

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;
- Social issues, community services and recreational facilities
- Risk and hazard

- 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.

3.1.3.2 The Impact on the Cultural Characteristics of the Region

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 immigration 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.

• Ecological aspects

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.

• On the economy and development

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).

The quality of the variables will be discussed in chapter four. The set of variables

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.

The SIA of the Corridor Sands project addressed the socio-economic/cultural impacts. 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.

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 640 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

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.

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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.

Homesteads were far more dispersed than in any of the other settlement types.

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).

changes to their access to land and resources

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:

was to ensure that the resettlement and compensation offered for the lost

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.

Development projects that displace people invariably generally give rise to severe

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.

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resettle people as and when the mining operation requires but it will further reduce

Communal villages (“aldeias comunais”) – 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 respectify 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.

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 1950s. 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 spheres. 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 proactive. 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 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.

Impact was essential

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.

Additional people impacted by the area

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 Sexually Transmitted Diseases

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.

was a particular concern. Through a public

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 Mamakoluoqa 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

3.4 • E 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.

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

A detailed investigation revealed two possible sites for a distribution substation in the greater Durban-Pietermaritzburg area. These were near Thornhill, Durban, and adjacent to Thomville Village. A site inspection indicated that the Thomville site was technically preferable because of better site access to the site, available 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 Anadane, pending the final decision on the transmission line route between Venus and Anadane (Willems, 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 Thomville, 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

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).

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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-Pietermaritzburg area could be made.

3.4.3 IMPACTS IDENTIFIED

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. Resettlement and expropriation.
Tourism	Activities: angling, camping, walking, hiking, hunting, para-sailing, hang-gliding, ecotourism, guesthouses and hotels. 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.

3.5.2 APPROACH AND METHOD

For the purpose of this study only the social aspects of the Dumacoal EMPR are discussed here. Dumacoal appointed Abosearch to do an SIA and to draw up a land management plan (LMP) for Dumacoal Coal Mine. Two main 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.

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.

During the second round of interviews the majority of participants felt that the mine. 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.

Impacts at both the individual and family level were also expected to be significant. 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 Burdige. 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).

- Alternative uses for the remaining surface infrastructure;
- Potential for economic growth in the area after the mine's closure;

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.

Variable	BALDAMHA STEEL	CORRIDOR SANDS	MOHALE C&I	ERROM C&I	DURNACOL C&I
Cultural restrictions					
Location and layout of activities in the area		Y (1)	Y (1)		
Traditional layout		Y (1)			
Size of and location of residential plots			Y (1)		
Infrastructure					
Special attention to rural areas, markets or services		Y (1)			
Size or extent of religious or cultural organisations		Y (1)			
Size or extent of social or cultural organisations			Y (1)		
The history of cultural institutions		Y (1)			
Focus on the role of specific factors of the affected people		Y (1)			
Attitudes to change	Y (1)			Y (1)	Y (1)
Demographic characteristics of the community	Y (1)	Y (1)			Y (1)
Location, distribution or density of population	Y (1)				Y (1)
Existing age or gender composition	Y (1)				
Existing occupational composition of the area	Y (1)				
Existing religious movements	Y (1)	Y (1)			Y (1)
Extent of capital	Y (1)		Y (1)		
Economic and employment status of the affected people				Y (1)	Y (1)
Gender groups					Y (1)
Local work force in the area	Y (1)	Y (1)	Y (1)	Y (1)	Y (1)
Distribution of income	Y (1)		Y (1)		Y (1)
Local market	Y (1)	Y (1)		Y (1)	Y (1)
Rate and scale of land use and growth	Y (1)	Y (1)			Y (1)
Local needs and the sustainability capacity of the area	Y (1)	Y (1)			
Movement of people away from existing employment in the area	Y (1)	Y (1)			
Non-local labour remaining in the area after completion of development	Y (1)				
Pressure in parallel with particular skills, age range	Y (1)	Y (1)	Y (1)		Y (1)