# A Model for Social Impact Assessment in Southern Africa

by

JAMES HAYES

(8924961)

Submitted in part fulfilment of the requirements for the degree

MASTER IN ENVIRONMENT AND SOCIETY

In the Department of Geography

University of Pretoria

Pretoria

February 2002

Study Leader

Professor N.F. Alberts

I would like to express my gratitude to the following people for their valuable contributions to this document:

My study leader, Professor Alberts, for his assistance and encouragement,

My colleagues at the Department of Housing for their support and availability of resources.

My parents for all their love and guidance.

Experts in the field for sharing their knowledge and availability – Dr Dawid de Waal, Dr Sharon Biermann, Ina Stahmer.

And above all to our heavenly Father for his grace.

## OPSOMMING: 'N MODEL VIR SOSIALE-IMPAK-ANALISE IN SUIDER-AFRIKA

Die studie stel 'n model vir sosiale-impak-analise voor vir toepassing in die Suider-Afrikaanse konteks. Die voorgestelde model sluit eerste- en derdewêreldse sosiale komponente in, aangesien al twee komponente in Suider-Afrika aangetref word. Die model beskryf die analiseproses en bevat 'n lys van sosiale veranderlikes wat tydens die proses ondersoek behoort te word.

'n Teoretiese model word ontwikkel aan die hand van die internasionale proses en sosiale veranderlikes. Hierdie model word dan aangewend om vyf gevallestudies te evalueer in terme van die proses wat hulle gevolg het en die sosiale veranderlikes wat hulle gebruik het. Vier van die gevallestudies hou verband met die vestiging van infrastruktuur, en een met die beëindiging van 'n mynbou-aktiwiteit. Al die gevallestudies het te doen met projekte wat in Suider-Afrika uitgevoer is en almal het 'n streeksimpak.

Tydens die ondersoek is bevind dat die sosiale-impak-analises soos vervat in die gevallestudies deel gevorm het van omgewingsimpak-analises. Die proses wat gevolg is het ooreengestem met die aanvaarde internasionale praktyk. Gemeenskapsdeelname was ook deel van die sosiale-impak-analises.

Die gevallestudies is geëvalueer aan die hand van die lys van sosiale veranderlikes. Die doel daarvan was om te bepaal of daar enige ander sosiale veranderlikes was wat nie deur die bestaande lys gedek word nie, en wat ingesluit kan word by 'n lys vir toekomstige gebruik in sosiale-impak-analise in Suider-Afrika.

'n Model word uiteindelik voorgestel wat in die Suider-Afrikaanse konteks gebruik kan word, asook 'n uitgebreide lys van sosiale veranderlikes wat tydens toekomstige studies ondersoek kan word.

Ten slotte, sosiale-impak-analises word in Suider-Afrika gedoen, hoewel dit nie wetlik afdwingbaar is soos die geval is met omgewingsimpak-analises nie. Sosiale-impak-analises is deel van omgewingsimpak-analises en sluit gemeenskapbetrokkenheid voor die aanvang van groot projekte in. 'n Paar addisionele sosiale veranderlikes kan by die bestaande internasionale lys gevoeg word om sosiale aspekte kenmerkend van die Suider-Afrikaanse konteks aan te spreek.

*Kernwoorde: Sosiale-impak-analise, Sosiale veranderlikes, Model vir sosiale-impak-analise.*

**SUMMARY: A MODEL FOR SOCIAL IMPACT ASSESSMENT IN SOUTHERN AFRICA**

The study proposes a model for social impact assessment for application in the Southern African context. The proposed model includes first and third world components, as both components are found in Southern Africa. The model describes the analysis process and contains a list of social variables that should be examined during the process.

A theoretical model is developed based on the international process and social variables. This model is then applied to evaluate five case studies in terms of the process they followed and the social variables they utilised. Four of the case studies relate to the establishment of infrastructure and one relates to the termination of a mining activity. All the case studies deal with projects that were conducted in Southern Africa and all have a regional impact.

During the investigation it was established that the social impact assessments as contained in the case studies formed part of environmental impact assessments. The process that was followed corresponded with the accepted international practice. Community participation was also part of the social impact assessments.

The case studies were evaluated against the list of social variables. The purpose of the evaluation was to determine if there were social variables that were not covered in the existing list, and could be included in a list for future use in social impact assessment in Southern Africa. A model is eventually proposed for application in Southern Africa, in addition to an extensive list of social variables that can be investigated in future studies.

To conclude, social impact assessments are done in Southern Africa, although they are not enforced by legislation, as is the case with environmental impact assessments. Social impact assessments form part of environmental impact assessments and include community involvement before major projects commence. A number of additional social variables can be added to the existing international list to address social aspects characteristic of the Southern African context.

*Key words: Social impact assessment, Social variables, Social impact assessment model.*

## ABBREVIATIONS

| | |
|---|---|
| AID | Agency for International Development |
| AIDS | Acquired Immune Deficiency Syndrome |
| DEA | Department of Environment Affairs (1992) |
| DMEA | Department of Mineral and Energy Affairs |
| DWAF | Department of Water Affairs and Forestry |
| EIA | Environmental Impact Assessment |
| EIR | Environmental Impact Report |
| EIS | Environmental Impact Statement |
| EMP | Environmental Management Plan |
| EMPR | Environmental Management Programme Report |
| FHA | Federal Highway Administration |
| HIV | Human Immuno-Deficiency Virus |
| IAIA | International Association for Impact Assessment |
| IAP | Interested and Affected Parties |
| ICGP | Interorganisational Committee on Guidelines and Principles for Social Impact Assessment |
| IEM | Integrated Environmental Management |
| LHDA | Lesotho Highlands Development Authority |
| LHWP | Lesotho Highlands Water Project |
| LMP | Land Management Plan |
| MEC | Malgas Environmental Consortium |
| NEMA | National Environmental Management Act |
| NEPA | National Environmental Policy Act |
| SIA | Social Impact Assessment |
| SSP | Saldanha Steel Project |
| STD | Sexually Transmitted Disease |

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# 1 INTRODUCTION

In the United States the planning of development projects were initially concerned with the effect of these projects on the physical environment. Today a more holistic approach is followed: not only the impacts on the physical environment, but also the impacts on the human environment receive attention. The legal recognition of this approach was greatly advanced by the 1969 National Environmental Policy Act (NEPA) of the United States, which included the human environment as a concern in environmental issues. Hence environmental impact assessments (EIAs) focus mainly on the physical and biological properties of natural environments, and social impact assessments (SIAs) concentrate specifically on human aspects of the environment, that is, on "people impacts". Ultimately, as part of an EIA, an SIA provides information to understand the consequences of a project, activity or action on a specific community.

According to Burdge (1995), an SIA has no single, universally accepted definition. It is mostly described as the systematic analysis of the likely impacts a development event or project will have on the everyday life of individuals and communities.

Most of the theory, experiences and case studies of SIAs available today in South Africa are based on international cases, applicable to the first world or the third world. However, authors like Taylor *et al.* (1992) correctly state that a first world focus cannot be applied to third world countries because the environment, environmental problems and social development stages are different.

This study is an attempt to answer the following topical questions: What is the current situation in Southern African, where a mix of first and third world development problems prevails? What is the extent and nature of SIAs conducted in Southern Africa?

## 1.1 PROBLEM STATEMENT

The student in Southern Africa is referred to international theory and procedure, and case studies of SIAs in first or third world scenarios. In overseas countries, SIA procedure is backed by legislation, including a definition of the procedure and a set of social variables for addressing the social issues affecting individuals and the community. But what is the situation and procedure regarding SIAs in Southern Africa?

## 1.2 AIM OF THE STUDY

The aim of this study was to determine and understand the nature and extent of SIAs in the local context, in terms of the processes, variables and constraints encountered and addressed during their application, so as to provide the practitioner and student with a better view on Southern African vis a vis international SIAs. For this purpose literature reviews and documented case studies were perused. However, the ultimate aim was to develop a model for SIAs in the Southern African context.

## 1.3 OBJECTIVES AND HYPOTHESES OF THE STUDY

- To review the development of the SIA worldwide in order to understand which changes contributed to its current nature.
- To determine if SIAs are being done in Southern Africa, where they are not enforced by legislation.
  Hypothesis: SIAs are undertaken when large-scale development projects are planned.
- To establish what process is followed, if SIAs are undertaken.
  Hypothesis: An internationally adopted process is followed, but the steps in the SIA might be adjusted where the SIA is part of an EIA.
- To determine which variables and issues in international studies form part of local SIA content. Are there social variables unique to the SIAs in Southern Africa?
  Hypothesis: Certain social variables might be unique to Southern African studies, that is, might not occur in international, first world studies.

## 1.4 METHODOLOGY

This study was based on data from literature reviews and documented case studies. For the purpose of the study five case studies in Southern Africa were investigated, more specifically their application process and variables, and their role in the planning of the projects concerned:

- The Saldanha Steel Project environmental impact assessment (Western Cape);
- The Corridor Sands environmental impact assessment (Gaza Province, Mozambique);
- The social impact assessment of the second phase of the Mohale Dam development (part of the Lesotho Highlands Water Project);

- The environmental study on the transmission line between Estcourt and Pietermaritzburg;
- The Durnacol Coal Mine social impact assessment on the closure of the mine.

The various case studies were selected on the basis of:

- Their location in Southern Africa;
- The studies had to address both first and third world characteristics;
- The studies needed to have a regional or large-scale impact;
- The studies had to be well known and accessible, either from a library, a consultant or an internet report;
- The studies had to represent different development projects (e.g. new industrial development, closure of a mining facility, new and additional infrastructure).

The literature on SIAs was reviewed with a focus on the methodology of SIAs, problems, and variables for measuring the change in the approach to human aspects. Furthermore, the relevant legislation and policy guidelines were perused. The case studies were evaluated against the internationally adopted process as well as a checklist of variables developed in 1992 by the South African Department of Environment Affairs (its name then), the issues identified by Burdge (1995) and the list prepared by the Interorganisational Committee on Guidelines and Principles for Social Impact Assessment (ICGP) in 1994.

The social variables extracted from the various case studies were compared against the "theoretical" checklist of variables. This comparison helped to determine the following:

- If variables were unique to a specific study or environment or specific circumstances;
- Whether a comprehensive set of variables would enhance the description and analysis of development impacts on a community as well as the development of alleviating measures as part of an SIA.

The study is reported by means of a theoretical discussion in the second section, followed by a description and analysis of the five case studies in the third section. The fourth section presents an evaluation of the variables. The fifth and last section

contains the model for SIAs in Southern Africa, a discussion of the results of the analysis, and a discussion of the initial hypotheses in view of the results of the study.

## 2 THE THEORY OF SOCIAL IMPACT ASSESSMENT

### 2.1 INTRODUCTION

This section addresses the history, status and process of the SIA from an international perspective. The South African legislation and guidelines are discussed, as well as the influence of these on the SIA procedure. Other issues covered in this section relate to why the SIA is needed and the contribution an SIA is supposed to make in the development process.

In terms of the feasibility of the SIA process, reference is made to the application of the SIA, the methods used during the SIA and the types of SIA. Methodology, design and social issues are investigated to enlighten the reader and assist in decision making. Shortfalls of the methodology and its application are also discussed.

### 2.2 WHAT IS A SOCIAL IMPACT ASSESSMENT?

Burdge (1995) stated that an SIA has no single, universally accepted definition. "The content and subject matter consist of distinguishable components that consistently appear when the SIA process is implemented." Burdge identified five characteristics of an SIA based on the writings of several SIA practitioners:

- SIA is a systematic effort to identify, analyse and evaluate social impacts of a proposed project or policy change on the individual and social groups within a community in advance of the decision making, in such a manner that the information derived from the SIA can actually influence decisions.
- SIA is a means for developing alternatives to the proposed course of action and determining the full range of consequences for each alternative.
- SIA increases knowledge on the part of the project planners and the affected community.
- SIA raises consciousness and the level of understanding of the community and puts the residents in a better position to understand the broader implication of the proposed action.
- SIA includes within it a process to alleviate the social impacts likely to occur if the affected community desires that action.

Wolf (1983) asserted that "social impact assessment" is what social science is all about and that social scientists are concerned with analysing the conditions, causes and consequences of social phenomena and social life. Determining the "social effects" or "social impacts" becomes merely an exercise in filling in the blanks. It would appear then that "social impact assessment" is a measure to estimate and appraise the condition of a society organised and changed by large-scale applications of technology.

Soderstrom (1981) defined "social impact assessment" as the change in the "activity, interaction, or sentiment of a unit" as it responds to the impacts on it from the surrounding environment and the resultant changes that occur due to the interdependent relationships in the *system.* A proposed project will therefore alter one or more of these elements in a unit to different degrees and these changes will in turn alter other elements and units.

An SIA is considered as a subset of an EIA, in that it is an assessment of the impact on people and society of major policies, plans, programmes, activities, and developments. Social impacts or effects are those changes in social relations between members of a community, society or institution, resulting from externally induced change. The changes might be physical or psychological and might affect social cohesion, general lifestyle, cultural life, attitudes and values, social tranquillity, relocation of residents, and severance or separation. For example, in the construction of large hydroelectric dams, large populations are relocated to unfamiliar environments. This results in social discontent, unhappiness, increased illness, and a loss of productivity and income (Gilpin, 1995).

Cock (1994) stated that SIA is something of a hybrid, a method of policy analysis, a planning tool, and a research approach. It is an essential part of understanding the process of social change and giving it direction. It involves different research methods and techniques to investigate at least four major categories of impacts:

- Demographic – population changes, displacements and relocation problems;
- Socio-economic – changes in employment patterns, systems of land tenure, income levels;
- Institutional – changed demands on local services;
- Community – changes to social networks and levels of social cohesion.

An SIA can provide better information for decision making and offers great potential for integrating scientific policy analysis in a democratic political process. An SIA is used to investigate the social and cultural impacts of development plans, programmes and projects. Furthermore, an SIA is an effective tool for informing the public, encouraging its participation in policy debate and reducing the disproportionate influence of special interest groups in decision making. The sociologist has both the research and analytical skills to participate in the execution of SIAs. An SIA has significant potential for promoting development and mitigating the adverse impacts of eco-tourism on the physical environment of local communities.

Vanclay (1999) defined an SIA as an all-encompassing framework for impact assessments that incorporate public participation and institutional issues. In such a model, the SIA includes the psychological and health effects experienced by individuals and the social and cultural effects experienced by communities, as well as the institutional and financial effects experienced by societies. The emphasis of an SIA must be on which impacts will be experienced and/or perceived by people, and it may be worth separating the SIA from more technical analysis focusing on physical impacts.

Social impact assessment can be defined as the process of assessing or estimating, in advance, the social consequences that are likely to follow from specific policy actions or project development, particularly against the background of the national or provincial environmental policy and legislation concerned. Social impacts include all social and cultural consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organise to meet their needs, and generally cope as members of society (Burdge, 1995; Burdge and Vanclay, 1995; ICGP, 1994).

## 2.3 HISTORICAL DEVELOPMENT OF SOCIAL IMPACT ASSESSMENT

Authors like Finsterbusch (1995) and Burdge and Vanclay (1995) described the historical development of SIAs since the passing of the National Environmental Policy Act (NEPA) in 1969, when environmental history was made in the United States. NEPA made provision for the integration of the assessment of development impacts "on the human environment". It required the identification of methods and procedures "... which ensure that presently un-quantified environmental amenities and values be given appropriate consideration" (ICGP, 1994).

NEPA required that any "major federal actions significantly affecting the quality of the human environment" be included in the environmental impact statement (EIS). The aim of the EIS is to estimate the action's impacts on the environment. Taylor *et al.* (1992) stated that the Santa Barbara oil spill was only one instance of environmentalism that stimulated the inclusion of an SIA in the EIS. Affluent Americans were faced with a direct affront to their environment – black, gooey oil on their heretofore pristine beaches. In terms of the NEPA requirements, federal agencies had to use a systematic and interdisciplinary approach to ensure the integration of the natural and social sciences in environmental design and planning that may impact on the environment. The result was impressive. In the first ten years after NEPA implementation, almost 12 000 environmental impact assessments were completed. Around 1 200 lawsuits contesting these assessments were filed.

Table 1 provides a brief historical description of other legislation in the United States that impacted on the support for SIAs.

**Table 1: Statutes and Regulations that Mandate or Contain Provisions for the Conduct of Social Impact Assessment**

| DATE | LAW | PROVISIONS |
|---|---|---|
| 1970 | National Environmental Policy Act of 1969. | Calls for the integrated use of the social sciences in assessing impacts "on the human environment". It requires the identification of methods and procedures that ensure that presently un-quantified environmental amenities and values be given appropriate consideration. |
| 1976 | Magnuson Fishery Conservation and Management Act. | Where a "system for limiting access to fishery in order to achieve optimum yield" is deemed necessary, the Act requires the Secretary of Commerce and the regional Fishery Management Councils to consider in depth the economic and social impacts of the system. |
| 1978 | US Council on Environmental Quality 1978. Regulations for implementing the procedural provision of the NEPA. | "'Human environment' shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment." |
| 1978 | Outer Continental Shelf Lands Act. | "The term 'human environment' means the physical, social, and economic components, conditions and factors which interactively determine the state, condition, and quality of living conditions, employment, and health of those affected directly or indirectly" by the resource development activities in question. |
| 1980 | Comprehensive Environmental Response, Compensation and Liability Act. | Calls for working with affected publics through community relations programs and assessing community and state acceptance of Superfund plans and affecting local populations. |
| 1982 | Nuclear Waste Policy Act. | Calls for the preparation of an EIS, specific demographic limitations on sitting the nuclear repository; inclusion of affected Indian Tribes in the sitting process and impact assistance. |
| 1986 | Superfund Amendments and Reauthorisation Act. | Work with an affected public through community relations programs and assessing the acceptance of plans by local communities. |
| 1986 | Council of Environmental Quality re-issue of regulations implementing the procedural provisions of the National Environmental Policy Act. | The treatment of incomplete or unavailable information is clarified. |
| Interorganisational Committee on Guidelines and Principles for SIA (1994) | | |

Although various pieces of legislation made provision for the inclusion of social aspects, Taylor *et al.* (1992) stated that the social dimension was rarely included in any detail in these early assessments. It can hardly be claimed that specific projects were approved, rejected or changed radically on the basis of social assessment. However, many decisions were affected in more subtle and indirect ways by the recognition of social factors.

Finsterbusch (1995) stated that during the 1970s a tremendous number of EISs were produced, of which many included SIAs. Since 1980 the production of EISs has declined greatly. The EISs for construction projects (roads, dams, power plants, airports, tunnels, bridges, power lines) declined the most. The Federal Highway Administration (FHA) was involved in the submission of SIAs, although most of the actual SIA work done was by the state highway departments and their contractors. The FHA produced more than a third of all SIAs up to May 1980. Towards the late 1970s most of the federal highway system was completed. As a result the number of FHA SIAs conducted under NEPA requirements declined substantially. The FHA filed only 24 final EISs in 1993 compared to 56 in 1980.

By applying a technique using project titles and maps, Finsterbusch (1995) estimated that the 24 road projects assessed and filed in 1993 did not exceed 200 miles of constructed roads. None of the projects indicated an extremely long or time-consuming social impact assessment, and none showed evidence of extensive social impact assessment activity.

According to Finsterbusch (1995), the Corps of Engineers was the second most active agency in the field of SIA in the 1970s. It produced nearly twenty per cent of EISs and was involved in dam projects that involved relatively complicated SIAs. Since 1980, however, dam construction has declined greatly caused by higher and realistic discount rates became available. The downward trend in the dam business was evidenced by the fact that the Corps of Engineers filed only one final EIS for a dam project in 1992 and none in 1993. The Corps of Engineers played a significant role in the environment and 16 final EISs were submitted in 1993. Most of them were for navigation, flood control, and beach erosion control projects, or for various non-construction projects that had few social impacts.

Another very important type of government action, which required an EIS with an SIA component, was energy development. These types of development were not

numerous but they became a major focus of SIA research and accounted for many of the best academic publications involving SIAs. However, since 1980 energy developments have dropped considerably.

Another major construction activity, namely the siting of hazardous and non-hazardous waste landfills that require an EIS with the associated SIA, has also dropped since 1980. This type of activity, including the siting of a national nuclear waste repository, has become a growing national concern and a major contributor to the virulent national NIMBY (not-in-my-backyard) syndrome. The Nuclear Waste Policy Act was passed in 1982 and in 1983 nine sites in six states were selected for consideration. By 1985 only three sites remained for consideration and political factors seemed to play a larger role in the elimination of these sites than environmental factors. In 1987 Congress legislated that the repository would be located at the Yuca Mountain site in Nevada, which was on federal land and therefore the least susceptible of the sites to public protests.

The only area where EISs and associated SIAs expanded was management plans for land and resource use. Such plans for the Forest Service became the leading government actions requiring an EIS, and increased from 16 final EISs in 1980 to 54 in 1993. The Bureau of Land Management filed 15 final EISs for land and resource use plans in 1993.

The SIA field has declined dramatically since 1980, according to Finsterbusch (1995), both in human and in research funding resources, because the construction of highways, dams and energy facilities has declined dramatically and the nuclear hazardous waste candidate sites have shrunk from nine to one. At the same time the practice of SIA has greatly increased in Canada and Western Europe and is developing in other parts of the world.

### 2.3.1 SOCIAL IMPACT ASSESSMENT IN OTHER DEVELOPED COUNTRIES

The New Zealand procedures show similarities to NEPA requirements but lack legislative backing. The Commission for the Environment was the agency for overseeing and reporting to the New Zealand government on the effectiveness of the procedures. The commission's primary role was to audit environmental impact reports. But the commission was often subjected to government's will, as it had no established legal mandate. The impetus for imposing environmental protection and enhancement procedures, according to Taylor *et al.* (1992), came from controversies

such as the raising of Lake Manapouri for electricity generation. There are interesting parallels between the Manapouri proposal and the Santa Barbara oil spill in that they both struck a note of widespread public discord, leading to formal environmental assessment requirements.

Taylor *et al.* (1992) mentioned that public participation was required in New Zealand for environmental audit procedures. The public participation process was sometimes confused with social assessment. But the process of public participation that was usually employed, was very limited and often simply provided the opportunity to make submissions or appear at formal hearings. These early efforts should therefore not be confused with the consultative process of a social impact assessment as advocated today.

In New Zealand, for instance, an early piece of social assessment research that gained international recognition was a large project monitoring the impacts of the Huntly thermal power project. The research received substantial government backing. Many planners, developers and others involved in the practical side of impact assessment and mitigation regarded the project by and large as an academic exercise.

Paradoxically, while there were examples of too little social analysis there were also examples of too much social analysis. This was more often the case when academics were contracted to do the work. In assessing the community in question in a traditional way, these studies tended to become lengthy social overviews. They lacked any real focus on issues or projections of likely future social effects, although they usually provided baseline data for subsequent, more focused assessments.

### 2.3.2 SOCIAL IMPACT ASSESSMENT IN DEVELOPING COUNTRIES

Third world development projects are another important area for SIAs. Social impacts have been considered in project design and selection processes since the Agency for International Development (AID) issued guidelines for "social soundness analysis" in 1975. In most cases, SIAs were social feasibility studies rather than impact assessments. These studies did not try to identify all the significant potential social impacts of the project, but constituted a community needs analysis. The purpose of these SIAs was to discover whether there were cultural or institutional factors that would hinder the success or feasibility of the project (Taylor *et al.*, 1992).

The guidelines governing the social soundness analysis were more vague than the SIA guidelines adopted by agencies working under NEPA requirements. The social soundness guidelines set out a few research requirements. Experienced anthropologists or other social scientists would be hired to develop the problem statement in order to assess the issues and how the proposed project would fit in with the affected communities and cultures. In their review of project design documents in 1988, Finsterbusch and Van Wicklin generally found that social soundness analyses were weak and the socio-cultural factors were negatively perceived, which often contributed substantially to poor project performance (Taylor *et al.*, 1992).

## 2.4 LEGISLATION AND GUIDELINES ASSOCIATED WITH SOCIAL IMPACT ASSESSMENTS

As mentioned at the beginning of this study, NEPA made definite changes to legalisation over the years, so that human aspects of the environment were included in impact assessments. NEPA made provision for specific sections in the social impact assessment procedure. An example can be found on the NEPA website: "Fact Sheet – What is Social Impact Assessment?" This site makes reference to the definition of, differentiation between, and legalisation on "social assessment", "socio economic impact assessment" and "social impact assessment". The website further addresses the essential components, such as the principles, variables, methods and typical steps of an SIA. The last section of the website deals with SIA contracts, including the scope of service and the principles the contractor should adhere to.

In the South African instance, broad policy guidelines stipulated the requirements for the management of the environment and resources, including the need to address the human aspects. The South African policy guidelines were conceived during the 1992 United Nations Earth Summit when a global plan for sustainable development was finalised. The Rio Declaration on Environment and Development noted several principles relating to the environment and society:

- *Principle 1: Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.*
- *Principle 3: The right to development must be fulfilled so as to equitably meet development and environmental needs of present and future generations.*

- *Principle 4: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.*
- *Principle 5: All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.*
- *Principle 8: To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.* (http://www.unep.org)

As a member of the United Nations, South Africa has incorporated these principles into existing actions and legislation.

The then South African Department of Environment Affairs issued a series of guideline documents in 1992, which included a checklist of environmental concerns. This checklist includes a number of issues that need to be addressed during an EIA and SIA. The checklist is still being applied in practice. This checklist will be analysed in full later in this study.

The Department of Mineral and Energy Affairs issued a document in 1992, namely *Aide-Mémoire*, which stipulates the requirements and procedure for the preparation of environmental management programme reports for mines (EMPRs). *Aide-Mémoire* was compiled in terms of the environmental requirements and directives of the Minerals Act, No. 50 of 1997. The purpose of *Aide-Mémoire* was to assist in structuring EMPRs and provide a single document that would satisfy the various authorities concerned with the regulation of the environmental impacts of mining (South Africa, 1992).

More recent legislation in South Africa makes provision for the sustainable development and involvement of its communities. The Constitution of South Africa, Act No. 108 of 1996, article 24 (South Africa, 1996) states that:

"Everyone has the right –

- To an environment that is not harmful to their health or well-being; and

- To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –
  - i. Prevent pollution and ecological degradation;
  - ii. Promote conservation; and
  - iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

In addition, the National Environmental Management Act (NEMA), No. 107 of 1998 (South Africa, 1998), states under the heading "National Environmental Management Principles" that:

- The principles mentioned in the Act must serve as the general framework within which environmental management and implementation plans must be formulated.
- Environmental management must place people and their needs at the forefront of its concern and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated. The decisions must be appropriate in the light of such considerations and assessments.

Although no requirements or procedures are stipulated in the current legislation, SIA reports are developed according to international standards and the 1992 environmental checklist guideline document and, where applicable, *Aide-Mémoire*.

## 2.5 FEASIBILITY OF SOCIAL IMPACT ASSESSMENT

Barrow (1997) mentioned that SIA has been applied in various situations, including development projects, investigations of affected groups, communication and

technology change, institutional and social change, structural adjustment and community development.

- *SIA and infrastructure:* Infrastructure developments, according to Barrow (1997), can affect urban and rural residents and include, amongst others, water supply dams and hydro-electric schemes, hydrocarbon exploitation, mining, agricultural development, flood control, land development, irrigation schemes, drainage schemes, resettlement, improved communications and industrial development. Some projects impact on a national or even global scale. An example of industrial development with a substantial impact is Henry Ford's production lines, which had global socio-economic impacts. This study investigated five projects: the Saldanha Steel Project in the Western Cape, which was aimed at the establishment of a new steel-producing facility; the Corridor Sands project in Mozambique's Gaza Province, which addressed the creation of a new mine in a rural area; the Mohale Dam project, which was aimed at the development of a dam and was part of a bigger water-providing project in Lesotho; the Durnacol Coal Mine study, which took a look at the impacts arising from the closure of a mining activity; and the Estcourt to Pietermartizburg transmission line study, which evaluated the social impacts of the additional infrastructure, during and after their erection, in order to support infrastructure in the province.
- *SIA and tourism:* Tourism is considered to be a growing sector and an important area of development in both developed and developing countries. Tourism, according to Barrow (1997), provides the ideal opportunity for doing SIAs. Tourism can affect a region in various spheres, including the cultural, social, economic, health and physical environments. Impacts are greater in regions where the community is isolated and the development or innovations are rapid. There is no shortage of post-development assessments, which are valuable for establishing typical patterns of impact for determining the effectiveness of social impact assessments. SIAs with a pro-active tourism focus are less common. An example of such an SIA would be a study of a hotel complex to be built in a relatively undeveloped area with the aim of making recommendations on how assessment policies and procedures could be improved. SIAs can also be applied to ascertain the potential for conflict between the interests of the host community and the interests of the tourists. Tourists are likely to respond to local hostility or other social problems by going elsewhere.

- *SIA of different energy scenarios:* Barrow (1997) mentioned that SIA has been applied to possible future energy scenarios and proposals for various national energy policies, such as taxes on pollution.
- *SIA and land development/resettlement:* Land development is a broad subject that encompassed many things - from the development of unspoilt natural areas to the redevelopment of occupied land or derelict sites. The associated impacts are varied, according to Death and Christensen in Barrow (1997). SIA can be applied with great success and is seen as a valuable tool. Resettlement, whether voluntary or enforced, has caused marked social impacts. Most of these relocations resulted from large projects.
- *SIA and agricultural change*: According to Cernea, Chamala, Pinhero, Pires and Campbell in Barrow (1997), the modernisation of agriculture and the spread of technology in developing countries have been the focus of a substantial number of SIAs. Tremendous socio-economic impacts have been associated with Green Revolution innovations since the 1960s. Some largely unexpected and serious impacts have called for strategies that alter the negative impacts. In the past century the replacement of subsistence farming with cash crop production has affected huge areas of the world and has had serious impacts. Those accustomed to cash crop production have also had to face many developments and some have turned to contract production, thereby binding themselves to restrictive schedules and production options. This has resulted in major socio-economic impacts.
- *SIA and health:* The social impacts of a wide range of health issues in both developed and developing countries have been studied, including HIV/AIDS, ageing and dependent populations, migraine, cancer, heart disease, tobacco consumption, illicit narcotics, medical treatment innovations and new pharmaceuticals (Barrow, 1997).
- *SIA and technology change:* Technological innovations and change, according to Barrow (1997), constitute a field where SIA has been applied in developed and developing countries. Technology affects employment opportunities, habits and quality of life, and even minor changes have huge impacts such as the development of the personal computer and fax machine.

## 2.6 THE SCOPE OF SOCIAL IMPACT ASSESSMENT

This section describes the principles set for SIA, and the methodology and steps that need to be followed in the process. The various issues or variables that need to be addressed during an SIA will also be discussed from a theoretical point of view.

### 2.6.1 PRINCIPLES FOR SOCIAL IMPACT ASSESSMENT

There is general consensus that the SIA should include a discussion of the impacts of the proposed action on components of the human environment, and steps that could be taken to enhance positive impacts and mitigate negative ones.

Authors like Burdge (1995), Finsterbusch (1995) and Taylor *et al.* (1992) pointed out that the SIA practitioner should focus on the more significant impacts and quantify these where feasible and appropriate. These writers furthermore suggested that social impacts should be presented in such a manner that decision makers and community leaders could understand them.

The same authors listed the following principles, which they saw as benchmarks for conducting an SIA:

- Public involvement in SIA to identify affected groups;
- Taking cognisance of impact equity (who "wins" and who "loses") to accommodate sensitive groups;
- Highlighting the SIA focus area, possible impacts identified by the affected public and impacts identified through social science expertise;
- Explicitly identifying methods and assumptions, and determining their significance;
- Giving feedback to project planners;
- Using SIA practitioners to do SIA;
- Development agency and community taking joint responsibility for mitigation and monitoring;
- Identifying appropriate data sources for SIA;
- Addressing gaps in the data during the scoping phase.

### 2.6.2 METHODOLOGY OF SOCIAL IMPACT ASSESSMENT

Carley (1983) asserted that SIA methodology should promote a systematic, orderly approach to the study of development problems. This is important to simplify the complex reality for busy decision makers. SIA methodology should assist in problem

definition (or locating a problem), which is the first and often the most important step in an SIA.

Carley (1983) stated that SIA methodology should be designed to enlighten and assist political choice, not to predict the future. The methodology should furthermore assist in satisfying the information needs of all the parties to policy decision making. In addition, methodology should be developed for application in a wide variety of situations, as described by Barrow and mentioned earlier in this paper.

According to Carley, the following factors should be considered during the planning of an SIA:

- Data requirements
- Resource capability
- Quantification and qualification
- Desegregation of data
- Probability of impact occurrence
- Significance of impacts
- Sensitivity analysis
- Robustness measures
- Hierarchical structure
- Value assumptions
- Mitigation measures
- Communicability
- Public debate
- Causal understanding
- Validity

According to Taylor *et al.* (1992), the SIA strategy should involve the affected parties in the design of their future. This also suggests that the affected parties be involved in the development of alternative plans. Some planners and decision makers hold the view that "abstract futures" cannot be predicted with any degree of accuracy. This view is not well received by the managers of development projects, because they are faced with the finite constraints of their development or programme options, and the view does not concur with the legal requirements of the regulatory environment that they are working in.

### 2.6.3 THE SOCIAL IMPACT ASSESSMENT PROCESS

Burdge and Vanclay (1995), Finsterbusch (1995) and the Interorganisational Committee (1994) identified ten generic steps in an ideal SIA:

- Step 1 begins with a *public involvement programme* that communicates with affected parties to obtain their input throughout the impact assessment process. This is both a social scientific and political consideration. This step coincides with the view of most social scientists that the assessment of social impacts is not complete or valid unless the inputs of affected parties are obtained. Social scientists cannot speak for affected communities despite their sophisticated measurements of conditions and expected impacts. Public involvement is also a political consideration in that affected parties must be given the opportunity to participate in decision making.
- Step 2 and 3 relate to *obtaining information* on the alternatives being considered and on the existing relevant conditions. These steps provide basic information for both the SIA and any policy decisions that claim to be rational.
- Step 4 is *"scoping"* and is probably the key step in designing the SIA. First it requires the development of a relatively exhaustive list of potential impacts of the action. Second it requires the selection, from the list, of the potential impacts to be studied in the SIA. It is vitally important that the public participate in scoping, or at least that public concerns are well represented. Otherwise public trust will be broken and the likelihood of public protest will increase.
- Step 5 is the *main research step and leads to the projection of estimated effects*. The three main information sources for impact identification are the literature, experts and field research (including informant interviews). The social impact assessor tries to establish what happened in similar past cases through studying the available literature, as a guide to what could happen in the current case. The experts can advise on how they think the case will deviate from, or conform to, the normal patterns arising from past cases. The focus of the field study can then be to test the hypotheses of the experts and the applicability to the current case of the general patterns of impacts identified in past cases.
- Step 6 is the difficult task of *predicting how the affected parties will respond.* Most SIAs do not implement this step, or do very little of it. It is essential to estimate higher order impacts and the political consequences of the action – and this makes for information that should interest decision makers. It also

entails ascertaining the attitudes of affected parties toward both the action and its direct impacts, and their probable responses to the impacts. Respondents' statements about their responses may however poorly predict their subsequent actions, but the statements can at least alert the agency to potential problems and their possible solution by appropriate agency actions.

- Step 7 is the *estimation of indirect and cumulative impacts*. This is an obvious next step, but is often neglected or skimped. Again the patterns found in past cases can guide this step.
- Step 8 is the *recommendation of changes in the action or alternatives* that would avoid the predicated negative impacts and enhance the positive impacts. These changes should be subjected to an SIA before they are implemented.
- Step 9 is the *mitigation of the negative impacts* by avoiding, minimising or rectifying the impacts, of by providing compensation for them.
- Step 10 involves *monitoring* to ensure that the negative impacts are dealt with as they happen. Most SIAs lack this step but it should be remembered that the purpose of assessing impacts is to manage them. However, assessing social impacts is a very difficult task, and not all problems can be anticipated or dealt with ahead of time. A programme that monitors the impacts and adjusts the action to unanticipated new conditions must supplement an SIA.

### 2.6.4 CRITICISM ON THE APPLICATION OF SOCIAL IMPACT ASSESSMENT

Various writers, including Taylor *et al.* (1992), Finsterbusch (1995), Becker (2001) and Bowles (1981), who described the development of the SIA process, criticised the application of SIA.

According to Taylor *et al.* (1992), the first SIAs were characterised by a number of problems related to the inclusion of a social dimension within the overall environmental assessment. Sociologists and other scientists were slow to define the social dimension. An aspect highlighted by Cock (1994) is the ability of social scientists to get involved in the environmental arena. Even if the social dimension was defined, it was often left out of the analysis – perhaps because the results sometimes called into question the emphasis on economic analysis, went against political judgements, or simply failed to deliver useful input to management.

Economic analysis was often substituted for social analysis and, according to Taylor *et al.* (1992), this problem persisted. The substitution is understandable in that the study of economics is built around the structure of choices. Its quantitative nature also makes economics more immediately applicable to the needs of decision makers. When the economic analysis did move into the social arena, the focus was often on population change and quantifiable effects of developments and resource management decisions on jobs and demands for community services.

The World Bank and the Development Bank of Southern Africa incorporate less SIA aspects in their project planning than the AID. This is understandable as, due to their function, banks emphasise economic factors in project design. Both the above-mentioned banks have been criticised for the negative environmental and social impacts of some of their projects, so they have become more sensitive to these issues. Over the years the World Bank has substantially increased the number of sociologists and anthropologists on its staff to incorporate more social factors in its deliberations on policies and project designs.

Development agencies have been criticised for doing the wrong things and for doing things the wrong way. A more defined and clearer role for SIA in their deliberations should raise their scores on both these issues. Barrow (1997) mentioned that researchers like Nelson (1985, cited in Finsterbuch, 1995) accused development agencies of helping the rich more than helping the poor, and the Paddocks (1973, cited in Finsterbuch, 1995) and Kottak (1985, cited in Finsterbuch, 1995) accused them of starting chains of events that have unanticipated and unaddressed serious negative social impacts. Since SIAs address these problems they deserve to be more fully utilised by development agencies.

The criticism of the procedures of development agencies focuses on their top-down approach, which usually fails to attain significant client participation in design, redesign, implementation, operation and maintenance of projects. SIAs can help address this problem because they can be used to make the project process more participative.

Carley (1983) argued for an examination of the SIA from a methodological point of view. According to him, Flynn (1981) reviewed a number of attempts at developing SIA methodology and found the following:

- They demonstrated a poor understanding of methodological developments in the social sciences.
- The scope and usefulness of the methods proposed were seriously overestimated.
- The quantification of impacts was often arbitrary and not done in a useful way.
- The critical areas of SIA were without any developed methodology.
- The titles of SIA methods were overblown and misleading.

According to Carley (1983), the problems were related to impact quantification, value measurement and value weighting, and the integration of socio-economic and environmental variables.

Although SIA procedure and guidelines have been clearly defined by authors such as Becker (2001), Bond (1995) and Lane (1997), other difficulties are encountered, including:

- The limited opportunity for community participation reflects the fact that practitioners generally undervalue the benefits of participation and misunderstand the role of public participation. By involving the public throughout the research process, the research is informed by local knowledge, articulates important value choices and demonstrates that impact assessment research is accountable and responsive to local communities.
- The most important problem these days relates to the politicisation of environmental and social assessments. In the process the adverse consequences of development are de-emphasised while the potential positive consequences are highlighted. SIA was designed to provide decision makers with an independent appraisal of the costs and benefits of a particular course of action. According to Lane, the use of SIA as a political tool has undermined its potential.
- Size and time of the study.
- Moral obligation towards the affected community.

### 2.6.5 DEFINING A SOCIAL VARIABLE

According to Burdge (1995), SIA variables point to measurable change in human populations, communities and social relationships, resulting from a development project or policy change.

Burdge (1995) stated that an SIA variable must comply with the following:

- An SIA variable is operative when a community may be affected by project development and policy change. SIA variables do not refer to the total social environment; they only explain the consequences of the proposed impact event. Other portions of an environmental impact statement or planning document cover economic, physical and land use change.
- An SIA variable will alert the decision maker or planner to a specific consequence of the proposed action. The extent of the consequence depends upon the type of project and geo-political setting. The direction of change is not assumed in the labelling of SIA variables.
- An SIA variable always has a discrete, nominal, or continuous empirical indicator that can be measured, collected and interpreted within the context of a specific social impact setting.
- All SIA variables are based upon data that can be collected or made available during the planning and decision-making stage as well as other stages in the development of the project or policy. Because SIA information is required before the event, planners reply upon data that can be obtained in advance.
- An SIA variable does not require, but may utilise, information from surveys of the general population. Survey data vary in quality depending upon the amount of care taken in questionnaire design, sampling and interviewing. However, results from survey research might contribute to the understanding of several SIA variables. Data from well-designed questionnaires will address limited objectives and enhance the understanding of a community's responses to planned social change.
- An SIA variable is not to be confused with such sociological labels as "middle class", "ethnicity" or "small groups". These labels define sociological concepts and situations but do not describe changes that take place in communities due to project development.

What variables are examined in an SIA? In any given case, this will depend on the results of scoping, and adjustments may have to be made as the analysis proceeds. New variables may be found to be important, and some initially thought to be important may be found to be of less significance.

### 2.6.5.1 International Variables

In this section, various lists of social variables, which have been developed by various authors over the past forty years, will be studied. The reason for this is twofold: first, to determine the development of the variables and, second, to have a basis from which to develop a list of social variables that can be used in the Southern African context. Studying the various lists of social variables will ensure that a comprehensive list can be developed.

Table 2 lists areas of human concern as developed by Munn during the 1970s for inclusion in the SIA. Munn (1975) described an impact indicator as "an environmental element or parameter that provides a measure of a human concern, on at least some qualitative scale". What is important is that psychological dimensions feature in this definition.

**Table 2: Areas of Human Concern (Impact Categories)**

| AREAS OF HUMAN CONCERN | IMPACT CATEGORIES |
|---|---|
| 1. Economic and occupational status | Displacement of population; relocation of population in response to employment opportunities; services and distribution patterns; property values |
| 2. Social pattern or lifestyle | Resettlement; rural deprivation; change in population density; food; housing; material goods; nomadic; settled; pastoral; agricultural; rural; urban |
| 3. Social amenities and relationships | Family lifestyles; schools; transportation; community feelings; participation vs. alienation; local and national pride vs. regret; stability; disruptions; language; hospitals; clubs; recreation; neighbourliness |
| 4. Psychological features | Involvement; expectations; stress; frustrations; commitment; challenges; work satisfaction; national or community pride; freedom of choice; stability and continuity; self-expression; company or solitude; mobility |
| 5. Physical amenities (intellectual, cultural, aesthetic and sensual) | National parks; wildlife; art galleries and museums; concert halls; historic and archaeological monuments; beauty of landscape; wilderness; quiet; clean air and water |
| 6. Health | Changes in health; medical services; medical standards |
| 7. Personal security | Freedom from molestation; freedom from natural disasters |
| 8. Religion and traditional belief | Symbols; taboos; values |
| 9. Technology | Security; hazards; safety measures; benefits; emission of waste; |

| AREAS OF HUMAN CONCERN | IMPACT CATEGORIES |
|---|---|
| | congestion; density |
| 10. Cultural | Leisure, fashion and clothing changes; new values; heritage; traditional and religious rites |
| 11. Political | Authority; level and degree of involvement; priorities; structure of decision making; responsibility and responsiveness; resource allocation; local and minority interests; defence needs; contributing or limiting factors; tolerance |
| 12. Legal | Restructuring of administrative management; changes in taxes; public policy |
| 13. Aesthetic | Visual physical changes; moral conduct; sentimental values |
| 14. Statutory laws and acts | Air and water quality standards; safety standards; national building acts; noise abatement by-laws |
| Source: Munn, 1975 | |

Burdge (1995) mentioned 26 variables, categorised under population impacts, community/institutional arrangements, conflicts between local residents and newcomers, individual and family-level impacts, and community infrastructure needs. The population impacts entail all the demographic aspects, as well as the influx and presence of temporary workers in the area, and possible relocation. The community and institutional issues relate to the forming of attitudes towards the project and their expression in the study area, and the changes that might occur in employment and occupational opportunities. The conflicts mainly derive from the introduction of new social classes and the change in the industrial and commercial focus. Individual and family impacts include the disruption in daily living, religious practices and social networks, and the change in leisure opportunities and perceptions of health and safety. Community infrastructure encompasses the change aspect, land issues and effects on cultural and historical resources.

Table 3 provides a more recent listing of social monitoring variables from Taylor *et al.* (1992). These variables reflect a better understanding of sociological and structural issues and a better representation of social impact assessment.

**Table 4: The Social Impact Assessment Variables: The Current List of Twenty Eight**

| *Population Impacts* |
|---|
| • Population change |
| • Influx or outflow of temporary workers |
| • Presence of seasonal (leisure) residents |
| • Relocation of individuals and families |

| |
|---|
| • Dissimilarity in age, gender, racial or ethnic composition |
| *Community/Institutional Arrangements* |
| • Formation of attitudes toward the project |
| • Interest group activity |
| • Alteration in size and structure of local government |
| • Planning and zoning activity |
| • Industrial diversification |
| • Living/family wage |
| • Enhanced economic inequities |
| • Change in employment equity of minority groups |
| • Changing occupational opportunities |
| *Communities in Transition* |
| • Presence of an outside agency |
| • Interorganisational co-operation |
| • Introduction of new social classes |
| • Change in the commercial/industrial focus of the community |
| • Presence of weekend residents (recreational) |
| *Individual and Family-Level Impacts* |
| • Disruption of daily living and movement patterns |
| • Dissimilarity in religious practices |
| • Alteration in family structure |
| • Disruption in social networks |
| • Perceptions of public health and safety |
| • Change in leisure opportunities |
| *Community Infrastructure Needs* |
| • Change in community infrastructure |
| • Land acquisition and disposal |
| • Effects on known cultural, historical, sacred and archaeological resources |
| Source: Taylor et al., 1992 |

The variables listed by the ICGP cover the same topics, but in more detail, as described by Burdge and Taylor *et al.* The following are key variables that need to be addressed, according to the ICGP (1994):

- *Population characteristics*. What are the current structure and organisation of the potentially affected population? Are they stable or changing? Are there ethnic, economic or social group distinctions within them? How are wealth, poverty, employment and levels of income distributed through the population? How are people employed? How many and what kinds of people are unemployed, and in what kinds of activities (particularly those that may be affected by the action under review)? Are there seasonal population changes,

or other kinds of influx and outflow? What effects could the alternative action have on these factors?

- *Community and institutional structure*. How are the affected communities organised, both explicitly (through systems of government, etc.) and informally (through voluntary associations, interest groups, etc.)? What are the employment and economic dimensions of each group? Are there any existing economic, social or cultural inequities among groups based on ethnicity or other factors? What experience of change do the various groups have? How are the groups linked (if at all) with regional and national organisations? Do local planning and zoning affect them? What changes in these variables may be caused by the alternative action?
- *Political and social resources*. How are power and authority distributed in the community, both formally and informally? Who are the relevant stakeholders? What are their interests? How do they organise and exercise power internally and externally? How do they react, or are they likely to react, to the alternative action?
- *Individual and family factors*. What factors influence the daily lives of potentially affected members of the community? What are the patterns of family, friend and acquaintance relationships? How stable is the pattern of residence? Do people in different groups feel that they currently have a satisfactory way of life? Are they concerned about what the proposed action would do to their way of life, or interested in possibilities for improvement? What attitudes do people have toward risk, health, safety and the proposed alternative? What values do they ascribe to the environment? Are they concerned about displacement or relocation, if this is perceived to be a possible result of the alternative? Do they trust their political and social institutions to handle change?
- *Community resources*. How do people use the land, whether urban or rural? How do they use the natural environment? Are there subsistence uses? Spiritual uses? Recreational uses? Are there conflicts among any of these uses? Are there historically or culturally sacred sites, or religious uses of the natural environment? Are there culturally valued neighbourhoods, shopping areas, recreational areas or gathering places? Are there culturally valued patterns of social interaction such as clubs and other informal groups? Are there valued historical places, archaeological sites, or collections of historical artefacts or documents? How available are housing and community services

like police protection, water, sewer service, electricity, schools, libraries and computer facilities? How will the proposed action affect any of these variables? (ICGP, 1994.)

Table 4 provides a more defined list of the twenty-eight social impact assessment variables found in *Community Guide to Social Impact Assessment* (Burdge, 1995). This list is clearly sociologically, structurally and system oriented.

**Table 5: Social Impact Assessment: List of Social Impacts**

| INDIVIDUAL AND HOUSEHOLD LEVEL | COMMUNITY AND INSTITUTIONAL LEVEL |
|---|---|
| Death, death of a family member | Death of people in the community |
| Arrest, imprisonment, detention, torture, intimidation or other abuse of human rights inflicted on an individual | Violation of human rights, freedom of speech |
| Reduced availability of food and adequate nutrition | Adequacy of physical infrastructure (water supply, sewerage, services and utilities) |
| Reduced control over fertility (availability of contraception, and empowerment) | Adequacy of community social infrastructure, health, wealth, education, libraries etc. |
| Reduced level of health and fertility (ability to conceive) | Adequacy of housing in the community |
| Reduced mental health, increased stress, anxiety, alienation, apathy, depression | Workload of institutions, local government, regulatory bodies |
| Uncertainty about impacts, development possibilities and own life as a result of social change | Cultural integrity (continuity of local culture, tradition, rites) |
| Actual personal safety, hazard exposure | Rights over, and access to, resources |
| Experience of stigmatisation and deviance labelling | Influences on heritage and other sites of archaeological, cultural or historical significance |
| Reduction in perceived quality of life | Loss of local language or dialect |
| Reduction in standard of living, level of affluence | Profanisation of culture |
| Decline in economic situation, level of income, property values | Inequity (economic, social, cultural) |
| Decreased autonomy, independence, security of livelihood | Changed inequity, social justice issues in relation to minority or indigenous groups |
| Change in status or type of employment, or becoming unemployed | Gender relations in the community |
| Decrease in occupational opportunities, potential diversity, flexibility in employment | Economic prosperity |
| Moral outrage, blasphemy, religious affront, violation of sacred sites | Dependency/autonomy/diversity/viability of the community |
| Upsets (objection/opposition to the project), NIMBY (not in my backyard) | Unemployment level in the community |
| Dissatisfaction due to failure of a project to comply with heightened expectations | Opportunity costs (loss of other options) |
| Annoyance (dust, noise, strangers, more people) | Actual crime |

| INDIVIDUAL AND HOUSEHOLD LEVEL | COMMUNITY AND INSTITUTIONAL LEVEL |
|---|---|
| Disruption of daily living, way of life (having to do things differently) | Actual violence |
| Reduction in environmental amenity value | Social tensions, conflict or serious divisions within the community |
| Perception of community cohesion, integration | Corruption, credibility and integrity of government |
| Community identification, connection to place (Do I belong here?) | Level of community participation in decision making |
| Changed attitude towards local community, level of satisfaction with the neighbourhood | Social values about heritage and biodiversity |
| Disruption of social networks | |
| Alteration in family structure, family stability, divorce | |
| Family violence | |
| Gender relations within the household | |
| Changed cultural values | |
| Source: Burdge, 1995 | |

It is interesting to note that many of these impacts are strongly psychological and require a clear psychometric approach to measurement and description in that what is of concern are perceptions, attitudes, values, experience and subjective well-being. Such parameters are no less measurable than more nominal level events, but the measurement process involves more than categorisation and counting. Very few SIA practitioners appear to be comfortable with the measurement or indeed specification of psycho-social impacts. What appears to happen is that checklists and category lists are developed and treated as conceptual models, arguably at the expense of thinking through substantive conceptual and measurement issues (Vanclay, 1999). Individual respondents are quite capable of reporting on their *internal* as well as *external* environment, and indeed most measures relating to individuals' emotional experience or state are in fact a reflection of their assessment of, or their experienced relationship with, the immediate external environment.

### 2.6.5.2 The South African Case

In the case of South Africa the Department of Environment Affairs and the Environmental Evaluation Unit of the University of Cape Town developed in 1992 a checklist of environmental characteristics to support EIA and SIA in South Africa (Department of Environment Affairs, 1992). Their checklist comprised thirteen broad categories, which were broken down into more specific sub-categories of issues that need to be addressed. At the beginning of each category the question is put: "Could

the proposed development have a significant impact on, or be constrained by, any of the following?" Table 5 presents the checklist for the social aspects included:

**Table 6: Variables used in the South African Checklist**

| |
|---|
| ***Cultural Resources*** |
| • Structures and sites of architectural, cultural or historical heritage |
| • Sites of archaeological or palaeontological importance |
| • Special attraction of local sites, traditions or events |
| • Sites or areas of religious or spiritual significance |
| • Sites or areas of special social or cultural interest |
| • The integrity of cultural resources |
| ***Socio-Economic Characteristics*** |
| *Demographic Aspects* |
| • Growth rate of the local population |
| • Location, distribution or density of the population |
| • Existing age or gender composition of the population |
| • Existing biographical composition of the population |
| • Existing migration movements |
| • Inflow of tourists |
| *Economic and Employment Status of the Affected Social Groups* |
| • Economic base of the area |
| • Distribution of income |
| • Local industry |
| • Rate and scale of employment growth |
| • Labour needs and the spare labour capacity of the area |
| • Movement of labour away from existing employment in the area |
| • Competition through non-local labour moving into the area |
| • Non-labour remaining in the area after completion of the development |
| • Pressure to comply with particular skills, age range or gender needs |
| • Job opportunities for school leavers |
| • Short- and long-term unemployment trends |
| *Welfare Profile* |
| • Incidence of crime, drug abuse or violence |
| • Extent of homelessness and overcrowding |
| • Adequacy of services |
| • Adequacy of support systems such as crèches and shelters for destitute children |
| • Quality of life |
| *Health Profile* |
| • Availability of clinic/health services |
| • Incidence of disease |
| • Incidence of mental illness |
| • Threats to health from pollution |

| |
|---|
| *Cultural Profile* |
| • Existing lifestyles, household composition and family network |
| • Religious and cultural attitudes, outlooks and expectations of local population |
| • Cultural or lifestyle diversity |
| • Cultural or lifestyle stability |
| ***Social Infrastructure Services*** |
| *Education* |
| • Demand for specific types of technical skills training |
| • Demand for specific types of industrial training |
| • Adequacy of existing technical institutions |
| • Adequacy of nursery, junior and secondary education facilities |
| • Need for additional educational facilities |
| • Demand exceeding the planned provision of educational facilities |
| • Preschool facilities |
| *Housing* |
| • Property values and levels of rates |
| • Potential conflict over land use |
| • Availability of housing stock |
| • Need to release additional land for housing development |
| • Acceptability of such land release |
| • Adequacy of infrastructure for further housing development |
| • Ability of private or local authority to provide housing |
| • Compatibility of planned development with existing housing |
| • Location for suitable housing sites |
| • Sites suitable for construction camps |
| • Standard of provision of facilities required by authority |
| • Design and layout of site facilities |
| • Use to which construction camp may be put after termination of the construction period |
| ***Social and Community Services and Facilities*** |
| *Health Service Facilities* |
| • Adequacy of temporary facilities during construction phase of development |
| • Adequacy of on-site health facilities |
| • Adequacy of facilities for primary health care |
| • Adequacy of the existing health services to cope with increased population |
| • Projected provision of health service facilities |
| • Need for additional facilities |
| *Emergency Services* |
| • Adequacy of existing emergency services |
| • Projected provision of services to meet increased demand |
| • Need for additional emergency services |
| • Adequacy of the emergency and safety services provided by the developer |

| |
|---|
| • Ability of the local resources to deal with emergencies |
| *Recreational Facilities* |
| • Adequacy of existing facilities |
| • Projected provision of facilities to meet increased demand |
| • Need for additional facilities |
| • Recreational and service facilities in the workplace |
| *Risk and Hazard* |
| • Level and identity of hazard to the public |
| • Probability of occurrence |
| • Extent of effect – local, regional or panoramic |
| • Standards required for process equipment |
| • Workers' safety/degree of risk |
| • Level of risk and hazard for other living organisms |
| *Health and Safety* |
| • In the workplace |
| • Surrounding areas |
| Source: Department of Environment Affairs, *Checklist of Environmental Characteristics*, 1992 |

The "checklists" cover the same topics with some variation in the level of detail and focus. The above-mentioned categories cover the social and human aspects well and indicate the various effects that development projects might have on the human and physical aspects of a community.

### 2.6.6 COMPARISON BETWEEN VARIOUS VARIABLES

Table 6 presents a comparison of the above-mentioned three lists of variables. The comparison is aimed at determining, in the first instance, whether the lists address the same issues and, in the second instance, to what extent the variables have been expanded on. The basis for this exercise is the South African version of the variable list.

**Table 7: Variables used in an SIA**

| VARIABLES | MUNN | BURDGE & TAYLOR | ICGP | SOUTH AFRICAN |
|---|---|---|---|---|
| ***Cultural Resources*** | | | | |
| Structures and sites of architectural, cultural or historical heritage | | X | X | X |
| Sites of archaeological or palaeontological importance | X | X | X | X |
| Special attraction of local sites, traditions or events | X | | X | X |
| Sites or areas of religious or spiritual significance | | | X | X |
| Sites or areas of special social or cultural interest | | X | X | X |

| VARIABLES | MUNN | BURDGE & TAYLOR | ICGP | SOUTH AFRICAN |
|---|---|---|---|---|
| The integrity of cultural resources | | X | X | X |
| Physical amenities | X | | | |
| ***Socio-Economic Characteristics of the Affected Public*** | | | | |
| *Demographic aspects* | | X | X | X |
| Growth rate of the local population | | | X | X |
| Location, distribution or density of population | | | X | X |
| Existing age or gender composition | | X | X | X |
| Existing biographical composition of population | | X | X | X |
| Existing migration movements | | X | X | X |
| Inflow of tourists/presence of seasonal (leisure) residents | | X | X | X |
| Relocation of individuals and families | X | X | X | |
| *Economic and Employment Status of the Affected Social Groups* | X | X | X | X |
| Economic base of the area | X | X | X | X |
| Distribution of income | | | X | X |
| Local industry/industrial diversification | | X | | X |
| Rate and scale of employment growth | | X | | X |
| Labour needs and the spare labour capacity of the area | | X | | X |
| Movement of labour away from the existing employment in the area | | | | X |
| Competition through non-local labour moving into the area | | | | X |
| Non-local labour remaining in the area after completion of development | | | | X |
| Agricultural activities | X | | | X |
| Pressure to comply with particular skills, age range or gender needs | | | | X |
| Job opportunities for school leavers | | | | X |
| Short-and long-term unemployment trends | | | | X |
| Formation of attitudes towards the project | X | X | | |
| Interest group activity | | X | | |
| Government structure/alteration in size and structure of government | X | X | X | |
| Changes in laws | X | | | |
| Planning and zoning activity | | X | | |
| *Welfare Profile* | | | X | X |
| Incidence of crime, drug abuse or violence | | | | X |
| Extent of homelessness and overcrowding | | | | X |
| Adequacy of services | | | | X |
| Adequacy of support systems such as crèches and shelters for destitute children | | | | X |
| Quality of life | | | | X |
| *Health Profile* | X | X | | X |
| Availability of clinics/health services | X | X | | X |
| Incidence of disease | X | | | X |
| Incidence of mental illness | X | | | X |
| Threats to health from pollution | | | | X |

| VARIABLES | MUNN | BURDGE & TAYLOR | ICGP | SOUTH AFRICAN |
|---|---|---|---|---|
| Role of nutrition/availability of food | X | | | |
| *Cultural Profile* | | | X | X |
| Existing lifestyles, household composition and family networks | X | X | X | X |
| Religious and cultural attitudes, outlooks and expectations | X | X | X | X |
| Cultural or lifestyle diversity | | X | X | X |
| Cultural or lifestyle stability | | X | X | X |
| Change in leisure opportunities | X | X | | X |
| Presence of outside agency | | X | | |
| Introduction of new social class | X | X | | |
| Presence of weekend residents - recreational | | X | | |
| ***Social Infrastructure Services*** | | | | |
| *Education* | X | | X | X |
| Demand for specific types of technical skills training | | | | X |
| Demand for specific types of industrial training | | | | X |
| Adequacy of existing technical institutions | | | | X |
| Adequacy of nursery, junior and secondary education facilities | | | | X |
| Need for additional education facilities | | | | X |
| Demand exceeding the planned provision of education facilities | | | | X |
| Pre-school facilities | | | | X |
| *Housing* | X | | X | X |
| Property values and levels of rates | | | | X |
| Potential conflict over land use | | | | X |
| Availability of housing stock | | | | X |
| Need to release additional land for housing development | | | | X |
| Acceptability of such land release | | | | X |
| Adequacy of infrastructure for further housing development | X | | | X |
| Ability of private or local authority to provide housing | | | | X |
| Compatibility of planned development with existing housing | | | | X |
| Location of suitable housing sites | X | | | X |
| Sites suitable for construction camps | | | | X |
| Standard of provision of facilities required by authority | | | | X |
| Design and layout of site facilities | | | | X |
| Use to which construction camp may be put after construction period | | | | X |
| Land acquisition and disposal | | X | | |
| ***Social and Community Services and Facilities*** | | | | |
| *Health Service Facilities* | X | X | X | X |
| Adequacy of temporary facilities during construction phase of development | | | | X |
| Adequacy of on-site health facilities | | | | X |
| Adequacy of facilities for primary health care | | | | X |
| Adequacy of existing health services to cope with increased population | | | | X |

| VARIABLES | MUNN | BURDGE & TAYLOR | ICGP | SOUTH AFRICAN |
|---|---|---|---|---|
| Projected provision of health service facilities | | | | X |
| Need for additional facilities | | | | X |
| *Emergency Services* | | X | X | X |
| Adequacy of existing emergency services | | | | X |
| Projected provision of services to meet increased demand | | | | X |
| Need for additional emergency services | | | | X |
| Adequacy of the emergency and safety services provided by the developer | | | | X |
| Ability of local resources to deal with emergencies | | | | X |
| *Recreational Facilities* | X | X | X | X |
| Adequacy of existing facilities | | | | X |
| Projected provision of facilities to meet increased demands | | | | X |
| Need for additional facilities | | | | X |
| Recreational and service facilities in the workplace | | | | X |
| Supporting infrastructure: police, libraries, etc. | | | X | |
| Shopping facilities | | | X | |
| ***Risk and Hazard*** | | | | |
| Level and identity of hazard to the public | | X | X | X |
| Probability of occurrence | | | X | X |
| Extent of effect – local, regional or panoramic | | | X | X |
| Standards required for process equipment | | | | X |
| Safety and design review | | | | X |
| Safety audits | | | | X |
| Hazard and operability reviews | | | | X |
| Failure mode and effect analysis | | | | X |
| Workers' safety/degree of risk | | | X | X |
| Level of risk and hazard for other living organisms | | | X | X |
| ***Health and Safety*** | | | | |
| In the workplace | | X | | X |
| Surrounding areas | | X | X | X |
| ***Psychological Features*** | | | | |
| Involvement | X | | | |
| Expectations | X | | | |
| Stress/frustrations | X | | | |
| Mobility | X | | | |
| Family lifestyles | X | | | |
| Community feeling | X | | | |
| Self-expressions | X | | | |

Table 6 summarises the various issues and variables that are addressed during an SIA. Most of the categories are covered by the five sources. Only the level of detail and the particular descriptions of the variables vary. A category that is not covered by the South African version is physical amenities, although certain of its variables are mentioned, though not to the extent done by Munn (1975). The relocation of individuals or families, the effects of formations of attitudes towards a project on the affected communities, interest group activities, planning and zoning activity, the role of nutrition, the presence of new classes or groups, and the acquisition and disposal of land are also not present in the South African checklist. The governmental aspects, which include the formal and informal administrative structures and changes in laws, are also not listed. A change in government structure might occur during the development of a project, and it might have an impact. It is further interesting to note that Burdge and Taylor did not make specific reference to two social infrastructure services, namely education and housing. The ICGP only referred to the broader categories, while the South African version went into a detailed analysis of the educational and housing issues. It needs to be stressed that the issues and variables are only guidelines for projects. Individual projects could feature fewer or more variables, depending on the type of project and activity.

Munn was the only author who made reference to the psychological features, and that was already done in 1975. Burdge only referred to the psychological variables at a very late stage when he refined the variables and split the variables between individual/household and community/institutional levels. The psychological features are not covered in the South African list.

Land acquisition and the disposal thereof are not mentioned in the South African list, but agricultural activities are treated in detail under a separate heading and include aspects of the usage of farmland, availability of resources, pollution and disease control measures. Erosion, the spread of invasive alien plants and housing are also covered in the section under agriculture.

## 2.7 AN EVALUATION MODEL FOR SOCIAL IMPACT ASSESSMENT

The evaluation model has been developed from the literature studied as reflected in the preceding sections. It is based on the best practices encountered internationally and will be used to determine which aspects and variables need be included in an improved model for Southern Africa.

The process that should be applied during the assessment:

- Step 1: Identifying the *need* for a social impact assessment, and determining the *objectives* for such a study.
- Step 2: Introducing a *public involvement programme* for eliciting input from the affected parties throughout the impact assessment. This is both a scientific and political requirement in SIA methodology.
- Step 3: Identifying *the relevant topics and issues* that need to be addressed in the course of the public involvement process.
- Step 4: *Obtaining information* on possible alternatives and the existing relevant conditions. This is basic information for both the SIA and for any policy decisions that claim to be rational.
- Step 5: *"Scoping",* which is probably the key step in designing the SIA. It involves, first, the development of a relatively exhaustive list of potential impacts of the action and, second, the selection, from that list, of the impacts to be studied in the SIA.
- Step 6: *Doing the actual research, and projecting the estimated effects.* The three main information sources for impact identification are the literature, experts and field research (including informant interviews). The social impact assessor tries to establish what happened in similar past cases by studying the available literature as a guide to what could happen in the case study.
- Step 7: *Predicting how the affected parties will respond.* Most SIAs do not implement this step, or do very little of it. It is essential to estimate higher order impacts and the political consequences of the action – information that should interest decision makers. This step also entails determining the attitudes of the affected parties toward both the action and its direct impacts, and their probable responses to the impacts. Respondents' statements about their responses might poorly predict their subsequent actions, but the statements can at least alert the agency to potential problems that might be resolved by appropriate agency actions.
- Step 8: *Estimating the indirect and cumulative impacts.* This is an obvious next step, but is often neglected or skimped. Again the patterns found in past cases can guide this step.
- Step 9: *Recommending changes in the action or alternatives* that would avoid the predicated negative impacts and enhance the positive impacts.
- Step 10: *Mitigating the negative impacts* by avoiding, minimising or rectifying them, or providing compensation.

- Step 11: *Programmed monitoring* to ensure that negative impacts are dealt with as they happen. Most SIAs lack this step but it should be remembered that the purpose of assessing impacts is to manage them. A programme that monitors the impacts and adjusts the action to unanticipated new conditions must supplement an SIA.

A further element of the model will be the use of the variables as derived from the previous section. The comparative evaluation of the variables will be dealt with in a separate section of the study and will be presented in tabular format.

Each of the five case studies will be evaluated against these variables and processes. The model will be amended on the basis of the results of the evaluation. This model will then be presented for application in the Southern African context.

## 2.8 CONCLUSION

This chapter has reviewed the development in both the SIA process and the change in management towards the greater acknowledgement of ecological concerns. It has focused on the inclusion of social or human aspects in the environmental assessment. The changes in legislation are also in accord with the changes in management style in the 1970s and 1980s towards environment-friendly management. Although the number of SIAs has declined considerably in the United States since 1980, SIA procedure has matured and can now be applied to various fields. At the same time, SIA has become more popular in other parts of the world, although concern has been raised in third world situations that only social needs are identified.

Even legislation and policy statements clearly highlight that the human factor is part of the environment and that human and social aspects need to be addressed. Consideration of the human or social factor can either be enforced by broad environmental legislation, as in the case of NEPA, or can be dealt with by itself, as in the case of the South African legislation. The importance of the human and social aspects is stressed at various government levels. Government departments have been responsible for guiding the SIA process by developing various guideline documents for practitioners of SIA.

An SIA has a definite contribution to make in any development project. Various projects have human aspects that should be addressed, not only in terms of needs

but also in terms of mitigating measures. An SIA needs to be a holistic process with various people from different fields providing data. The level of community participation is very important for the practitioner, as the community has to determine its needs and ways to address them.

An SIA can provide better information for decision making and offers great potential for integrating scientific policy analysis in a democratic system. It is also an effective tool for informing the public and encouraging its participation in policy debate.

An SIA is a definite process consisting of several steps, some of which distinguish it from a social analysis. The latter only addresses needs and does not indicate the intensity of the impact. Neither does it suggest measures for mitigation. The steps in an SIA that are unique are scoping, responding to the affected parties, mitigation and monitoring. It has been noted that a social variable implies a measurable, changeable feature of human communities, a feature that relates to either the demographic composition of the community or the daily activity of the community, and to either economic or social aspects of the community. The variables used in an SIA must cover the community and institutional aspects, conflicts between the existing and new issues, aspects that might impact on an individual and family level, and community infrastructure needs. An SIA needs to pinpoint the specific consequences of a proposed action. The issues addressed during an SIA only refer to human aspects and activities, or infrastructure that might influence human activity during and after the proposed project.

# 3 CASE STUDIES

## 3.1 SALDANHA STEEL PROJECT

### 3.1.1 BACKGROUND

The Saldanha Steel Project (SSP) was a proposal made by a group of four companies to build a steel plant at a location near Saldanha Bay. The steel plant would produce about 1 million tons of hot-rolled steel coils per year. The construction costs for the plant was estimated at about R4 000 million. All the steel produced would be exported. The additional hot briquette iron produced would either be exported or sold locally. The motivation for the project was to beneficiate iron ore for export, to earn foreign exchange and to further develop the West Coast Region. During operation the plant was expected to employ 600 permanent workers and during construction a number of temporary employment opportunities would arise. This number was expected to vary during the different phases of construction, with a maximum of 2 000 jobs estimated over the construction period (CSIR, 1994).

The preferred location was identified during Phase 1 of the feasibility study. The main factors for the selection of Saldanha Bay as the preferred location for the steel plant were mostly economic, that is, Saldanha Bay has the required facilities for iron exports. The Malgas Environmental Consortium (MEC) undertook a preliminary environmental assessment of the proposed project. It was found that significant environmental impacts could occur and a full EIA of the proposed plant was recommended at the identified location in Saldanha. In March 1994 the CSIR was commissioned to undertake this EIA. The EIA was based on the Integrated Environmental Management Procedure, as described by the Department of Environment Affairs (1992). The EIA coincided with the detailed planning and design phase of the proposed project.

The purpose of the EIA was to provide information to decision makers that would assist them in evaluating whether or not the proposed project should proceed at the proposed site. A broad interpretation was given to the term "environment" in order to include both biophysical and socio-economic aspects. In addition the EIA was intended to provide information that could guide an environmental management plan (EMP) for the activities of the site. If a decision was reached to proceed with the development of the steel plant, the formulation of an EMP for the steel plant would be necessary to ensure that the proposed mitigation and monitoring requirements arising from the EIA were heeded.

The environmental impact report (EIR) compiled by the CSIR provided the background to the SSP, and to the need, purpose and goals of the EIA. The other chapters of the report contained the approach to, and the methods used in, the EIA, specialist studies, the description of the affected environment and the SSP, the assessment of the effect and a synthesis of issues, predicated impacts and their implications for monitoring, mitigation, management and planning.

### 3.1.2 APPROACH AND METHOD

A firm of independent consultants, Crowther, Campbell and Associates, was appointed by the CSIR as independent facilitators to ensure the involvement of the public and interested parties throughout the EIA. The draft EIR formed part of the public consultation process, and interested and affected parties (IAPs) were invited to submit their comments regarding the report. The comments received were forwarded to the CSIR EIA study team and were included in the final report.

Scoping was undertaken in order to identify the issues that needed to be addressed in the assessment phase of the EIA. This was achieved through an open, participative approach involving the public and other interested parties. The goals of the scoping phase included the sharing of information, the identification of information gaps, obtaining early participation of all involved parties in the EIA process, and ensuring that all parties supported the EIA approach. At the end of the scoping phase feedback workshops were held in Saldanha, Vredenburg and Cape Town. From the workshops the following five key issues emerged:

- Ecological issues
- Risk of air and water pollution
- Effects of infrastructure needed for the steel plant
- Effect on aesthetics and "sense of place" of Saldanha
- Socio-economic and cultural issues

The specific terms of reference for the social specialist study were developed and later applied during the assessment process:

- Describe the existing social characteristics, problems, issues and trends in Saldanha Bay Region;

- Describe the existing demands for social services and facilities (e.g. education, housing, health and welfare) and identify areas where shortages or under-utilised facilities exist;
- Involve local interest groups in order to identify the possible social impacts for each phase of the project, including the potential influx of labourers and growth of informal settlements;
- Describe union activity, worker organisation and income level in the Vredenburg-Saldanha-Langebaan area;
- Describe the potential opportunities and constraints for the utilisation and training of local labour in the construction and operational phases.

For the purpose of the SIA, certain assumptions were made to guide the process, including the issue of land claims, which was beyond the scope of the SIA. For the purpose of the SIA, Crowther, Campbell and Associates defined "social assessment" as follows:

> "A process that helps to manage social change arising from intended and current policies and projects. It is focused on individuals, groups, communities and sectors of society affected by change, usually at a local or regional level. It is a process that uses social analysis and research, monitoring, methods of public involvement and consultation and community development."

The assessment of the potential impacts on the social environment was based on the *Integrated Environmental Management Guidelines* (Department of Environment Affairs, 1992). The checklist was used along with the "issues" drawn up during the public consultation process. The purpose of using the checklist and issues inventory was to assist in identifying the potential impacts and benefits of the Saldanha Steel Project in a rigorous and transparent manner. The following issues, including various sub-categories, were addressed:

- Demographic aspects
- Economic and employment impacts
- Welfare
- Health
- Culture
- Social infrastructure (schools and housing)
- Social issues, community services and recreational facilities
- Risk and hazard

The criteria for the impact assessment were obtained from the draft regulations published under Section 26 of the Environmental Conservation Act of 1989. The issues were described in terms of the extent, duration, intensity, probability of occurrence, legal and company requirements, significance, status of impact and the degree of confidence in predications. The recommended management actions were categorised into mitigation objectives recommended, mitigation/enhancement actions, effectiveness of the mitigation actions, and recommended monitoring and review programme.

### 3.1.3 IMPACTS IDENTIFIED

#### 3.1.3.1 The Impact on Housing Demand and Supply

Housing demand was increasing rapidly and housing backlogs already existed in the region. The region was experiencing an influx of job seekers and more affluent people contributing to the tourism industry. Housing supply responded by the development of numerous resorts, coastal suburbs and rural smallholdings, whereas development for middle- and low-income families was considerably slower. The design of the steel plant included a proposal for serviced land on the site for housing workers. The proposed steel plant would increase the rate of in-migration to the region. This increase would consist mostly of job seekers and low-income families and would continue from the construction to the operational stages of the project.

The assessment indicated that, as a result of the in-migration of job seekers during the construction stage, the housing demand for low-income households would increase as a result of the steel plant. This would lead to increased squatting, homelessness and overcrowding, in addition to the housing shortages that already existed. A negative impact of high significance would therefore occur and affect the middle- and low-income population of the region. The staff needed for the operation of the steel plant would increase the demand for high-quality formal housing.

Mitigation would be effected by the adoption of a housing policy by the steel plant and the local authority.

#### 3.1.3.2 The Potential Benefits to the West Coast Economy and Development

Spin-offs and links with businesses involved in construction would stimulate the local, regional and national economy, such as those producing construction materials,

building steel-producing plants, providing peripherals such as computer technology, and supplying business services. The most specialised equipment would be imported and would be of no benefit to the national economy. The operation of the steel plant would create at least 600 jobs in the region and an unknown number of indirect employment opportunities.

The assessment indicated that the potential benefits to the regional, provincial and national economy would be of high significance. The potential benefits were not site-specific and the steel plant would pay rates for services to the local authority, which would result in an economic benefit of high significance to the region.

### 3.1.3.3 The Impact on Population Growth and Unemployment in the Region

The region was experiencing rapid population growth. The growth was due to the in-migration of low-income job seekers, the natural growth of the existing population and the purchase of coastal holiday and retirement homes by more affluent groups. The steel project would cause the rate of population growth to increase further. This would increase the size of the economically active population, yet unemployment might also rise.

The assessment indicated that an increasing rate of population growth would have a significant impact on the existing population. This was because the anticipated competition for existing resources and facilities would increase, given the already high levels of unemployment. The impact would begin at the construction stage and continue during the operational stage of the project.

### 3.1.3.4 The Impact on Community Welfare and the Availability of Social Services

The influx of workers and job seekers associated with the construction and operation of the steel plant would increase the demand for social services and facilities. This would affect schools, many of which were already overcrowded, as well as health facilities such as clinics and the hospital. Existing health problems resulting from poor nutrition, poverty, homelessness and overcrowding would increase rapidly. The demand for recreational and community facilities would also increase. Existing public facilities were already in short supply and the situation could get worse.

The assessment indicated that the impact of increased demand for community welfare and social facilities was of great significance for the population of the region. There was a high probability that this impact could occur during the construction phase and continue in the long term.

#### 3.1.3.5 The Impact on the Cultural Characteristics of the Region

The West Coast has a distinctive culture due to its historical development and dependence on the sea. Its people are predominantly Afrikaans speaking and religious and have strong family and community associations. The incoming workers and job seekers would probably be composed mostly of low-income black households and a smaller number of well-educated professionals. Cultural and language differences were likely to occur between existing residents and these newcomers.

The assessment indicated that the impact on the cultural characteristics of the region could be of medium significance, occurring in the long term or even permanently. This was because existing residents could experience reduced feelings of community association and security and because competition for jobs, facilities and social services would increase.

#### 3.1.3.6 The Impact due to Pollution Risks and Hazards to Local Communities

Dust from existing iron ore handling facilities was a concern to local communities, particularly its possible effects on health and living conditions. The proposed steel plant could result in an increase in dust and other emissions. The impact of these would be experienced in areas downwind of the steel plant, including existing residential areas in the region. The impact of the dust was found to be of high significance in the vicinity of the site and medium significance at a regional level. Coal dust from the steel plant could be associated with lung conditions but it was predicted that the dust concentrations beyond the boundaries of the steel plant would be well below the levels of South African legal requirements.

The assessment indicated that the impact of pollution risks and hazards could be of medium significance to the region. This was because air pollution was already of concern to local communities and because other industries would also be established in the near future. The impact could persist in the long term if proposed residential areas to the north of the proposed site were developed. The pollution risk to workers'

health could be of high significance. This was because the predicted concentrations of dust within the plant site could be higher than the prescribed legal level. A low degree of confidence was associated with this assessment because the design of the steel plant was not finalised at the time of the study.

#### 3.1.3.7 The Impact on Archaeological and Palaeontological Resources

The region is of considerable archaeological and palaeontological importance. This is because many archaeological/palaeontological sites occur in the region and because many of these sites are of high quality and of international importance, an example being Hoedjiespunt. Preparing the site and constructing the steel plant would involve excavations and levelling of areas, which could disturb or destroy the archaeological and palaeontological resources.

The assessment indicated that the impact on the archaeological and palaeontological resources could be of medium importance. The site contained archaeological resources in recently deposited surface sand and older resources in calcrete material. The calcrete sediments could contain evidence of human development during the Middle Stone Age. These areas were protected by the National Monuments Act of 1969 (CSIR, 1994).

### 3.1.4 CONCLUSION

The SIA of the SSP was an infrastructural development study. It formed part of an EIA and therefore was one of the specialist reports contained in the EIA. The study touched on regional and national impacts.

The SSP had a very clear process in terms of public participation and social assessment. Public involvement was contracted to independent facilitators. They gathered information via workshops held with the communities and interested parties. During scoping all the issues that needed to be addressed were identified. The SIA set goals for information sharing, the identification of information gaps and participation. The terms of reference and a definition of the SIA were developed to define the scope and parameters of the SIA of the SSP.

The potential impacts that were identified, were based on the *Integrated Environmental Management Guidelines*. Each impact was described, its extent was estimated and ways in which it could be addressed were teased out. No mention was

made of a monitoring plan in the SIA, but this might have been addressed in another section of the EIA of the SSP. All in all the SIA followed international prescriptions.

Issues that raised concern were:

- Ecological aspects
- Risk of air and water pollution
- Effects of infrastructure
- Aesthetics and the sense of place of Saldanha
- Socio-economic and cultural issues

The following impacts were investigated:

- On housing demand and supply
- On the economy and development
- On the demographic profile and unemployment in the region
- On the community's welfare and the availability of social services
- On the cultural characteristics
- On health
- On archaeological and palaeontological resources

The analysis of the variables will be discussed in chapter four. The list of variables covered in the SIA of the SSP was very comprehensive and the variables were covered in detail. This SIA can therefore be described as very comprehensive and successful.

## 3.2 CORRIDOR SANDS PROJECT: SOCIAL IMPACT ASSESSMENT

### 3.2.1 BACKGROUND

The SIA of the Corridor Sands project addressed the socio-economic/cultural impacts associated with the proposed Corridor Sands heavy minerals mining project in Gaza Province in Mozambique. In the 1997 census, Gaza Province had an estimated population of 1 062 380 people. It was heavily dependent upon its agricultural base to support the regional economy and 7,6% of the population were classified as rural dwellers.

Declining returns from migrant labour to South Africa had a negative impact on the economy. Access to migrant labour had important socio-economic implications. It gave young men alternative access to income and greater economic independence from their families, resulting in a decline in extended families and a growth in nuclear families. It also meant that households became less directly dependent on subsistence crops, and allowed the population to expand into areas where agriculture was not the chief source of income.

The declining socio-economic standards in the southern provinces were exacerbated by the civil war. The signing of a peace accord paved the way for a successful transition to peace in Mozambique. This led to an overwhelming emphasis on social reconstruction. Many of the people who were displaced by the war returned to their homes and began rebuilding their lives. Tourism increased in importance as visitors, mostly South Africans, returned to the coastal beaches.

At provincial level the Corridor Sands project was critical from a number of perspectives. More specifically, the project might provide a source of local employment and go some way towards easing the dependency on the natural resources in the district. In addition, the project had the potential to increase private sector employment in the district (Huggins *et al.*, 2000).

#### 3.2.1.1 Background to Chibuto

The town of Chibuto had a population of 51 450, of which 23 450 people lived in the town itself. There were about 840 households living in the study area. The average household size was about eight people and therefore about 6 500 people might be affected by the proposed project. Chibuto was developed as an agricultural service centre providing a market and infrastructural support to the farming activities in the

district. The decline in large-scale and commercial agricultural activity after independence led to the gradual disintegration of the services provided in the town. Although the town served as the district's administrative headquarters, the infrastructure was neglected. With the onset of Renamo activity the town became home to people displaced from the surrounding rural areas. Increasing dependence on the town's resources, with a decline in the tax base to support its maintenance, meant that the resources disintegrated rapidly. In 2000 the town's infrastructure was gradually being rehabilitated (Huggins *et al.*, 2000).

#### 3.2.1.2 Socio-economic Consequences of the Floods

During February and March 2000 the southern provinces of Mozambique experienced heavy flooding, resulting in extensive loss of life and property. An estimated 25 000 people took refuge on the higher areas in and around the town. In Chibuto the floods resulted in an increase in:

- Pressure on local, provincial and national government
- Population size
- Household food shortage
- Cost of basic commodities
- Potential for conflict over land
- Aid and development

In addition, the floods increased the project's appreciation of the socio-economic value of the sandy soil of the study area, that is, that is was a reliable source of food and a refuge during times of flood and drought (Huggins *et al.*, 2000).

### 3.2.2 APPROACH AND METHOD

The project was expected to impact directly upon the people living in the study area and upon those in the wider region. The EIA report consisted of a number of specialist reports, including an SIA report. The purpose of the SIA was to examine the macro socio-economic environment, the provincial and district context, and issues relating to households directly affected by the project.

The terms of reference for this study were to examine the impacts of the project, to contextualise these impacts and then to assess them. The report addressed the patterns of settlement in the mining area and land use rights associated with them. The critical issue of burial sites and the relationship between communities and these

sites were investigated. The report further assessed the impacts, ranked them in terms of significance, and recommended mitigation and management strategies to deal with the impacts. Since a detailed resettlement and compensation plan was presented in a separate study, it was excluded from the scope of the SIA.

The information of the SIA report was prepared after a scoping study and more intensive field research. The dominant field method utilised was a series of in-depth household-based interviews with respondents from randomly selected homesteads. The interviews were structured by means of a questionnaire but respondents were asked to speak freely about issues of concern. Qualitative interviews with key stakeholders were also undertaken (Huggins *et al.*, 2000).

### 3.2.3 IMPACTS IDENTIFIED

#### 3.2.3.1 Loss of Productive Land and Settlement Type

This was the issue of greatest concern both to the affected population and the Corridor Sands project. Access to the land and its resources was of critical importance to sustain the livelihood of people who had been rendered extremely vulnerable by poverty, changes in the system of migrant labour and the protracted civil war. The settlement patterns could be divided into four types:

*Urban* settlement – people living formally in Chibuto and accessing available services such as water and electricity. Most Chibuto households continued to cultivate land outside of town as part of their subsistence activities. Urban residents identified two homes – an ancestral home attached to their field and a home in Chibuto.

*Peri-urban settlements* – on the outskirts of town. These areas were densely settled, with permanent structures made of brick or reeds, and houses were divided into separate family units. Formal job opportunities were negligible in peri-urban settlements and people continued to rely heavily on the limited subsistence produce of their fields.

*Communal villages* ("aldeias communais") – villages administrated through a system of secretaries reporting to a locality secretary. The strategy behind these villages was to concentrate people in areas that could be more easily protected and administered than the dispersed rural settlements. The homesteads were clustered on small plots of land adjacent to the larger fields.

*Rural settlements* – the residents remained here during the war, or returned here in the post-war years. The homesteads and fields were seldom demarcated with fences but boundaries between the lands of individual owners were clearly recognised. Homesteads were far more dispersed than in any of the other settlement types.

Rural and communal village residents whose settlements would have to be removed if mining was to go ahead would be affected the most. Residents of villages, peri-urban and urban settlements and those whose fields fell within the study area would also be affected by reduced access to land and resources. People living and farming in areas that were to become host sites for resettlement would also be affected by changes to their access to land and resources.

In an ideal world, mitigation in the form of the successful implementation of a resettlement and compensation plan would greatly minimise the impact of a development project. However, structures were fluid and dynamic and not all of those directly affected would respond in the same way. In all likelihood some people would be much better off after the implementation of the project, some slightly better off, some slightly worse off and some much worse off. The challenge for the developer was to ensure that the resettlement and compensation catered for the last two categories. Without successful resettlement and compensation the impact on the vulnerable categories was likely to be negative and of high significance.

#### 3.2.3.2 Resettlement

Development projects that displace people involuntarily generally give rise to severe economic, social and environmental problems. Involuntary resettlement may cause severe long-term hardship, impoverishment and environmental damage, unless appropriate measures are carefully planned and carried out. Thus the successful implementation of a widely accepted resettlement and compensation plan will significantly reduce these impacts. If such a programme is carried out in phases and resettle people as and when the mining operation requires this, it will further reduce the negative impacts and ensure the successful rehabilitation of land.

Most access to and use of land in the Chibuto area were not supported by a title deed, but rather by traditionally recognised criteria such as historical settlement,

familial inheritance and current occupation and cultivation of land (Huggins *et al.*, 2000).

#### 3.2.3.3 Undermining Local and Traditional Authorities

The expropriation of land in the study area could undermine the residents' confidence in their traditional and elected authorities. This could result from a perceived failure, on the part of these authorities, to protect local interests. The expropriation of land would result in an impact of moderate significance. Mitigation in the form of successful inclusion of these authorities in a widely acceptable and participative resettlement and compensation process would reduce this impact. Affected communities should experience expropriation as a participative process rather than as a sudden and unexpected event that the traditional authorities were seen to be unable to influence.

#### 3.2.3.4 Changes to Social Systems and Structures and Household Strategies

The project might alter existing power relations and thereby increase the potential for conflict within and between settlements. The environmental significance of this might be high. Altered power relations might result in perceived and real differences in access to employment between settlements, which might reduce the functioning of current inter-village social support systems. The environmental significance of this impact would probably be high.

Employment of outsiders, particularly expatriate workers, might create tension and potential conflict with local residents. The environmental significance of this impact would probably be high. Mitigation for the respecify three impacts in the form of successful and participative community-based forums would reduce the significance of these impacts.

The implementation of the project would probably contribute to a perceived sense of reduced emotional well-being. Mitigation in the form of open and transparent interactions between the developer and affected individuals would reduce this impact, but the environmental significance would probably be high.

The implementation of the project would probably contribute to a disruption of emotional support structures. Mitigation in the form of creating resettlement blocks that recognised that support networks rely on the geographical proximity of

dependent households would reduce this impact, and the environmental significance would probably be moderate.

The implementation of the project would probably contribute to an increased incidence of sexually transmitted diseases, including HIV. Mitigation in the form of educational programmes and awareness raising might reduce this impact, but the environmental significance would probably be high.

Household livelihood strategies in the Chibuto area could be understood as ongoing negotiation between demands on the household to engage in cash-generating activities and demands to engage in food-producing activities. A range of factors ultimately determined household activities and priorities, including household size and demographic composition, household location, economic differentiation between households, variations in traditional rights to resources such as land, and the general local and regional economic climate. Common trends within households that collectively determined the myriad of forms that households took are listed below:

- Trend 1: Households closer to the urban centre tended towards engaging more in cash-generating activities whereas households located in rural areas tended towards engaging more in food-producing activities.
- Trend 2: In times of relative economic prosperity, households tended towards engaging more in cash-generating activities in addition to food-producing activities, whereas in times of relative economic hardship they tended to focus on food-producing activities.
- Trend 3: Female-headed households were generally poorer than male-headed households.
- Trend 4: Younger households tended to engage in cash-generating activities more than older households, which tended to engage more in food-producing activities.
- Trend 5: Households with greater access to land had greater potential to engage in cash-generating activities as well as food-producing activities.
- Trend 6: Households with access to regular and stable migrant remittances were more able to invest in, and therefore gain returns on, local resources (Huggins *et al.*, 2000).

### 3.2.3.5 Impacts of Relocating Graves

The project would require the relocation of graves. Mitigation in the form of an appropriate and culturally sensitive process to relocate the graves would reduce this impact, but the environmental significance of this impact would definitely be high.

The relocation of graves and gravesites as a result of the mining activity would have a most significant impact on the livelihoods and lifestyles of the people, as gravesites had great significance for them. This emerged from the belief that the spirit of individual persons maintained an active interest in the living and exerted an influence on them. Consequently, graves developed into sites of particular social significance beyond their role as symbols of the relationship between the living and the dead. It was largely the practice of ancestor worship that imbued graves with particularly strong cultural significance.

On an individual level, graves represented important sites for coping with the death of close relatives. Not all individual activity in respect of graves was directed at graves of recently deceased relatives. In some cases, the diagnosis of a traditional healer might reveal that the ancestors required an individual to pray at particular graves. Graves also provided individuals with a psychological sense of belonging to a family and a broader community. The ancestral protection and blessing that were achieved through practices around graves also contributed towards ensuring the well-being and prosperity of the homestead as a functioning social unit. Good crop yields, good fortune and positive social relationships within the homestead were often attributed to ancestral blessing that resulted from appropriate traditional behaviour. Misfortune within the homestead, on the other hand, was sometimes explained as the result of ancestors withholding favours or blessings.

In addition to these important social functions, graves also represented a powerful claim to land. The graves of forefathers on or around one's fields constituted a traditionally acceptable "proof" of ownership of those fields through a history of family occupancy within an area (Huggins *et al.*, 2000).

### 3.2.3.6 Changes to the Physical Environment

The project would cause a number of changes to the physical environment that would impact on the people living in and around the study area. Many of these changes, such as an increase in dust, were assessed in other specialist studies. The

implementation of the project would increase ambient noise levels. Mitigation to reduce this impact was unlikely to be effective, and the overall environmental significance of this impact was assessed to be moderate.

The implementation of the project would probably increase safety risks. Mitigation would only reduce this impact slightly. Its overall environmental significance was therefore assessed to be moderate. The project would contribute to a loss of access and transport routes. Mitigation through the replacement of these routes would reduce the significance of this impact to moderate.

The visual quality of the study area would impact on local residents as the size of the pit increased and the height of the evaporation dam rose. Mine infrastructure would impact on the aesthetics of the area. In order to manage this, appropriate rehabilitation of the evaporation dam would have to be carried out to blend the dam with its surroundings. This impact was difficult to rate with current knowledge and the significance was therefore not known.

#### 3.2.3.7 Expansion of Economic Opportunities and Extension of Service Provision

The creation of permanent jobs would be beneficial. Optimisation of such action entailed the recruitment of local people, which would result in an impact of high positive significance.

The creation of opportunities for the expansion of the skills base would probably result in a beneficial impact. Optimisation of such action entailed the training of local people, which would result in an impact of high positive significance.

The extension of services would probably result in a beneficial impact. Optimisation of such action entailed creating access for local people to better services, which would increase the benefits of the impact. The environmental significance of this impact would be highly positive.

Encouraging socially responsible utilisation of tax monies would optimise the expansion of the national tax base, although this was beyond the scope of the developer's control. The environmental significance of this impact would be highly positive.

#### 3.2.3.8 Return to the Land

The return of rehabilitated land to people would probably result in a beneficial impact. Optimisation of such action entailed rehabilitation of the land in a manner that would leave it more productive than it had been in the past so it could be utilised in a sustainable manner. The provision of extension services and marketing channels would also help in this regard. Successful rehabilitation would increase the benefits of the impact significantly. The environmental significance of successful rehabilitation would be highly positive.

#### 3.2.3.9 Housing

The development of appropriately planned housing for permanent staff and construction workers would probably result in a beneficial impact. Optimisation of this impact entailed developing housing in a manner that was commensurate with the logical growth of the Corridor Sands housing policy. The environmental significance of this impact would be highly positive.

#### 3.2.3.10 Smelter and Mineral Processing Site

The development of the smelter at Chibuto together with the mineral processing plant and related infrastructure, including a rail siding and storage facilities, would require the permanent occupation of about 100 ha of land. Local training programmes should therefore be instituted. The environmental significance of this impact would be highly positive.

### 3.2.4 CONCLUSION

The establishment of a mining activity was the proposed development action and would have definite impacts on the lives of the rural area. The study had regional significance. The SIA report of the Corridor Sands project was a separate report, as was the case with the SSP, and formed part of the EIA report. The SIA established terms of reference with which to examine the impacts, contextualised and assessed the impacts, explored the needs to be addressed where households were directly affected, and identified the required mitigation measures.

The study was a classic SIA, resulting in a thorough social analysis in the study area. A detailed description of historical, demographic and infrastructure information was

provided. As Chibuto was a dominant rural area it was important to understand the settlement patterns, as the land had ancestral value to the residents and in many cases provided in the livelihood and food production. The graves had great religious significance and formed part of ancestral worship. They further provided the individual with a psychological sense of belonging to a family and broader community.

A scoping study was done to obtain information. Structured interviews were conducted with the aid of questionnaires. No mention was made of public participation besides the structured interviews with the households.

The identified impacts were discussed and assessed, and mitigation measures were suggested. The impacts of the development were:

- Loss of production land
- Resettlement
- Undermining the local and traditional authority
- Changes to the social systems and structures
- Relocation of the graves
- Changes to the physical environment
- Expansion of economic opportunities and extension of services
- Possible return to rehabilitated land
- Housing changes
- Erection of smelter and processing site

The SIA strongly focused on cultural and socio-economic aspects, on both individual and community levels, as described by Munn and Burdge. Therefore the SIA did not cover all the aspects covered by the other SIAs. The study however provided important insight into cultural and traditional issues and together with other reports provided a comprehensive information base. The cultural issues indicated the significance of the impacts of the development, and the suggested mitigative measures raised the validity of the study. All the social aspects in a community need to be understood and, as the study indicated, need to be addressed in detail. A full analysis of the social variables will be given in chapter four.

This SIA provided extensive background information, addressed the social issues, and then suggested mitigation measures to benefit the development. The social

variables mainly focused on the basic needs and strong cultural beliefs of the population.

## 3.3 LESOTHO HIGHLANDS WATER PROJECT (MOHALE DAM)

### 3.3.1 BACKGROUND

Anticipated water shortages in Gauteng gave rise to the Lesotho Highlands Water Project (LHWP). An annual water demand increase of 3,8% due to projected population growth led to the first discussions on the project between South Africa and Lesotho in the 1960s. After the evaluation of more than 2 000 variations amongst several main alternatives the final proposals for the transfer of water from Lesotho to the Vaal Dam were endorsed in 1986 and the LHWP came into existence through the signing of a treaty between the two countries. The project consisted of a large and complex water transfer scheme that would alter the water course and deliver water from Lesotho to South Africa by way of two dams and a diversion tunnel (LHDA, 1997).

The purpose of the EIA of the LHWP Phase 1B was to identify and describe the positive and negative effects in the biophysical and socio-economic sphere. The EIA described the relative importance of the various impacts and proposed mitigative measures.

A number of environmental issues surfaced during implementation of Phase 1A. At the time the Lesotho Highlands Development Authority (LHDA) was dominated by an engineering philosophy, and the environment interest within the LHDA was in its infancy. Examining the experiences from Phase 1A, the LHDA would be able to avoid a number of problems in the design, planning and implementation of Phase 1B. The lack of client focus and service orientation was a shortcoming that was identified in Phase 1A. From an environmental point of view the LHDA was not pro-active. In the formative years there was little or no coordination between the engineering, construction and environmental division. The people who were to be most affected by Phase 1A were not kept informed of aspects of the project that were relevant to them and they had no forum in which to express their views or provide input regarding these aspects. A rural development programme was planned to mitigate a number of Phase 1A impacts and to enhance the environment, but it was slow in starting and suffered management and implementation difficulties.

### 3.3.2 APPROACH AND METHOD

An EIA was developed and put into place in the early planning and design stages of Phase 1B. Baseline studies were commissioned to provide the necessary information for the preparation of the EIA report. People to be affected were kept informed throughout, particularly those who were required to relocate. A very active participation programme resulted in a facility being available to local people for deciding upon their own destiny regarding relocation. A rural development programme for mitigation of impacts on relocated communities was prepared well in advance of project construction. Field teams had to maintain public awareness and to provide on-site compensation for local impacts to a specified maximum amount (LHDA, 1997). The experience gained from Phase 1A led to a more comprehensive and effective programme for the environmental management of Phase 1B.

The basis of the EIA was a large number of commissioned studies. These included studies on water quality and aquatic communities, biological baseline information, epidemiology, prehistory, the Maloti minnow, resettlement and development. Studies also included individual environmental assessments for the major engineering components of the project. The latter group of studies included a social baseline study of the Mohale catchment, and studies of the downstream impacts of the Senqunyane/Senqu River system, and the Orange River respectively.

Workshop participants determined the list of important environmental components to be addressed. Scoping for the assessment was based on these components and on the extent and timing of anticipated impacts (LHDA, 1997).

#### 3.3.2.1 Public Participation

The residents in the areas of the proposed construction sites had input to the preparation of the various environmental assessments prepared for the different engineering components of the project. In particular the people whose land was to be inundated by the Mohale reservoir were involved in continuous participation. Several workshops were held in the early stages of the EIA to identify impacts and discuss mitigative measures to be taken. Presentations of draft reports were made to the LHDA and the second presentation was jointly conducted by the assessors and representatives from the Phase 1B area. A Sesotho summary of the EIA in its draft final stage was delivered to the villages throughout the project area and feedback

was received that either confirmed the EIA findings or could be used to modify the report.

Phase 1B of the LHWP would consist of the erection of the Mohale Dam on the Senqunyane River, a diversion weir on the Matsoku River and transfer tunnels delivering water to the Katse reservoir. This phase would also include the upgrading of existing roads and the development of new roads, the development of construction camps and the provision of power transmission and telecommunications facilities (LHDA, 1997).

### 3.3.3 IMPACTS IDENTIFIED

A project of the nature, size and complexity of Phase 1B would have a large number of impacts on the socio-economic and biophysical environment. The impacts of each of the important environmental components were considered. Each impact was scored for four factors and the scores were added to rate the significance of the impact. The levels of significance ranged from "very high" to "high", "moderate" and "low". Suggestions for mitigation were provided for each impact described. The variables described were based on the South African and international checklists. The adverse impact on housing and village infrastructure in the reservoir area was obvious. Inundation would result in the loss of agricultural livelihood, biomass fuels, food security and community social structures. Based on experiences from Katse (Phase 1A), the effects on the informal sector, commercial ventures and food security were predicated. The effects on short-term employment were derived from observations elsewhere. The impacts on the various cultural practices were derived from observations elsewhere where people had been exposed to large development activities and where income-earning opportunities had been provided. The impacts on local village schools were derived from the Katse experience (Phase 1A). The impacts on clinics, occupational health, public safety, STDs, substance abuse and other health problems were all derived from the Katse experience and observations elsewhere. The impact on archaeological sites was derived from the fact that inundation would make them inaccessible (LHDA, 1997). Only the most important impacts or groups of impacts are briefly described in the following sections.

#### 3.3.3.1 Housing and Village Infrastructure Relocation

A total of 387 households would be required to relocate as a result of inundation. Such dislocation could be very disruptive for those who had resided in the same

location for many years or generations. Through community participation and the resettlement and development programme these families were allowed to choose the location of their future homes. They would be resettled and provided with homes and various infrastructure and services that would be equal or superior to what they would be leaving behind.

The impact on housing and village infrastructure would be high. Mitigation for inundated villages and homes would include full resettlement. There was no practical mitigation for informal settlements along the access roads. Structural problems and cracks in houses and village infrastructure as a result of the blasting and drilling would be repaired through the compensation programme.

#### 3.3.3.2 Land Tenure

The impact on land tenure would be moderate. Mitigation would include compensation, job training and income-generating projects. The loss of livelihood as a result of inundation and construction would be definite, permanent, regional and highly severe The impact on livelihood and subsistence agriculture would be high.

#### 3.3.3.3 Informal Economic Sector and Related Issues

Although the local economy would improve during the period of construction, the results of a significant expansion of commercial sex could disrupt families and increase the levels of STDs in the communities. The sale of brew could lead to substance abuse, crime, fighting and injury. The impact would be definite, regional, of moderate duration and highly severe. The negative impact on the informal sector would be high. However, this would be partially offset by the economic benefits of more desirable informal sector ventures such as teashops, barbering, shoe repairs, snack food outlets and improvements in the local economy. Mitigation would include more effective policing, including the establishment of a police post at Mohale, and health education.

#### 3.3.3.4 Short-Term Employment

In the long term the dependence on cash would create a way of life from which it would be difficult to break away. With the possibility of diminishing job opportunities over time, household impoverishment would increase. The impact would be definite in the medium term, and highly severe in the region as a whole.

The negative impact on short-term employment and its consequences would be high. The problems created by the short-term employment could be mitigated to some extent through the introduction of rural development activities that would provide long-term income generation. Skills training for specific jobs on the construction site would be provided in order that the local people could take these skills elsewhere following the completion of the scheme. Workers were to be informed quite emphatically that their employment would have a definite termination date, but that their wages would be structured in such a way that they would have an income for several months after termination of their service contracts.

#### 3.3.3.5 Food Security

Many of those living in the highlands relied on locally produced crops for some or all of their food. The loss of arable land and the resultant decrease in local food security would affect some 3 000 people who relied on food grown in the identified Mohale inundation area. A number of families would lose their food security as a result of fields lost to the dam footprint and infrastructure. Food security would also be a problem in the Matsoku area, although to a lesser extent than in the Mohale area. The effect would be definite, permanent, extensive and moderately severe. The impact on food security would be high.

In terms of mitigation, those who lost their land would be resettled or provided with suitable other compensation. Crop improvement would be introduced in order to compensate for the loss of crop yield through the loss of cropland.

#### 3.3.3.6 Cultural Identity

The highlands people had developed a unique culture of which they were proud. The project and a host of related activities would affect the traditional activities and culture of these people throughout the project area. It would be important to protect as much of the culture as possible. The people had to be ensured that they would be able to continue their lives in an independent and socio-economically viable manner. The people in the affected area required one return from the project: jobs. The guarantee of jobs would be fair compensation for the various socio-economic impacts that they were to experience.

Local cultural identity would be eroded and for many it would be lost as they became integrated with another culture dominated by steady work hours, cash rewards and spending patterns associated with urban life. The impact would be definite, permanent, regional and highly severe. The impact on cultural identity would be high.

Mitigation could include compensation packages, where required. These should not comprise simple handouts. Such handouts would destroy the self-reliance, initiative and capacity of the mountain people to survive under harsh, difficult conditions. Compensation annuities provided in perpetuity would a better alternative. No mitigation for the cultural change and loss of cultural identity would be available.

#### 3.3.3.7 Community Social Interactions

The village structure throughout the catchment area was expected to deteriorate but not break down entirely. The deterioration would be permanent, regional and of low severity. It would be very serious for those who relied on village social interactions for their livelihood and existence. The impact on community social interaction was expected to be moderate. Partial mitigation for the loss of community social interaction could include the relocation of entire communities.

#### 3.3.3.8 Family Social Structure

Many households were quite accustomed to having the household head absent for many months at a time whilst that person was working in a South African mine. The likely impact was expected to be temporary, extensive and of low severity. It might be widespread but would not be serious. The impact on family social structure would be low. There was no mitigation for the impact on family social structure.

#### 3.3.3.9 Traditional Activities

Traditional activities were expected to continue. The impact on traditional activities would be temporary, extensive and of low severity. There were no mitigative measures for any of the traditional activities.

#### 3.3.3.10 Gender Issues

Housewives would probably be disadvantaged, irrespective of whether or not they or their husbands gained employment from the project. The likely impact was expected to be temporary, extensive and of high severity. The impact on gender issues would

be moderate. However, the cash that women could earn through jobs related to the project might offset the impact. There was no mitigation for women's extra burden unless men recognised the need for, and contributed to, more equitable task sharing.

#### 3.3.3.11 Schools and Clinics

Opportunities for members of a community to obtain employment in later life were diminished by a decrease in the quality of local educational services. The impact would accrue to all children of school-going age in a given community and the effects of the impact would be permanent. The availability of medical services would decrease unless the project provided additional services. As a result of an influx of people to the area, medical facilities might not be readily available to the permanent residents. The likely impact was temporary, local and of moderate severity. The impact on schools and medical facilities would be moderate.

Mitigation would include the expansion of existing schools and the establishment of new and replacement schools. Mitigation would also include the provision of medical clinical services. The provision of medical services was part of the LHWP and thus the project provided an overall benefit in this regard. Facilities at the nearest hospitals could be improved so as to deal with referrals from clinics.

#### 3.3.3.12 Occupational Health

A careless, badly managed work site could lead to many injuries and some fatalities. The damage could be permanent and could affect many people, both directly and indirectly. The consequences might be felt over an extensive area. The likely impact would be temporary, site specific and of very high severity. The impact on occupational health would be moderate.

Injuries could be minimised and fatalities avoided with the implementation of an effective and comprehensive safety plan. The plan should include proper training of all equipment operators. All machinery should be equipped with warning equipment. All construction workers would be provided with appropriate safety training and awareness seminars, as well as appropriate safety equipment, safety hats and boots, safety gloves and other necessary protective clothing. The plan would contain an emergency response component that would detail medical treatment procedures as well as evacuation procedures. Each of the construction sites would have substantial first aid equipment and at least one person at each site at all times would have

appropriate first aid training. Mitigation for the impacts that could be caused due to maintenance of the repeater stations would include proper training and safety equipment including proper eye protection. Training of workers who were exposed to hazards was essential.

#### 3.3.3.13 Nutrition

The impact of food availability would only affect a small number of families since the total cropland lost would be relatively small. However, the impact would be permanent and would be serious for those families affected. Generally, nutritional levels would decrease. This would affect the population in proximity to the road and the construction sites. The effects could lead to ill health. The impact would be definite, permanent, extensive and moderately severe, and therefore consider to be high. However, this could be offset by the availability of a wide variety of affordable nutritional foods imported to the area.

Mitigation could include crop improvement on the remaining lands of each farm. This improvement could also include, through extension services, the planting of mixed crops to optimise nutritional benefits.

#### 3.3.3.14 Sexually Transmitted Diseases

The influx of a large labour force that would be relatively wealthy in comparison to the local people without project jobs would alter the lifestyles and cultural activities of the latter. The high proportion of single males in the labour force would result in increased sexual encounters with prostitutes from outside the local communities or with local women. An increased STD incidence was expected among the local population, and the spread of HIV/AIDS was a particular concern. Through a public health programme the project would raise public awareness on the subject of STDs and distribute free condoms. However, it was highly unlikely that an increase in the incidence of STDs would be prevented, although the problems at the Mohale tunnel or Matsoku would not be as severe as they would be at the Mohale Dam area. The construction crews for Matsoku and the tunnel would be bussed from Ha Lejoene and Mohale, respectively. The impact of STDs would be definite, permanent, regional and highly severe. The impact of STDs would be very high.

Mitigation would include a public health education programme, the distribution of free condoms to workers and the local population, and the control of development of

STDs in the vicinity of the workers' camp. An expensive but effective measure would be to provide construction workers with married quarters.

### 3.3.3.15 Substance Abuse

Substance abuse can tear families apart and destroy the familial economy as more of the family income is spent on drugs such as alcohol. All family members are affected. Substance abuse can lead to crime committed for the purpose of obtaining more money for substance purchase. Substance abuse would be localised, affecting only a small proportion of the community, but it would seriously affect the families concerned. The impact would be definite, temporary, regional, and moderately severe. Public education on the dangers of substance abuse would contribute to the control of substance use.

### 3.3.3.16 Other Health Problems

The peaceful atmosphere in the communities would be lost for up to five years during the construction period. Individuals could sustain permanent physical harm from noise, dust and stress levels. As a result of the activity of the project, long-term psychological problems could emerge. Their effects were unlikely to be severe, and they would probably affect only a portion of the population. The impact of other health problems was probable, temporary, extensive and of low severity. These situations, for example air and noise pollution threatened the health of both residents and the construction workers. The impact on other health disorders, resulted from noise and air pollution would be high.

Mitigation would include strict hours for machinery operations and the detonation of explosives, as well audio warnings for events such as blasting. It would also include the wetting of roads to contain dust levels and other controls for minimising noise and dust. Further mitigation might include continued local community involvement to ensure that people were made aware of construction programmes and schedules. An advanced resettlement programme for the people of Ha Tsapane and Mamakoluoa should be considered.

### 3.3.3.17 Public Safety

The construction areas presented a number of safety-related dangers to both people and animals. Apart from the risk of drowning, the dangers were only temporary and

localised, but they could lead to serious injury or death. People from Kutu Kutu, using the tunnel as a shortcut, could meet with a sudden deluge of water and would be drowned. The impacts of public safety on the community would be probable, local, temporary and highly severe. The impact of the reservoir and water behind the weir was possible, local, permanent and highly severe. The impact on public safety would be high.

People of the villages had to be made aware of the dangers associated with the construction phase of the project. Warning signs would be posted in appropriate locations, all vehicles and machinery associated with construction would be equipped with audio and visual warning devices and all facilities would be designed to avoid accidents. Safety devices would be provided where required. Particularly risky areas, including quarry and spoil dump areas, and other work areas, would be fenced.

#### 3.3.3.18 Access

Because farmers would no longer be able to move their livestock into preferred summer grazing areas without travelling great distances, livelihoods would be affected. Cultural ties might be disrupted and economic activity affected. The impact of dividing a large portion of the catchment into two parts by the construction would be extensive. This impact would be permanent and a serious burden to those who were affected.

Not all residents would gain economically as a result of the construction activities. Some would have to face the increased cost of transportation. This impact would be serious and permanent, and could affect a large number of people throughout the catchment. The impact on access would be high.

Mitigation would include the provision of an access road around the reservoir, linking the two sides, as well as a ferry service and ferry terminals with proper access steps. Mitigation at Matsoku would include the provision of footbridges across the Matsoku weir in appropriate locations. Mitigation for the access problem for the people at Ha Tspane would include a footbridge across the river downstream of the work site.

#### 3.3.3.19 Archaeological Values

Bushman rock paintings were a threatened cultural resource and the paintings at two of the sites were of great significance. One of the paintings apparently depicted four

elephants. Paintings of elephants were rare in Lesotho, the only one other site known being located in the lowlands. Inundation would destroy the sites and their features permanently. The impact on archaeological features was not extensive, but it was important, particularly for the sites containing paintings. The impact would be definite, permanent, local and of low severity. The impact on archaeological features was moderate.

### 3.3.4 CONCLUSION

The study dealt with dam development and could be categorised under infrastructural development. The SIA conducted in Phase 1B was informed by lessons learned in Phase 1A, the most important being the involvement of the public in the various stages of the project. The SIA was part of an EIA that aimed at identifying and describing the positive and negative effects of the LHWP on the biophysical and socio-economic sphere. The SIA study paved the way for keeping the people informed about the development of the LHWP.

A lot of emphasis was placed on public involvement during Phase 1B. Extensive public participation was obtained via workshops in the area, and in the case of illiterate people the workshops were conducted in the local vernacular. The aim of the workshops was to identify impacts and propose mitigation measures where necessary. The scoping was shaped by public input on probable impacts. Social impacts were identified in respect of the following:

- Place of residence, housing and village infrastructure
- Land tenure
- Informal economic sector and related aspects
- Short-term employment
- Food security and nutrition
- Cultural identity
- Social interaction on community level
- Family structure and traditional activities
- Gender issues
- Social infrastructure (schools and clinics)
- Occupational health
- Sexually transmitted diseases and substance abuse
- Other health problems
- Public safety and access

- Archaeological sites

The study covered almost all the social issues included in an ideal SIA. The social variables are fully analysed in chapter four. During the assessment various issues were discussed, as well as their effects in the area or community and mitigation measures. Some of the issues would have a positive impact while others would have a negative effect. The extent of the impact would vary during the lifespan of the project.

A very good idea of the study was to distribute a Sesotho version of the draft report to all the communities affected by the development, to ensure that they were kept informed. This was supported by workshops conducted in their language. No monitoring programme was put in place. The SIA of Phase 1B was a success.

## 3.4 ENVIRONMENTAL STUDY ON THE TRANSMISSION LINE BETWEEN ESTCOURT AND PIETERMARITZBURG

### 3.4.1 BACKGROUND

As the national electricity supply authority in South Africa, ESKOM is responsible for the generation and supply of electricity throughout the country. It was decided in 1991 to construct a new high-voltage transmission line to the greater Durban-Pietermaritzburg area from the coal-fired power stations in Mpumalanga Province. The Land Survey Department of Eskom was tasked with finding a route for two 400kV transmission lines from the Venus substation at Estcourt to the Ariadane substation at Thornville.

The most obvious supply source was the Venus substation, near Estcourt, which was established in 1990 to obtain power from the Majuba power station and to optimise the use of the 275 and 400kV networks in western KwaZulu-Natal. Venus also relayed power from the Drakensberg pumped-storage power station Ariadane.

The two alternative sources were Pegasus near Dundee and Mersey northeast of Albert Falls, both substations. Pegasus was not desirable, mainly due to the long transmission distances involved. Mersey was rejected because the substation had reached its full design capacity and was not capable of supplying such a large additional load over the longer term.

A detailed investigation revealed two possible sites for a distribution substation for the greater Durban-Pietermaritzburg area. These were near Henley Dam and adjacent to Thornville Village. A site inspection indicated that the Thornville site was technically preferable, because of better line access to this site, suitable topography and a generally superior infrastructure, including road and rail links. It was therefore decided to proceed with the construction of a new 400kV substation, named Ariadane, pending the final decision on the transmission line route between Venus and Ariadane (Willemse, 1996).

### 3.4.2 APPROACH AND METHOD

A full EIA was done by the Environmental Division of the Land Survey Department of Eskom. The primary goal of the study was to identify a corridor within which a new transmission line could be built between Estcourt and Thornville, with the least negative impact on the total environment. The identification of such a corridor was to be informed by the social welfare criteria of equity, efficiency and sustainability. The

goal of the EIA was to identify, predict, interpret and communicate information, and to propose mitigation measures for the possible impacts of the development proposal on the well-being of the total environment. According to Willemse (1996), the objectives of the EIA were to:

- Collect information relevant to the geographical area involved;
- Identify the likely effects of the development and issues raised by interested and affected parties;
- Predict specific impacts;
- Determine the significance and importance of these impacts;
- Suggest possible measures to mitigate negative impacts;
- Integrate and synthesise the information and results;
- Present a conclusion on the best solution.

These goals and objectives are in accordance with the integrated environmental management procedure first advocated by the Council for the Environment (1989) and refined by the Department of Environment Affairs (1992).

The main purpose of the final EIA report was to provide an adequate information base at an appropriate level of detail on which a decision on the most appropriate option for the provision of additional power to the greater Durban-Pietermartizburg area could be made.

The building of a new power line was considered to be the most suitable option after evaluating the various alternatives for addressing Durban's power needs. The transmission line was considered to be the most cost effective means of conveying electricity. It was also felt that, provided the line was sensitively positioned, it should have a minimal impact on the environment.

Having identified the need for a 400kV transmission line, Eskom had to:

- Identify suitable supply and distribution substations for the new line;
- Decide whether to use overhead lines or underground cables;
- Identify a suitable route and building a new line parallel to the existing transmission line or existing infrastructures, in this way optimising existing Eskom power line servitudes, thus following a "Greenfield" approach (Willemse, 1996).

#### 3.4.2.1 Public Participation

Mindful of criticisms of earlier efforts at public participation, Eskom appointed a communications facilitator to advise on consultations related to the publication of the procedure and the decision-making process.

The consultative process was informed by the *Integrated Environmental Management Guideline Series* (1992) published by the then Department of Environment Affairs. The objectives were to:

- Encourage the identification of new interested and affected parties;
- Communicate adequately and timeously with all interested and affected parties;
- Provide all IAPs with an opportunity to meet with the Eskom team to discuss the report;
- Provide all IAPs with adequate opportunity to submit verbal or written comments on the report;
- Ensure that the comments of IAPs be considered and where appropriate taken up in the revised report;
- Provide IAPs with adequate opportunity to review the revised report;
- Facilitate the decision making to make the process acceptable to the majority of IAPs.

### 3.4.3 IMPACTS IDENTIFIED

A full EIA was done on the project area, but for the purpose of this study only the social aspects addressed in the Eskom study will be investigated. Issues that were addressed by Willemse (1996) were:

- Socio-economic issues
    - Land use
    - Urban areas, smallholdings and informal settlements
    - Forestry and wooded areas
    - Conservation areas
        - Nature and game reserves
        - South African natural heritage sites
        - Privately owned nature and game reserves
        - Sites of conservation significance
        - Elements of environmental Atlas of critical environmental components – focus on the physical environment

        - Biosphere reserves
    - Infrastructure
        - Roads
        - Railway lines
        - Pipelines
        - Power lines and associated structures
        - Telecommunications
        - Air fields
        - Dams
        - Quarries
    - Agriculture
        - Land potential
        - Property sizes
        - Land values
- Socio-cultural issues
    - Tourism and recreation
    - Historical and archaeological sites
    - Vacation and retirement holdings
    - Aesthetics
    - Population stability

The assessment was done by identifying issues of concern through consultation with the IAPs. The issues were then grouped into broad categories of concern and described against a set of criteria. These criteria described the assessment – the extent, duration and nature of the impact, intensity, probability, risk, reversibility and mitigation. A number of alternative corridors were evaluated against these criteria and then rated before and after mitigation actions.

Table 7 indicates the major categories of concerns and issues that were addressed in each:

**Table 8: Categories of Concern in the Transmission Line Development**

| CATEGORY | ISSUES INCORPORATED INTO EACH CATEGORY |
|---|---|
| Infrastructure | Roads, railway lines, telecommunications and broadcasting facilities, dams, agricultural installations, power lines, pipelines, air fields, buildings and residences, any man-made structures and proposed new developments, quarries. |
| Economics | Capital cost of the project, length of line. |
| Population density | Health hazards such as injuries or deaths arising from accidents, or perceived health |

| CATEGORY | ISSUES INCORPORATED INTO EACH CATEGORY |
|---|---|
| | effects arising from the effect of electromagnetic fields.<br>Resettlement and expropriation. |
| Tourism | Activities: angling, camping, walking, hiking, hunting, para-sailing, hang-gliding, ecotourism, guesthouses and hotels.<br>Visuals: physical landscape elements (waterfalls and rapids, rock formations, land forms, topographical features, fauna and flora); cultural landscape elements (cultural patterns and man–made structures); historical place elements (historical and geological sites); elements of scenic beauty. |
| Land use | Current land use practices (afforestation, sugar cane, cultivated areas, dairy, grazing, irrigation, crop spraying, livestock farming, retirement holdings, smallholdings and studs of all kind. |
| Archaeology | Archaeological sites (remains from prehistoric times and not from recent history). |

### 3.4.4 CONCLUSION

The EIA was based on the development of new infrastructure in a rural area. The main community activity was related to farming and the population affected would be very small, thus the impact of the proposed project would be limited. The SIA formed an integrated part of the EIA. Hence the social impacts were dealt with in a cursory manner. In addition, the social impacts identified would be of short duration, that is, they would only be in operation until the construction of the transmission line was completed. The most negative and lasting impact of the project would be the visual aspects of the transmission line. The SIA involved consultation with the affected parties and the identification of issues. The results provided the decision makers with relevant and necessary information to make an informed decision about the construction of the power line.

## 3.5 DURNACOL COAL MINE: ENVIRONMENTAL MANAGEMENT PROGRAMME

### 3.5.1 BACKGROUND

In contrast with the other studies, where a facility or industry was to be established, the Durnacol Coal Mine SIA dealt with the closure of a mine.

The Durnacol Coal Mine is situated in Northern KwaZulu-Natal and is one of Iscor's mining division collieries. Mining activities started in 1904 when the mine supplied steam coal to the Durban harbour. Since the takeover by Iscor in 1954 it supplied coking coal to the different Iscor steelworks. By the time of the takeover, the first mine was already depleted and the second mine was in the last phase of its productive life. The third mine was then in an advanced state of development.

The colliery held mining rights to more than 13 900 hectares. Durnacol had a complement of about 2 700 employees in the beginning of 1998. Mining activities were to be terminated in 2002/3, and successful rehabilitation and mine closure were the key concerns (Geldenhuys, 1999).

As the community had to remain sustainable, the current residential areas, office areas and workshop would not be considered for rehabilitation. An environmental management programme report (EMPR) would address the physical environment and include assessment of the impact of mine closure on the social environment. For its part, the environmental study was aimed at producing an environmental management and closure plan that would balance the need for human safety, environmental protection and the restoration of land to productive use where practicable (Geldenhuys, 1999).

### 3.5.2 APPROACH AND METHOD

For the purpose of this study only the social aspects of the Durnacol EMPR are discussed here. Durnacol appointed Afrosearch to do an SIA and to draw up a land management plan (LMP) for Durnacol Coal Mine. Two major tasks were identified for the SIA, namely the development of an effective public involvement plan, and an assessment of relevant social factors in a manner that would dovetail with the environmental risk assessment. A process was initiated to promote broad-based consultation with IAPs to obtain their involvement in the identification of impacts. The initial consultation served to identify a strong need for the environmental and social assessment to include the development of an LMP in respect of the affected area.

In Durnacol's view, an SIA should provide a systematic advance analysis of the likely impacts that a development event might have on the day-to-day life of persons and communities. SIAs are done to help individuals, communities as well as organisations to understand and be able to anticipate the possible social consequences for human populations and communities arising from proposed projects, developments or policy changes. An SIA also suggests ideas and alternatives to the identified problems. It further serves to identify:

- Potential for social mobilisation against the proposed actions;
- Social impacts that cannot be resolved;
- Variables that will have to be addressed by avoidance or mitigation.

In accordance with *Guidelines and Principles for Social Impact Assessments*, the Interorganisational Committee on Guidelines and Principles for Social Impact Assessment supports the approach that is followed in impact assessments. All the steps as discussed in the theoretical section of this study (pages 24-25) were included in the Durnacol case study. The client also requested that a land use management plan be developed. The purpose with the plan was to develop an integrated set of goals and objectives. A realistic needs-based LMP could enable the mine to pro-actively address some of the social impacts of its intended actions and create additional development opportunities for the local community (De Waal and Breytenbach, 1998; Geldenhuys, 1998).

### 3.5.3 IMPACTS IDENTIFIED

Under the description of the existing environment the following social issues were identified:

- There were no archaeological and cultural sites found on the mine property.
- The closure of an economic activity that had been the centre of business for years would have a significant impact on the social environment.
- With the worldwide focus on sustainable development the latter would be a key issue to address.

The study addressed population density and growth in the Newcastle, Glencoe, Dannhauser and Dundee communities in detail, as well as age, gender and race ratios based on 1970, 1980 and 1991 population figures. Only Newcastle had experienced a positive population growth.

The economic activities of the four towns and the sources of employment/occupations were described in detail. Unemployment was also discussed. In Dannhauser, urban unemployment was higher than rural unemployment, while in Dundee, Glencoe and Newcastle rural unemployment was higher than urban unemployment.

A positive short-term benefit was expected during the closure phase in that skilled and unskilled labour would have to be employed in this phase. Hence local, regional and national businesses would earn additional income. However, the crime rate and squatting might increase due to the large influx of temporary labour. This tendency could increase towards the very end of the life of the mine, which was in the foreseeable future.

Housing in the area was discussed and the houses were divided into medium- and high-priced houses, and low-cost houses. The social infrastructure was considered, notably Dannhauser/Durnacol's schools, hospitals, clinics, sports and recreation facilities, shopping facilities, police, telecommunications, magistrate's offices and roads.

It was clear that the mine closure would have an impact on the socio-economic environment and would require transparent consultations with the IAPs.

The SIA variables covered in the Durnacol project included all those listed in the theoretical section of this study – pages 30 to 31, as discussed by Burdge. These are: population impacts, community and institutional arrangements, conflicts between local residents and newcomers, individual and family impacts, and community infrastructure (De Waal and Breytenbach, 1998).

The Durnacol study followed a series of public meetings with the community. In the first round of meetings the respondents were asked how they saw the future of the area after the closure of the mine. The major perception was that the area would become deserted. Issues such as large-scale unemployment, emigration of people, loss of buying power, closure of businesses, social and moral disintegration, and loss of pupils in schools were identified (De Waal and Breytenbach, 1998).

During the second round of interviews the majority of participants felt that the mine closure would have a negative effect, and that the major impact in the economic sphere would be in terms of loss of business and loss of job opportunities. A large percentage of the population of the mining area would leave the area in search of employment elsewhere. A small percentage might be interested in acquiring permanent accommodation in mine housing.

In terms of community or institutional arrangements, the expendable income from the mine that was spent in Dannhauser, Dundee, Glencoe and Newcastle was significant and hence its withdrawal would be a major loss. The business community expected a loss of 50-60% in turnover. This indicated the closing down or relocation of businesses.

Impacts at both the individual and family level were also expected to be severe. The mine employed about 3 000 people, and given the average household size of 5, about 15 000 people would be affected. The SIA indicated that the number might even be as high as 45 000 people. Another area was the schools - the closure of the mine would directly affect almost 36% of the school-going population, without considering the ripple effect. Given that effect, the figure might even double (De Waal and Breytenbach, 1998).

Regarding religious activities, at least seven traditionally white denominations would cease to exist in their current mode. There was also little prospect of adapting their buildings for other purposes. In addition, child abuse and teenage prostitution might increase with the increased unemployment in the mining area.

Under the topic of community infrastructure the property market was addressed. Because of the small number of industries, the area would be unable to absorb the job losses. Hence the property market was expected to suffer a severe cut in property prices. Some mine employees expected that the mine's houses would be sold to them at a reduced price.

In terms of mitigation measures, the employer was urged to keep the following aspects about the working environment in mind:

- Equitable retrenchment and/or translocation of personnel;
- Alternative uses for the remaining surface infrastructure;
- Potential for economic growth in the area after the mine's closure;

- Positive cash flow.

The marketing of the houses, offices and workshops had to be left to private individuals. It was essential to have the mine areas and facilities officially proclaimed as townships. It was necessary to start negotiating with the local municipality about legal requirements regarding the services.

The establishment of manufacturing-type industries that could utilise the surface infrastructure and form the mainstay of the local economy would ensure the inflow of capital in the area and more job opportunities. Other commercial ventures would logically follow if there were a vibrant economy.

The following alternatives were proposed for the use of the existing infrastructure:

- Development of alternative industries
- Correctional services facilities
- Cultural tourism
- Retirement village
- Privatisation of workshops
- Transfer of the mining infrastructure to the local authority

For each of these activities an aim, objectives, a strategy, assumptions, advantages and disadvantages were listed (De Waal and Breytenbach, 1998).

### 3.5.4 CONCLUSION

This SIA was different from the other case studies as it addressed the closure of a mining facility. Independent consultants were appointed to conduct the SIA and develop an LMP for the Durnacol Coal Mine.

The scope of the SIA was to develop a public involvement plan and assess the relevant social issues. The public was involved by means of a series of public meetings. The SIA addressed the impacts of the closure of the mine on the local and regional economies and the affected parties. The identified issues were discussed, the impacts were explored and mitigation measures were proposed. The SIA was in line with the guidelines and principles for SIAs. As part of decision making, the study investigated the alternative usage of the existing facilities as a mitigation measure. All

the steps required for an SIA were followed, and all the relevant variables were addressed.

### 3.6 CONCLUSION ON ALL THE CASE STUDIES

The extent of each of the five studies depended on their nature, size and complexity. All the studies identified impacts that could influence decision making before the project started. All the projects might have severe impacts on the social aspects of human lives in the relevant community if the impacts were not addressed properly. This conclusion concurs with Burdge's opinion, that is, the purpose with an SIA is to identify the impacts before the project starts.

All the studies measured up to the principles set for SIAs as described by Burdge (1995), Finsterbusch (1995) and Taylor *et al.* (1992), and all the studies described used the SIA and public involvement in identifying affected groups and appropriate data sources. The studies incorporated the concept of impact equity for affected groups and were aimed at providing a win-win situation for everyone. All the studies focused on the possible impacts as identified by the affected parties. The studies were done by SIA consultants or persons with specialist knowledge of social impacts. Furthermore, the results of each of the five studies provided feedback to the planners of the various projects.

The hypothesis that SIAs are being done in Southern Africa, despite the fact that they are not enforced by legislation, has been confirmed. The only study where the issue of legislation was applicable was that of the Durnacol Mine where an EMPR was required.

The second hypothesis has also been confirmed, namely that the SIA process applied in Southern Africa is the same as that applied internationally. In fact, the SIA process followed by the five studies was the same as the standard process prescribed by the ICGP. The involvement of the public to identify the issues and their variables (known as "scoping") was evident in each study. Mitigation measures were proposed for each variable and were in line with the significance and impact of the variable. During the public participation or consultation process the proposed measures could be discussed and accepted. The SIAs focused on aspects that might affect the individual and the community.

The studies were primarily done in rural and semi-rural areas and addressed the development of a new facility or infrastructure, except in the case of the Durnacol study, which attended to the proposed closing of a mine. Some variables were unique to a particular study, as was the case of the Corridor Sands project, which focused on the importance of cultural aspects or heritage, such as gravesites and respect for traditional leadership. The impact of change emerging from a project on households and the fear of change were raised in all the studies, except the transmission line study.

## 4 EVALUATION OF THE VARIABLES

Table 8 contains all the different variables. The variables are those listed by the Department of Environment Affairs and the ICGP. The case studies are evaluated against these variables to determine which are commonly used, how extensively are they used, and if there are unique variables used in the various case studies.

**Table 9: Case Study Evaluation: Variables Analysis**

| VARIABLES | SALDANHA STEEL | CORRIDOR SANDS | MOHALE DAM | ESKOM | DURNACOL |
|---|---|---|---|---|---|
| **Cultural resources** | | | | | |
| Structures and sites of architectural, cultural or historic heritage | | X (H)* (graves) | X (H) | | |
| Sites of archaeological or palaeontological importance | X | | X (M) | X | |
| Special attraction of local sites, traditions or events | | X (H) | | | |
| Sites or areas of religious or spiritual significance | | X (H) | | | |
| Sites or areas of special social or cultural interest | | | X (M) | | |
| The integrity of cultural resources | | X (M) (leadership) | | | |
| **Socio-economic characteristics of the affected people** | | | | | |
| *Demographic aspects:* | X | | | X | X |
| Growth rate of the local population | X (L) | X | | | X |
| Location, distribution or density of population | X (H-) | | | X | X |
| Existing age or gender composition | X (L+) | X | X (M) | | X |
| Existing biographical composition of population | X (L+) | | | | X |
| Existing migration movements | X (H-) | X | | | X |
| Inflow of tourists | X (L+) | | X | | |
| *Economic and employment status of the affected social groups:* | | | | | X |
| Economic base of the area | X (H+) | X (H+) | X | X | X |
| Distribution of income | X (L) | | X | | X |
| Local industry | X | X (H+) | | X | X |
| Rate and scale of employment growth | X (L+) | X (H+) | | | X |
| Labour needs and the spare labour capacity of the area | X (M+) | X (H+) | | | |
| Movement of labour away from existing employment in the area | X (L+) | X (L+) | | | X |
| Non-local labour remaining in the area after completion of development | X (H-) | | | | |
| Pressure to comply with particular skills, age range | X (L+) | X | X | | X |

| VARIABLES | SALDANHA STEEL | CORRIDOR SANDS | MOHALE DAM | ESKOM | DURNACOL |
|---|---|---|---|---|---|
| or gender needs | | | | | |
| Job opportunities for school leavers | X (M+) | X | | | |
| Short- and long-term unemployment trends | X | | | | X |
| *Welfare profile:* | | | | | |
| Incidence of crime, drug abuse or violence | X (L-) | | X (M) | | X |
| Extent of homelessness and overcrowding | X (M+) | | | | |
| Adequacy of services | X (M-) | | | | X |
| Adequacy of support systems such as crèches and shelters for destitute children | X (M-) | | | | |
| Quality of life | X (L+) | X | | | |
| *Health profile:* | | | | | |
| Availability of clinics/health services | X (L+) | | | | |
| Incidence of disease (STDs/AIDS) | X (H) | X (H) | X (H) | | |
| Incidence of mental illness | X | X (H) | | | |
| Threats to health from pollution | X (L-) | | X | | |
| *Cultural profile:* | X | | | | |
| Existing lifestyles, household composition and family network | X (H-) | X (H) | X | | X |
| Religious and cultural attitudes, outlooks and expectations | X (H-) | X (H) | X | | X |
| Cultural or lifestyle diversity | X (H-) | X (H) | X | | |
| Cultural or lifestyle stability/religion | X (H-) | X (H) | X | | |
| **Social infrastructure services** | | | | | |
| *Education:* | | | | | |
| Demand for specific types of technical skill training | X (L+) | | | | |
| Demand for specific types of industrial training | X (M+) | | | | |
| Adequacy of existing technical institutions | X | | | | |
| Adequacy of nursery, junior and secondary education facilities | X (M-) | | X (M) | | |
| Need for additional education facilities | X (M-) | | X | | |
| Demand that exceeds the planned provision of education facilities | X (M-) | | | | |
| Pre-school facilities | X | | | | |
| *Housing:* | X | X | X | | X |
| Property values and levels of rates | X (M+) | X | | | X |
| Potential conflict over land use | X (M-) | X | | | |
| Availability of housing stock | X (M+) | | | | X |
| Need to release additional land for housing development | X (L+) | | X (H) | | |
| Acceptability of such land release/resettlement | X | X | X | | |
| Adequacy of infrastructure for further housing | X (L+) | | | | |

| VARIABLES | SALDANHA STEEL | CORRIDOR SANDS | MOHALE DAM | ESKOM | DURNACOL |
|---|---|---|---|---|---|
| development | | | | | |
| Ability of private or local authority to provide housing | X (L+) | | | | |
| Compatibility of planned development with existing housing | X | | | | |
| Location of suitable housing sites | X | | | | |
| Sites suitable for construction camps | X | X (H+) | | | |
| Standard of provision of facilities required by authority | X | | | | |
| Design and layout of site facilities | X | | | | |
| Use to which construction camp may be put after construction period | X (H+) | | | | |
| **Social and community services and facilities** | | | | | |
| *Health service facilities*: | | | | | |
| Adequacy of temporary facilities during construction phase of development | X | | X | | |
| Adequacy of on-site health facilities | X | | | | |
| Adequacy of facilities for primary health care | X | | X | | |
| Adequacy of existing health services to cope with increased population | X (L+) | | | | |
| Projected provision of health service facilities | X | | X | | |
| Need for additional facilities | X (L) | | X | | |
| *Emergency services*: | | | | | |
| Adequacy of existing emergency services | X (L+) | | | | |
| Projected provision of services to meet increased demand | X (L+) | | | | |
| Need for additional emergency services | X (L+) | | | | |
| Adequacy of the emergency and safety services provided by the developer | X (L+) | | | | |
| Ability of local resources to deal with emergencies | X (L+) | | | | |
| *Recreational facilities*: | | | | | |
| Adequacy of existing facilities | X (L+) | | | | |
| Projected provision of facilities to meet increased demands | X (L+) | | | | |
| Need for additional facilities | X (M-) | | | | |
| Recreational and service facilities in the workplace | X | | | | |
| *Risk and hazard:* | | | | | |
| Level and identity of hazard to the public | X (M-) | | X (M) | | |
| Probability of occurrence | X | | X | | |
| Extent of effect – local, regional or panoramic | X | | | | |
| Standards required for process equipment | X | | X | | |
| Safety and design review | X | | X | | |

| VARIABLES | SALDANHA STEEL | CORRIDOR SANDS | MOHALE DAM | ESKOM | DURNACOL |
|---|---|---|---|---|---|
| Safety audits | X | | X | | |
| Hazard and operability reviews | X | | X | | |
| Failure mode and effect analysis | X | | X | | |
| Workers' safety/degree of risk | X | | X | | |
| Level of risk and hazard for other living organisms | | | | | |
| *Health and safety:* | | | | | |
| In the workplace | X | | X | | |
| Surrounding areas | X | | X | | |

L = Low H = High + = Positive

M = Moderate - = Negative

## 4.1 DISCUSSION

All five case studies addressed the demographic aspects, either in an SIA or some of other report that supplemented the EIA. Gender and age were discussed in detail under a demographics section. This section was followed by a discussion of the economic base of the areas and possible job opportunities for the affected parties. The Durnacol study addressed alternatives for land use/job opportunities after the closure of the mine. It looked at where both males and females could be absorbed in the labour force, both in the formal and informal sector. Two of the studies addressed local industries, including related labour issues and the labour capacity of the areas. The transmission line study indicated that the communities would not be affected economically by the project. The Saldanha Steel study and the Corridor Sands study considered job opportunities for school leavers. The informal sector economy was strongly emphasised in the Corridor Sands study but was not one of the variables on the checklist. Hence this variable could be added to the checklist for Southern Africa.

In terms of welfare, two of the studies dealt with an increase in crime, violence and drug abuse. These problems were associated with the influx of construction and other temporary workers into the region. In a rural area such as Gaza Province such problems did not seem to occur, and the strong traditional values there could be the reason. The Saldanha Steel study addressed the adequacy of services and homelessness, and relocation and resettlement featured strongly in the Corridor Sands study, which also pointed to a decline in homelessness. "Quality of life" was only used as a variable in the Saldanha Steel and Corridor Sands studies. However, as the variable was not defined or described in detail, the two studies may have interpreted the variable differently.

Three of the studies referred to the high incidence of disease in general and sexually transmitted diseases in particular, and in all instances the mitigation measures were preventative. This variable seemed to be a concern when the workforce was temporary. Another concern cited in the reports was the effect of the emotional trauma of change on the local population.

Educational facilities were addressed in detail in the Saldanha Steel and the Durnacol Coal Mine studies. This may have been the result of the urban features of the towns. The existing facilities were expected to be severely affected by the proposed actions/projects. The Mohale Dam study called for the provision of additional educational facilities.

Housing/accommodation for the affected parties was discussed in all the studies except the transmission line study. The term "housing" was also used in a context where people needed to be resettled due to the closure of a mine or the raising of a dam floodline. The Saldanha Steel study specifically mentioned the provision of additional low-cost housing, as well as high-quality formal housing for professional mining people. The Durnacol Coal Mine study addressed the proposed impact of the mine closure on the property market and alternative uses for the existing infrastructure.

The Corridor Sands study discussed various housing types, namely formal housing, communal villages and rural settlements. The settlements in the proposed mining area had strong links with subsistence farming, and their pending relocation and resettlement would therefore greatly affect their income. This called for compensation for the land they were to lose. The land also had a strong heritage value. Community participation in the assessments went a long way towards identifying the issues mentioned here.

Although the variable – housing types, was not an item in the checklist, it formed a very important part of the Corridor Sands Study. Land tenure was discussed in the Corridor Sands and Mohale Dam studies. In fact, it was highly rated in both studies. It is therefore recommended that the checklist be adapted to make provision for variables related to rural communities where land tenure types are important and subsistence farming is associated with housing issues or the community's values.

Health, emergency and recreational facilities were only discussed in detail in the Saldanha Steel study. Health facilities in the Lesotho Highlands Water Project study were covered under temporary facilities erected during the construction phase as well as under the need for future health care. The Saldanha Steel study, which described the establishment of a new industrial development in an area with existing infrastructure, identified the need for additional and better facilities for the expanding community. The Corridor Sands and Mohale Dam developments were located in rural areas where these facilities had not been established yet. Hence they were not addressed in the relevant studies.

The risk/hazard and safety variables were addressed in detail in the Saldanha Steel and Mohale Dam studies, as the safety of workers was important at both projects. At the transmission line the hazard might be temporary and limited to the construction site.

A social variable not contained in the checklist, but highlighted in two studies, was the issue of food security and nutrition. This issue was related to housing and land tenure where subsistence farming was exercised. This was a clear indication of the need for identifying variables for a rural setup in particular.

The variable "access" should be seen in the light of the nature and extent of the Lesotho Highlands Water Project. The project consisted of a whole infrastructure development for the dam area and included the construction of access roads, weirs and a series of dams. Access during the construction phase was an important issue for the residents of the area as the area consisted of a couple of rural settlements. Not all of the studies used the same variables, but the same topics were covered, as indicated by the checklists of the ICGP and the Department of Environment Affairs.

## 4.2 CONCLUSION

The variables used in the various studies were in accordance with the variables listed in the various sources. These variables included population impacts, community or institutional arrangements within the community, conflicts between local residents and newcomers, individual and family-level impacts, and community infrastructure needs. The population impacts included all the demographic aspects, as well as the presence and influx of temporary workers in the area, and relocation aspects. The community and institutional issues related to the forming of attitudes towards the project and the presence of the labour force in the area and the changes that might

occur in employment and occupational opportunities. The conflicts were mainly associated with the introduction of new social classes and the change towards an industrial and commercial focus. Individual and family impacts related to the disruption of daily living, religious practices and social networks, the change in leisure opportunities, and perceptions regarding health and safety. Community infrastructure related to the change of the community composition, land issues and effects of change on cultural and historical resources.

However, an SIA in Southern Africa should include variables specific to the third world context, such as the contribution of the *informal economy* to the regional economy, *land tenure types* and heritage aspects connected to these, as cited in the Corridor Sands study, and *food security and nutrition,* which variable is associated with settlement patterns and land tenure. Hence the third hypothesis of this dissertation can be accepted, as there are certain variables unique to the Southern African context.

## 5 AN SIA MODEL FOR SOUTHERN AFRICA

An SIA considers social aspects that affect human life in the environment. As SIAs in Southern Africa are an integrated part of EIAs or EMPRs, it is important for an SIA to determine its parameters, either by means of defining the scope of work to be included in the proposed assessment. An SIA must include the following steps:

- Step 1: The determination of *the need* for a social impact assessment, and of the *objectives* of such a study.
- Step 2: A *public involvement programme* that enters into dialogue with affected parties to obtain their input throughout the impact assessment. This is both a scientific and political requirement in SIA methodology.
- Step 3: During the involvement of the public, *the topics and issues to be addressed* can be identified.
- Step 4: *Obtaining information* on the alternatives being considered and on the existing conditions. This is basic information for both the SIA and for any policy decisions that claim to be rational.
- Step 5: *"Scoping"*, which is probably the key step in designing the SIA. It involves two steps, the first being the development of a relatively exhaustive list of potential impacts of the action and, second, the selection, from that list, of the potential impacts to be studied in the SIA.
- Step 6: The *main research step, namely the projection of estimated effects.* The three main information sources for impact identification are the literature, experts and field research (including informant interviews). The social impact assessor tries to establish what happened in similar past cases through studying the available literature as a guide to what could happen in the case study.
- Step 7: The task of *predicting how the affected parties will respond.* It must be admitted that most SIAs do not implement this step, or do very little of it. It is essential to estimate higher order impacts and the political consequences of the action – information in which decision makers should take an interest. It also entails ascertaining the attitudes of affected parties towards both the action and its direct impacts, and their probable responses to the impacts. Respondents' statements about their responses might poorly predict their subsequent actions, but their statements can at least alert the agency to potential problems that might be resolved by appropriate agency actions.

- Step 8: The *estimation of indirect and cumulative impacts*. This is an obvious next step, but is often neglected or skimped. Again the patterns found in past cases can guide this step.
- Step 9: *Recommendations for change in the action or alternatives* that would avoid the predicated negative impacts and enhance the positive impacts.
- Step 10: *Mitigating the negative impacts* by avoiding, minimising, rectifying or reducing the impact, or providing compensation.
- Step 11: A *monitoring programme* to ensure that negative impacts are dealt with as they happen. Most SIAs lack this step but it should be remembered that the purpose of assessing impacts is to manage them. A programme that monitors the impacts and adjusts the action to unanticipated new conditions must supplement an SIA.

Table 9 provides a list of all the variables that need to be considered in planning an SIA. This table contains all the common and unique variables derived from the analysis of the tables discussed earlier in the study.

**Table 10: List of all Variables**

| VARIABLES |
|---|
| ***Cultural resources*** |
| • Structures and sites of architectural, cultural or historic heritage |
| • Sites of archaeological or palaeontological importance |
| • Special attraction of local sites, traditions or events |
| • Sites or areas of religious or spiritual significance |
| • Sites or areas of special social or cultural interest |
| • The integrity of cultural resources |
| • Physical amenities |
| ***Socio-economic characteristics of the affected public*** |
| *Demographic aspects:* |
| • Growth rate of the local population |
| • Location, distribution or density of population |
| • Age or gender composition |
| • Biographical composition of population |
| • Migration movements |
| • Inflow of tourists/presence of seasonal (leisure) residents |
| • Relocation of individuals and families |
| *Economic and employment status of the affected social groups:* |
| • Economic base of the area |
| • Distribution of income |

| VARIABLES |
|---|
| • Local industry/industrial diversification |
| • Rate and scale of employment growth |
| • Labour needs and the spare labour capacity of the area |
| • Movement of labour away from employment in the area |
| • Competition by non-local labour moving into the area |
| • Non-local labour remaining in the area after completion of development |
| • Agricultural activities |
| • Pressure to comply with particular skills, age range or gender needs |
| • Job opportunities for school leavers |
| • Short- and long-term unemployment trends |
| • Formation of attitudes towards the project |
| • Interest group activity |
| • Government structure/alteration in size and structure of government |
| • Changes in laws |
| • Planning and zoning activity |
| *Welfare profile:* |
| • Incidence of crime, drug abuse or violence |
| • Extent of homelessness and overcrowding |
| • Adequacy of services |
| • Adequacy of support systems such as crèches and shelters for destitute children |
| • Quality of life |
| *Health profile:* |
| • Availability of clinics/health services |
| • Incidence of disease |
| • Incidence of mental illness |
| • Threats to health from pollution |
| • Role of nutrition/availability of food |
| *Cultural profile*: |
| • Lifestyles, household composition and family network |
| • Religious and cultural attitudes, outlooks and expectations |
| • Cultural or lifestyle diversity |
| • Cultural or lifestyle stability |
| • Change in leisure opportunities |
| • Presence of outside agencies |
| • Introduction of new social classes |
| • Presence of weekend residents (recreation) |
| ***Social infrastructure services*** |
| *Education:* |
| • Demand for specific types of technical skills training |
| • Demand for specific types of industrial training |
| • Adequacy of existing technical institutions |

| VARIABLES |
|---|
| • Adequacy of nursery, junior and secondary education facilities |
| • Need for additional education facilities |
| • Demand that exceeds the planned provision of education facilities |
| • Pre-school facilities |
| *Housing:* |
| • Property values and levels of rates |
| • Potential conflict over land use |
| • Availability of housing stock |
| • Need to release additional land for housing development |
| • Acceptability of such land release |
| • Adequacy of infrastructure for further housing development |
| • Ability of private or local authority to provide housing |
| • Compatibility of planned development with existing housing |
| • Location of suitable housing sites |
| • Sites suitable for construction camps |
| • Standard of facilities required by authority |
| • Design and layout of site facilities |
| • Use to which construction camp may be put after construction period |
| • Land acquisition and disposal |
| ***Social and community services and facilities*** |
| *Health service facilities:* |
| • Adequacy of temporary facilities during construction phase |
| • Adequacy of on-site health facilities |
| • Adequacy of facilities for primary health care |
| • Adequacy of health services to cope with increased population |
| • Projected provision of health service facilities |
| • Need for additional facilities |
| *Emergency services:* |
| • Adequacy of emergency services |
| • Projected provision of services to meet increased demand |
| • Need for additional emergency services |
| • Adequacy of the emergency and safety services provided by the developer |
| • Ability of local resources to deal with emergencies |
| *Recreational facilities:* |
| • Adequacy of existing facilities |
| • Projected provision of facilities to meet increased demands |
| • Need for additional facilities |
| • Recreational and service facilities in the workplace |
| • Supporting infrastructure: police, libraries, etc. |
| • Shopping facilities |
| ***Risk and hazard:*** |

| VARIABLES |
|---|
| • Level and identity of hazard to the public |
| • Probability of occurrence |
| • Extent of effect – local, regional or panoramic |
| • Standards required for process equipment |
| • Safety and design review |
| • Safety audits |
| • Hazard and operability reviews |
| • Failure mode and effect analysis |
| • Workers' safety/degree of risk |
| • Level of risk and hazard for other living organisms |
| ***Health and safety*** |
| • In the workplace |
| • Surrounding areas |
| ***Psychological features*** |
| • Involvement |
| • Expectations |
| • Stress/frustrations |
| • Mobility |
| • Family lifestyles |
| • Community feelings |
| • Self-expressions |

## 5.1 CONCLUSION

Over the past forty years the SIA has changed and grown into a broad process that can be applied to a development project to determine the possible impacts of the project on the daily lives of the affected community. Thus the SIA has become an economic and political tool.

SIAs are being conducted in Southern Africa and form part of the EIA process. The SIA consists of a number of steps which, depending on the project size, may be incorporated with the EIA. The internationally adopted SIA can be applied in the Southern African context. This means that the practitioner attends to the following steps: a public involvement programme; collection of information; scoping; projection of the effects; prediction of how the affected parties will respond; estimation of indirect and cumulative impacts; proposals for changes or alternatives; mitigation; and monitoring. In the case studies discussed in this dissertation the SIA was the

instrument for public involvement in the whole project and not only in determining the social impacts.

The social variables used in Southern Africa are the same as listed by the ICGP. However, the variables need to be extended to cater for third world scenarios. For instance, the informal sector in the economy, land tenure types and the associated cultural aspects, and the issue of food and nutrition should be taken into consideration.

## 5.2 RECOMMENDATIONS

The student and practitioner of SIAs in Southern Africa should apply the standards and social variables that have been adopted internationally because they have been shown to be relevant to the Southern African region in that they disclose the social impacts of development projects on people's daily lives.

However, as the Southern African context contains both first and third world characteristics, the latter has to be catered for. This study has therefore explored five case studies with a view to identifying variables that need to be added to the SIA in Southern Africa and other third world regions. These variables turned out to be more specific issues that should be included under the main headings. The relevant variables are: the contribution of the *informal economy* to the regional economy; *land tenure types* and the possible associated heritage aspects; and *food security and nutrition,* which is associated with settlement pattern and land tenure. Which of these variables are relevant might differ from project to project.

In addition, the Southern African context requires that certain established topics such as economic and employment of affected social groups, health profile, cultural and housing profiles be studied in more detail and also that the broadest possible range of these topics be addressed in development projects. The issues such as identified might have a very important impact on the project and so enhance progress and the development of communities in developing countries.

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