complete loss of true meaning of IKS. Berkes *et al.* (2000) also assert that the dismissal of IKS as unsystematic and incapable of meeting rapid economic growth and contemporary

environmental problems resulted in indigenous traditions and cultures being seen as less progressive. The devaluing of IKS led to the adoption of new life styles and technologies resulting in the discrimination and exclusion of indigenous people and their knowledge from planning of development initiatives that impact on their lives. The non-use of IKS did not only suppress it but also resulted in certain useful IKS getting lost and sometimes becoming extinct (Berkes *et al.*, 2000)

As noted earlier, IKS is stored in traditional and cultural practices, taboos and folklore, and is mainly transmitted to the rest of the community members by word of mouth and through practical activities in which both the young and old participate (Mpofu *et al*., 2009; Dondolo, 2005). Consequently, the banning and abolishing of traditional leadership institutions and traditional practices resulted not only in the suppression of IKS but also in reduced transmission of this body of knowledge. Due to reduced transmission, when elders and certain custodians of IKS die, IKS is lost. The tragedy of such loss is expressed by Hampate Ba-Miller in (Aubel, 2006, page number not given) when he said, "*In Africa, when an old person dies it is like when a library burns down*". This statement highlights the great loss of IKS that occurs as a result of reduced transfer of this knowledge to future generations. This highlights the "weakness" of traditional methods of storing and transmitting IKS.

Behera and Nath (2005, 211) emphasize that IKS has been relegated and neglected because of being undocumented. Its orality has reduced its power or legitimacy in sustainable development initiatives. This situation may indicate that it is not only the effects of colonisation, Christianity and education that may have contributed to the suppression of IKS but also the weak means of storage and transmission.

Despite the effects of colonisation, Christianity, formal education and civilization (which posited IKS as out dated, barbaric or constituting of superstitions with no meaning and therefore unsuitable for contemporary socio-economic development and environmental issues), some core values of IKS have survived (Mapedza, 2007;

Reid *et al.*, 2006; Lawes *et al.*, 2005). The intrusion of western culture has not completely washed IKS from the face of the earth. Some people did not only resist adopting foreign culture imposed on them by external pressures of colonisation and education but also resisted Christian domination over their lives. Some people however, accepted western culture not only because it was imposed on them due to modernisation and globalisation, but at the same time they continued to practice traditional and cultural practices discreetly. Continuing to practise and observe certain IKS aspects in spite of hostile socio-political environment of the colonial and apartheid regimes ensured that certain aspects of IKS has been transferred from one generation to the next (Department of Trade and Industry (DTI), 2004).

3.5 Recognition of IKS

Since the early twentieth century, certain useful aspects of IKS have been receiving increasing recognition in socio-economic and environmental issues. The recognition of IKS stems firstly from the fact that despite the suppression, reduced transmission and it being weakened by external forces such as western science and modernization, IKS continues to exist. According to Ntuli (2002) certain core values in traditional practices and cultural beliefs have survived and in some cases grown with Africa societies and communities. Secondly, especially from the post modern need to recognise the legitimacy of other world views, positivist views have shifted. As a result IKS is receiving growing attention from different sectors of the economy such as in education, medicine, and natural resource management as well as in environmental management strategies such as EIAs. IKS has received attention in these fields of the economy because of its potential benefits. IKS are being recognized as potential sources of knowledge, skills, technology and rational thinking (Berkes *et al.*, 2000). Furthermore Chigwenya and Manatsa (2007); Muhando (2005); Turner *et al.* (2000) and Muchena and Vanek (1995) claim that knowledge, values and skills embedded in IKS have been acknowledged as invaluable and integral to sustainable development initiatives.

3.6 The voice of indigenous communities

As highlighted earlier, the suppression of IKS was not only caused by the effects of colonisation, Christianity and education, but also due to modernization, population growth and globalisation. It has to be pointed out that even if the introduction of a western world view sought to modernise people in colonised countries to accept the foreign culture, it is not all of them that accepted and identified wholly with the foreign culture (Comaroff and Comaroff, 1991). According to O'faircheallaigh (2007) some indigenous communities resisted the colonial and Christian campaign to reconstruct their everyday lives and gain complete command over their means of producing social value and material wealth. A practical example of this is given by Comaroff and Comaroff (1991) who explain that in South Africa, certain tribes like the Tswanas resisted Christianity from the beginning, by demanding the expulsion of missionaries from their community and refusing to talk to them. This resistance contributed to the survival of certain traditional and cultural knowledge during the period of colonisation, and in the case of South Africa, during apartheid. This survival of certain IKS, according to Mbatha (2010), may be the reason why approximately 80% of people in Africa still rely on traditional medicine. Today in South Africa, approximately 80% of people practice Christianity but under the surface still believe in traditional African religion (Mbatha, 2010).

Comaroff and Comaroff (1991) assert that colonisers used the Christian religion and education to create a new world view of civilization, humanism, equality and civil rights amongst the colonised. They (1991,312) further explain that 'in the process of replacing the African culture with the European one, contradictions in the missionary campaign emerged where the creation of social classes revealed the preferential treatment of the colonisers and missionaries over the colonised'. According to Comaroff and Comaroff (1991) it was at this stage where the colonised became aware that the civil rights preached by both the church and colonisers were not

being realised and consequently became conscious of colonisation. As early as the 1900s, different indigenous communities in developing countries such as South Africa were already aware of Christian and political domination over their lives, and some traditional leaders openly resisted the building of churches in their traditional lands (Comaroff and Comaroff, 1991). Some people also began to fight for independence. The 1960s in South Africa became a period of resistance leading to Black Nationalism, and complaints and protests against the oppressive Apartheid rule. The struggle against the oppressive government intensified in the 1980s such that even reformed church leaders protested against the bans on African religion (Comaroff and Comaroff, 1991). According to Comaroff and Comaroff (1991) the struggle in South Africa was not only for political freedom but also for traditional religion and cultural freedom. However, Cassidy *et al.* (2011) assert that after independence, because of globalisation and modernization, there was no need to discard western knowledge that was already operating and go back to IKS because modern practices had reduced the use of certain IKS, rendering some of it redundant. However, certain aspects of IKS that are valuable continue to be used and some of them have been incorporated into mainstream practices in medicine, agriculture and environmental management. Furthermore, Comaroff and Comaroff (1991) assert that certain "dangerous" aspects IKS are still being used, especially in traditional medicine. For example the use of body parts, leading to abduction, mutilation and killing of people.

O'faircheallaigh (2007) asserts that the exploitation and degradation of the world's remaining biodiversity hot spots within indigenous communities in countries such Canada and Australia contributed towards indigenous communities voicing their concerns. According to Naidoo (2007) and O'faircheallaigh (2007) these communities were among the first to raise environmental awareness and concern about the detrimental environmental effects resulting from uncontrolled exploitation of natural resources on their communal lands. Having noticed the degradation of their traditional resources, some indigenous communities began to question the

reliability of scientific knowledge which was being used in environmental management and demanded the recognition of their contributions in socio-economic and environmental matters that affected their lives. O'faircheallaigh (2007) and O'faircheallaigh and Corbett (2005)assert that indigenous communities in Australia and Canada fought hard and started setting requirements to developers to recognise and integrate them and their knowledge as a precondition for developers to exploit natural resources in their communal lands.

3.7 Acknowledgement of IKS in regulative and institutional frameworks

The stance taken by indigenous people in different parts of the developing world has resulted in international and national debates on how to integrate IKS into the mainstream of development. Grenier (1998) asserts that governments have shown political will to listen to indigenous people by establishing policies and programmes that support the use of IKS. Patel (2009) confirms this by stating that the concept of integrating IKS into EIAs has its roots in campaigns by indigenous communities fighting against exploitation of their indigenous resources.

Demands by indigenous communities have resulted in the establishment of international and national environmental and developmental frameworks that provide for the recognition, protection and use of IKS (Mukuka, 2010; O'faircheallaigh and Corbett, 2005). In response to debates regarding IKS, policy makers who deal with development in different sectors of the economy started to engage in international and national initiatives to promote and encourage the recognition of the importance of IKS as an invaluable source of knowledge. International agreements and conventions in turn resulted in the spread of the recognition that IKS could be relevant to socio-economic development and environmental management to developing countries such South Africa.

The international community demonstrated the acknowledgement of the importance and use of IKS by convening conventions and conferences to discuss ways of integrating IKS in developmental and environmental issues. The Agenda 21 document signed at UNCED in 1992 was among the first international agreements on economic development to provide for the participation of indigenous communities and the use of their knowledge in environmental management. The WSSD of 2002 also underscored the significance of involving indigenous communities and their knowledge in achieving the goals of sustainable development. The WSSD deliberations advocated for international and national efforts that employed environmentally sound activities that recognise the critical role indigenous knowledge systems can play in achieving the ethos of sustainable development. In the same way, the CBD also signed at UNCED in 1992 advocates for the involvement of local communities in environmental management because they possess inner knowledge of the natural environment which is essential in conservation and sustainable use of biodiversity (CBD, 2004).

Furthermore, several other international organisations such as the World Bank advocate for the recognition of IKS as relevant to development (Ochalla, 2007). Other international organisations such as UNESCO and ICSU also acknowledge the importance of IKS (Battiste, 2002). These organisations hold conferences and publish IKS material to recommend the integration of IKS in socio-economic and environmental issues.

Following international trends, South Africa demonstrated its acknowledgement of the importance of IKS, firstly by being party to several international agreements and conventions that relate to the recognition of the importance of IKS in environmental management. As a result South Africa is obligated to conform to the minimum standards set by these with regards to promoting IKS in environmental issues. Secondly, South Africa has endeavoured to fulfill this obligation by drawing up several government efforts to promote and encourage the recognition of the

importance of IKS in developmental and environmental issues.

Before describing recent initiatives that show the efforts made to revive the importance of IKS, it is important to explain that the recognition of the importance of IKS dates back to the colonial and apartheid regimes where as pointed out earlier, some indigenous South African communities protested against bans on their religion and cultural ceremonies. It should also be noted that some cultural and traditional practices and belief systems (through which IKS manifest itself) survived and perpetuated, in spite of suppression. These traditional and cultural practices and beliefs that have persisted have continued to shape and inform African thinking and therefore form the basis for acknowledging the importance of and reviving the use of IKS in different socio-economic activities (DTI , 2004).

When South Africa gained independence in 1994, the democratic government enacted several measures of redress regarding the social, cultural, political and economic ills of the Apartheid regime. South Africa has demonstrated the acknowledgement of the importance of IKS first and foremost by enacting a national constitution that provides for the promotion and use of IKS. Section 185 of the South African constitution provides for the protection and promotion of rights of cultural religious and linguistic communities (The Constitution of Republic of South Africa, 2010). This provision in the constitution forms the basis from which all institutional and regulatory environmental management frameworks that provide for the recognition of the importance of IKS are developed. Australia and Canada also have constitutions and state legislations that protect and promote the recognition of the importance of IKS in socio-economic development and environmental issues (O'faircheallaigh and Corbett, 2005; Battiste, 2002).

The first legislative frameworks that were put in place by the South African government towards affirming the importance of IKS include among others the Patents Act 57 of 1978 which was amended in 2005, the Trade mark Act 194 of

1993 and the Design Act 195 of 1995. In 1999, the National Heritage Resources Act of 1999 was published, followed by the National Environmental Management of Biodiversity Act 100 of 2004 and the Intellectual Property Laws Amendment Bill of 2007 (Mukuka, 2010, 5-6). These Acts show the growing appreciation by the government of the importance of IKS in socio-economic development hence the need to regulate its use and protect and conserve it as a national heritage.

Furthermore, in recent years several government departments such as the DST; the Department of Education (DoE); the DTI; the Department of Arts and Culture (DAC), the Department of Health (DoH), the Department of Agriculture (DoA) and DEAT are focusing on IKS. These departments work together and in their different disciplines advance the recognition of the importance and use of IKS. For example, the DoH recognised the use of traditional medicine by promulgating the Traditional Health Practioners Act. The Act would help to promote access to safe and rational use of traditional medicine. The National Curriculum Statement (NCS) produced by the DoE has a strong drive towards recognising and affirming the critical role of IKS in Science and Technology education (DTI, 2004). The DST produced a policy document as an effort to affirm, develop, promote and protect IKS (DTI, 2004; Hart and Vorster, 2006). The IKS policy aims to establish an enabling framework to stimulate and strengthen the contribution of IKS to socio-economic development in South Africa (Mwaura, 2008). It is also the duty of the DST to coordinate different government departments to ensure that there is a coherent approach to IKS matters.

In South Africa, DEAT is the authority that is responsible for environmental management issues, and has since established acts and regulatory frameworks that are to ensure that socio-economic development initiatives put into consideration environmental issues. The ECA 73 of 1998, the NEMA 107 of 1998 and the White Paper Policy on environmental management were formulated to provide guidelines for the establishment of environmental management strategies such as the EIAs. As noted earlier, these frameworks promote the participation of local communities and

their knowledge in environmental management. NEMA principles and EIA guidelines stress that decision makers should take into account interests, values and needs of IAPs, recognising all forms of knowledge including indigenous knowledge (Brownlie and Wynberg, 2001). This is an encouragement to developers for the recognition of the importance and use of IKS in predicting and identifying adverse environmental impacts as well as in suggesting mitigation measures.

In addition to the already mentioned government effort of putting in place legal frameworks to promote the revival of the importance and use of IKS in environmental management, other government affiliated organisations ensure that the value of IKS is revived. These include the Working Group of Indigenous Minorities in Southern Africa (WIMSA), South African Council for Scientific and Industrial Research (CSIR), Indigenous, Knowledge Systems of South Africa (IKSSA) and Imbewu Youth Programme of South Africa National Parks. These organisations work with various communities around the country and use IKS to stimulate environmental awareness and public participation in the conservation and use of natural resources, such as wildlife and medicinal resources (Mwaura, 2008; Masaga, 2005). The WIMSA and CSIR, in one of the best known cases of the pharmacological development of IKS have worked with the San, with regards to medicinal knowledge, conservation and the use of the Hoodia plant in weight control medications (Ochalla, 2007; Channells, 2005).

South Africa's stance is progressive in trying to form new structures and frameworks for integrating IKS in environmental management and it has done well in formulating these. The establishment and reviews made on policies and regulations indicates that the government recognises the irreplaceable and unique value of traditional knowledge, practices and cultures of South Africa in socio-economic development and environmental management (Lawes *et al.*, 2004). As far as EIAs are concerned the ultimate aim of promoting and encouraging the use of IKS is to ensure that the local communities can be able to participate meaningfully in EIAs, using their

indigenous knowledge. However, the questions that arise are firstly, how far these are actually implemented on the ground, and secondly, is there sufficient political will to enforce the meaningful participation of locals to ensure that IKS are used together with western science when carrying out EIAs and in environmental management.

The next section describes the relationship between western science and indigenous knowledge systems to show how indigenous knowledge systems can be used at a complimentary level with science when conducting EIAs.

3.8 The relationship between Western Science and IKS

According to Naidoo (2007) western science supplies the major body of knowledge that is used in responding to most developmental and environmental issues. Thus the introduction of scientific knowledge in other countries resulted in western science taking precedence over indigenous knowledge because of its appropriateness and relevance in dealing with socio-economic and environmental issues (Cassidy *et al.,* 2011). This preference for western science resulted in the relegation and rejection of certain aspects of IKS as far as economic development is concerned.

Chambers (1991) asserts that scientific knowledge and IKS are different in that scientific knowledge is recognised as a universal body of knowledge because it is documented and thus easily accessible for use in different countries. IKS is understood as a body of knowledge that is localized and is stored and preserved in people's memory and in traditional artefacts. Unlike scientific knowledge IKS is only transmitted from one generation to the next by oral means and therefore tends to operate from a particular cultural perspective or context only, while scientific knowledge may be applied in any situation or context around the world. Cassidy *et al.* (2011) suggest that the limited applicability in the use of IKS in different aspects of socio-economic, environmental and political development of the modern world has been the reason for African countries not rejecting western forms of dealing with

socio-economic development and environmental issues. Naidoo (2007) explains that any matter being investigated in IKS is examined and interpreted contextually, while in science, the investigated matter is examined and tested in the laboratory which then gives results which can be universally applied. This, coupled with the effectiveness of science in for example, the medical and agricultural sectors, has resulted in the continued dominance and use of western knowledge as far as economic development is concerned.

Chigwenya and Manatsa (2007), Turner *et al.* (2000) and Muchena and Vanek (1995) assert that the differences that exist between scientific and indigenous knowledge form the basis for the complimentary role that these two bodies of knowledge have. Chambers (1991) expressed a similar view and explained that IKS and science are complimentary, because when combined, they may achieve what neither would alone. Chambers (1991) asserts that the complimentary use of IKS and western science has worked well in the fields of agriculture and medicine as well as in environmental management and natural resource conservation. Also traditional knowledge regarding healing powers of certain plant and animal species may be used to further promote scientific investigation on the medicinal value of traditional medicine. For example, in Tanzania, scientific knowledge was used to validate the effectiveness of traditional herbal treatment of opportunistic Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) infections (Gorjestani, 2005). According to Chigwenya and Manatsa (2007), Muhando (2005), Turner *et al.* (2000) and Muchena and Vanek (1995) traditional beliefs and practices, religious beliefs and ceremonies, and totems and taboos may be used to enhance scientific environmental and natural resource management. Naidoo (2007) suggests that indigenous people possess valuable ecological knowledge because entrenched in indigenous languages, customs and practices may be as much understanding of nature as is stored in the libraries of modern science.

Besides the differences, science and indigenous knowledge systems have certain common characteristics. For example, Snively and Corsigilia (2000) assert that in both, an issue is verified through repetition, empirical observations and pattern recognition. Both knowledge systems, although having originated independently, are in constant evolution through continuous change and development. This is due to innovation from within, or it may be from outside influences, as adaptation to new environmental challenges takes place.

Some authors including Gibson (2003) and Usher (2000) assert that research has shown that indigenous knowledge systems are a valuable, essential and valid source for information about the natural environment, the relationship between nature and people and in the use of natural resources. This has resulted in some communities recognizing and subsequently elevating indigenous knowledge systems to work in a complimentary way with science. Despite the acknowledgement of IKS as an invaluable source of knowledge, Dewalt (1994) asserts that IKS is not always good because some indigenous people have also committed overgrazing, over hunting and over cultivation and sometimes they rely on IKS practices which may be wrong or even harmful. As such, Hart and Vorster (2006, 9) warn that whenever IKS is promoted, it should always be remembered that IKS is not flawless and equal to or better than scientific knowledge.

3.9 The use of indigenous knowledge systems in EIAs

The EIA process is an environmental management strategy of achieving sustainable development, which requires the incorporation of indigenous knowledge systems to compliment western knowledge. Agenda 21 principles and other international environmental management frameworks state that sustainable development requires a platform that articulates both scientific and indigenous knowledge. To understand the complimentary use of indigenous knowledge and western science in EIAs requires the description of four frames of reference, suggested by Sallenave (1994),

Johannes (1993) and Chambers (1991) through which indigenous knowledge can be integrated into EIAs. These are the taxonomic, spatial, temporal and social aspects of indigenous knowledge. EIA consultants usually rely on these perspectives when predicting and identifying potential adverse environmental impacts of developmental projects.

The taxonomic frame of reference refers to the use of local language names for plants and animals, animal and plant types and groupings of local flora and fauna that are found within the site of the proposed development (Johannes, 1993; Chambers, 1991). When conducting EIAs, consultants and environmental specialists could identify and name plant and animal species using local languages, enabling the participation of local communities who could then provide such valuable environmental knowledge. Having named plant and animal species and identified and located other important sites, EIA specialists can move on to locate these elements within the community which are likely to be affected by the proposed development.

The spatial aspect of the EIA process deals with the distribution of environmental resources and involves, for example, identifying feeding grounds of various animal species, migratory patterns, aggregation sites of certain plant and animal species and sensitive sites (Johannes, 1993; Sallenave, 1994). Mwaura (2008), O'faircheallaigh (2008), Huntington and Mymrin (1995), Sallenave (1994) and Chambers (1991) point out that the local people know about the location of feeding grounds, sensitive areas such as traditional sacred sites, archaeological sites and burial grounds. O'faircheallaigh (2008) and Johannes (1993) explain that since IKS could contribute local experiences about spatial distribution of local biophysical processes and events, the participation of locals in EIAs is important. The identification of natural and human made features by these locals can ease the work for consultants and so speed up the EIA process. A study by Huntington and Mymrin (1995) carried out to assess how local people use traditional and ecological

knowledge to locate Beluga whales for controlled fishing showed that the use of mapping for locating aggregation sites, naming of sites, identifying and locating patterns by locals could be used simultaneously with scientific knowledge or even Geographical Information Systems (GIS) mapping. Indigenous people may provide the mental map while scientists use this information to create topographical maps showing spatial aspects of the biophysical elements, processes and events (Masaga, 2005; Huntington and Mymrin, 1995; Johannes, 1993). As noted earlier, Huntington and Mymrin (1995) assert that ecological knowledge provided by locals is very useful in creating maps showing both temporal aspects of biophysical events and processes. These maps could be used in identifying, predicting and assessing detrimental environmental impacts of proposed development projects.

Showers and Malahleha (1992) further emphasise that local communities provide observations that provide a rich data base for scientific assessment of environmental conditions and changes. The use of western science to validate IKS may indicate the complimentarity of both systems of knowledge. In this way confidence in traditional knowledge is being rebuilt.

The temporal frame of reference in EIAs deals with timing of physical and biological events and processes. Writers including Sallenave (1994), Johannes (1993) and Chambers (1991) point out that local people, as the main resource users; possess knowledge about the timing of many of the significant physical and biological events and processes of their natural environment. Furthermore, Dahl (2002) and Chambers (1991, 89) explain that local people have a better perception about the ‘what, when and where’ of both living and non-living elements of their environment. They explain that local people, because of constant and long periods of interaction with their natural environment, have the ability to identify the timing of biological processes such as plant blooming, flowering, fruiting, insect abundance and breeding cycles, all of which are determined by local season and weather cycles and which could be valuable to the EIA process. Indigenous people have the ability to

provide information about variations from time to time related to species aggregation sites, water levels of surface water sources and gestation periods of various animal species which may not be easily identified by EIA experts at the time of the EIA process. Dahl (2002) and Sallenave (1994) assert that indigenous people could also provide information about the changing populations of birds and animal species in habitats between day and night, and summer and winter. The participation of locals therefore, provides some information that may not be readily available to EIA consultants over the short time frames of conducting EIAs.

Sallenave (1994) argues that within the social frame of reference, the EIA process as an environmental planning and management tool allows for and mandates the consideration of the traditional conservation ethic of the local people whose livelihood will be affected by the proposed economic activity. Sallenave (1994) further explains that the EIA process does not only deal with the impacts of the proposed project but also the impact of the altered access to natural resources. Sallenave (1994) and Chambers (1991) also affirm that it is only through the participation of the local community that their conservation ethic, which is the way the locals perceive the value and use the environment, might be ascertained.

EIA experts should involve local communities and their indigenous knowledge systems in order to find out how they perceive, use and value the natural environment. The participation of local communities in EIAs can indicate the presence or absence of the conservation ethic of people. Understanding the local communities' perceptions about environmental and ecological issues may assist in suggesting scientific mitigation measures for identified environmental impacts. These may be measures which are likely to conform to certain traditional values and practices of the local people.

Bisset (1990) emphasises that the complimentary use of indigenous knowledge systems and science in EIA processes results in the development of a holistic

framework for predicting and identifying environmental impacts. Such a holistic framework works effectively with the systems diagram EIA method used for identifying environmental impacts. The system diagram method uses diagrams to show energy flows in an ecosystem and how they can be affected (Bisset, 1990, 54) This holistic framework has been adopted in Canada, and Gibson (2003, 6) explains that scientists, policy makers and environmental managers have incorporated the taxonomic, spatial, temporal and social perspectives of IKS into national and regional environmental management tools such as EIAs. According to Gibson (2003) even the Canadian Environment Act was amended to include the four perspectives. The government created a policy that requires the recognition, consideration and use of indigenous knowledge systems as a legitimate knowledge system to be used in assessment proceedings. Other countries which have made successful efforts on the use of IKS in EIA include Australia, Japan, and Latin America.

The use of the system diagram EIA method ensures that when EIA consultants are dealing with environmental impacts they do not compartmentalize effects or elements of the natural environment, but look at impacts as they affect the entirety of the environment. Bisset (1990) further clarifies that when EIA consultants integrate IKS and western knowledge in predicting and identifying environmental impacts, they look at the entire ecosystem. Aspects of the entire ecosystem that are dealt with include temporal and spatial elements of energy flows, biophysical events and processes of the ecosystem. These elements are dealt with as elements that are interdependent, with feedback loops and complex relationships. The use of indigenous ecological knowledge does not only speed up the EIA process but also provides adequate information to decision makers. Despite the fact that using indigenous knowledge could involve more people to consult and take into consideration, it may result in more people accepting the outcomes of the EIA process. This in turn could limit appeals and counter appeals about the outcomes resulting in fast implementation of the development project.

A research study conducted by Sibanda (2004) revealed that the Communal Areas Management for Indigenous Resources (Campfire) project for community wildlife management in Zimbabwe successfully incorporated the Tonga beliefs and knowledge about hunting seasons and prohibitions on the hunting of female animals. The Tonga indigenous knowledge about animal migration patterns was also used in wildlife management guidelines to set up hunting zones and times for the local community. The use of such knowledge shows that the participation of local people in the EIA process is likely to provide valuable knowledge which can be used by experts to predict and assess the environmental impacts of proposed development projects. This knowledge can also be used in suggesting mitigation measures that align with cultural values and practices related to their resource management systems. If EIA consultants incorporate indigenous knowledge in the EIA process, they commit themselves not only to promote IKS but also to contribute to its survival. In this way they assist in promoting the transmission of IKS to future generations.

Considerable progress in adopting this holistic framework that uses the spatial, temporal, taxonomic and social frames of reference to integrate IKS into EIAs is being made, especially in developed countries. As noted earlier, countries such as Canada and Australia appear to be taking heed of the international position endorsed by UNCED, WCED and WSSD that IKS should be incorporated into sustainable development initiatives.

However, Bynoe (2006) points out that even if developing countries have done fairly well in formulating policies and acts that promote and encourage the use of IKS in environmental management tools, little has been done to ensure the actual implementation of policy principles on the ground. Cassidy *et al.* (2011, 92) point out that in developing countries, while government policies increasingly pay lip service to indigenous knowledge and promote its use, it must be noted that there are situations where the same policies structurally undermine the options for using IKS. Policy principles that replace traditional leadership with councillors in decision-making and

centralising decision-making at national level undermine the ability of locals to use indigenous knowledge and traditional practices based on their understanding of the environment (Cassidy *et al.*, 2011). Again, implementing the environmental management requirements of including IKS is a challenge for developing countries such as South Africa. This is especially due to lack of political will, economic constraints, corruption, and the need to promote development.

3.10 Indigenous Knowledge Systems in environmental management in South Africa

Since the objective of this research project is to find out whether IKS has been integrated into selected EIAs, it is first necessary to verify how certain EIAs that have been conducted in South Africa have used the EIA guidelines to use IKS in the EIA process.

South Africa, as signatory to a number of international declarations and conventions that promote sustainable development, has made great efforts to promulgate national environmental management strategies and policies and acts for the same cause. As noted earlier, South Africa has achieved this by ensuring that NEMA and the ECA goals and objectives all encourage and promote the establishment of environmental management tools such as EIAs. In terms of NEMA and Section 56 of the EIA guidelines, the EIA process should involve indigenous communities and all forms of knowledge (Brownlie and Wynberg, 2001). By these statements the government of South Africa shows its commitment to ensuring that integrating indigenous knowledge systems is promoted at local, provincial and national levels.

Some writers, including Bernard and Khumalo (2004) assert that despite Sections 5 and 6 of NEMA explicitly indicating that indigenous knowledge systems are relevant and important to EIAs, the use of IKS during the EIA process in South Africa is still in its infancy. Integrating IKS into EIAs is highly recognised and acknowledged on

paper but it encounters a variety of socio-political obstacles (Cassidy *et al.*, 2011).

As we have seen, South Africa is one among the African countries which has made the greatest effort in establishing environmental management policies that promote and encourage the use of indigenous knowledge systems. However, the question that remains is about whether these are effectively implemented and to what extent they are legally binding. For example, some of the EIA case studies as mentioned below show that there is little public participation, especially of the indigenous communities who may be affected by the developments. This has also been observed by Erickson (1994) who asserts that, although all legally required EIAs mandate public involvement, too few assessment teams make direct use of the local people as opposed to paid consultants and specialists, especially during the scoping process. He explains that the use of paid consultants leads to the overlooking of site-specific information, local values and concerns, hence reducing the relevance of the EIA. Brownlie and Wynberg (2001) also support this claim by asserting that the TORs used by EIA teams for various specialist studies have inadequacies in terms of impact coverage because TORs indicate less use of IKS since there is no documentation of IKS in TORs. The lack of IKS in TORs may also create a presumption that the position of the government with regard to incorporating IKS in environmental management is just lip service. The sections in NEMA and EIA regulations that encourage the participation of indigenous communities and their knowledge may simply be seen as a gimmick to get buy in from rural communities.

An assessment of EIA case studies by Brownlie and Wynberg (2001) indicated that only specialists, experts, scientists and their contributions are recorded in EIA reports. For example EIA reports on EIA processes for the proposed Gamsberg mine in the Northern Cape, for proposed Dredge mining in Kwa-Zulu Natal and for proposed diamond mining in the Western Cape recorded only the views of expert stakeholders. The EIA reports indicate the involvement of IAPs, including locals, but their contributions and the use of IKS is not recorded. The lack of local community

contributions in EIA reports indicates that in developing countries like South Africa, giving western knowledge a higher status and recognition than IKS impedes the integration of indigenous knowledge into EIAs.

However, Dowling (2004) and Rabie (1994) explain that in few EIA case studies where there has been intense involvement of local communities and use of their knowledge, there is improved final decision-making regarding the proposed development project. This improvement is due to broadened environmental perspectives as well as improved compliance with such decisions. For example, EIA studies carried out for Eskom (Baker and Pullen, 2009); the Department of Water Affairs and Forestry (DWAF) (Rossouw, 2009) and for NCP Chlorchem (Pty) Ltd (Bulman, Butland and Teurlings, 2009) indicate that the extensive and meaningful involvement of all stakeholders and IAPs in scoping and impact assessment phases resulted in a synergy in the stakeholder issues. This synergy occurs in stakeholder issues that recorded and responded to social issues that were identified and subsequently assessed (SAIEA, 2009). Despite the lack of reference to the use of IKS in the identifying environmental, social and economic issues and impacts in the above EIA studies, the participation of local communities proved helpful. The meaningful involvement allowed locals to freely and confidently give their views and opinions regarding the proposed projects. For example, Dippenaar and Lorhner (2009, 8) in their EIA study for the Kouga Wind Energy project in Jeffreys Bay, acknowledge that building on local knowledge resulted in greater efficiency in predicting impacts and developing effective mitigation measures for identified environmental impacts. This is a reasonable indication that the involvement of locals and the use of the information they provide may result in achieving better EIA outcomes.

The examples of EIA studies mentioned above show that while the utilisation of indigenous knowledge systems or other forms of knowledge has been acknowledged in policies and acts, little detailed analysis or case study material

exists that indicates how IKS has been used in EIAs for developmental projects in South Africa.

3.11 Conclusion

The recent debates in the literature about the credibility and validity of IKS as a valuable source of knowledge have significantly raised its profile in socio-economic matters. Also a wide range of literature shows that several countries around the world have become aware that IKS is an essential contributor to sustainable development (Nel, 2004, 101). As a result several countries have taken heed of legislative and regulatory frameworks to use IKS not only in areas of agriculture, medicine and natural resource conservation and management but also in EIAs for mining developments.

The use of IKS in EIAS is also gaining momentum in several countries around the world, especially in Canada and Australia. In South Africa also, the creation of the IKS unit within the Department of Science and Technology and the establishment of IKS legislation and policy shows that IKS is slowly being taken seriously in socio-economic development and environmental issues (Mosimege, 2004). The establishment of the Indigenous Knowledge Systems of South Africa Trust (IKSSA) (Masaga, 2005; Gila, 2004) shows that IKS has received reasonable attention as a valuable source of knowledge that could be used to complement western knowledge in its use for ensuring meaningful local community participation in development projects.

Chapter 4.

Research Methodology

4.1 Introduction

In this chapter the qualitative research design used in this research investigation is outlined. This is followed by a description of the study area as well as the reasons for choosing this area. The advantages of qualitative research include the use of a case study research approach. Here this has encompassed the use of purposive sampling, semi-structured interviews and focus group discussions. In terms of secondary sources of data, document analysis was performed to supplement the data gathered from the primary sources of information. This chapter also highlights the concept of validity and reliability as used in this research study. Finally, the procedures used for data analysis and presentation are described.

4.2 Qualitative research design

Qualitative research looks at variables in their natural setting and the researcher goes to the actual setting to collect the data (Neuman, 1997). Neuman (1997) claims that in qualitative research the researcher starts only with a topic and research questions, then the theory develops during data collection. He explains that a qualitative research design, based on grounded theory is where the theory is built from data which is collected from the field. This research approach covers a variety of disciplines and is a multi-method focused research method.

In this study, the research site encompassed three villages, namely Armoede, Ga-Molekana and Sekuruwe from Mapela rural community in Limpopo Province, South Africa. The reason for selecting this specific site was that people in rural

communities were seen to be more likely to be able to provide information that could show whether EIA experts conducting an EIA actually adapt to the NEMA requirements of including indigenous knowledge during the EIA process. The EIA report for Anglo Platinum Mogalakwena Section mine and the Review document of the EIA report for Anglo Platinum Mogalakwena Section mine were also analysed to provide additional insight as to whether there had been participation by the local villagers in the EIA process and whether their IKS had been considered and integrated.

4.2.1 Advantages of qualitative case study research

Simons (2009) defines “case study” as an empirical inquiry of a particularly complex single case which relies on multiple sources of evidence. She explains that it is an in-depth exploration of a particular project or programme in a real-life context. The purpose of a case study is thus to generate an understanding and knowledge of a specific concept and/ or inform policy development, professional practice and civil/community action (Simons, 2009, 21; Vanderstoep and Johnston, 2009, 209). This methodology was consequently used in this research study due to its strengths in allowing for purposive sampling to select participants for the research; for semi-structured interviews and focus group discussions; all of which could be supplemented by document analysis. One of the most important considerations in choosing this approach was also that a case study research design allows being able to explore the topic in depth and detail despite the fact that the interviewed sample may be small (Naidoo, 2007; Trochim, 2006).

Formal semi-structured interviews were used to conduct face to face interviews with village participants, who included a traditional healer, chief, community committee members and the other elderly people from the villages of Armoede, Ga-Molekana and Sekuruwe.

4.3 Delimitation of the Research Area

As noted in the introduction to this study, the research was conducted in the vicinity of the Anglo Platinum Mogalakwena Section mine in the villages of Sekuruwe, Armoede and Ga-Molekana of Mapela community in Mokopane District of the Limpopo Province. The study area is located thirty five kilometres north west of Mokopane town, in a platinum rich region where there are two large Anglo Platinum mining operations taking place. The location of the study area on a national basis is shown in Chapter 1, figure 1.1. Figure 4.1 shows the location of Mapela community in relation to Mokopane town and other neighbouring settlement. Then Figure 4.2 shows the boundaries of the study area which comprises of the three villages of Armoede, Ga-Molekana and Sekuruwe which are located in Mapela community. This figure also illustrates the location of the three villages in relation to each other.

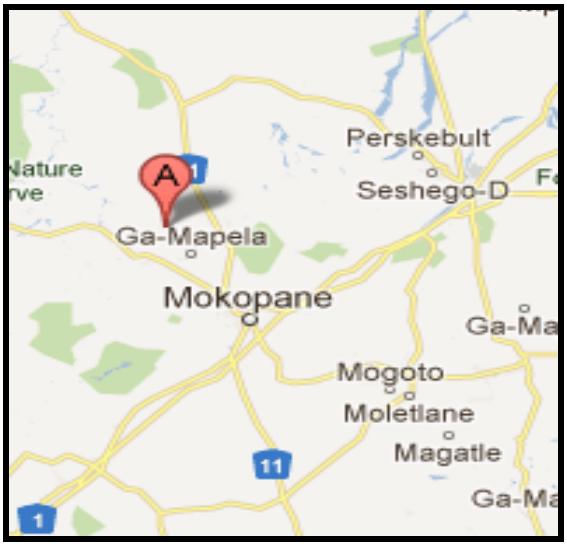

Figure 4. 1: Mapela Community in Mokopane[3] **Figure 4. 2:** Villages that make up the Research Area[4]

[3] www.maps.google.co.za/maps?hl

[4] www.maps.google.co.za/maps?hl

People in these villages live a semi-subsistence/rural way of life. However, there are limited agricultural activities: only a few people practise small scale subsistence crop farming and livestock rearing. The traditional system of leadership comprising of Chiefs and Headmen controls most of the day-to-day activities in the community. Traditional practices such as use of traditional medicine, umbuyiso (appeasement of ancestral spirits) and traditional marriage and burial practices are still observed by most villagers in this community.

Platinum mines have contributed to the general infrastructural development in this area. The three villages that make up the study area are adequately provided with social amenities like roads, electricity, schools, business centres and a clinic.

4.4 Description of the three villages

4.4.1 Armoede

Armoede is a new village where people who were relocated from Ga-Puka, a nearby area, were resettled. The village is situated between Ga-Molekana and Ga-Sekhaolelo and as shown in Figure 4.3, there is limited arable land for people to practise extensive crop farming.

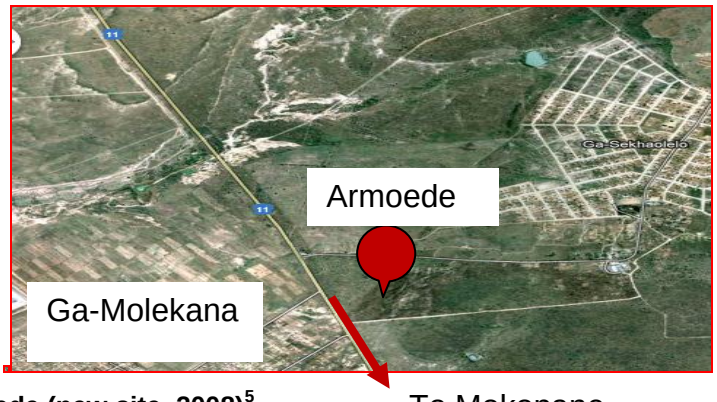

Figure 4. 3: Location of Armoede (new site, 2008)[5]

[5] www.maps.google.co.za/maps/hl

This community, just like in the other two communities, follows a traditional way of life, where people practice limited subsistence agriculture. The traditional leadership structure is still operational with the chief and his aides running the day to day traditional affairs of the community. However, the community is divided according to those who support the Section 21 (S21) community committee and those who are against the S21 committee and support a new community committee. The S21 community committee was formed when the community committee that was initially elected to represent the local people in matters regarding the expansion of the mine operations was registered as a Section 21 company in terms Section 21 of the Companies Act. The company was to be funded by the mine to provide services to the concerned local communities. The new community committee was formed to replace the S21 community committee as the S21 committee was accused of betraying people. The issue was that the S21 committee had agreed to certain decisions made by the mine that were taken to have been unfair to the community. The chief belongs to the faction that supports the new committee.

The village is adequately resourced with social amenities like roads, electricity, schools, a clinic and housing. These were provided for by the Anglo Platinum Mogalakwena Section mine as part of the relocation compensation package.

4.4.2 Ga-Molekana

The village is located very close to the Anglo Platinum Mogalakwena Section mining plant. Villagers in this village refused relocation as had been suggested by the EIA study recommendations. As shown on Figure 4.4 below Ga-Molekana village is the closest to the mining area and the slimes dam created by dumping of mine waste.

Figure 4. 4: Ga-Molekana Village in the vicinity of the mine and slimes dam[6]

As in the villages of Armoede and Sekuruwe, the villagers appear to follow a traditional way of life and do a little subsistence farming because as shown in Figure 4.4, there is very little arable land which can be used for farming activities. The traditional leadership is still running the day to day affairs of the community. However, in this case due to the conflict that exists between the community and the traditional leadership, most villagers have stopped observing the legitimacy of the chief and his aides. This conflict developed because the traditional leadership supported the mining company in its efforts to resettle the villagers in another location.

The village also has been supplied with social amenities like electricity and schools by Anglo Platinum Mogalakwena Section mine. The accommodation facilities,

[6] www.maps.google.co.za/maps/ll

though not provided by the mine, are mainly brick and tile.

4.4.3 Sekuruwe

Sekuruwe village is the furthest from the Mogalakwena mine plant. It is a relatively old village. The villagers settled here in the early 1990s when they were relocated from another area that was taken over by the mine. When the villagers were relocated, they left behind their burial site. However, this also had to be relocated between 2008 and 2009 to give space to expanding mine operations. Figure 4.5, below shows the location of Sekuruwe in relation to the surrounding areas.

Figure 4. 5: Location of Sekuruwe in Mapela[7]

As in the two other villages, people appear to live a traditional way of life. Very

[7] www.maps.google.co.za/maps?ll

limited subsistence farming is practised. The traditional leadership structure in this village has been disrupted due to factions that have been created due to differing views regarding the exhumation of graves in the old community grave site. A new community committee has been formed which has taken over discussions pertaining to grave exhumation. The new committee is supported by some people who are dissatisfied with the exhumation of graves. This committee works without the chief because the chief belongs to the group that supports the community committee, and which is being accused of betraying the community.

4.5 Reasons for choosing the research area

The reasoning behind choosing these three villages in Mapela community was that the villagers were likely to be able to provide information relevant to the investigation, which was to find out to what extent the public participation process, had enabled the integration of IKS into the EIA process. The suitability was based on the following considerations: Firstly, the fact that an EIA study for expanding mining activities at Anglo Platinum Mogalakwena Section conducted in 2002 ensured that the public participation process had been carried out. Secondly, the participation of some villagers in the EIA process ensured that the village participants in this research would be people who were involved in certain deliberations regarding the EIA process. In addition, the three villages had been affected by a variety of activities and events, associated with the expansion of mining activities, which have been taking place at this locality over a period of time. The context of public participation however, varied considerably between the villages. One of the villages, i. e. Armoede, was a new village of people who were relocated from Ga-Puka in 2008. The second village, Ga-Molekana, refused relocation. The third village, Sekuruwe, was relocated a long time ago, but recently, there was exhumation and relocation of bones of the deceased relatives of the villagers from the old burial site to a new site.

Another reason for choosing these villages was that the results of the EIA study indicated that expanding mine operations had a number of effects, including the potential progressive effects of relocation, loss of traditional land for farming and grazing and loss of traditional sacred land through the exhumation of graves for reburial in a new site. These progressive effects in turn could impact on the indigenous knowledge systems of the local people. In addition, the fact that some of the villagers who participated in meetings related to Anglo Platinum Mogalakwena Section mine operations still follow a traditional way of life, validates the choice of this research area as a suitable one for verifying whether EIAs have adapted to include IKS as per NEMA requirements.

Despite the differences in the villages, the fact that the were all involved in several consultations with Anglo Platinum Mogalakwena Section mine representatives, rendered them sufficiently similar to be considered as one case.

4.6 Purposive sampling of village participants

The purposive sampling technique was used to select village participants from the three villages of Armoede, Ga-Molekana and Sekuruwe. This was used because it allows for the selection of information rich participants who play key roles in the case being investigated (Simons, 2009; Creswell, 2003). Purposive sampling was also used because it ensured that the selection targeted individuals with distinct and important perceptions about the topic and the issues being investigated (Naidoo, 2007Trochim, 2006; Rao, 2000). This method also allows for the selection of predefined participants, i. e. those who are able to provide the required and relevant information.

The referral system of identifying participants was used and some interviewed members of the communities provided and recommended names of prospective and relevant participants. The selection was based on people with the potential of

possessing substantial knowledge about indigenous knowledge systems in their communities. In addition, village participants were selected depending on recommendations made about their involvement and participation in one way or another in meetings regarding EIA issues, or where issues related to the expansion of mining activities of Anglo Platinum Mogalakwena Section mine were being discussed.

4.6.1 The sample

During the study, a total of twenty five participants were interviewed. The breakdown of the interviewed participants per village is as follows:

Table 4. 1: Number of Interviewed participants

Participant	Armoede	Ga-Molekana	Sekuruwe	Total
Traditional leader	1			1
Former committee member	1			1
NGO worker		1		1
Chairperson: new committee			1	1
Traditional healer			1	1
Villagers	5	4	5	14
New Committee member	1	1	1	3
S21 committee	1	1	1	3
Total	9	7	9	25

Amongst them, there were five key participants namely a traditional leader, a former committee member, an NGO worker, a chairperson of a community committee and a traditional healer. In addition, fourteen elderly and middle aged villagers from the three villages formed the village participant sample. Three members who belonged to the S21 committee faction were interviewed. It is important to note that the five key village participants were interviewed both times I visited the study area for

conducting interviews, i. e. I interviewed each one twice. The key participants were interviewed at each visit because it was clear that they possessed a lot of information which was of benefit to this study.

Other participants included six focus group members, two from each village. Among the focus group members were representatives from current community committees. The selection process of members of the focus group targeted villagers with specific opinions and experiences about the mining activities and public participation. The group was comprised of elderly men and women from the three villages. The members were recruited though referrals from face to face interviews.

4.7 The preliminary visit to Mapela

A preliminary visit to the three villages of Armoede, Ga-Molekana and Sekuruwe was undertaken to seek permission from the traditional leaders to carry out the research. This visit included introducing the research topic, specifying the type of participants needed and setting dates for the next visit. A brief piloting of the interview questions was done to verify whether the questions in the interview schedule could provide answers that could help achieve the objectives of the study.

It is of interest to note that in the research proposal, Motlhotlo village was initially selected as the study area because the village met the parameters for the research objectives. However, the outcomes of the preliminary visit led to a change of the study area because permission to carry out research in Motlhotlo village was not granted. The reason given was that there had been a lot of research carried out in that village before. However, the action taken by the chief may be associated with research fatigue. Clark (2008, 955) asserts that research fatigue occurs when individuals and groups of people become tired of engaging in research and it can be identified by a demonstration of reluctance toward continuing engagement with existing project or refusal to engage with any further research. In Motlhotlo, the

participation of people in research as noted by Clark (2008) had had no positive impact on their circumstances. The fact that previous research did not necessarily lead to anything positive for the community resulted in any further participation in research being perceived to have no or limited value in their lives. The traditional leadership in Motlhotlo recommended the villages of Sekuruwe, Armoede and Ga-Molekana as suitable ones for a study area. After meeting with one of the traditional leaders from Armoede and other community leaders in Sekuruwe and Ga-Molekana, permission was granted to carry out this research study in Sekuruwe, Armoede and Ga-Molekana.

Appointment dates were set for subsequent visits to conduct the interviews and the focus group discussion with the relevant participants. The preliminary visit was successful because it assisted in building a good working relationship with the community. A person was assigned to help with interpreting and locating the homes of participants who were recommended by other interviewed participants. During interviews, a snowball sampling or chain referral sampling method was thus used to identify and locate other relevant participants. Key participants and other participants who had been interviewed were asked to use their social networks to recommend other villagers who met the selection criteria and could contribute meaningfully to this research (Trochim, 2006). Two, two day visits to the research site were undertaken to collect data between September 2010 and November 2010.

4.8 Data collection strategies

The data was collected through interviews, focus group interviews and document analysis. Interviews were used as the primary tool for collecting data. The data collecting tools are discussed in detail below; first the interviews, followed by the focus group discussion, and finally, the document analysis.

4.8.1 Semi-structured interviews

In this study, data was collected by interacting with selected participants and getting

their views regarding indigenous knowledge, public participation and EIAs, through interviews. An interview schedule with semi-structured interview questions was used to facilitate face to face interviews with village participants from the three villages. The interview schedule helped to pace the interview and to make the entire conversation more systematic and comprehensive.

Semi-structured questions were used in the interviews because this allows for some flexibility and interviews can be modified to accommodate new issues, ideas and questions as they arise. This method also allows the researchers to eliminate unsuitable questions during the interviews (Simons, 2009; Trochim, 2006; Gillham, 2000). Consequently, interviews were interactive with research questions being able to be adjusted according to responses from the village participants (Simons, 2009; Creswell, 2003). (See Appendix A)

The semi-structured interview questions were then developed into open-ended type of questions. (See Appendix A) These questions allowed the participants to give their opinions, insights, attitudes and experiences freely, elaborately and in great detail (Naidoo, 2007; Schwartzman, 1993). Open ended questions also allowed immediate response to what participants said through probing for clarity and getting detail or more information from them (Simons, 2009; Vanderstoep and Johnston, 2009, 224; Naidoo, 2007). Even though probing was effectively used to get as much information as possible from participants, remembering most of what took place during the EIA study, especially for the elderly, was difficult.

4.8.2 Focus group

A focus group is defined as research technique which is used to collect data through group interaction on a given topic (Morgan, 2007). In this research study, one focus group discussion with six villagers from the three villages who participated in an EIA study or other mine related meetings was conducted. It is important to note that the villagers did not know that when they were giving information to the Anglo Platinum

Mogalakwena Section mine representatives they were in fact being involved in the EIA study. This focus group discussion assisted me in gathering data on the cultural norms of the three villages with regards to the existence and use of IKS in the community.

The focus group discussion also helped, as recommended by Kitchin and Kate (2000) in generating broad impressions of cultural issues of concern to the villagers. This was especially true for those that related to identifying adverse environmental impacts and suggesting mitigation measures during the EIA process. The focus group interviews assisted in building on the data of the semi-structured interviews (Kitchin and Kate, 2000). The focus group discussion was used to get a better understanding of issues because the interaction between villagers opened up opportunities for the participants to remind each other of what happened.

Once the purpose of the focus group had been explained, group members were asked to come up with a list of issues related to the expansion of mine operations they thought could be discussed. This list of issues and guidelines that were relevant to the integration of indigenous knowledge into the EIA process were together used to guide the group discussion. (See Appendix B and C)

4.8.3 Recording information

A voice recorder was used to tape-record both individual interviews and focus group discussions. Recording of information is important because interview memory cannot be completely relied on, while tape recording of exact words of participants could always assist to identify participants' point of view and also help in writing transcriptions and reports (Naidoo, 2007; Kitchin and Kate. 2000) that still carry the participants' voices. Voice recording ensures accuracy of reporting and adds to the veracity of reporting (Simons, 2009, 51).

Voice recording is important because it ensured that there were no distractions

during the interviews and discussions. Attention was directed towards interviewing instead of being divided between interviewing, listening and writing down major points. According to Simons (2009, 51) recording of interviews frees the interviewer from writing, thus allowing for smooth flowing discussions and interviews. However, during interviews and the focus group discussion the information that was seen as important was also written down.

Permission to tape record interviews and discussions was asked from participants prior to the start of the interviews. Anonymity of participants and was also assured.

4.8.4 Document analysis

Document analysis is a useful tool to obtain certain information that involves a detailed examination of the content of a particular body of material (Simons, 2009). In this research study, the EIA report for an EIA process that was carried out in 2002 for Anglo Platinum RPM –Mogalakwena Section Mine, and a report produced after a review of the EIA report for Anglo Platinum RPM –Mogalakwena Section Mine, were examined for the purpose of identifying;

- issues regarding the public participation process,
- the type of villagers who participated in the EIA process,
- the EIA stages at which the villagers participated during the EIA process,
- the use of indigenous knowledge in the EIA process

The rationale for this analysis was to establish the extent to which information collected during interviews and focus group discussion was consistent with information on reports with regard to public participation and IKS integration into EIAs (Simons, 2009). Document analysis was also used as a supplementary data collecting tool since it had the potential of providing important information that may not necessarily have been given by village participants during interviews.

Apart from collecting information from interviews and focus group discussion,

information was also collected during two community meetings which I was invited to attend. One was in Sekuruwe and the other in Armoede. Here I was able to listen to villagers discussing issues related to mining operations in their villages.

4.9 Data presentation and analysis

The information that was collected from interviews, focus group discussion and document analysis was then transcribed and summarised into categorised notes soon after the interviews when categories were obtained by organising common ideas into groups (Creswell, 2003; Gillham, 2000). After reading through transcriptions, two main themes were identified depending on the objectives of this study: issues regarding public participation and those regarding IKS. Each main theme covered a set of ideas or issues contained in several subthemes. Codes, as explained by Attride-Stirling (2001) were used to put related issues into subthemes. The major subthemes for public participation included: Knowledge and awareness of environmental policy and management tools; The EIA process in Mapela; Issues regarding public participation and Requirements of EIA regulation regarding public participation. The major subthemes for IKS included: Issues regarding the existence, transmission and suppression of IKS, Public participation and IKS, Integration of IKS into EIAs, EIA and IKS situation in Mapela vis-à-vis other development projects in South Africa, IKS that could have been used in the EIA study and Morality in IKS. Once the subthemes for the two main themes were identified and named, the content in each subtheme was described, interpreted and explained (Attride-Stirling, 2001). The discussion of findings was done by making reference to literature review.

4.10 Validity and reliability

All research needs to fulfil the requirements of validity and reliability. According to Golafshani (2003, 599) validity briefly refers to the appropriateness, meaningfulness, truthfulness and usefulness of inferences made from the data. Reliability is defined

by Simons (2009) and Golafshani (2003) as the degree of consistency of measuring instruments or the extent to which the results are similar over different forms of the same instruments or occasions of collecting data. To ensure the validity and reliability in this research study three different methods of collecting data were used. The interviews and the focus group discussion were also recorded. This use of several methods to collect data allowed for triangulation, a way of comparing data from different sources to judge the accuracy and relevance of the results (Simons, 2009; Gillham, 2000; Tellis, 1997). Document analysis enhanced the interpretation of data to verify and validate data that was collected through interviews and the focus group discussion. This enabled misrepresented information e. g. from interviews, to be compensated by data that was collected from text analysis. Also, information that was collected during community meetings helped to provide information which could be used to support that obtained through other methods.

4.11 Conclusion

This chapter described the research methods that were used in my study area. The research process used a number of data collection methods to answer the research questions regarding the integration of indigenous knowledge into environmental impact assessment processes. The strategic selection of participants contributed to the collection of relevant information about IKS in the study area. The next Chapter presents; analyses and discusses the data pertaining to the EIA process and issues of public participation in Mapela community.

Chapter 5.

Results, Analysis and Discussion: The EIA process and issues of public participation

5.1 Introduction

The purpose of the current chapter is to consider issues and problems of public participation and interpretation of policy. This chapter begins by briefly outlining the historical background of mining in the Mapela rural community. It describes the local community's knowledge about EIA policies, regulations and the EIA process. This chapter further highlights how the public participation process regarding the expansion of mining activities, relocation of villagers and grave exhumations was carried out in the villages of Ga-Molekana, Armoede and Sekuruwe. This chapter also describes briefly the type of stakeholders and IAPs who participated in the 2002 EIA process. The forms of public participation that were used during the EIA process are analysed to show how meaningful community engagement could be in matters that directly affect the lives of the local people. Lastly, it discusses the challenges that were encountered during the public participation process in Mapela.

This Chapter focuses on issues related to EIAs and public participation and findings of the study are presented under the following major subheadings: Historical background of mining in Mapela community; Impacts of mining; Knowledge and awareness of environmental policies and management tools and Issues of meaningful participation in Mapela.

5.2 Historical background of mining in Mapela community

According to information collected during the interviews, platinum mining in the

Mapela rural community dates back to 1926, when it was taking place on a very small scale. Low demand for platinum and difficulties of extraction due to lack of technology during that time resulted in the mine being closed. Some village participants who were interviewed claimed that mining activities only reopened in 1991 when the demand for platinum as a valuable mineral rose again. There are two major platinum mines that are operating within this community: one is located near Motlhotlo while the other, called the Anglo Platinum Mogalakwena Section mine, is in the vicinity of Sekuruwe, Ga-Molekana and Armoede villages.

5.3 Effects of Anglo Platinum Mogalakwena Section mine

The resumption of mining activities at Anglo Platinum Mogalakwena Section mine has gradually resulted in the improvement of the provision of basic social services in the 3 villages. The villages are serviced with communal piped water, electricity, gravel roads, schools and clinics. Accommodation facilities have also improved. But in spite of these developments, people of Sekuruwe, Ga-Molekana and Armoede complain that the resumption of mining activities has led to several problems for them.

The expanding mining operations have been encroaching into the traditional lands of these 3 nearby villages. Almost all the participants indicated that this encroachment has resulted in the loss of both grazing and crop farming land as well as access to other natural and cultural resources e.g. herbs and grave sites. The expansion of mining operations also led to the relocation of some villagers from Ga- Puka and Ga-Sekhaolelo to the new village called Armoede. Some participants stated that by 2008 most villagers had relocated to Armoede except for a few villagers who refused to be relocated. With regards to relocation, the participants could not give the exact number of villagers who were relocated or the number of those who refused to do so, but a report produced after a review of the Anglo Platinum Mogalakwena Section mine (Anglo Platinum Mogalakwena Mine, 2009, 15) indicates that at least 432

households (i.e. 87%) had been relocated from old Ga-Puka to Armoede, with only 65 households (i. e. 13%) remaining in the old village.

Several participants expressed similar sentiments regarding the hardships they are facing as a result of expanding mining operations. These included issues regarding resources. One participant pointed out that "*now after we are settled here, we see that we were not treated fairly because we are suffering more than before we were relocated, we did not have a good idea of what all this meant. We did not know that leaving our land would lead to this. We cannot grow crops because the land is scarce.*" Another participant added, "We *want fresh talks with the mine, talks that will make us get what we deserve. The money they gave us is too little; we do not know how they came up with that small figure. I finished mine in just one year.*"

Such expressions show that some villagers have become aware that they should have or perhaps could have demanded a larger share of economic benefits that could better have compensated for the loss of access to their natural resources and land - which for them is a source of their livelihood. This finding may be compared to that of O'faircheallaigh (2007, 320) who reported that some indigenous communities in countries such as Canada and Australia are now demanding to have their voices listened to with regards to the exploitation of natural resources in their traditional land. He explains that local people have come to realise that they must be given the opportunity for meaningful contribution in decisions that affect their lives, in order to ensure that decisions made contribute towards locals benefiting from developments that affect them.

5.4 Knowledge and awareness of environmental policies and management tools in Mapela

As noted earlier on, when mining activities at Anglo Platinum Mogalakwena Section Mine resumed in 1991, it was not yet mandated to conduct EIAs for proposed

development projects, even those with the potential of causing detrimental environmental impacts. Consequently no EIA study was done. However, since 1994, institutional and regulatory environmental frameworks such as the ECA 100 of 1987, the Minerals Act and chapter 5 of NEMA have been revised to ensure that they require developers to consider environmental issues in economic planning and development. In line with these policy developments, in 2002 an EIA study for expanding mining operations at Anglo Platinum Mogalakwena Section mine was undertaken by consultants from SRK Consulting South Africa. This study involved various environmental specialists such ecologists and technical auditors.

According to the EIA report (SRK Consulting South Africa, 2002) the EIA study that was carried out in 2002 was to cover the then present mine expansions and any that could occur in the future. The EIA report stated that the nearest villages to the proposed mining site, i.e. Ga-Puka and Sekhaolelo, were to be relocated for safety reasons and to allow for expanding mining activities. However, the EIA report also made provision for future expansion. Consequently, the expansion into the villages in areas around Anglo Platinum Mogalakwena Section mine did not require further EIAs. Only consultations with the villagers were required to be done. This confirms information that was collected during one-on-one interviews with some villagers who explained that the creation of a slimes dam which would affect the grave site of the Sekuruwe community in 2008 did not involve an EIA process, but just required consultations with the community.

Since NEMA provisions and EIA regulations and guidelines require the EIA process to involve the local community and use of their local knowledge, the community was expected to be aware of EIA policies and the EIA study that had been carried out in their community. Awareness of these environmental management strategies should have meant that they possessed some knowledge about EIAs. However, the investigation revealed that only 2 participants knew about EIA policies and acts. The rest claimed not to know anything about the EIA study.

For people to be meaningfully involved in EIAs they should first of all be aware of the existence of such environmental protection strategies. In this research study, it was found that 23 out of 25 participants were not aware of environmentally related policies that provide for the involvement of local communities and the use of their indigenous or local knowledge in development issues that directly impact on their lives. These participants, who included the chief, stated that they had never seen any policies or rules written somewhere which allowed them to be involved in what the mine was doing in their area. The chief said, "*We think the mine is talking to us just because they are told by the government*." The limited communication between the villagers, the government, the EIA experts operating in this area, about environmental policies and acts has led to lack of information amongst villagers with regards to their right to be involved. When asked why they did not know about the existence of environmental policies and regulations, one participant said, "*The mining company and these educated people - even some politicians - look down upon us. They think we are poor and illiterate and so treat us like idiots.*"

This lack of knowledge about environmental policies and acts by most village participants corresponds with Brownlie and Wynberg's (2001) assertion that governments in several developing countries lack political will in educating people about the importance of their involvement in environmental and development issues that impact on their lives. It also reveals the disconnection that exists between reality and policy. Policies are formulated for everyone and for protecting people, yet they seem to be accessible only to the educated. It could therefore be inferred that the lack of knowledge about environmental management policies and acts by most village participants was a deliberate strategy by policy makers, to ensure that the information does not cascade from policy makers down to the implementers and through to the people at grass roots, i.e. those who are affected when the policies are being implemented. This inference agrees with Arnstein's assertion that the lower forms of public participation at the bottom of the ladder are often used by the

government and experts to pretend as if they are genuinely seeking information from the local communities. This is done with limited assurance that the views of people will be considered in decision-making, as experts are usually aware that local communities have limited knowledge with regards to their participation in development issues. One of the two participants who did have some knowledge explained that he gained knowledge about environmental management through his work at Action Aid, an NGO that works with local communities that are affected by mining activities. The other obtained some knowledge from being involved with the mine as a representative on the local community committee. This finding corresponds with O'faircheallaigh and Corbett's (2005) assertion that the participation of indigenous communities in environment and development issues is widely recognised in theory but practice falls far behind principle.

The fact that only 2 out of 25 village participants possessed a little knowledge about EIA policies and acts demonstrates that that being just an ordinary community member, may result in exclusion from this kind of information. These findings differ from what is reported to be happening in other countries such as Colombia and Canada, where according to O'faircheallaigh (2007) and White *et al*. (2007) the governments are encouraging and enforcing the involvement of indigenous communities in EIAs. The government is also involved in educating people about environmental management policies, acts and guidelines through environmental awareness campaigns. This seems not to have happened in this community.

5.5 The EIA process in Mapela

As noted, even for the two participants who admitted of having heard about an EIA study, people were confused. It was not clear to them whether the EIA study that was undertaken in 2002 was to be used for all subsequent new mine operations taking place post 2002 or whether it covered those living in the vicinity of the 3 villages. The environmental NGO worker said, "*Yes, I heard about the EIA study but*

I am not sure whether it was done for this community. Actually, I have a copy of the EIA report that was carried out in 2002 for Mogalakwena Mine; it is not clear whether it was carried out for all the villages affected by this mine." The former S21 committee member said, "*Sometimes I hear people saying the mining company is using results of an EIA study that was done long ago for expanding activities in our village so we are not very sure*." Despite having heard about the EIA the two participants were not able to clearly describe the purpose of an EIA.

Brownlie and Wynberg (2001) assert that there is limited application and implementation of NEMA provisions on EIAs despite the NEMA provisions that decision-making on environmental and development issues should take into account the interests, values, and needs of all participants, recognising all forms of knowledge including indigenous and local knowledge. The findings of this study seem to be in line with their assertion, which explains why some people were not aware of the existence of environmental policies, acts and regulations; nor of the EIA study that actually took place in their community. All the interviewed village participants agreed that they attended several meetings where the mine authorities explained issues relating to the expansion of mining operations, yet they claimed that the mine authorities never mentioned anything about an EIA study. Such claims from village participants suggest that EIA experts may not have explained clearly to the community during meetings that they were carrying out an EIA study for expanding mining activities. What was lost was explicit education relating to the public participation process.

These findings illustrate that developers may carry out EIAs without meaningfully engaging the local communities to a level where they can understand the entire EIA concept, or where they consider the perspectives of villagers. The developers might have viewed the EIA from the mine perspective, i. e. as an inclusive process that has looked into all the villages in the vicinity of the mine that would be affected in terms of a "master plan". On the other side, the villagers might have viewed the EIA

in relation to the distinct village differences, with each village being regarded as a discrete entity on its own. This difference in perspective indicates that developers and EIA experts may not have been aware of the potential for a different perspective, hence did not take it into consideration. NEMA and EIA regulations require meaningful participation of local communities in EIAs where there is a two way communication process in order to come with amicable decisions, yet they do not clearly spell out the procedures for doing this. This lack of proper guidelines for local community participation tends to allow developers to abuse such ambiguities in NEMA and EIA regulations and this then limits meaningful public participation.

Despite the various weaknesses in the involvement of the locals in the various EIA stages, the Environmental Impact Assessment Report (EIR) (SRK Consulting South Africa, 2002) revealed that the prescribed EIA stages of screening, scoping, assessing and evaluating impacts and suggesting of mitigation measures were in fact carried out during the EIA process for Anglo Platinum Mogalakwena Section mine. However, participants lacked information about the EIA study procedures since most of them were not aware that they had participated in an EIA process. In fact they did participate. Developers appear to have followed policy but the concern lies with the issues of transparency and moral responsibility for EIA consultants to ensure that villagers at least understand the purpose of their involvement in various stages of EIAs.

5.6 Inclusiveness of stakeholder selection

With regard to stakeholder involvement, once again the EIA report demonstrates that the EIA consultant adhered to the requirements of the EIA guidelines as stipulated in the EIA regulations by engaging a wide range of stakeholders. The composition of selected stakeholders was inclusive in that most participants attested to various people participating in various meetings where mining activities were discussed. However, it is important to note that participants did not know initially that

the various people they saw in their community were participating in the EIA study; to them it was just another mine activity. One participant said "*even if we attended several meetings, most of us did not know that any study about the effects of mining was being carried out during that time*." Participants from Armoede said that during that time when the mine people were getting information about their relocation, a lot people were involved, including government officials, the chiefs, councillors, community representatives and other officers from the mine. They themselves were also involved because they were asked a lot of questions about their property. The EIA report by SRK Consulting South Africa (2002) also confirms the inclusiveness of the stakeholder selection as it indicated that a wide spectrum of stakeholders participated in the EIA study. These included various environmental experts such as ecologists and botanists, local level land owners, traditional leaders, and community and civic organisation representatives and some community members. These stakeholders are shown to have participated in various stages and aspects of the EIA process.

However, even though some participants agreed that a lot of people were involved in activities related to the expansion of mining operations and the subsequent relocation and grave exhumation, they were not able to tell what these different people were actually doing. Therefore most participants maintained that they did not see any environmental expert during the meetings. Others said that they did not know what those people were doing because no one told them and hence they thought they were employed by the mine. On these issues of who was who in those meetings and activities that took place in their community, one participant explained "*No one told us who those people were and so how could we know*." A review of the EIA report of the EIA study for Anglo Platinum Mogalakwena Section mine by Ndaba (2009) indicates that various specialist studies (which included the prediction, identification and assessment of impacts) were actually done. Impact significance was determined with reference to different environmental aspects such as fields, forests, habitat, and water sources. Furthermore, impacts were quantified to

ascertain losses and gains. Quantifying impacts led to the suggestion of mitigation measures such as the relocation of villagers from Ga-Puka to Armoede and monetary compensation for villagers for their loss of land for grazing and farming and general relocation expenses. Villagers at Sekuruwe were compensated for the loss of their traditional grave site and for funeral expenses. However, the EIA report does not show to what extent the locals participated or to what extent assurance was sought that the locals understood what was going on in various stages during the EIA study. Some participants maintained that they had attended meetings where they were told about relocations and the money which they were going to get for losing their homes, grazing and farming land but which they did not understand to be constituted as having taken part in the EIA study. The traditional leader from Armoede said, "*During meetings, the mine representatives assured us that the money we were to get could cover all the losses that were going to occur because of the expanding mine operations*." What was then exposed by this investigation was a serious mismatch in intention and execution of policy. Policy was followed as required, but it did not produce the intended engagement or protection of the affected parties.

In both the 2002 EIA study and 2008 consultation, community committee representatives were used as major stakeholders representing the local communities of Armoede, Ga-Molekana and Sekuruwe. However, the conflicts that arose between the mine representatives and communities and between the communities and their representatives also indicate a serious weakness in community stakeholder selection and composition and communication. This will be elaborated in Subsection 5.7 on issues of meaningful public participation.

The review of EIAs in South Africa by Brownlie and Wynberg (2001) revealed that limited participation of local communities suggests that the lack of knowledge about EIAs by indigenous communities shows that the requirements i. e. for public participation of indigenous people in environmental management legislation remains

a theoretical aspect which is rarely practised on the ground. The findings of this study matches with their findings. The lack of information about EIAs by local communities highlights the marginalisation of these local communities from decision-making about environmental issues that impact directly on their lives. The reviews compiled by Brownlie and Wynberg (2001) which assessed EIA reports for several proposed development projects illustrated that most of the listed participants were experts. This together with findings from this research suggest that some EIA consultants, and other specialists such as ecologists and archaeologists, simply assume that local people, because they normally do not possess expert knowledge, need not to be seriously involved in EIAs, let alone be informed about EIA studies being carried out in their localities.

Evidence from the research carried out by O'faircheallaigh (2010) indicates that the situation in South Africa is similar to other countries. It appears that the lack of knowledge about EIAs by rural local communities demonstrates that indigenous communities are not viewed as being able to contribute meaningfully to the decision-making process. Furthermore, it indicates that there are limited measures put in place by the relevant authority to raise awareness in villagers about EIAs and their potential involvement in EIAs.

Despite the fact that the EIA report depicts that the EIA process was inclusive of all the major stakeholders, including the representatives from the local community, the EIA report does not clearly show the recorded views of IAPs such as local community members and civic organisations. Only the views from experts are recorded in the EIA report. This demonstrates that while the government promulgates legislation to guide the carrying out of EIAs, the lack of information in the EIR to show the contribution of other stakeholders, especially indigenous communities, demonstrates that the implementation on the ground in this regard is still elusive.

5.7 Issues of meaningful public participation in Mapela

As noted earlier, environmental management policies such NEMA 107 of 1998 and Section 56 of the EIA guidelines and regulations of 2006 promote public participation of indigenous communities and the use of different forms of knowledge in environmental and development issues (Brownlie and Wynberg, 2001). Therefore, as stated at the outset of this research report, the other object of this study was to ascertain the extent of indigenous community participation in EIAs that seek to predict and identify environmental impacts caused by development projects.

From the interviews, it was clear that the public participation process employed various participation forms ranging from meetings with the traditional leadership, the community representatives and the villagers, as well as door to door visits with households that were going to be relocated in the case of Armoede. The findings of this research study agree with Dowling *et al*.'s (2008) assertion that public participation may take various forms, ranging from meetings, workshops with stakeholders, and IAPs. To initiate and facilitate public participation, the mine representatives followed the traditional protocol of approaching the traditional leaders, followed by the establishment of community committees with whom they would engage.

5.7.1 Protocol

The EIA process engaged several expert stakeholders but from the views of participants few people from the local community participated in any meaningful or informed way. However, the way the mine representatives initiated public participation in the respective villages shows that the traditional protocol of engaging with the local communities was religiously followed. The participants agreed that the first point of call, as a means of involving the local communities, was through meetings between the mine representatives and the traditional leadership. According to those interviewed in this research study, their involvement in issues regarding their relocation was through the chief, who was the first port of call for EIA

consultants. Consequently, the participants from the 3 villages concurred that only the chiefs were informed in the early stages of the public participation process about the mining company's intentions to expand mining operations. The villagers were informed later on. One participant from Armoede explained, "*At first*, t*he mine people held several meetings with our traditional leaders. After that a community committee comprising of the chief, his aides and other community members was formed to represent us*." Other participants added that the community committees were tasked to take people's concerns to the mine people and also bring feedback to the community.

The developer thus followed policy requirements in this case but it does appear that there was lack of transparency with regards to issues that were being discussed between the mine representatives and the traditional leadership. The tension between the interests of the developer and the communities that developed later suggests the mine might have withheld information during the initial stages of public participation. This view, i. e. that information might have been withheld is based on different perspectives. On the one hand, it may be speculated that EIA consultants may have purposefully done so as they saw no substantial reason behind giving too much information to villagers who might after all possess limited or no knowledge about EIAs. On the other hand, giving enough and relevant, information to the villagers in the initial stages of public participation may have allowed meaningful participation of villagers in the EIA, thereby eliminating tensions that later on developed between the mine and the villagers.

5.7.2 Tensions between villagers and community committees

The "public participation process" was mainly characterized by a few individuals who played the role of representing the community. A study by Ndaba (2009) on the relocation consultation process from old Ga-Puka to Armoede confirms that small committees (such as the Relocation Steering Committee of Ga-Puka villagers who were relocated to Armoede and other committees for Sekuruwe and Ga-Molekana)

were used to mediate between the villagers and the mine representatives.

The process of public participation in the three villages was thus largely through mediation between the community committees and the mine authorities. Participants stated that at first, their respective committees occasionally brought feedback to the rest of the community after every meeting they held with the mine representatives. This means that the respective community committees held meetings with villagers in their communities in order to inform them what was discussed with mine representatives. But with time, feedback meetings between the community committees and the villagers were reduced. In addition to reduced feedback and number of meetings, some participants claimed that villagers began to notice that meetings held between villagers and community committee members were characterised by a one way flow of information. One elderly participant said, *"In most instances community representatives only brought back to us what they had been told by the mine representatives. We were not given the chance to express our views*." To this, some of the villagers who were interviewed emphasised that even if community representatives had taken their concerns to the mine authorities, feedback demonstrated that their concerns were not put into consideration. Some elderly participants said that they thought that the problem emanated from the fact that the selection of committee members was not fair. They claimed that the committees comprised of the chiefs, chief aides, and some ordinary community members who were known to be friends with the chiefs. Suspicions developed amongst the villagers of community representatives being bribed by the mine, and infighting started within community committees resulting in some community members losing trust in the committees. The disagreements with regards to the integrity of community committees negatively impacted on the public participation process. Participants from Armoede explained that these disagreements resulted in the dissolution of at least 3 community committees. This situation did not ensure the continuity of creating good working relationships and decisions, as every new committee would demand fresh consultations.

However, the results from Ndaba's (2009) review of the EIA report present a different view from that of participants with regards to the representativeness of community committees. This review maintains that the committees were representative because they comprised both locals and non-community people such as representatives from the government and district council. These differing views therefore show that there were issues with regards to representativity and the selection process.

Some participants stated that despite the tension that had developed between the community committees and the villagers, the community committees were advised by a lawyer, who was hired by the mine, to register as a 'not for profit company.' Participants in this research study emphasised that once community committees were registered as S21 companies, the committee members started to advocate for the interests of the mine. Most participants claimed that the conflict between the villagers and community committees and the breakdown of trust in the community committees in the 3 villages worsened after these committees were registered as S21 Companies. The loss of trust in S21 committees became an obstacle to carrying out public participation in that these committees could no longer mediate between the villagers and the mine.

The chief from Armoede outlined the problem by saying that committees were bribed to agree to be registered as S21 companies. Participants stated that corruption also occurred in situations where S21 committee members and their relatives were favoured: in benefits such as offering of employment and the receiving of salaries were limited to those in the 'inner circles'. Participants elaborated that this favouring caused S21 community committees to support the interests of mine instead of those of the local communities. The chief explained that once the committees became S21 they betrayed the communities. Some participants expressed similar views and one of them explained, "*When they*

became S21 they stopped working for us and they supported the mine, you could tell from the way they talked. They were no longer on our side and so we had to do something. We formed new committees by electing our own new people who were going to truly represent us."

The S21 committees were thus accused of being 'sell outs' by the villagers. Ndaba (2009), in his study, indicated that S21 committees eventually lost legitimacy in the eyes of complaining villagers. As such participation of S21 committees in issues relating to mine developments, were viewed as null and void by the rest of the community. This was an obstacle to public participation because the S21 committees could no longer mediate between the villagers and the mine representatives as they were being blamed for not transferring information and people's grievances to the mine representatives and for endorsing issues the people did not.

Participants' claims that the S21 committees were bribed correspond with findings of a study conducted in Umga Municipality of the Eastern Cape by Bernard and Khumalo (2004, 123). Here it was revealed that traditional leaders were sometimes bribed, when they fell prey to developers with incentives and promises, and who bargained on their lack of knowledge of accepted procedures and requirements regarding EIAs. In their findings, Bernard and Khumalo (2004, 123) show that the chief endorsed the Hydro-Electricity Power development project without consulting diviners. They explained that the chief thought the diviners were going to reject the project because of their belief that the project could drive away ancestral spirits in the pools, and also hinder access to the pool for them to perform rituals. Findings reported from Calabash Case Studies prepared by Common Ground (SAIEA, 2009) on Impact Assessment case studies from Southern Africa also point out that the use of traditional community structures to consult with the stakeholders may compromise meaningful participation, as chiefs may inhibit certain stakeholders from raising their concerns, when they had already endorsed the proposed projects. In a similar way,

the findings of this research study indicate that the mining company may have bribed the community committees by registering them as S21 companies to win their favour so that they could support and authorize every activity on behalf of the community without the whole community's knowledge.

All the participants indicated that suspicions and the breakdown of trust for S21 committees created tensions among community members in all the three villages. Ndaba (2009) reported that the new committees claimed to be on the people's side. In all the 3 villages, the abandonment of S21 committees by disgruntled community members resulted in the division of community members into two groups. One group supported S21 members and the other non-S21 members. The formation of new community committees and divisions amongst the villagers disturbed the public participation process. The mine representatives had to start new consultations with new community committee since villagers demanded new consultations with the mine in order to set right past agreements that were being rejected by new committees. However, participants emphasised that it was difficult for new committees to nullify some of the agreements that were signed under the leadership of the previous committees. One participant from Armoede said, "*We are still pressing for fresh talks on compensation because we have seen that the money that we were given was too small. It was finished long back yet the mine is still making money from our land.*" Another, the chairperson of the new community committee in Sekuruwe elaborated, "*We want a long term lease which is going to go on for generations so that the community will continue to benefit as long as the mine is operating because they took away our land which we were going to leave for our children.*" Participants' views suggest that there is more consultation that needs to be done by the mine representatives and now it should be meaningful, their views should be seriously considered in decision-making.

However, despite the divisions which were created amongst the villagers leading to the formation of new community committees, the use of community committees

played a major role in facilitating some communication between the mine, mine representatives and the villagers.

5.7.3 Issues pertaining to the integrity of public meetings

The most common form of public participation used by the mine representatives were the meetings held with committees and/or community members. The meetings were held for informing or consulting with the local people on issues regarding the expansion of mining operations.

Despite the fact that the mine representatives used various forms of meetings with different groups of people from the local communities (and while the public participation process in these communities may have been wide and inclusive in terms of involving a large number of villagers), most of the research participants claimed that they did not feel that most meetings meant anything substantial to them. Participants explained that when the mine representatives held meetings with the villagers they pretended that they were listening to them, but in most instances did not do what they had agreed on. According to participants, even though they attended several meetings with the mine authorities or with community committees, having their concerns addressed during meetings was identified as a problem. One participant from Sekuruwe who had disagreed with relocation of graves to a new site said "*I refused to have my relatives' graves dug. I did not give them the names of my deceased relatives. Not me only even other people refused but the graves were dug*." This claim points to the mine representatives operating according to principles, but without intending for there to be meaningful participation.

Most participants asserted that their suspicions about these meetings were fulfilled when the graves were finally exhumed without overall community consent. The way this was done indicated that views and concerns from the local people raised during meetings seem not to have been put into consideration in final decision-making. It also indicates that the public participation process was generally less inclusive and

less sensitive to the concerns of the local community. Once again, this points to the issue of not just being compliant to policy requirements but to moral obligation on the side of developers. It is the duty of EIA consultants and specialists to ensure that the actions undertaken by developers create mutual benefits for all and respect for other people's culture even if different from their own.

The research findings of this study indicated that meetings between mine representatives and the villagers from the three villages served as what Bishop and Davis (2002) call a 'symbolic gesture' in the EIA process or they were pseudo meetings that were held merely to satisfy the requirements of NEMA and EIA regulations and guidelines. Arnstein's (in Choguill, 1996) view is that developers usually use informative and consultative meetings to create a false appearance of inclusive and meaningful participation by pretending that they are seeking views but actually give no assurance that concerns from the community will be taken into account in the final decision-making. This method of public participation is regarded by Choguill (1996, 439), Bishop and Davis (2002), and Bynoe (2006, 37) as tokenism where informative meetings and consultations are used to show that local community members were involved and indeed endorsed the proposed project, yet this was not the case.

The research findings indicated that during meetings there was lack of meaningful and productive communication between mine representatives and the local people from the 3 villages. One of the main issues to emerge was that communication regarding compensation packages for relocation, loss of traditional land and exhumation of graves seems not to have been meaningful and transparent. This view is based on the finding that almost all the participants from the 3 villages claimed that they did know how the mine representatives came up with the figures and that their views were not sought in the issue of compensation. One elderly participant from Armoede said, "We *thought that the officers - who were moving around our homes before we relocated - asking about our property, helped the mine*

representatives to calculate the amount". Participants indicated that they got different amounts ranging between R8 000.00 and R12 000.00. All the participants had a common view that the value of the compensation package was done in secrecy and lacked meaningful community contribution. One of the participants from Ga-Molekana also explained*, "we do not know what issues were considered in coming up with the amount of money each affected family was given*." For the villagers who were compensated for grave exhumation, an issue considered in the next chapter, one participant from Sekuruwe said, "*The amount you got depended on the number of graves you had, but we do not know how they came up with the figure for 1 grave. I never had a say on the amount of money we were going to get."* All the twenty five participants, including those from the former community committees, agreed that they did not contribute views regarding the amount of money to be given to them. These claims suggest that mine representatives used top down strategies, where the purpose of public participation is seen as a way of passing on information to people about decisions already taken. The meetings seem not to have been used to talk to each other meaningfully to come to a decision regarding appropriate compensation. Ndaba's (2009) study of the EIA report for Anglo Platinum Mogalakwena Section Mine highlighted that a technical audit was done to determine the compensation packages for villages in both relocation and grave exhumation cases. The responsible personnel may have forgotten to put into consideration the literacy level of the beneficiaries in terms of money issues when they were carrying out the audit. The findings that the meetings were held to pass on information to people about decisions already taken correspond with Wel's (2006) and Patel's (2009) assertions that local communities are usually not given the opportunity to contribute towards final decision-making. They explain that engagement with local people is through informative meetings which are only held to tell people how development may affect them.

Failing to open a platform for talking to each with regards to quantifying losses and coming up with the value for compensation was identified as one of the main

problems in the public participation process. It is clear that there was communication between the villagers and mine representatives but the fact that people did not understand how the compensation package (which is an outcome of an EIA process) was determined suggests that some information was withheld by the mine authorities during the EIA process.

This demonstrates that despite the EIA regulations stipulating that the participation process should be transparent; this does not usually happen on the ground. This suggests that even though South Africa has produced relevant policies for public participation, there is still a lot of work that has to done to ensure that the implementers of these policies are able to effectively practise policy requirements on the ground. The breakdown between policy and reality should be prioritised if indeed these policies should yield tangible results especially for the grass roots people.

Secondly, the misunderstanding in communication between the villagers and mine representatives is evidenced by claims from participants that they did not realise the compensation was a once off payment. Rather, they thought they were going to be paid compensation for a long time. One participant from Armoede who was relocated from Ga-Puka said, "*The first time they told us we will get R1 000.00 a month for 10 or 12 years, but I can't remember well. Then after we were paid the money we heard that it was a once off payment. I was shocked. It is when we realised that we had been cheated.*" Similar sentiments arose in 10 responses of participants from Armoede and Sekuruwe. Another participant from Sekuruwe commented, '*the mine representatives used money to make some of us think what they were doing is good. They knew that because we are poor we will agree to anything as long as there is money to be given'*. During interviews (see Question 4 in Appendix A) 22 participants agreed that they "realised that they were cheated" with regards to compensation packages and that very little was said to them about the long term effects of the loss of their land, their source of living. One of the elderly participants explained, *"I used to grow crops in my field to get food. I used less*

money to buy food then but now I have to buy everything even mealie-meal and milk I used to get from livestock."

Thirdly, some participants claimed that in addition to not having been involved in coming up with the compensation package, they only received a part of the compensation money. One participant from Arrmoede explained, "*When we agreed to be relocated and everything was set, we only received part of the money for compensation. We were promised to be given the remaining amount when everyone has relocated, but because some people refused relocation, even today they are still there. We do not know when we will get our money.*" This misunderstanding between the mine representatives and villagers also resulted in villagers viewing the mine representatives as having failed to keep their promises. This action by the mine representatives, as claimed by villagers, hints at the assertion by Bishop and Davis (2002) and Bynoe (2006) that sometimes developers take advantage of faults in the participation process to attract villagers to agree to their plans regardless of whether they understood issues regarding relocation and compensation. It also could be inferred that this might have been a strategy used by mine representatives to ensure that those villagers who were willing to relocate would force others to do the same, despite the valid reasons they raised against being relocated - which included loss of land for pasture and farming and loss of the burial site.

Bishop and Davis (2002) assert that developers hold meetings with the communities and concentrate on short term benefits so that they can get buy in from people. Environmental management policies such as NEMA and EIA regulations encourage meaningful participation of indigenous communities which necessitates the understanding of both short and long term impacts of development by these people. However, the findings here indicated that the public participation process was characterised by misunderstandings in communication. This in turn indicated that there was lack of appropriate steps taken by the mine representatives to ensure that IAPs, especially villagers, understood the conditions regarding compensation for

them to make informed decisions.

It appears that there were also misunderstandings with regards to the type and quality of houses which villagers were given when they relocated to Armoede. Some participants from Armoede, including the chief, reported that the houses that they were promised were different from the ones that they actually got when they were relocated. Participants claimed that the houses that were eventually constructed and the sanitation facilities did not match up with the model houses that were used to demonstrate the type of houses they were going to get. One of them explained that "*The house that was built at first to show us the type of houses we were going to get was beautiful and big. But now we got different houses, some small and others big*." Some participants, during a focus group meeting at Armoede, complained that their houses have developed cracks, and the toilets are located outside their yards, making it difficult for people to use the toilets at night. These complaints from participants indicate that due to limited meaningful explanations during meetings, or due to villagers failing to understand the whole concept of model houses, mine representatives might have raised very high expectations in the villagers who then thought they were cheated when they got the houses they did not expect. Bishop and Davis (2002, 18) assert that developers tend to skilfully deceive people by making attractive promises to influence them to agree to their plans. It appears that the situation in this case gives support to this argument.

Some participants expressed mixed sentiments with regards to promises that were made by the mine representatives. While they felt that they had been cheated, they did acknowledge that there have been some improvements in terms of the provision of other facilities such as schools, roads and clinics, highlighting the possibility for differing perspectives regarding the quality of compensation.

Keeping and maintaining registers of IAPs who attend meetings during public participation is a clearly stated requirement of NEMA and EIA regulations and

guidelines. According to participants from Sekuruwe, mine representatives drew up registers for meetings. Most of the participants pointed out that they wrote their names on pieces of paper each time they attended meetings. Participants claimed that they heard that the mine representatives used those registers as confirmation that people agreed to whatever was discussed at the meetings. This claim, that meeting attendance registers were used to endorse the decisions taken by the mining company as if all who attended the meeting had agreed to the meeting deliberations, was not verified with the mine representatives and may have been said by participants to gain sympathy.

However, some participants had different views with regard to attendance registers. One participant, who is a current member of the dysfunctional S21 community committee, disputed the above claim and said, "*Nothing like that was done, because the mine went ahead to exhume the graves does not mean they depended on the register to show that people agreed. Instead the mine removed graves because a lot of people agreed and they even got compensated before the graves were removed.*" The mine representatives indeed followed the requirements of the EIA regulations of maintaining a register of IAPs who participated in a public meeting. Nevertheless, contrasting views with regards to the use of these registers raises questions about general consensus regarding decisions that were agreed upon during public meetings.

The findings of this research study with regards to the use of registers seem to correspond with Choguill's (1996, 438) assertion that developers sometimes rely on pseudo participation or "sneaky use" of EIA policy requirements. These requirements include maintaining attendance registers for meetings held with local communities. However, the registers then get used as a rubber stamp to allow development to commence regardless of different concerns that were raised by the community.

The findings of this research study indicated that community meetings between the mine representatives and villagers from the 3 communities were characterised by a sense of intimidation: Eighteen participants indicated that people felt intimidated during community meetings. The chair person of the non-S21 community committee from Sekuruwe said, "*The mine people threatened me. They even asked me whether I was making myself the lawyer for the community and did not allow me to talk, but I told them as long as I live I will talk for us*." This view was also expressed by some participants during the focus group discussion and by those who support the S21 community committees. The 3 participants who support S21 committees agreed that there was "too much fighting" during meetings. However, they explained that had the mine followed proper procedures, especially regarding the issue of grave exhumation, conflicts between the mine and the community would not have occurred. One of them said, "*We want development in our area, I support the mine but they must make sure that they listen to people and come to agreements, instead of forcing and threatening people to accept everything they have planned*." The use of threats during meetings might have compromised the meaningfulness of public participation and in turn the effectiveness of communication between the mine representatives and the community.

A study of the involvement of chiefs, diviners and spirit mediums in community based natural resource management in South Africa by Bernard and Khumalo (2004) also revealed that it is not only the developers who intimidate the local communities, but indunas (chiefs) also threaten community members who may be seen as causing trouble during meetings. In this research study, participants indicated that community members belonging to different factions also threatened each other. In some instances physical and verbal fights occurred among the factions during meetings. Such threats and fights, which may have been a result of misunderstandings in communication during meetings, strained relations between the developers and the communities, and between community members.

Participants explained that community participation through meetings became difficult as these meetings were characterized by disagreements from conflicting factions. Having to deal with not just two committees from one village with different agendas, but also two groups of people (those for S21 and the anti-S21 people) during meetings, seems to have been a great challenge for the mine representatives. For the mine representatives the apparent lack of progress led to them carrying on with certain activities, for example, grave exhumations without an amicable agreement between the mine and all villagers being reached first.

The divisions amongst the community members also led some chiefs, e.g. a chief from Armoede, to support the newly formed community committees. This in turn resulted in the breakdown of communication between the mine representatives and the locals. Participants explained that the anti-S21 community members boycotted meetings that were hosted by S21 committees. They added that community members supporting S21 committees were not allowed in meetings hosted by new committees. In one of the visits to the study area, at a community gathering, one elderly man pointed to a man passing by and said, "*You see that man, he cannot come to this meeting because he supports S21 committees*." This was a challenge to the public participation process in the sense that it became difficult for the mine to get cooperation from the locals even for issues that needed their participation and were supposed to be of benefit to the community.

5.7.4 Power relations/clash of belief systems

From the interviews, problems with the public participation process arose from the fact that the views offered by the villagers were not recognised as important compared to those from the mine representatives, i.e. participants in the interviews indicated that the mine representatives did not take issues raised by the community members seriously. One participant said, "*They do not listen to us, they just tell us what they want to do*." Brown and Jacobs (1996, 496), O'faircheallaigh (1999, 65)

and Patel (2009) assert that issues of power are always embedded in environmental issues. The importance and the power given to experts is overemphasized with developers and EIA consultants relying more on western science than local knowledge resulting in sidelining of local communities and their knowledge. This situation appears to have occurred in my research area since the views expressed by participants indicate that mine representatives relied more on scientific knowledge. Experts who held a scientific perspective when conducting EIAs seem to have perceived indigenous communities as unknowledgeable about environmental issues. This in turn appears to have led to the marginalisation of concerns raised by local communities. Finally, there was no guarantee that community concerns were put into consideration during decision-making.

From the interviews, it was clear that the relationship between mine representatives and the villagers was not of partners that talked to each meaningfully in the process of decision-making, with regard to loss of land and the exhumation of graves. One participant from Sekuruwe said, "*The mine people boasted and told us that even if we refuse to sign the forms and to take the money, there is nothing we can do as long as others have signed the contracts agreeing to allow the expansion of mining activities*."

Choguill (1996, 439) and Bishop and Davis (2002, 20) assert that top-down methods of community involvement during meetings is merely information sharing, and always gives more credence to expert knowledge than to indigenous knowledge. They claim that meetings that are held just to pass on information to the communities are the lowest form of public participation used by developers. Here the views of the locals in decision-making are regarded as less important and therefore not accommodated. The findings of this research study support these assertions.

Since it was discovered that most participants lacked some knowledge regarding the EIA process, some EIA requirements, for example, of placing notices about EIA in

the newspapers were explained to some participants. When participants were asked whether they had seen the advertisements about the EIA study for Anglo Platinum Mogalakwena Section Mine in newspapers, most of them said that they had not. They explained this was because they have limited access to provincial and national newspapers. Participants indicated that there was no newspaper delivery in their community and that because of their poor financial status they usually do not have extra money to buy the newspapers. They added that reading and understanding the information and doing what they were expected to do was going to be difficult, especially for the elderly, due to literacy problems. Consequently, advertising the EIA study in newspapers can be interpreted as actually enhancing the inaccessibility of information that would have allowed the villagers to participate in the early and crucial stages of the EIA process. This is so because the interviewed villagers from Mapela claimed that they never saw any EIA study advertisement in the newspapers. The chief said, "*I do not buy a newspaper. If I go Mokopane for some other business, I do not even think of buying a newspaper*."

As a result of not seeing the advertisement, several participants indicated that villagers participated in the EIA only at the final stage of implementing mitigation measures for impacts that were identified during the EIA process. One of them said, "*We did know about the EIA process, we were only involved by telling those people who were moving around our homes the kind of property we have. Even in the meetings, it was about us moving to a new area. We were asked to choose between two farms and we chose this one where we are living now*." Another participant from Armoede, during a focus group discussion expressed a similar opinion by saying, "*We only got involved in issues that were related to our relocation. When they were still looking at what the mine will do to us, our homes and land for farming and grazing, we were not involved*."

It is thus clear that the mine representatives accurately followed the requirements of NEMA and EIA guidelines by advertising the EIA study, but the fact that adverts

were inaccessible suggests that as participants indicated, the procedure actually sidelined the local communities. This requirement, i. e. of advertising the EIA study in newspapers, indicates that policy makers may have overlooked rural communities' access to information and the levels of education, especially for the elderly people.

These views from the village participants are supported by findings of an independent review by McCullum (2010) of the physical resettlement undertaken by Anglo American Platinum mine. This review also showed that in the actual EIA study of predicting and identifying impacts of extending mine activities and suggesting of relocation as one of the mitigation measures, there was limited involvement of the community. This review indicated that local people got involved in development issues only after the final decision regarding their relocation had been made, and that community members only took part in selecting the farm where they were to be relocated.

These findings show that expert/lay knowledge power issues in environmental matters contributed to the marginalisation of the local communities of Sekuruwe, Armoede and Ga-Molekana from the EIA process. Similar to these findings are the findings reported by Patel (2009, 100) regarding public participation of local communities in the Gautrain rail link EIA study. She pointed out that the public were only consulted when enormous resources had already been spent and developers were already committed to going ahead with the rail link. Participation at that stage meant that there had not been a real opportunity for the public to shape the solution to the transport problem. The findings of this research study indicate a similar scenario.

The majority of participants agreed that the problem of understanding each other could be related to different belief systems. Some participants, e. g. the chief, the traditional healer and the chair person of the non-S21 community committee at Sekuruwe emphasised that the clash between western policies and traditional

culture was evident, especially in relation to grave exhumation issues. They explained that most villagers wanted to perform traditional rituals to appease their ancestors before the exhumation process was undertaken. Some participants claimed that due to the fact that mine representatives thought the rituals were not important, the opportunity to perform the rituals was not given. The failure by experts to consider the culture of the local community in this situation brings to question the type as well as their education and training regarding the EIAs of experts who carried out the EIA process in this community. If they were South Africans, the assumption could be that the education and training regarding EIAs they obtained was scientific oriented, As a result this education and training may not have equipped them with the skills of considering cultural values of local communities when conducting EIAS.

All the participants from Sekuruwe revealed that some villagers refused compensation packages to show that they were against the exhumation process. One participant from Sekuruwe said, "*I refused their money because I was being bought to agree to something which is against my tradition and culture. I also refused to provide the details of my parents' and relatives' names and graves that were located in the area which was earmarked for the construction of a slimes dam, but still the graves were exhumed*."

Consequently, it is clear that the views expressed by participants demonstrate that despite the EIA regulations stipulating that IKS should be considered important in the EIA process, expert knowledge is shown to overpower IKS even in matters where IKS is relevant. The conclusion, therefore, is that the experts who are considered more powerful in terms of knowledge related to environmental issues have a greater influence in the final decision-making even on matters that affect the villagers most. The failure to consider the cultural expectations of the locals may point to the fact that EIA consultants and specialists received education and training which did not include the knowledge on how to deal with aspects of culture during

EIAs. This therefore calls for a revised education system that will equip EIA consultants and specialists with the skills of engaging with local communities in a way that will create opportunities for indigenous knowledge to shape decision-making and create an opportunity for truly meaningful public participation.

5.7.5 Protest

Most participants indicated that community action in which genuine involvement was demanded did not stop as a consequence of electing new committees: the villagers had to resort to seeking the services of lawyers and other environmental management based NGOs. Thus all the participants from Sekuruwe agreed that when the assistance they had sought did not stop the grave exhumation they resorted to a protest. According to the participants, the protest was not only to express their views against the relocation of graves as a result of expanding mining activities, but also in order to be listened to. Several participants expressed sentiments of anger. One of them explained, "*When the mine continued with the digging of bones to bury them in the new site against our will, on the day of reburial we blocked the gate to the new grave site. People protested. The mine representatives telephoned the police and some people were arrested. But we fought and after this we were advised to use lawyers. The digging of graves at the old grave site stopped, and also reburials stopped. Our voice was heard*." A study of the review report on the EIA study by Ndaba (2009) concurs with the views expressed by the participants. Here it was also explained that the developer and their consultants failed to adequately address the grievances and conflicts in a more amicable way. This resulted in the creation of resistance groups and enmity between the mine and the community, hence the protests.

The way the villagers acted to express their dissatisfaction corresponds with the assertion by O'faircheallaigh (1999) that if people feel that they are left out of decision-making about a project, they become cynical and hostile to developers and

consultants, especially when their perspectives regarding the spiritual and religious importance of sacred sites and land are marginalized. He explains that if people feel that there is lack of meaningful community participation in matters that directly affect their livelihood they resort to contestations against final decisions made by the proponent and their contractors. The findings of this study show that some villagers from Sekuruwe appear to have decided to make the developer take heed of their concerns through the courts and appeals. Their appeal was to at least have the bones properly sorted out so that they could do reburials in a traditional way. In a similar way, O'faircheallaigh and Corbett's (2005) and O'faircheallaigh's (1999) studies on the integration of aboriginal knowledge in developmental issues indicated that indigenous communities in countries such as Canada and Australia now also hold protests and blockades, and go to court to demand meaningful participation and use of their knowledge in developmental issues.

According to participants the protests sent a message to the mine representatives in that the intervention from the government and archaeological experts resulted not only in the stoppage of further exhumation of graves in the old burial site and reburial of these in the new burial site, but also in the exhumation of those that were already reburied at the new site. Most participants agreed that had the developer listened to their concerns and allowed them to participate fully in the process of grave exhumation, this would not have happened. It is also equally important to note that the current involvement of villagers through community selected representatives in the community-mining company deliberations is a result of the conflict that emanated from the initial failure to take community concerns seriously. Here the focus in the discussion has been on public participation. In the next chapter the emotions linked to worldview and IKS, underlying the protests, and the action of villagers in relation to the exhumation of graves, will be discussed.

5.8 Requirements of EIA regulations regarding public participation

Danelle and Kate (2009) assert that EIA guidelines on public participation encourage the participation of the local community and the use of their knowledge in EIAs, but they do not give further guidance on how this may be achieved. They infer that this may contribute to limited meaningful participation of local communities since it leaves the whole idea of local community participation at the discretion of the developers and EIA experts. These then make decisions on how, when and for what reasons the local community should be engaged, let alone use their indigenous knowledge. This may be a challenge in that developers and EIA experts will opt for the easy and cheap way of involving the community, because meaningful participation may be more expensive, since for example they may have to develop their own methods and procedures.

As noted, the 3 villages of Sekuruwe, Armoede and Ga-Molekana now operate under new committees and are being assisted by Action Aid and Jubilee. These are two international NGOs working with communities that are being affected by mining activities. However, the involvement of these two NGOs did not necessarily mean that public participation opportunities have been widened. Instead, as revealed by one participant, who works for Action Aid, the NGOs seem to place little emphasis on the participation of people at the grass roots level. This becomes a challenge to the public participation process because as asserted by Bernard and Khumalo (2004) and Brownlie and Wynberg (2001) those working with indigenous people may lack insightful ways to advocate for meaningful participation of local people and the eventual integration of IKS into environmental and developmental issues.

5.9 Conclusion

The findings of this study indicated that developers and EIA experts religiously follow the requirements of conducting EIAs but the problems lies with what really takes place on the ground when each stage of the EIA process is being implemented. Are

the EIAs carried out as a rubber stamp to officialise the approval of the project, or as a responsible measure of ensuring that the project adheres to the principles of sustainable development? From this study, results show from the research site, that is South Africa, there is still a lot of work to be done to ensure that EIAs are not just a lip service activity, well conceived on paper, but lacking capacity and political will to ensure that environmental issues are seriously incorporated into all development activities. The findings of this study also showed that local communities do participate in EIAs but that they may not be aware that they are participating in an EIA process. Participation without really knowing what the activity is all about may lead to their views and concerns being sidelined. This marginalisation indicates that because of the way policy can be interpreted, there could be a breakdown between policy and reality, which results in what may be seen as limited implementation of policy procedures. In my research study, the mine representatives employed various public participation methods, but the participation of the locals seems not to have contributed much to the decision-making. This resulted in conflicts between developers and the local communities.

The findings also indicated that local communities have realised that their participation in environmental and developmental matters that directly impact on their livelihood is not taken seriously. It is also only retrospectively that they come to understand the importance of participation. The findings of this research study also showed however, that local communities demand meaningful participation. This corresponds with Bishop and Davis's (2002, 14) assertion that "the tradition of private discussions and agreements are being challenged, and existing patterns of consultation that lack meaningful community involvement are also being rejected as insufficient," hence local communities now demand far greater and meaningful participation.

It is clear from this study that allowing indigenous communities to represent themselves and participate meaningfully in EIAs could help as asserted by

O’faircheallaigh (2007) to ensure that amicable decisions for both the developer and the community are achieved. Currently, in the study area, the reality of public participation can be seen to lie on the bottom of Arnstein’s ladder of participation, and that is what is required is education of developers and experts carrying out EIAs with regards to how to make public participation meaningful in the context of South Africa, and education of the public, as to the EIA policy and their rights to meaningful participation.

Chapter 6.

Results, Analysis and Discussion: The EIA Process and Indigenous Knowledge Systems.

6.1 Introduction

Chapter 5 highlighted the problems associated with the limited meaningful public participation in the 3 villages affected by the mine development. In Chapter 6 the findings relating to policy requirements that IKS should be considered in EIAs are presented. One of the most important consequences of the limited participation experienced by the villagers in the research study area was that their IKS were not explicitly sought or referred to. However, it was clear during the interviews, that such IKS could have been used meaningfully if it had been actively sought and acted on by the developers.

This chapter begins by outlining the existence and definition of IKS as indicated by participants. Next the ways of transmitting indigenous knowledge from one generation to the next in the 3 villages are highlighted. This is followed by referring to the reasons for IKS suppression and how this suppression has impacted on the integration of IKS into EIAs in this study area. In this chapter, an analysis of selected EIA reports and TORs is given which highlights the extent these EIAs adapted to the requirements of integrating IKS. The chapter concludes with a discussion of the IKS that could have been used in the current study area in relation to various biophysical and socio-economic aspects that should be covered in EIAs. The questions that provide the basis for the discussion that is presented can be found in the interview schedule in Appendix A and the focus group guide in Appendix B.

6.2 Existence and definition of indigenous knowledge systems

On being asked about the kinds of knowledge that people possessed, most participants indicated that certain elderly people in their villages still possess indigenous knowledge. They pointed out that the IKS bearers in their area are mainly the traditional healers, traditional leaders and other elderly people in the community. Some of the villagers who were interviewed were able to refer to IKS as found in their traditional practices, beliefs and taboos, and values that guide their way of life. Other participants added that their ways of thinking and behaving are so entrenched in their traditional way of life that it has just become part of what and who they are. They are not necessarily aware of their IKS because it is part and parcel of everyday life. One of the participants explained this by saying, "*Most of our traditional knowledge comes out when we do our traditional ceremonies or other activities related to our culture such as going to traditional healers for medicine.*" The view that IKS is part and parcel of everyday life corresponds with findings of a study by Rahman (2004) which revealed that IKS is deeply rooted in indigenous people's actions, experiences as well as in their ideals, values and emotions. Rahman (2004, 318) further explains that even though indigenous people possess tremendous amounts of IKS, because this knowledge is tacit, i. e. something not visible and expressive, and hard to share; only a small amount of IKS is expressed in words. This was confirmed in this study. While most participants indicated that it was their traditional lifestyles that reveal the existence of IKS, 3 participants, i. e. the traditional healer, the chief and an elderly man from Sekuruwe, elaborated that various traditional practices like paying lobola (bride price), appeasement of ancestral spirits, doing funerals in a traditional way, consulting izangoma (spirit mediums) and the use of traditional medicine are still practised by many villagers. These views also correspond with the assertions by Berkes *et al.* (2000) who state that IKS incorporates indigenous people's knowledge related to their lifestyles which include agricultural, religious, and medicinal and food gathering practices.

6.3 Transmission of indigenous knowledge systems

Participants indicated that indigenous knowledge in their communities is transmitted from one generation to the next through oral communication and the performance of various rituals. They explained that the younger generation learns from the elders by observing actions done by elders during traditional ceremonies, rituals and other cultural practices. One of the participants explained, "*I always try to involve my children when I am appeasing my ancestral spirits. We go together to graves early in the morning so that they can see what I do and hear what I say during the appeasement ceremony.*" Some participants added that some of the knowledge is passed on through taboos, especially in terms of young people being warned about the importance or the dangers of certain activities.

The findings of this study with regards to storage and transmission of IKS matches with the assertions by Gadzirayi *et al.* (2006, 139), Reid *et al.* (2006) and Aubel (2006) who also point to traditional leaders and healers as people who play an important role as keepers and transmitters of IKS. The findings also correspond with Angayuqaq and Kawagley's (2005) assertions that young people learn IKS by taking part in traditional activities which are performed by the elderly, traditional leaders and healers. These elders are regarded as the cornerstones of the community, whose responsibility is the continuity and perpetuation of the use of IKS across generations. The view that IKS is imbedded in traditional rituals, taboos, beliefs and other cultural practices concurs with the assertions of Gadzirayi *et al.* (2006), Lawes *et al.* (2004), Odora Hoppers (2002) and Chambers (1991), who say that IKS are enshrined in traditional ceremonies and practices, customs, spiritual beliefs, rites, rituals, taboos, religion, values and culture of indigenous communities.

Participants emphasised that IKS plays a crucial role in the preservation of grave site. Grave and natural resources found within grave sites are regarded as sacred; as such they should be treated with utmost reverence. Some elderly participants explained that the reverence given to graves sites relates to this area being

perceived as the home of the ancestral spirits. The IKS relating to these is, as noted above, enshrined in rituals. These include pouring of libations and informing ancestors of what is to take place.

Since the government of South Africa has developed environmental management regulations and guidelines that require the use of this knowledge it is the government's mandate and EIA experts' responsibility to ensure that this knowledge is meaningfully used to contribute towards sustainable development.

6.4 Suppression of IKS

However, participants indicated that even though IKS exist in their community, the use of this knowledge faces several challenges. They noted that because people now live a modern way of life, and some of them have adopted what may be regarded as a new culture, they no longer take part in any traditional family or community activities. This has resulted in the gradual suppression of IKS: One of the participants echoing the sentiments of a number who were interviewed said, "*Since the country was colonised, a lot of new ways of life were introduced, e. g. schools, hospitals and churches and these have in several ways reduced the importance of our traditional knowledge.*" Another participant, among those who claimed that reduced participation of the young in traditional activities negatively affects IKS transmission, explained that "*Not using our traditional knowledge or taking part in activities that involve our culture has reduced the transmission of this knowledge to younger generations. This makes our knowledge to be lost.*" The view expressed by participants is that through the suppression and downgrading of traditional lifestyles, some people abandon their traditional knowledge and ways of living for modern knowledge and lifestyles. However, there are some who have embraced the two lifestyles, who, for example those who despite living in urban areas and being well qualified in various professions, still practice traditional ceremonies such as appeasement of the ancestors.

As noted by the participants quoted above, some authors such as Comaroff and Comaroff (1991) and Ochalla (2007) assert that in South Africa and other African countries, colonisation, Christianity and education, forced occupation, invasion, servitude, apartheid, and ethnic cleansing have all resulted in the suppression of IKS. Mwaura (2008, 29) explains that "IKS is being suppressed and sometimes lost due to globalisation and the introduction of new knowledge, which results in younger generations shunning traditional lifestyles and practices and adopting modern ones." These same factors seem to have contributed to the suppression of IKS in the traditional communities of Sekuruwe, Armoede and Ga-Molekana. Indigenous knowledge systems seem to have lost value amongst indigenous people who have accepted scientific knowledge as connected with progress. Consequently indigenous knowledge, which is regarded as belonging to a past era and irrelevant in the face of modern life, is lost. As observed by Sibanda (2004, 254) in his study on community wildlife management in Zimbabwe, "developmental programmes do not recognise all traditional beliefs, practices and knowledge, yet there is still residual IKS among people which could be used productively in environmental management." Sibanda (2004) therefore suggests that the use of IKS could not only promote IKS, but also contribute to its survival. A similar view seems to be applicable in my research study as most of the developmental activities are run by people who have been trained in a western science orientation and who are employed by government. Even where the locals are involved, their contribution rarely influences how projects have to be managed.

Some participants, after they were asked what other issues have limited the use of IKS in their community, indicated that the leadership of government elected leaders in their communities contributes towards the suppression of traditional knowledge. They explained that the selection of government leaders, such as councillors, does not consider whether one possesses IKS or not, yet these leaders work with people in development issues than traditional leaders. As such this may lead to the reduced

use of traditional ways of dealing with community issues. The traditional leader said, "*These leaders seem to have more powers than us chiefs because they are the ones who are more involved in development issues, yet they do not have much traditional knowledge they can use*." Another participant added, "*Because people who lead us nowadays are elected, the people who carry out elections just nominate people regardless of whether they know or do not know much about our tradition*."

These views seem to correspond with Gadzirayi *et al.*'s (2006) assertion that the disruption of the traditional governance systems, first by the colonial and then by the present democratic regimes, has reduced the power of, and control by traditional leaders, and this has contributed to the suppression of IKS.

Some participants claimed that government or mine officers who operate in their villages look down upon their traditional knowledge. They believe this has resulted in the limited use of indigenous knowledge and has caused some people in the village also to shun their culture. One villager, after he was asked whether he knows any IKS and to what extent it was used in his community in development, said, "*I know a lot but the mine company treated us black people as idiots, they think we know nothing*." This suggests that even though some people still possess IKS, they feel that those in authority, who while they have the mandate of providing an opportunity for indigenous communities to use their knowledge, look down upon them. Another participant voiced the same sentiments but emphasised that the government is also to blame for the suppression of indigenous knowledge. He said, "*The government does not do anything to the companies that do not follow the rules of involving people and their knowledge meaningfully in EIAs*."

This view, i. e. that experts downgrade indigenous knowledge, and thereby contributing to its suppression, corresponds with Isaac's (1996), Turner *et al*.'s (2000) and Lawes *et al*.'s (2004) views that the intrusion of western science has resulted in the degeneration of indigenous knowledge systems to 'outdated

concepts, unsuitable for contemporary socio-economic and environmental issues'. The point raised by some participants that their traditional knowledge is seen as less valuable to EIAs also matches with Dahl's (2002) argument that scientific scepticism about the credibility and validity of indigenous knowledge systems has often become a barrier to the integration of IKS into EIAs. This view is also supported by O'faircheallaigh and Corbett (2005) who assert that the reluctance to recognise the legitimacy of other forms of knowledge can render indigenous people's interests in land and resources invisible- a tendency reinforced by the practice of environmental assessments being undertaken by consultants contracted by project developers.

Despite this suppression of IKS, there was evidence that such knowledge still exists in the traditional communities of Sekuruwe, Armoede and Ga-Molekana. Several participants, especially the elderly in the communities, and the traditional healer and chief, indicated that they possess indigenous knowledge which may be useful to environmental and development issues. Mukuka (2010) asserts that certain core values in traditional practices and cultural beliefs have survived and in some cases grown with African societies and communities. The same may be said for the communities in my research area.

The continued existence of certain IKS has resulted in this body of knowledge being acknowledged as resilient and relevant in various sectors of the society, including education and medicine. However, they can also be important in natural resource management, and in environmental management strategies such as EIAs.

6.5 Public participation and IKS

In South Africa, the public participation process requires the involvement of indigenous communities and their knowledge. One of the objectives of my research study was to find out how public participation may facilitate the use of IKS in socioeconomic development. According to most participants, issues relating to their

traditional way of life and to what extent it could be affected by loss of their traditional land for settlement, farming, pasture and other natural resources, were not brought up during the public participation meetings. Twenty three participants indicated that they were not even aware that IKS is knowledge which may be used in environmental issues that are dealt with at community-developer level. One of these participants exclaimed "*I am surprised to hear that our traditional knowledge is important even though it is not written in books*." Participants were also not aware of the existence of policies that promote the use of IKS in development issues that affect indigenous communities. This indicates that for participants, meaningful participation was about having their concerns and views considered in decision-making, especially those related to getting economic benefits, rather than in participating using their IKS.

The EIA experts carried out the public participation requirements through meetings but seem to rarely have asked people IKS related issues. This indicates, as previously noted, that EIA experts in their various fields of specialty need in-service training in order to equip them with skills of including IKS in EIAs.

6.6 The integration of IKS in EIAs

According to an EIA report by SRK Consulting South Africa (2002), an EIA study for Anglo Platinum Mogalakwena Section mine was carried out in 2002. The EIA study was meant to cover both present and all future mine developments and operation expansions. The EIA report from this EIA study stated that for future expanding mine operations, only consultations with the affected villagers were to be carried out.

As noted earlier, NEMA and EIA regulations and guidelines require the EIA process to involve local communities and their traditional knowledge. However, the results of my study show that not only was there limited meaningful involvement of local communities in the EIA process but that this specifically appears to have reduced

and/or eliminated the opportunities for the access and use of IKS. Consequently, there was a lack of meaningful integration of traditional knowledge in the EIA process due to the fact that the villagers were not aware that an EIA study was being carried out nor that the policy required the integration of IKS, and that they were not asked about any traditional knowledge during the consultation with mine representatives. Participants from Armoede explained that during meetings the issues discussed were related to the effects of relocation. Some participants added that even the people who told them about the loss of land for farming and pasture and that they were going to leave their graves behind said nothing that could have prepared them to think about how all these impacts could affect their traditional way of life.

According to the EIA report referred to above, a wide spectrum of stakeholders was employed to assist in the EIA. These included different environmental specialists, traditional leadership and traditional community members from the affected villages. These people who were all involved at different stages of the EIA process, could have led to opportunities for the integration of IKS since the stakeholders included people who ascribed to IKS.

However, the views of participants in my study indicated that villagers only got involved in the discussions regarding the expansion of the mine in the final stages. Findings by Ndaba (2009) in his review report of the EIA report carried out in this area support the views of participants, that consultations took place only towards the end of the EIA process. The late involvement of villagers in the EIA process was seen by participants in the light of my research study which enquired into this aspect of the EIA process as having led to limited use of their traditional knowledge. They also claim that some of the decisions had been predetermined by the mine representatives.

These differing perspectives indicate that the policy is open to interpretation: the EIA

report indicates that communities were involved, but probing highlighted the fact that the spirit of this involvement did not match the spirit of the policy. There was a problem in carrying out the EIA process in my study area.

At a foundational level, one of the problems was that most participants believed they had not taken part in the EIA study. Even those participants who knew that an EIA study for Anglo Platinum Mogalakwena Section Mine was carried out in 2002 denied having taken part in the EIA process. One of the participants said, "*I hear that the EIA process for the expansion of mining activities that have affected the surrounding villages of Sekuruwe, Armoede and Ga-Molekana was undertaken but most us do not remember taking part in that study.*" The mine representatives failed to explain and make villagers understand the EIA process such that even though they did participate as they did not know what was going on. Because the participants did not understand the whole concept of the EIA process, there were few opportunities and even less awareness of the possibility of the integration of IKS into the EIA process.

The participant who works for Action Aid indicated that the limited use of indigenous knowledge in environmental and developmental issues may also be due to the fact that the major aim of this organisation was to ensure that public participation open up chances for people to get economic benefits from development activities taking place on their traditional land. He explained that this NGO has not yet openly advocated for the use of traditional knowledge. Consequently, the failure by the developer to engage people meaningfully in the EIA study, and the lack of IKS advocacy from environmental management oriented NGOs, shows that the EIA process in rural development projects in South Africa appears to have not adapted or understood the requirements of including indigenous knowledge systems. The engagement of the local community in the EIA process in my study area was carried out in line with the NEMA of 1998 and EIA regulations but the involvement of the local community did not promote the use of IKS. This finding corresponds with O'faircheallaigh and Corbett's (2005) assertion that while negotiated agreements

between indigenous communities and project developers promote the recognition and use of indigenous knowledge, there is no guarantee that consultants will use IKS during the EIA process.

6.7 EIA and IKS situation in Mapela vis-à-vis other development projects in South Africa

In order to establish whether the lack of acknowledgement and use of IKS in EIAs is prevalent in South Africa, a study of existing EIA reports was done to find out to what extent they adapted to the requirements of including IKS. The EIA reports that were accessible included that for Umfolozi 765 kv Transmission Line (Baker and Pullen, 2009); the Sodium Hypochlorite Plant and relocation and upgrade of a Chlorine Depot (Bulman *et al*., 2009); and the Berg Water Project: Charting the Future for Large Dams (Rossouw, 2009). These reports show a wide consultation of different stakeholders. The stakeholders included specialists in ecology, heritage resources, tourism, civil society organisations, local authorities, community based groups, traditional leaders and agriculture and business representatives. These reports also show that several public participation methods were used. The characteristics of the above outlined EIAs match the findings of my research in as far as the stakeholders and public participation methods are concerned. In addition, the information in the EIA reports seems be in agreement with the findings in my research study area, i. e. that there is limited explicit indication or reference to traditional knowledge. One of the differences appears where some EIA reports indicate that notices and proposals were described in English and isiZulu. The use of both languages is likely to contribute to the accessibility of information to local communities. They may at least understand what is required of them and what is going on in their locality.

Another factor which contributes to limited use of indigenous knowledge is that the TORs that set out the parameters for carrying out an EIA study do not capture ways that could be used to integrate IKS. This echoes Brownlie and Weinberg's (2001)

assertion that even the TORs that are used during the EIA process have limited indications that show that IKS was considered during the development of those TORs. The assertion that TORs contribute to limited integration of IKS in EIAs is also supported by O'faircheallaigh (2007) who states that information contained in the TORs about issues that have to be addressed; the information that has to be provided by the EIA report; and the methods that have to be employed, shows that these TORs are usually developed for specialist studies only. The lack of explicit guidelines therefore results in EIA Practioners failing to use indigenous knowledge in EIAs.

However, it is important to note that the lack of indigenous knowledge integration into the EIA process also stems from the limited knowledge and awareness by the villagers that such knowledge can be used in developmental and environmental issues. Those few participants that referred to their traditional knowledge did so only after I had done some probing to establish what they thought about using their traditional knowledge in suggesting mitigation measures to the developer. The responses from most participants demonstrated that there is a limited thrust towards having their indigenous knowledge incorporated except for issues related to the burial site.

Most participants argued that their involvement in EIAs should have ensured that they benefitted financially. One of them said, "*The mining company should be paying all of us some money every month for the rest of our lives as long as the mine is also operating".* Another participant said, "*The mine must not take the land as theirs but must rent the land because the land belongs to us and it is the main source of our livelihood*". These views from participants may suggest that the way forward to getting people and their knowledge integrated in EIAs is not just to ensure that EIAs provide ways to satisfy local people's financial benefits from development projects but also to provide ways of making local people realise that their IKS is equally important in developmental issues. The use of IKS in developmental issues

can contribute towards IKS preservation. However, it is important to note that sometimes local communities may have unrealistic financial expectations for the integration of IKS into development projects. Also such expectations should be cautiously looked into as they may result in exploitative demands by local communities. There is, therefore, a need to balance local community economic benefits and meaningful participation which promotes the use of IKS.

The findings of this research study echo findings of some studies in South Africa and elsewhere that were carried out by Li (2008); O'faircheallaigh (2007) and Nel (2004). These studies showed that there is still inadequate use of indigenous knowledge, especially in EIAs, despite the fact that both international and national environmental management frameworks promote and encourage the involvement of indigenous communities and use of traditional knowledge in environmental and development issues and EIAs. Such similar findings indicate that environmental management legislative and institutional frameworks should go beyond just setting requirements of IKS integration to providing explicit techniques of how to do this.

6.8 IKS that could have been used in the EIA study

To find out the possibility of the availability of IKS relevant to EIAs, participants in my study were probed to give examples of indigenous knowledge they could have provided if the mine authorities had asked them. Some participants gave interesting examples of IKS which could have been successfully integrated in predicting and identifying environmental and social impacts during the EIA process. These included the location and importance of natural resources such as medicinal herbs and animals, apart from the importance of burial sites. The findings indicated that some villagers in the research area possessed knowledge about significant physical and biological characteristics and uses of their natural environment, especially with regard to various plant species, wild animals, birds and water sources.

6.8.1 Plants

Most participants indicated that the creation of slimes dams along the mountain slopes resulted in special plants being destroyed, while areas where there were no slimes dams became inaccessible. One elderly community member, and a traditional healer, both from Sekuruwe, explained that most of the plants which, include herbs along the foot of the mountain ranges, flourish during the rainy season because the flat land at the base of the slope allows more water to sink in, which was then used by the plants and grass. Five participants indicated that they could name different types of useful herbs that were found along mountain slopes which had been lost due to relocation and the creation of slime dams. The traditional leader added, "*The loss of land along mountain slopes was a great loss to herbs such as the 'resurrection plant' (umafavuke)*[8] *or 'Myrothamnus flabellifolis' and other moisture loving plants which we used to cure a lot of diseases"*.

Participants claimed that because they were never given a chance to be involved even in identifying areas where the community healers harvested herbs, they had now lost access to those areas because no measures were put in place allowing the healers to continue harvesting herbs in the land that belongs to the mine. The traditional healer bemoaned the fact that now she could not perform her healing duties well since her collection of herbs was now restricted in the protected area.

These views indicate that if an EIA study had been conducted in a manner that had allowed the local community to use their traditional knowledge to name and identify areas rich in herbs, an amicable mitigation measure could have been devised to enable the community to keep on harvesting the herbs in the protected area. Huntington and Mymrin (1995) report that indigenous people can provide mental maps of the temporal and spatial distribution of specific components of the ecosystem which scientists can then put on paper. The local community could have

[8] Umafavuke is a Zulu name for the resurrection plant

provided such information if they had been asked and the mine could have come up with a plan to meet the needs of the community. This would have served to develop goodwill and a willingness to work, with rather than against, the mine.

6.8.2 Wildlife

Participants pointed out that a lot of trees were cut to clear the space for the construction of slimes dams, which resulted in the loss of habitat and pasture for wild animals and nesting places for birds. This resulted in them migrating to other areas, and leading to the decline in the number of wild animals, whose parts also have been used for various medicinal purposes. For example the dung from hares is used for treating newly born babies (*ukucaba inkanda*). The babies are held above the burning dung in order to inhale the smoke which is believed to make them strong to resist any dangerous charms. Participants further stated that the loss of trees led to the decline of nests which also had been widely used by traditional healers to cure different ailments. For example the twigs, grass, feathers and bird droppings are smoked by people who have been attacked by "*utikoloshe"*, an invisible supernatural creature or spirit believed to harm people. The smoke is believed to heal people who have been attacked by the *utikoloshe*. One of the elders from Ga-Molekana said, "*When the mine took some of our land, the area for grazing became small, the grass was quickly overgrazed, wild animals moved away and our livestock died. With these animals gone we are not able to get certain animal parts that we use for curing diseases.*" For example donkey milk is used to cure Tuberculosis and asthma. The traditional healer pointed out that some villagers speculate that the lack of certain traditional medicine contributes to increased death rates in their community.

Meaningful participation of the local community could have made the developer aware of the importance of wildlife and domestic animals to the traditional way of life of the villagers. This could have resulted in the developer setting aside a buffer zone that could ensure that the medicinal needs of the people were not severely disrupted.

6.8.3 Farming land

Participants from the 3 villages indicated that the expanding mining operations resulted in reduced sizes of their grazing land and fields and in some instances complete loss of fields. Some participants pointed out that the loss of land for farming had indirectly increased poverty in their area.

Virtually all the participants from the 3 villages claimed that the reduction of the grazing land resulted in the decline in subsistence livestock farming. The problem was largely caused by overgrazing. Many participants, especially the elderly, appeared to have a sound conservation culture based on observation because they noticed the links between the decrease of the grazing land, overgrazing and the reduction in the number of livestock and wild animals.

A traditional healer also explained that the reduction in the number of livestock did not only negatively affect the sourcing of traditional medicine but also their traditional ceremonies. He explained that bones from goat feet are used by traditional healers as artefacts used for "throwing the bones" (*ukushaya amathambo*) i. e. the invocation of spirit mediums. Twelve elderly participants from the 3 villages also indicated that slaughtering a cow during a traditional ceremony to bring the spirit of a deceased elderly person into the family (*umbuyiso*) and appeasing the ancestral spirits (*ukuthethela*) is an important aspect of their culture. They further explained that due to the decline in the number of cattle, the practice of such traditional ceremonies is also on the decline. One of the elderly women from Sekuruwe said, "*I used to have a lot of cattle but now I have none and I cannot remember when my family last held ukuthethela. I cannot do it without slaughtering a cow because there are certain rituals that we should do using the blood and certain parts of the cow*".

Participants from Ga-Molekana said that they refused relocation but most of the villagers lost their fields anyway due to expanding mining operations. One of them, an elderly woman, said, "*I used to grow traditional crops like nuts, traditional beans,*

mpogo (African finger millet), and sorghum. I used mpogo and sorghum to brew traditional beer, especially when my family was going to hold a traditional ceremony but now I cannot do that because I lost my field."

Participants from Armoede, although they were involved in choosing the farm where they are now located, pointed out that their choice was ill informed. Three participants claimed that once they were settled they discovered that the land set aside for farming in their new area was "too small" to meet their crop farming needs. One participant, the chief, said "*There is no productive farming we can do on this land because the soils are barren due to the removal of the top soil. The other farm that was given to us is too far away, about 50 kilometres from here*." Most participants from Armoede also noted, just like the villagers in Ga-Molekana, that due to the shortage of land for crop farming, they were no longer able to grow traditional crops and this impacted negatively on their traditional way of life.

These findings indicated that villagers have an understanding of the relationships that exist amongst different components of the environment. Had the mine representatives sought this environmental knowledge and given people an opportunity to freely express their concerns as to how the loss of farming land could affect their traditional way of life, agreeable alternative measures could have been suggested. These measures could then have ensured people were provided with adequate productive land or at least that they went into the relocation with their eyes open.

6.8.4 Wells

Two participants indicated that prior to the relocation and the occupation of land along the foot of the mountains by mining operations, the villagers used to get water from perennial wells that were located along the foot of the mountain ranges. One elderly participant from Sekuruwe explained, "*Our wells never ran dry, they had water throughout the year. Even if there was drought just because they were located*

at the foot of the mountain they continued to give us water. But now, of course we are no longer using them because they were taken away from us, besides they now run dry during the dry season." The same elderly participant from Sekuruwe went on to explain why the wells had never dried. He said, "*Imithombo ibingomi ngoba imithambo yamanzi ithutsha ngaphansi kwentaba*" (wells never ran dry because water seams that allow water to seep into the wells originate below the mountain).

This explanation revealed that some elderly members of these communities seem to possess important hydrological knowledge. At least two other participants explained that apart from losing access to some of their traditional sources of water, which they had used for years, they assumed that mining activities, have affected the seasonal changes of water in the wells they used to use as their sources of water. One of them said, "*The wells have gone dry and we think it is due to underground water draining by the mine*". Their reason seems logical, although no scientific studies have been done to verify the cause of the wells drying up.

Chambers (1991), Sallenave (1994) and Dahl (2002) suggest that local communities have abundant ecological knowledge derived from long term relationships and observations with the natural environment, which may span centuries, having been passed from one generation to the next. It is because of this knowledge that the elderly participants were able to explain the impact of underground water draining on the wells.

The examples given above indicate that people in the research sample are aware of the interaction and interdependence that exists between ecological elements and processes. At least some people in these 3 villages are aware that the destruction of one component of the ecosystem results in ripple effects in other components. The findings of this study show that indigenous communities have the ability to view the natural environment in a holistic way. This finding concurs with assertions by Bisset (1990), Snively and Corsigilia (2000), Angayuqaq and Kawagley (2005) and

Gadzirayi *et al.* (2006) that IKS presents a holistic view of the natural environment. Sallenave (1994) reports that it is through the meaningful participation of the local community and the way the locals perceive the value and use of the environment that IKS can meaningfully contribute to EIAs. In this case, meaningful involvement of locals and use of their indigenous knowledge could have assisted in predicting long term environmental impacts of the mine, as well as in suggesting ways of alleviating the adverse impacts.

6.8.5 Exhumation of graves

Participants from Sekuruwe confirmed that issues regarding the sacredness of the graves and the need to perform traditional rituals before exhumation were raised during meetings with the mine representatives. But according to most participants the whole process of grave exhumation was messed up because the mine representatives did not allow them to be involved in the exhumation process. Participants emphasised that the villagers were only asked to provide names and the number of their deceased relatives who were buried in the burial site but were not allowed to carry out rituals to appease their ancestors. One of the participants explained, "*We were not even allowed to stand nearby to observe what was going on. The undertaker messed up everything because they could not easily locate the graves especially the very old ones that were no longer easy to see*". Participants emphasised that only the local people with a long history in the community, and the elderly who regularly visited the graves for their traditional rituals, would be able to identify the graves. Participants elaborated that the mine representatives hired the services of a general undertaker who used a Tractor Loader Backhoe (TLB) machine to dig up the graves, resulting in the breaking and mix up of bones from different graves. Participants also made it clear that if the developer had allowed them to identify the graves the process of grave exhumation could have been carried out in more acceptable manner.

The case of botched up grave exhumation, shows once more that the awareness of

traditional beliefs by experts and an understanding of its importance and use is seriously lacking amongst EIA experts and specialist. Ignorance in the sense of lack of awareness and ignoring the possibility of alternative viewpoints has led to failure in the EIA process to respond to the requirements of the inclusion of IKS in the EIA. The failure to adapt to these requirements of using IKS may in turn lead to the selection of inappropriate mitigation measures by EIA consultants and these may lead to negative effects in the community. The problem lies in different worldviews and knowledge. Brownlie and Wynberg (2001) assert that capacity constraints due to insufficient experience, expertise and less competent EIA consultants and specialists in the field of IKS usually results in a lack of understanding of cultural issues and a weak public participation process management. It also raises questions regarding the kind of education and training that EIA consultants have or should have, with regards to carrying out EIAs. If the training is western oriented, traditional worldviews may be ignored or denigrated, and in the EIAs process may be disregarded.

Participants, especially those from Sekuruwe, alleged that the process of exhuming graves for re-burial at a new grave site was not compliant with traditional practices. Any activity that has to be performed at the grave site should be done according to the strict rules of their culture.

According to some participants, villagers attended a chain of meetings that were held to inform people to register names of their deceased relatives in preparation for the exhumation process. With regards to providing names of deceased relatives, some participants were not willing to say whether they agreed or not in giving names of their deceased relatives. However, they pointed out that there was division amongst the villagers as some people provided names of their deceased relatives while others refused.

Referring to the exhumation process participants from Sekuruwe explained that they

were told that the bones of their deceased relatives at the old grave site were to be exhumed to give way to the construction of a slimes dam. Almost all the participants agreed that their indigenous knowledge with regards to burial sites was never asked for and they were not even allowed to observe the exhumation process. One elderly participant from Sekuruwe said, "*We were never asked whether we want to do our traditional rituals and tell our ancestors that they were going to be relocated to another burial site*." Another participant added, "*In my culture there is nothing you can do without telling your ancestors. Even when a child is getting married you tell the ancestors. What more of the removal of their bones? It is a taboo! You cannot just do it, look at what happened! The ancestors got angry and the whole process became messy. Now it is a court case. They did not want to be moved just like that*."

These views from participants indicate that the religious needs of the villagers were not considered as well as their right to practice cultural rituals of worship. Traditional communities are emotionally attached to the spiritual world and believe that where one is buried so is their spirit. Participants stated that villagers thought the exhumation and reburial of their deceased would lead to less effective rituals. One of the participants, an elderly member and chair person of the new community committee, said emotionally, "*I have never heard about it or seen it my entire life. If you exhume the bones, what about the flesh, the blood and the bone marrow which have mixed up with the soil? Those would be left behind, so taking bones alone is like taking just a skeleton*." This view indicated that the villagers believe that once people are buried in a given area, they become part of that natural environment. Consequently, as noted earlier, even the land, vegetation and other natural species within the burial site become sacred and should be treated with great respect. Dewalt (1994, 141), asserts that "local people believed that mismanagement of burial sites through cutting or burning of trees and grass by any person local or foreign is a very serious offence." The findings of this study seem to be in line with this assertion, which explains why people from Sekuruwe became angry with the mining company when the graves were exhumed before the villagers performed

rituals.

Participants further indicated that apart from not being allowed to carry out rituals, respective families were not asked to identify the graves. Instead the developer relied on a few community members in S21 community committees who did not have much knowledge about the location of graves in the grave site and were not able to identify the exact location of some of the graves. As a result the undertaker who was contracted by the mine to carry out the exhumation dug all over the place resulting in the breaking and mix up of bones from different graves. One of the participants explained by saying, "*Some graves were no longer easy to see especially for people who never knew where they were located, and for us it was going to be easy. We identify them by certain features such as stones or a cluster of a certain type of tree. Besides we go to the graves regularly to carry out our cultural rituals.*" Had the mine incorporated such knowledge, the exhumation process would have been successful. Allowing the villagers to perform their rituals would have assisted in suggesting mitigation measures and/or alternatives that would uphold the traditional principles of the community. The serious misunderstanding and mistrust that now exists between the community and the developer could have been prevented.

However, the gap that exists between South Africa's well advanced policy system on IKS integration into EIAs and policy implementation raises questions about EIA consultants' understanding of cultural values that need to be considered when carrying out EIAs. One has to wonder whether EIA specialists by their empathy and connection with people's needs at least through their contact with traditional culture, could have used their ethical responsibility of considering cultural expectations of indigenous communities. Or could it be that the education and training EIA specialists undertake influences them to look down upon IKS, to the extent of deliberately ignoring it?

Participants stated that the discovery of bones in the old grave site caused the Sekuruwe community committee to confront the mine, demanding the opportunity to view the bones in the coffins before reburial. When this was not granted, villagers protested. This eventually, led to the involvement of different community based archaeological and environmental organisations. Participants claim that the involvement of an archaeologist who demanded that bones which have been reburied at the new grave site be exhumed, led to the discovery that there had been mixing up of bones of different people in one coffin and that in some coffins there were no bones at all but just soil. This infuriated the villagers, who believed that the mine had denigrated their culture of respecting the dead, to the worst levels possible.

All the participants, even those in S21 committees, concurred that the shoddy exhumation process was the catalyst for conflict between the villagers and the mining company, leading to community members taking the mine to the court. Participants stated that the court ordered the re-exhumation of all bones that were buried in the new grave site and these are being kept in Pretoria until the court makes a decision of what has to be done with the bones.

In the meantime, the villagers have resolved to hold big traditional ceremonies to appease their ancestral spirits as a way of showing honour and respect. This, they explained, is because they believe the appeasement will solve the problem of drought as well as other culturally related problems. The elderly chair person of the new community committee from Sekuruwe said, "*Definitely after all these court cases we will do our traditional rituals. It will be a collaborative effort from different tribes because our community comprises of Pedi, Tswana and Ndebele people. Each tribe will celebrate its own way*."

The reburial is still to be done, as the court ruling that required a halt in the exhumation also stopped the reburial of the bones and the construction of the slimes

dam. The intervention by archaeologists and courts indicates that the promulgation of policies and other frameworks that promote and encourage the use of IKS in EIAs without carrying out training and awareness programmes to equip both the EIA consultants and local communities affected by development projects is not adequate.

This finding echoes with the views of Mwaura (2008, 34), O'faircheallaigh (2008), Huntington and Mymrin (1995), Sallenave (1994), and Chambers (1991), who assert that meaningful participation of local people in EIAs can provide specific traditional knowledge which can be used to identify sacred sites and burial sites. Furthermore, the involvement of the community in identifying the graves and also allowing them to practise their rituals could result in community support of the proposed development. Participants believe that if they were allowed to consult traditional healers and to appease the ancestral spirits, the exhumation process would have gone smoothly. This finding corresponds with Bynoe's (2006, 36) assertion that meaningful involvement of the community does not only assist in predicting and identifying impacts but also in reducing conflicts, thereby increasing acceptance of the project and building a good relationship between the community and the proponent of the development project.

6.9 Morality in IKS

Most participants indicated that some of the methods of public participation which were used by the mine representatives to make sure that the villagers accepted their development proposal disturbed people's cultural morality. The majority of the participants stated that the mining company had used money to obtain buy-in from some of the community members. Six elderly participants stated that the opportunity to receive money influenced some people to disregard the sacredness, spirituality and respect that they normally have for their tradition and culture. One of them elaborated, "*Even people we know as very traditional were overcome by greed and*

love for money such that they agreed to have graves exhumed without us performing proper rituals." Another participant added, "*Some villagers registered many graves. Some of them were non- existent so that they can get large amounts of money as compensation because more graves meant more money*."

Participants also claimed that the mining company treated some villagers favourably in terms of jobs and high compensation packages, resulting in some community members taking sides with the mining company. This they did even though they were aware that they were acting against their traditional beliefs. A villager from Sekuruwe said, "*The old committee that represented us was bribed when they were registered as S21, they were being paid money every month and their relatives got jobs. They stopped taking our concerns to the mining company. Instead they lied to the company and told them we agreed to everything that the mine had planned*." Another villager from Sekuruwe took a similar view but added, "*Some chiefs and their aides also betrayed us, they are taking sides with the mine, for example here at Sekuruwe we do not have a chief because he is now in the S21 Company, and he is not working with his people*". Here rejection of authority is based on a sense of betrayal, and mistrust of leadership that has been seen to act opportunistically.

The use of money by the mining company to win favour from the community corresponds to Bernard and Khumalo's (2004) point that this often results in the disregard of certain traditional and cultural issues by some people.

Participants in the focus group agreed with each other that the mine representatives revealed a lack of respect of their traditional beliefs and practices, and values placed especially on the dead during the grave exhumation process. Nowhere was this more blatant than in the exhumation of graves by a TLB. One of the participants explained, "*We were not given the chance to appease our ancestors before the exhumation of their graves. Now our ancestors are angry with us because we did not keep our traditional values*". These views from the participants indicated that it is

their moral duty to show reverence to their ancestors, and failure to do that results in them being punished.

Further to this, the lack of respect for the dead was highlighted by one elderly participant from Sekuruwe who said, "*After the exhumation process I went to the grave site. What I saw there shocked me. There were exposed bones all over the place. Even today as I speak Iam very angry with the mining company."* The traditional healer also described the discovery of bones as a shocking experience*, "What I saw there was frightening. There were pieces of bones scattered all over the place. According to my culture it is a taboo, it is not allowed*." Here the feelings of anger and pain are stated very clearly. Several other participants revealed that seeing the bones of deceased relatives aroused emotions of resentment amongst the people. To them their culture had been downtrodden and disrespected.

The belief by some participants of seeing graves as areas of spiritual significance which may not be separated from nature is also highlighted by O'faircheallaigh (2008) and Sallenave (1994). They explain the significance of grave sites by saying that indigenous communities see no separation between the physical world and the spiritual world: for them these are connected. They add that indigenous communities believe that the protection of one means the protection of all, and harming one also entails harming all. The local communities in my research study appear to be upholding a similar perspective with regard to respect they give to the natural environment.

One of the aspects of IKS is respect for one another in the community. However, the traditional system of life instils a sense of social cohesion amongst community members but elderly participants noted that the young now disregard their culture of respect. This has led to serious fights between the younger members of the community who hold different views on matters regarding the expansion of mining activities. The divisions between communities have developed to an extent where

community members fight against each other, or members from one group are not allowed to attend meetings hosted by another group. I attended two community meetings during my research visits to the study area, one at Sekuruwe and the other one at Armoede, and discovered that certain villagers were not allowed to attend these meetings. At the first meeting one participant actually pointed at a man passing by and said, "*Do you see that man, he will not come to this meeting because he supports the old community committee that was registered as a S21 company by the mine*." On the second occasion, the participants alleged that one villager had ended up in hospital with a broken arm having been attacked by people who support the S21 Company.

In the above described scenario, it is not clear who has to bear the blame for this breakdown in the social fibre of indigenous communities. One also wonders if how development instead of bringing unity and social cooperation where communities and developers have to work together with mutual respect for one another for the benefit of the present and future generations brings community division and conflicts.

6.10 Conclusion

The views from participants reveal that the public participation process was conducted as per NEMA and EIA requirements. However, this was undertaken in a way that only enabled limited opportunities for the integration of indigenous knowledge systems into both the EIA process and other subsequent consultation activities. This may indicate that while government policies increasingly pay lip service to IKS and promote its use, it must be noted that there are still a lot of challenges that face the implementation of such policies. The way local communities were involved in EIA study does not show the integration of IKS. This corresponds with Patel's (2009) assertion that despite EIA regulations encouraging public participation and the use of IKS in environmental and developmental issues, the

South African legal system still lacks channels for exercising these rights. She adds that besides the lack of channels there seems to be limited concrete requirements in place to ensure that developers and their EIA consultants strictly adhere to EIA regulations and guidelines.

The formation of new community committees to replace the old ones was envisaged as spearheading a better representative position by ensuring that community concerns with regards to development and environmental issues that could impact on people's lives could be heard and listened to. Despite the divisions that exist amongst communities, the new committees are determined to facilitate communication between the mine, the community and other relevant stakeholders. Most villagers seem to be united in the fight for their voice to be heard by developers. If the fight does not lead to the recognition and respect for culture, then it should at least lead to people benefiting meaningfully from the developments that are imposed on their traditional land. To achieve this, the participants indicated that the villagers from Sekuruwe, Armoede and Ga-Molekana made efforts - to the extent of using the services of lawyers, archaeology experts and environmental NGOs such as Action Aid and Africa Jubilee, as well as the South African Heritage Resources Agency (SAHRA) - to get the development proponent to take community concerns seriously in influencing decision-making. According to participants, these experts assisted in ensuring that the case of small compensation packages and the case of botched exhumation process proceeded to court. This may demonstrate that the way forward with regards to public participation is to make sure that there is proper and meaningful representation of local communities from the early stages of the EIA process.

As has been shown, the action taken by community members from the three villages in challenging the ways of participation that were used by the developer concurs with Bishop and Davis's (2002) assertion that there is need to rethink the democratic practice with regard to the public participation process. Such local community action,

together with government policies and IKS groups that promote and encourage the recognition of the importance and use of IKS, may eventually result in an understanding of the need for the integration of IKS in development and environmental issues. There are many benefits to be had from a mature and fair approach to following the environmental impact assessment policy and guidelines.

Chapter 7.

Conclusion, Recommendations and Areas for Future Research

7.1 Conclusion

This case study sought to investigate the effectiveness of public participation in promoting the integration of indigenous knowledge systems into the EIA process and how IKS contributes in identifying and predicting environmental impacts of development projects. The study area of comprising of the three villages of Armoede, Ga- Molekana and Sekuruwe proved relevant in exploring the integration of IKS into EIAs.

In terms of the EIA process adapting to the requirements of including IKS, the research has shown that while environmental management policies and regulations have the potential to facilitate the use of IKS in EIAs, there is a lack of practical ways of doing this. This study has indicated that in terms of the inclusiveness of the public participation process of the EIA study, the EIA regulations pertaining to community involvement were followed. An extensive public participation process that involved a variety of stakeholders including villagers from the affected communities was carried out. However, despite the efforts to involve a wide range of people, the lack of understanding of what was going by community members; the participation of the locals seems not to have contributed much to the decision-making process. The community members did not feel they influenced decision-making in any way which has created tensions and conflicts between the developers and the local communities.

With regards to the integration and contribution of indigenous knowledge systems into EIAs in the local context of Mapela, this study has shown that despite the availability of relevant IKS in Mapela community, the EIA study fell short because the involvement of the local community did not promote the use of IKS. The fact that the participants did not understand the whole concept of the EIA process and were not aware of the importance of IKS limited the opportunities of integrating IKS. The findings of this research study indicate that there is still a long way to go in South Africa to reach the stage where not only is meaningful public participation for indigenous communities achieved, but also where the integration of indigenous knowledge systems into EIAs is a reality.

However, despite the lack of coherent and practical ways of integrating IKS into EIAs in developing countries, and South Africa in particular, the 2006 EIA regulations show that South Africa has continued in its efforts to improve, harmonise and increase the coherence of EIA practices (Li, 2008). Such evolution of policy should be used to ensure that future EIA regulations describe explicitly the ways of integrating IKS into the EIA process. It also important to ensure that relevant indigenous knowledge is incorporated in developmental issues, since as asserted by Dewalt (1994), it is strong social responsibility and strong family and community ties that are related to feelings of obligation and responsibility, and it is these that form the basis for preserving nature for future generations. The process of public participation should go beyond consultations: it should entail sessions where developers and their contracted environmental specialists talk to local communities in an environment that opens opportunities for the integration of IKS.

7.2 Recommendations

Since this study revealed that IKS is still significant, available and relevant in the communities affected by mining developments, the training of EIA experts and related specialists to integrate western knowledge and IKS should become a priority

in South Africa. Such training could pave the way for meaningful engagement between local community members, including traditional healers, traditional leaders, hunters and other elderly members of the community, and the EIA consultants. As Mokuku (2004, 45) asserts, this knowledge is so deeply embedded in the culture that people are unconscious of its practical ecological benefits. It is therefore important that such knowledge should be seriously considered in EIAs so as to ensure local community empowerment in relation to environmental rights and governance. Integrating IKS into EIAs could ensure that both scientific and traditional dimensions of knowledge are explored when predicting and assessing of environmental impacts, and also in suggesting mitigation measures. In turn, this could lead to the acceptance and smooth implementation of proposed development projects.

The literature review shows that there is a shortage of skilled personnel to conduct EIAs that would fully and meaningfully adhere to requirements relating to using IKS in EIAs. Consequently, one of the priorities for South Africa should be capacity building for policy makers, and environmental management entities, as well as indigenous communities to be affected by development. These groups of people need to be trained in issues relating to IKS and environmental management to enable each stakeholder to be aware of their roles in ensuring the incorporation of indigenous knowledge systems into EIAs. This training may also instil moral values and provide EIA specialists with skills of how to involve local communities and consult people about sacred sites and their traditional way of life when conducting EIAs for proposed development projects in the rural areas.

Woodburne (2005, 10) asserts that EIAs are conducted firstly on the basis of TORs that indicate the scope of the process, secondly on issues that should be addressed, thirdly on the roles of different experts, and fourthly on the methodology to be used for assessment. Since TORs also provide the profile of baseline information from both national and local context and the study area, it is recommended that the

development of TORs in South Africa should capture the use of IKS in identifying and assessing environmental impacts and also in suggesting mitigation measures. For this to happen there should be awareness campaigns and environmental education for all parties, so that experts become aware of the importance of using IKS where it is relevant. In addition, this may help indigenous people to be aware of their right to participate in environmental issues that affect their livelihood. Specialists should be given a list of IAPs and issues that were raised by those people during the scoping phase in order to ensure that key stakeholders, e. g. those with a responsibility for biodiversity and heritage, are given the chance to participate (Woodburne, 2005, 16). Therefore the participation of local key stakeholders such as the traditional leadership and healers may also help with the integration of IKS into EIAs.

Mosimege (2004) asserts that the establishment of the IKS unit by the DST would promote the protection and documentation of IKS by creating legislation, policy and strategy as well as to encourage research, monitoring and evaluation of IKS. While the documentation of IKS in South Africa has only recently started at an official level, the government, besides encouraging and promoting the recognition and use of IKS through policy, needs to develop a set of practical guidelines which could be used during public participation to ensure IKS is incorporated when EIAs are carried out. The frequent and mandatory use of IKS through public participation could help preserve and document IKS and if IKS was documented in EIA reports this would assist in creating useful data base for the whole country. The establishment of an IKS database for the country could assist in fulfilling DTS's IKS policy that aims to establish an enabling framework to stimulate and strengthen the contribution of IKS in socio-economic development in South Africa.

It could be helpful also for the policy makers in environmental management to take heed of best practices in other sectors of the economy where IKS has been used for some time now, for example in natural resource management, medicine and

agriculture.

There is also a need to use local languages during the public participation process, especially in notifications, and in calls for concerns and comments from IAPs. This could help by giving the local communities an opportunity to understand what they are required to do and the opportunity to air their views about the impacts of the proposed development project. The use of local language in all communication and notification procedures may be one of the most important ways to enable the integration of IKS into the EIA process.

According to EIA regulations and guidelines, it is the duty of the project proponent, the EIA consultant and experts to ensure meaningful engagement of the local communities and their knowledge in EIAs; hence there is need for the relevant authority or ministry to set out clear procedures and ways on how to involve them. As revealed by this research study, the integration of IKS into EIAs for proposed rural development project may not only improve and speed up the process of impact prediction and assessment but also create good working relations between the developer and the community. This could result, as suggested by (O'faircheallaigh, 2010, 20; O'faircheallaigh, 2007; Duraiappah *et al.*, 2005, 3) in the empowerment of local communities to exercise control of their own social environment, giving them power to influence decision-making and as a consequence bringing into effect the purpose of the policy. For this to happen in South Africa, it will require political will and scientific support, not only in funding indigenous knowledge research to ensure its viability, but also in carrying out extensive and intensive capacity building in the communities affected and among people involved in EIAs.

7.3 Areas for future research

This research study relied mainly on the views of local communities about the integration of IKS into EIAs. My focus in conducting this study has been the local

communities, not the EIA experts and developers. Hence there is a need to carry out research which focuses on EIA consultants and other environmental specialists as the key participants. This research should explore their views and opinions about the use of IKS in EIAs, as well as the skills and methods they use to ensure that EIAs adapt to the requirements of integrating IKS into EIAs.

There is also a need for further research to explore the apparent failure in South Africa to comply with policy requirements that have been established, some of which date back to 1994. Such an investigation should identify barriers for meaningful involvement of local communities and their knowledge in EIAs. Identifying such barriers could in turn assist in developing strategies that may be used to increase and improve the participation of marginalised communities in socio-economic and environmental issues that directly impact on their lives.

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Appendices

Appendix A

Interview schedule for the local community participants

1. How did you know there was going to be mining taking place in this area?
2. Was there something which was done with regard to studying the area (EIA) before mining took place? What do you think was the purpose of this study (EIA)?
3. If you were involved in any of the studies or meetings that were done, how were you invited to take part?(public participation process, how, when, who)
4. What were you told about the mining which was to take place? (Advantages and disadvantages—scoping & impact assessment).
5. What did they want to know from you concerning the mining which was to take place?
6. What kind of advice or information did you give in relation to your traditional knowledge about the natural environment (trees, plants, rivers, water, wild animals, grass, birds) in this area?
7. What kind of advice or information did you give in relation to your traditional knowledge about tradition and culture (sacred sites, burial sites) in the area?(issues of relocation)
8. Do you think the information was helpful to the EIA experts?
9. From your own point of view, how useful were your opinions in achieving the objectives of the EIA process? (review process)
10. What sort of problems were there during the EIA process? (Challenges)
11. What do you think could be done to reduce such problems?
12. What do you think of the new laws that require communities and their indigenous knowledge to be involved in EIAs

Appendix B

Focus group

Suggested topics to guide discussion

What should be done before any mining takes place?

The public participation process (how it's done, who chooses participants, at what stages is it done)

Local community's knowledge about the natural and social environments (scoping & impact assessment; issues of relocation).

How do people know their views and opinions were used in decision-making? (Review process)

Laws with regard to local participation in EIAS

Appendix C

Focus Group

Topics suggested by focus group members to guide the group discussion

Relocation and compensation (Armoede)

Loss of farming land, wildlife and water sources

Grave exhumation and compensation (Sekuruwe)

Section 21 Companies

Meetings with the mines representatives

Appendix D

Interviews

Invitation to take part in "The integration of indigenous knowledge systems into Environmental Impact Assessment process in South Africa's rural development projects" research project

My name is Bekezela Moyo. I am carrying out a short term study through which I intend to explore local ways of doing environmental impact assessment. I will request discussions with groups of elders, and interviews with individuals. This study could encourage active local participation as well as the use of local indigenous knowledge in predicting and identifying harmful environmental effects on the natural environment due to mining activities.

Traditional knowledge (also called Indigenous Knowledge) has helped rural communities live successfully on the land. In modern times some of this traditional knowledge is getting lost. In many parts of the world communities are trying to save and use Indigenous Knowledge (IK). In South African too, government is promoting research into and use of IK environmental management projects. I believe that the community should have a say about this. This is a small-scale research project that will not exploit resources or seek out protected knowledge. Its focus will be on common practices that may contribute to environmental management

I kindly invite you to participate in my study. Your participation is entirely voluntary and you will not be penalized if in any way you may want to withdraw from this project. I invite you to answer the questions in a frank and honest manner. You are not obliged to answer all questions. The information from this interview will be used for academic purposes only. If you so wish I will not have your name appear in report findings, but with your consent I can report your name as co-participant and IKS holder.

If you accept it the conversation will be tape recorded. I appreciate your own busy schedules and will try not to make this research a burden by carrying out the discussion when it is most convenient to you.
The information collected during the interview will be kept confidential.

Thank you.

Appendix E

Informed interview consent form

I……., have read and understood the conditions under which this research is carried out. I understand that participation is voluntary and that if I choose to participate, I am free to withdraw from the study at any time, and this will not prejudice me in any way.

I understand that there are no financial benefits to be obtained from this exercise.

I ask your permission to tape record this interview. Please tick in the boxes to say yes or no in the table below.

	Yes	No
I agree to be part of the discussion		
I agree that you use a tape recorder		
I agree that you use my real name in research report		

Signed ……

Date ……

Appendix F

Focus Group

Invitation to take part in "The integration of indigenous knowledge systems into Environmental Impact Assessment process in South Africa's rural development projects" research project

My name is Bekezela Moyo. I am carrying out a short term study through which I intend to explore local ways of doing environmental impact assessment. I will request discussions with groups of elders, and interviews with individuals. This study could encourage active local participation as well as the use of local indigenous knowledge in predicting and identifying harmful environmental effects on the natural environment due to mining activities.

Traditional knowledge (also called Indigenous Knowledge) has helped rural communities live successfully on the land. In modern times some of this traditional knowledge is getting lost. In many parts of the world communities are trying to save and use Indigenous Knowledge (IK). In South African too, government is promoting research into and use of IK environmental management projects. I believe that the community should have a say about this. This is a small-scale research project that will not exploit resources or seek out protected knowledge. Its focus will be on common practices that may contribute to environmental management.

I kindly invite you to participate in my study. Your participation is entirely voluntary and you will not be penalized if in any way you may want to withdraw from this project. I invite you to answer the questions in a frank and honest manner. You are not obliged to answer all questions. The information from this discussion will be used for academic purposes only. If you so wish I will not have your name appear in

report findings, but with your consent I can report your name as co-participant and IKS holder.

If the whole group accepts it the conversation will be tape recorded. I appreciate your own busy schedules and will try not to make this research a burden by carrying out the discussion when it is most convenient to you.
The information collected during the group discussion will be kept confidential. If you agree to participation you are kindly requested to treat the discussion as confidential.

Thank you.

Appendix G

Focus group consent form

I……
., have read and understood the conditions under which this research is carried out. I understand that participation is voluntary and that if I choose to participate, I am free to withdraw from the study at any time, and this will not prejudice me in any way.

I understand that there are no financial benefits to be obtained from this exercise.

I ask your permission to tape record this discussion. Please tick in the boxes to say yes or no in the table below.

	Yes	No
I agree to be part of the discussion		
I agree that you use a tape recorder		
I agree that you use my real name in research report		

Signed ……

Date ……