

# ECONOMIC IMPACT STUDY OF SURFACING THE SANI PASS ROAD

DRAFT REPORT

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## EXECUTIVE SUMMARY

### Introduction

1. The KwaZulu-Natal Department of Transport (KZN-DOT) wishes to upgrade the Sani Pass Road (MR318). The purpose of this study is to take a holistic view of the costs and benefits relating to the upgrading of the road both in South Africa and Lesotho. Such a view would cover a conventional cost-benefit analysis, a resource economics analysis, Social Accounting Matrix and macro-economic impact modelling, and attention to development projects and aspects of international relations. The project covers the Sani Pass road in South Africa and the road from the border at Sani Top to Mokhotlong in Lesotho.
2. Six options were identified for Phase 2 of the Sani Pass road project by the engineering consultants. These are:
  - (i) Close pass – deproclaim road and hand over to Ezemvelo KZN Wildlife.
  - (ii) Re-gravel, minor drainage improvements, maintain.
  - (iii) Improve geometrics, upgrade drainage, retain splash troughs, construct retaining walls and re-gravel.
  - (iv) Improve geometrics, upgrade drainage, construct bridges, retaining walls, blacktop up to km25, gravel to km33.
  - (v) Improve geometrics, upgrade drainage, construct bridges and retaining walls, hard surface from km14 to km33.
  - (vi) Improve geometrics, upgrade drainage, construct bridges and retaining walls, blacktop from km14 to km31, and tunnel (3km).
3. Maintaining the status quo (defined as routine maintenance only) is an unsustainable long-term option because of the increased costs of trucking gravel, and hence upgrading to an improved or good gravel road is also not an option. Thus, the comparison in the economic analysis is between Options (i) and (v), i.e., between closing the road and providing it with a hard surface.
4. Option (v) allows accessibility to the public and not only 4-wheel drive vehicles. Despite greater accessibility, a surfaced Sani Pass road will not be an interstate highway competing with the N3 or N5. On the Lesotho side, the intention is to surface the road from Sani Top to Mokhotlong in order to complete a trans-Lesotho surfaced road.
5. The methodology for data collection consisted of a field visit to Lesotho (Maseru and Mokhotlong), a site visit to Sani Pass, an examination of specialist reports on economic, social, aquatic, vegetation and heritage impacts, a workshop held by resource economists with a panel of experts in Pietermaritzburg, and a considerable number of telephonic interviews.
6. The main assumptions in this study are:
  - The choice is between decommissioning the road and providing it with a hard surface to become an all-weather road.
  - The road plays a significant role in the facilitation of trade and commerce between eastern Lesotho and KwaZulu-Natal.
  - Tourism developments in Lesotho, including hotels, a spa and golf course are waiting on the completion of a surfaced Sani Pass road.
  - Sources of information are accurate.
7. The limitation in this report is that no information was obtained on possible new investment projects in the Underberg-Himeville area that could exploit

opportunities presented by the surfacing of Sani Pass and an improved connection to Lesotho.

### Economic Activities

8. In this section the focus is on those economic activities in the Underberg-Himeville and Mokhotlong District that generate traffic on Sani Pass which provides the only road across the border between Lesotho and KwaZulu-Natal, and hence the only artery for traffic between Mokhotlong District in Lesotho and the Underberg-Himeville area in KwaZulu-Natal.
9. In the Underberg-Himeville area, about 46,000 (26%) annual visitors travel up Sani Pass. The Sani-related visitors are estimated to contribute R41.7 million per annum to local accommodation establishments. Their expenditure on local trade (on food, beverages, fuel and souvenirs) is estimated at R47.2 million per annum.
10. There are four main 4x4 tour operators who transport approximately 19,000 visitors per annum up the Pass. Their total turnover is estimated at R11.5 million per annum, and they are only a small contributor to the regional economy.
11. The present study included an investigation into the possible impact of surfacing Sani Pass on adventure tourism. The verification was done through telephonic interviews with the tourism industry, notably inbound tour operators (who supply tourist to the 4x4 tour operators) and Tourism KZN.
12. The majority of inbound tour operators sell Sani as a soft, scenic tour, not as an adventure tour. They felt that surfacing would not devalue Sani Pass as an attraction. Surfacing in fact would enhance the trip in several ways although traffic growth and safety aspects would need to be monitored.
13. The inferences to be drawn are that the majority of foreign tourists would continue to be attracted to Sani, that some inbound tour operators might decide to use their own vehicles rather than the services of the 4x4 tour operators, and that the 4x4 tour operators would need to focus on improving the quality and uniqueness of their services and to enhance synergy with the inbound operators.
14. Restrictions on the value of goods purchased by Lesotho traders on any one trip from South Africa through Sani Pass pose a major problem to Mokhotlong traders and arise from the fact that SARS operates only at five commercial border posts.
15. For Mokhotlong traders wishing to bring in goods worth more than R5,000 at a time, the nearest commercial border post is Caledonspoort, the use of which involves a longer distance and corresponding higher transport costs.
16. The restriction limits the geographic catchment area of Sani Pass for cross-border trade.
17. The opening hours of the border post at Sani Pass are 6am-6pm. This puts Sani Pass at a disadvantage compared with Caledonspoort (6am-10pm) and Maputsoe (open 24 hours/day).
18. Statements by the District Administrator in Mokhotlong corroborate the views of Underberg traders to the effect that trade between Mokhotlong District and Underberg-Himeville has fallen. However, a meeting of Mokhotlong traders reiterated that Underberg was considered to be the cheapest source of goods for the Mokhotlong District. The meeting estimated that at present 70% of Mokhotlong trade was with Underberg-Himeville, and that this could increase to 90% if the road projects on both sides of the border were to go ahead.
19. The major economic activity in the Mokhotlong District relates to wool and mohair production.

20. It is estimated that the quality and quantity of wool and mohair produced could increase by as much as 40%.
21. With transport costs being the main costs for farmers, the improvement of Sani Pass is extremely important to wool and mohair producers in Mokhotlong District, and improving Sani Pass is regarded as essential for the Mokhotlong wool industry to expand.
22. The major development project in the Mokhotlong District at present is the construction of the Polihali Dam. Construction work is to begin in 2011 and will be completed in 2017.
23. At existing dams, the water agreement with South Africa limits development around the dam. However, the agreement is being examined with a view to reducing the limitations on development as many investors are interested in recreation projects. In the case of Polihali Dam, the Lesotho government is keen on having integrated development from Phase 1 onwards, and thus investment in accommodation and recreation could be attracted at an early stage after completion of the dam. Three large tourism projects are also being investigated in the Sani Top area. According to the Lesotho Tourism Authority, the surfacing of Sani Pass road is a requirement for the proposed recreation and tourism investment projects.

### Resource Economics

24. The study assessed the changes in condition and relative value of ecosystem services for the various scenarios. An ecosystem service is one that is generated by the natural environment, enhances human well-being and is directly used by people, e.g., large natural areas in the upper catchments of rivers have provided a regular supply of clean water but have been transformed through settlement, forestry or agriculture. The transformation changes the supply of ecosystem services.
25. The supply of ecosystem services will increase with the upgrading of the existing road to a surfaced road. This is due to improved stormwater attenuation as well as the decreased deposition of sediment which is eroded from the road and deposited in the streams and rivers. It is likely that these changes will result from improved ecological conditions.
26. The demand for many of the cultural ecosystem services, such as sense of place, spiritual wellbeing, and recreation, will change with the upgrading of the existing road to a surfaced road. The number of users, and therefore demand, will increase in terms of sense of place, access between Lesotho and South Africa, birding (and other wildlife) and botanising, the number of self-drive users of Sani Pass road, and users for recreational purposes, such as hiking, mountain biking and running.
27. Spiritual wellbeing is likely to be affected less by the nature of the road surface than by the nature of the road use (traffic volumes, types of use, speed and noise). Road use management is likely to be a key determinant of the quality of tourist experiences.
28. The upgrading of the existing road to a hard surface will have a negative effect on the four-wheel drive tour operators who will have to either stop offering four-wheel drive tours to the top of Sani Pass or offer a different package. Given that the approaches to the South African border post will be able to accommodate tour buses, but that the Pass will not be able to accommodate large buses, there is a potential market for guides to take these tourists up the Pass and into Lesotho.

## Financial Costs and Benefits

29. Capital costs of construction and maintenance costs of road options are compared against benefits. The implications for enterprises in the Underberg area are that, under Option 1, all existing business relating to Sani Pass would be permanently lost, whereas Option 2 would allow the enterprises to retain at least some and perhaps all of their existing business and to expand their businesses by tapping into increased traffic on the Pass. Thus, the negative effects for these operators can be mitigated by adaptation of their product offerings.
30. There are no benefits to enterprises in the study area from closing the Pass. A financial cost-benefit balance sheet would consist only of costs. Losses to existing businesses in the Underberg-Sani Top areas would amount to R106.34 million per annum. These losses would be a severe blow to accommodation establishments in the Underberg area, would be less vital but nonetheless significant for trading enterprises, and would represent the entire turnover of the Sani Top Chalet and the Underberg-based 4x4 tour operators which would presumably have to close.
31. For Lesotho, total capital and maintenance costs of R519.1 million over a 25-year period lead to new investments of R1,450 million, annual financial benefits of at least R197.122 million, and the creation of at least 2,000 temporary (construction) and 730 permanent jobs.
32. For the Underberg area, total capital and maintenance costs of R417.1 million over a 25-year period lead to retained business worth between R72.4-100.4 million per annum, and generated business (phased in over 3 years) of R66.7 million per annum, and thereafter business growth of at least R7.0-8.4 million per annum, resulting in annual financial benefits of between R146.1-175.5 million per annum from the fourth year after the road is completed.
33. The analysis compares the public costs of construction and maintenance of the road with the public benefits in the way of new investment and employment in a developing country (Lesotho) and the pecuniary benefits accruing to producers and enterprises in the Mokhotlong District and Underberg-Himeville. It is clear that the benefits exceed the costs.

## Macro-economic Impact

34. The study calculated the possible macro-economic impact of the proposed construction on the current economic activities in the area and the impacts on KwaZulu-Natal (KZN) and Lesotho. Economic activities in Underberg-Himeville and Mokhotlong District were evaluated in terms of possible impacts of the proposed construction both in the short and longer term. Tourism activities with the 4x4 tour operators and taxi operators would be the ones that would be most directly affected by the project.
35. A multiplier model was used that has previously been developed for projects in KZN. The model is based on the provincial Social Accounting Matrix (SAM). Current economic activities are expressed in terms of gross domestic product (GDP), employment and payments to households.
36. In layman's terms a Social Accounting Matrix (SAM) represents a mathematical matrix depicting the linkages that exist in financial terms between all the major role players in the economy, i.e., business sectors, households and government. It is very similar to the input/output table in the sense that it also reflects the inter-sectoral linkages in an economy.

37. For KwaZulu-Natal, the construction phase impact on GDP is approximately R261 million (in constant 2010 prices). Other impacts of the construction phase are the creation of 1,955 jobs, impacts on low-income, medium and high income households of R21 million, R26 million and R93 million respectively, and a negative impact on the balance of payments of approximately R265 million. Total government revenue is expected to increase by an average of approximately R57 million per annum.
38. For Lesotho, the construction phase impact on GDP is approximately R323 million. Impact on employment amounts to 2,422 jobs that will be sustained over the construction period. The impact on low-income, medium and high income households will respectively be R26 million, R32 million and R116 million. The negative impact on the balance of payments will amount to approximately R328 million. Total government revenue is expected to increase by an average of approximately R70 million per annum.
39. Tourism is a very important element of the economic structure of the Underberg-Himeville area. Its contribution to the area's GDP is R434.54 million, of which Sani-destined tourists contribute R93.34 million (21%). The 4x4 operators are responsible for R11.26 million (or 2.54%) of tourism's total contribution to GDP in the area.
40. Tourism is not such an important element of the economic structure of the Mokhotlong area. The Sani-origin tourists account for R6.07 million (39%) of the total tourist contribution to District GDP.
41. If the Pass is closed, all Sani Pass-related business in the Underberg-Himeville area and the Sani Top area will be lost. Tourism will be reduced to zero.
42. If the road is surfaced, and local tourism industry players in Underberg and Himeville are correct in believing that the 4x4 operators will be forced out of business, the consequences will be exactly the same as that of closing the Pass. This scenario therefore has the same economic impact consequences as Option 1 in paragraph 41 above.
43. However, there is unlikely ever to have been a case where an upgraded road fails to generate new opportunities and new traffic. It is therefore highly unlikely that surfacing the road would lead to a worst-case scenario. A medium scenario with a 50% loss of 4x4 operator traffic and a best-case scenario with 100% retention of such traffic appear to be reasonable. If these scenarios are compared with Option 1, the impact on the growth on the Underberg and Mokhotlong economies is positive. Clearly, any growth must yield a positive result when compared with the loss of all existing business which is inherent in Option 1.

### Economic Cost-Benefit Analysis

44. An economic cost-benefit analysis (CBA) looks at a project from the point of view of society as a whole. Financial prices are converted into economic prices through the use of shadow pricing which excludes transfers such as taxes and duties as well as interest which are not resource costs.
45. The shadow prices used in this study are derived from the consultants experience in road project appraisal in various parts of Southern Africa over a period of 40 years. In South Africa the shadow price factor (SPF) has varied from 0.79-0.91, while in neighbouring countries it has been between 0.80-0.87. For the Sani Pass section of the road, therefore, a mid-point value of 0.85 has been adopted while for the Mokhotlong-Sani Top road in Lesotho, a rate recently calculated by the consultants in Swaziland of 0.80 has been assumed. The Swaziland and Lesotho



- economies are broadly similar in terms of prices, given their position in the Southern African Customs Union vis a vis the dominant South African economy.
46. At the end of the study period, a road will retain some value. This is known to as residual value, and from discussions with engineers has been put at 45% of construction costs in South Africa and 25% in Lesotho in 2038. The reason for the difference is that the road in Lesotho will be designed for higher speeds and traffic volumes than Sani Pass, and is therefore likely to be due for improvement after 20 years of operation.
  47. The costs in a transport project relate to construction and maintenance. The benefits derived from a road project are those which accrue to users in the form of vehicle operating costs (VOCs), time savings and accident costs. Other benefits arise from the comparison between road closure and road upgrading: these benefits consist of the retention of existing business and the potential for growth of new business.
  48. In this analysis, a base case and a best case are identified. Under the best case it is expected that the 4x4 tour operators with mitigation will retain all of their business, while under the base case they would retain 50% of their business with mitigation.
  49. Data on vehicle operating costs (VOCs) were provided by the Cape Town office of SSI. The values used for VOCs are based on figures calculated by SSI for Sani Pass. Included in the VOCs for Sani Pass is also a time savings figure. To determine VOCs for the Sani Top-Mokhotlong road, the P318-1 (Km 14-25 of Sani Pass) VOC saving figures were used as a proxy as this section of Sani Pass most closely resembled the Sani Top-Mokhotlong road. The values used for the Lesotho component of the road are very conservative, and may work out to be much higher once a detailed study is undertaken for the Sani Top-Mokhotlong section.
  50. Under Option 1 with the road being decommissioned, certain traffic at present using Sani Pass would be diverted to routes through Fouriesburg, Ficksburg and Maseru. If Sani Pass were to be surfaced, the saving in distance and hence VOCs would be considerable. The VOC values under the distance savings calculations are those used by SSI for different vehicle types over different road types, gradients and conditions.
  51. A second set of time savings figures is based on the same principle as the distance saving calculations. In this case, the additional time spent on transportation as a result of the decommissioning of the road is multiplied by an average cost per hour for various vehicle types. These time savings figures are based on work done by Imani in a 2010 road construction project in Swaziland. Salaries and wages as well as labour market conditions are broadly comparable to those in Lesotho. To the extent that some of the goods reflected in Table 6.3 might be transported by South African rather than Lesotho carriers, the values would be understated since salaries and wages are higher in South Africa than in Lesotho.
  52. The results are shown as net present value (NPV) and internal rate of return (IRR).

Scenario	Discount rate (%)	NPV (Rm)	IRR (%)
Base case	10	3.5	10
Best case	10	56.0	11

53. Sensitivity analysis was conducted by (i) varying the discount rate to 8% and 12% to take account of possible shifts in the cost of capital, (ii) assuming that only 50% of development projects in Mokhotlong District occur, and (iii) combining a hard-surfaced road on Sani Pass with the status quo (gravel road) from Sani Top to Mokhotlong and excluding development projects in Mokhotlong District. The effect on NPV is shown in the table below.

Scenario	Discount rate (%)	NPV (Rm)
<u>Varying discount rate</u>		
Base case	8	153.2
	12	-96.5
Best case	8	223.0
	12	-55.0
<u>50% development projects</u>	10	-82.4
	8	36.6
	12	-160.8
<u>Gravel/no dev projects</u>	10	108.5
	8	216.3
	12	33.9

54. At the preferred discount rate of 10%, the results for the NPV are positive, indicating that the project is viable, and for the IRR are acceptable for project implementation. An IRR of 11% provides the funding agency with a result that exceeds the prime interest rate as well as the inflation rate.
55. Non-economic factors also need to be taken into account. These concern international relations in the Southern African Customs Union (SACU) and Southern African Development Community (SADC). The SACU has always recognised that the free flow of goods across borders depends on good transport links and systems. SADC has identified cross-border road routes for improvement and upgrading, the Sani Pass-Mokhotlong road being one of the remaining links that requires upgrading.
56. In 2001 the governments of South Africa and Lesotho issued a Declaration of Intent on Technical and Financial Cooperation in the area of road construction and transportation which recognised the situation of Lesotho as a landlocked country and its relationship with KwaZulu-Natal. The international relations aspect, therefore, provides strong grounds for justifying the Sani Pass-Mokhotlong road project.

### Mitigation Measures

57. A number of mitigation measures have been identified by the study team which would cushion any possible negative impacts on existing enterprises in the area of influence of the Sani Pass-Mokhotlong road.
58. These measures relate to:
- Aesthetics of the Sani Pass road
  - Road use management
  - In order to reduce the impacts on trade, tourism and accommodation, both the Lesotho and South African governments as well as the KwaZulu-Natal provincial administration should undertake aggressive marketing campaigns to promote the area for tourism. This is also a key finding of the social and earlier economic specialist reports.
  - The Lesotho Tourism Authority should develop new tourism routes,



- As a large percentage of foreign tourists who visit the area are linked to inbound tour operators, marketing efforts should be made to persuade those operators to continue to run tours to the Sani Pass area and to extend their tours into Lesotho rather than terminating at Sani Top.
- Opening hours of the border post should be extended commensurate with safety considerations.
- SARS should consider upgrading the border post, once it has been relocated, to commercial status, i.e., with no limit on the value of goods imported by Lesotho traders, in order to allow trade between Mokhotlong District and KwaZulu-Natal to reach its potential.

## Conclusion

59. The contention that an all-weather surface would only have negative impacts goes against all experience in previous road projects. Experience has shown that the improvement of road infrastructure to make areas more accessible has always resulted in increased visitor numbers. In the case of Sani Pass, a number of new possibilities would be opened up once the road works are complete, e.g., the Polihali Dam could be exploited as a tourist resort, and hotel development could incur in the Sani Top area, attracting ordinary SUV vehicles which are not necessarily 4x4s.
60. An all-weather road will generate new traffic, creating a tourism niche in the area.
61. This new traffic will inject significant streams of revenue into an area that is currently underperforming.
62. The new road will result in increased trade between the countries and the potential for new investment opportunities.
63. The road plays a significant role in the facilitation of the wool and mohair industry in Lesotho with the new road creating the opportunity for a 40% growth in this industry.
64. The decommissioning of the road will result in substantial distance and time saving costs due to traffic being rerouted.
65. The surfaced road results in significant levels of trade, tourism and accommodation being retained in the area.
66. A surfaced road will have a positive net effect on the ecology of the area with reductions in erosion and sedimentation.
67. The economic cost-benefit analysis reveals that a surfaced road will have a positive net effect to the overall project area and is viable. Although a limited number of stakeholders may be negatively affected, the overall benefit of having a surfaced road outweighs the costs of not having a road at all.
68. The macroeconomic impact analysis yielded positive results on GDP, employment, incomes and tourism.
69. The economic CBA yielded a positive net present value and an internal rate of return of 11% which exceeds the current interest and inflation rates.

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## 1. INTRODUCTION

### 1.1 Background

The KwaZulu-Natal Department of Transport (KZN-DOT) wishes to upgrade the Sani Pass Road (MR318). As part of the Environmental Impact Report (EIR) of Phase 2 (upgrading from km14 to km 33) being prepared by Arcus Gibb, a report on the economic aspects was commissioned and completed in 2009.

The present study was commissioned by Arcus Gibb on behalf of the KZN-DOT on 5 November 2010. The purpose of this study is to take a holistic view of the costs and benefits relating to the upgrading of the road both in South Africa and Lesotho. Such a view would cover a conventional cost-benefit analysis, a resource economics analysis, Social Accounting Matrix and macro-economic impact modelling, and attention to development projects and aspects of international relations.

### 1.2 Rationale for Surfaced Road

The project covers the Sani Pass road in South Africa and the road from the border at Sani Top to Mokhotlong in Lesotho.

Six options were identified for Phase 2 of the Sani Pass road project by the engineering consultants. These are:

- (i) Close pass – deproclaim road and hand over to Ezemvelo KZN Wildlife.
- (ii) Re-gravel, minor drainage improvements, maintain.
- (iii) Improve geometrics, upgrade drainage, retain splash troughs, construct retaining walls and re-gravel.
- (iv) Improve geometrics, upgrade drainage, construct bridges, retaining walls, blacktop up to km25, gravel to km33.
- (v) Improve geometrics, upgrade drainage, construct bridges and retaining walls, hard surface from km14 to km33.
- (vi) Improve geometrics, upgrade drainage, construct bridges and retaining walls, blacktop from km14 to km31, and tunnel (3km).

An economic cost-benefit analysis customarily compares “with” and “without” scenarios. For Sani Pass, the latter scenario would in fact be the base case which would imply the “do-nothing” option. This means that the status quo would be maintained, the status quo being defined as routine maintenance only. However, this is an unsustainable long-term option because of the increased costs both of repairing storm damage and washaways which are regular annual occurrences, and of trucking gravel for resurfacing. Borrow pits are not permitted in the World Heritage Site, and hence gravel has to be trucked in over a considerable distance. Because this is no longer a sustainable option, it implies the decommissioning of the road and handing it over to Ezemvelo KZN Wildlife.

For the same reason that the status quo is no longer sustainable, upgrading to an improved or good gravel road is also not an option. Thus, Options (ii) and (iii) have been discarded and are excluded from the analysis, meaning that the “with” scenario relates only to surfacing the road. The final design has incorporated Option (v) as the desired one, and has therefore eliminated Options (iv) and (vi). Thus, the comparison in the economic analysis is between Options (i) and (v), i.e., between closing the road and providing it with a hard surface.



Option (v) allows accessibility to the public and not only 4-wheel drive vehicles, i.e., small vehicle categories such as passenger cars, bakkies, SUVs and the larger taxi vehicles (GVM of 4.2 tons, Toyota Quantum-type) will be allowed. Fully laden trucks of 8-ton maximum payload, however, will be restricted to 4-wheel drive vehicles with a 13-ton GVM. Tour and passenger buses will be restricted to a short-wheel base 4x4 vehicle with an 8.5 ton GVM. Despite greater accessibility, a surfaced Sani Pass road will not be an interstate highway competing with the N3 or N5.

On the Lesotho side, the intention is to surface the road from Sani Top to Mokhotlong in order to complete a trans-Lesotho surfaced road. A feasibility study of upgrading this road to a bitumen standard is being undertaken by Aurecon for the Roads Directorate in Lesotho. The road to Mokhotlong and Sani Top is spectacular and includes the highest road in Africa at the top of the Tlaeeng Pass, 3275m above sea level. Between Sani Top and Mokhotlong is Black Mountain Pass, every bit as dramatic as Sani but in a very different way. Sani Pass spirals upward over a short distance, while Black Mountain Pass flows with the terrain, climbing steeply and then dropping sharply into deep valleys. Mokhotlong is 52 kilometres from Sani Top.

### 1.3 Methodology

A field visit to Lesotho was undertaken between 18-20 January 2011. Appointments with various government departments and officials were set up for the consultants by the Ministry of Public Works and Transport. Meetings were held in Maseru on 18 and 20 January and in Mokhotlong on 19 January.

The main aim of the visit was to obtain quantitative information wherever possible on economic activities in the area of influence of the Mokhotlong-Sani Pass road, economic development plans for Mokhotlong District, and economic statistics for Lesotho with a regional (district) breakdown. In discussions with various officials, it emerged that there is no National Economic Development Plan at present, although one is expected to be produced by mid-year. Similarly, there are no regional development plans for the districts. The National Tourism Development Plan was never approved by the cabinet, has never been implemented and is obsolete although the factual content remains valid. Some statistical information and extracts from internal reports were made available to us by various respondents in the meetings.

The consultants have examined the specialist reports on economic and social impacts as well as the reports by the aquatic, vegetation and heritage specialists prepared for the Environmental Impact Report, and have used certain information contained in these reports that are relevant to this study. Figures have been corroborated where necessary through interviews and further data collection.

A site visit to Sani Pass was undertaken on 11 February. Four team members made the trip, but because of rain and storm damage the final ascent was inaccessible by the 4x4 vehicle used. Two consultants climbed the final section along the switchback curves, crossing the border to Sani Top Chalets where an interview was held.

Resource economists held a workshop with a panel of experts in Pietermaritzburg on 8 March. This was attended by the following:

<b>Name</b>	<b>Organisation</b>	<b>Role</b>	<b>Expertise</b>
Myles Mander	FutureWorks	Facilitator	Resource economist
Michael Van Niekerk	FutureWorks	Environment management	Environmental consultant
Russell Stow	Arcus Gibb	EIA Project leader	Environmental consultant
Eduardus Gademan	SSI Engineers	Consulting engineer	Engineer
Frank Sturgess	Imani Development	Economist	Economist
Elsa Pooley	Indigenous Landscaping	Botanical impact assessment	Botanist
Mark Graham	Ground-Truth	Riverine and aquatic impact assessment	Riverine and aquatic specialist
Steve McKean	Ezemvelo KZN Wildlife (EKZNW)	Regional resource ecologist	Resource ecologist
Bianca McKelvey	Wildlife and Environment Society of South Africa (WESSA)	Environment conservation	Conservation manager

A considerable number of telephonic interviews were held with individuals in Durban, Pietermaritzburg, Underberg, Lesotho, Port Elizabeth, Johannesburg and Cape Town. The three groups of consultants – Imani, Conningarth and FutureWorks – maintained liaison during the study whilst preserving their autonomy. Thus, although their findings are broadly congruent, there are some minor differences in quantification.

#### 1.4 Assumptions and Limitations

The main assumptions in this study are:

- The choice is between decommissioning the road and providing it with a hard surface to become an all-weather road.
- The road plays a significant role in the facilitation of trade and commerce between eastern Lesotho and KwaZulu-Natal.
- Tourism developments in Lesotho, including hotels, a spa and golf course are waiting on the completion of a surfaced Sani Pass road.
- Sources of information are accurate.

The limitation in this report is that no information was obtained on possible new investment projects in the Underberg-Himeville area that could exploit opportunities presented by the surfacing of Sani Pass and an improved connection to Lesotho.

#### 1.5 The Study Team

Imani Development established a team which included specialists from Conningarth Economists (for macroeconomic modelling) and FutureWorks (for resource economics). In this report Sections 1, 2, 4, 6, 7 and 8 were written by Imani, Section 3 by FutureWorks and Section 5 by Conningarth. The team members were:

- Imani - Professor Gavin Maasdorp (Team leader)  
 - Mr Frank Sturgess
- Conningarth - Mr William Mullins  
 - Ms Melanie Mathee
- FutureWorks - Mr Myles Mander  
 - Mr Michael van Niekerk

## 2. ECONOMIC ACTIVITIES

In this section the focus is on those economic activities in the Underberg-Himeville and Mokhotlong District that generate traffic on Sani Pass which provides the only road across the border between Lesotho and KwaZulu-Natal, and hence the only artery for traffic between Mokhotlong District in Lesotho and the Underberg-Himeville area in KwaZulu-Natal.

### 2.1 Underberg-Himeville

#### 2.1.1 Tourism

According to data reported on in greater detail in Section 5 and synthesised from the social and previous economic specialist reports, the annual turnover of accommodation establishments in this area is R185.7<sup>1</sup> million per annum. This includes room and breakfast. Some 2,500 beds are provided, and bed-occupancy rates range from 50.7% for B&B accommodation to 57.3% for hotels. A total of 180,000 visitors per annum are attracted to the establishments; of these, about 46,000 (26%) travel up Sani Pass. The Sani-related visitors are almost equally divided between foreign and domestic tourists, and they are estimated to contribute R41.7 million per annum to local accommodation establishments. Their expenditure on local trade (on food, beverages, fuel and souvenirs) is estimated at R47.2 million per annum.

#### 2.1.2 4x4 Tour Operators

Another component of the tourism industry is that of 4x4 tour operators. There are four main companies involved, and they transport approximately 19,000 visitors per annum up the Pass. Their total turnover is estimated at R11.5 million per annum.

Although the four 4x4 tour operators are only a small contributor to the regional economy in the overall scheme of things, a special effort has been made in this study to examine the impact of surfacing Sani Pass on their businesses. The reason for this is a major conclusion of the existing economic report was that tour operators in the Underberg-Himeville area would lose considerable volumes of business, largely with regard to adventure tourism. The existing report recommended that a marketing study be undertaken of the impact on adventure tourists to ascertain whether or not an upgraded road would in fact reduce the attractiveness of the “Sani experience” and hence lead to a decline in the numbers of adventure tourists and in the tour operator business. The brief for the present study included further investigation into the possible impact of surfacing Sani Pass on adventure tourism. The verification was done through telephonic interviews with the tourism industry, notably inbound tour operators (who supply tourist to the 4x4 tour operators) and Tourism KZN.

##### 2.1.2.1 Organisation of Tours

The social and previous economic specialist reports assume that 17,000 foreign tourists take day trips up Sani Pass into Lesotho with the 4x4 operators. The organisation of tours for foreigners takes place as follows:

- Outbound tour agents (based in foreign countries such as the UK) draw up the specifications for their clients, and the inbound tour operators compile the itinerary. Inbound tour operators are those based in South Africa. They deal with inbound foreign tourists, and organise package tours for overseas visitors. Markets vary, e.g.,

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<sup>1</sup> For the sake of convenience, rands are used as the currency in this report. The Lesotho maloti is at par with the South African rand in the Common Monetary Area

British tourists are interested in the Battlefields and Sani Pass while American and German tourists have different interests.

- The 4x4 operators receive most of their foreign tourists at Underberg from the inbound tour operators. Trips up the Pass include a guide but, if there were a foreign language problem, a guide from the inbound tour operator would accompany the 4x4 vehicle. The usual charge is R250 per person each way, i.e., a round trip up and down the Pass for R500.

The 4x4 operators market themselves at the Tourism Indaba in Durban in May each year, selling their services to the inbound tour operators who in turn sell their services direct to overseas clients. The 4x4 operators mainly depend on the inbound tour operators although some might have direct contacts with outbound tour operators.

Arrangements made by the inbound tour operators (who are based mainly in Durban and Johannesburg) for Sani Pass trips vary from one company to another.

- Usually arrange accommodation in Durban for foreign tourists with a day trip to Sani Pass and back. Hand over the tourists at Underberg or Himeville to the 4x4 operators, wait for them, and bring them back to Durban. Some overseas visitors hire cars and drive themselves to Underberg.
- Day tour division in the company takes small groups of 2-3 persons to Sani Pass.
- Provides guided luxury bus tours over 35 days from Johannesburg to Cape Town, with two nights being spent at Sani Top Chalets. On another tour, only one night is spent at Sani Top Chalets.
- Provides day trips in its Quantum bus from Durban to Underberg as a package tour. Some self-drive tourists spend 1-2 nights at Sani Pass Hotel.

#### **2.1.2.2 Attractions/Selling Points**

Inbound tour operators were asked what the main selling points were in arranging tours to Sani Pass. Roughly similar viewpoints were advanced by most of the inbound tour operators.

- Main attractions are mountains and scenery, the opportunity to enter another country (Lesotho) and have another stamp in a passport (any tourist going up Sani Pass needs to present a passport at the South African border post and, if entering Lesotho, at the Lesotho border post at Sani Pass). Having a drink at the highest pub in Africa at Sani Top Chalets is also a selling point. There are occasional requests by foreign tourists to visit Khatse Dam in Lesotho. Sani Pass is seen as a rustic tour.
- It is the destination, not the road that sells the product. Adventure tourism appears to be more popular among younger visitors, and is defined as “anything one would not do at home”. It includes activities such as pony trekking, hiking and so on.
- Sani is well known as a destination.
- Sani is not regarded as an adventure but as a scenic tour.
- Company puts more emphasis on adventure together with culture in selling Sani Pass. If Sani Pass were a scenic route only, it would drop it from its itinerary and instead focus on the Garden Route and Outeniqua Pass although culture tourists and hikers might still prefer Sani. Other passes and Royal Natal/Tendele also have spectacular scenery. Nonetheless, local tourists and specialist outdoor (flora, hiking) tourists would still go to Sani but perhaps not tourists looking for rugged 4x4 experience. Of the adult tourists handled by this company, 20% go to Sani. The majority of the 20% are looking for a soft adventure and a cultural experience.

- Lunch at the highest pub in Africa is an attraction. The 4x4 tour operator supplied by the company takes foreign visitors to a homestead 5km into Lesotho for a cultural experience.
- Sells Sani as a soft adventure tour, emphasising the highest pass and rugged aspects with a slight risk element but not as a major 4x4 trip. This emphasis appeals to the majority of foreigners.

### **2.1.2.3 Impact of Surfacing the Road**

Inbound tour operators were asked what effect the surfacing of Sani Pass would have on tourism.

- Improved vehicle access will not detract from the attraction of Sani. More foreigners and locals would use Sani Pass. Passengers would like to use a coach to go up the Pass – this would be quicker and allow them more time at the top. At present, visits are very rushed at the top as the border gate closes at 6pm.
- The road would be more reliable if it were to have an all-weather surface. The company could perhaps use its own vehicle up the Pass as it might not be essential to continue using 4x4 tour operators, but this would lead to those operators losing business.
- The 4x4 operators would stay in business. The company would not wish to send its own driver and vehicle up the Pass.
- Company's vehicles are underutilised once they reach Underberg: they transfer day tourists to the 4x4 operators and then have to wait for them to return. Company would consider taking its own vehicles up Sani: would be cheaper for passengers if they remain on the same vehicle as at present they are paying for a service which includes two vehicles, and therefore prices could be decreased. However, this could only happen if a comfortable vehicle could use the Pass. Moreover, many foreign tourists would prefer to travel in an open 4x4 on a good surface than on a rough surface, and the preference for an open vehicle could well outweigh the higher cost of the present system.
- A surfaced road would increase safety levels. The company has heard some horror stories from foreign tourists. A surfaced road would not detract from views or be a reason to exclude Sani from itineraries, and the company would not stop sending tourists to Sani.
- The road surface is not an issue for foreign tourists, but it would be a pity to lose the present atmosphere if an improved road would lead to increased traffic, more private cars and congestion.
- Safety aspects would need to be monitored by the conservation area authorities – if traffic were to increase substantially, the road in fact might become less safe.
- Surfacing could lead to a change in clientele depending on how successful local B&Bs and the local tourism association are at Internet marketing. They need to target the self-drive market through the Internet. Apparently Internet selling is increasing, and the trend is for it to replace tour operators.

### **2.1.2.4 Summary**

The majority of inbound tour operators sold Sani as a soft, scenic tour, not as an adventure tour. Only one inbound tour operator emphasised adventure but in conjunction with culture, not on its own, and stated that the majority of its adult tourists going up Sani Pass are looking for a soft adventure and culture. Only this company felt that tourists in search of a rugged 4x4

adventure might desert Sani Pass. Of its tourists the majority were not looking for a rugged adventure.

The majority felt that surfacing would not devalue Sani Pass as an attraction. Surfacing in fact would enhance the trip in several ways although traffic growth would need to be monitored. Some inbound tour operators would not wish to use their own vehicles while two stated that they could consider doing so, thereby leading to a loss of their business to 4x4 tour operators.

The policy of most inbound tour operators is to sell Sani as a soft adventure and culture experience. This accords with the content of an article on the website <http://www.4xforum.com/africa-travels/lesotho/sani-pass> which states that Sani Pass once had the reputation of being close to impassable, but it is now suitable for almost all vehicles and can no longer be regarded as only a 4x4 drive.

Thus, the inferences to be drawn are that the majority of foreign tourists would continue be attracted to Sani, that some inbound tour operators might decide to use their own vehicles rather than the services of the 4x4 tour operators, and that the 4x4 tour operators would need to focus on improving the quality and uniqueness of their services and to enhance synergy with the inbound operators.

### **2.1.3 Trade**

Basotho in the Mokhotlong District have traditionally traded with the Underberg-Himeville area. However, there was no consensus of opinion among trading stores interviewed in Underberg about the trends in this trade. Some mentioned that traders in Mokhotlong appeared to be procuring more of their supplies from Pietermaritzburg, but the major wholesaler in Pietermaritzburg who was mentioned stated that there had been no increase in trade with Lesotho. This wholesaler supplied firms in Underberg, and felt that it was they who might be increasing the volume of their trade with Mokhotlong. In any event, it appeared that trade with Lesotho overall was only a small proportion of total trade in Underberg (probably 5% or less according to one cooperative). The problem in assessing trends on the part of the traders could be that they do not differentiate their customers by area of origin, and therefore are not always able to attribute volumes of sales to Basotho from the Mokhotlong area. Typical goods bought were blankets and plastic wear (especially by Indian and Chinese traders in Mokhotlong), chemicals, fertilisers, feeds and mealie meal.

## **2.2 Mokhotlong District**

There are 11 districts in Lesotho, of which Mokhotlong is the third largest in terms of area (4,075 km<sup>2</sup>). However, it contains the second lowest population (98,000 in 2006) and is the most sparsely populated with a density of 24 persons/km<sup>2</sup>. According to the District Administrator in Mokhotlong, the population of the country has fallen since the last census in 2006. This is attributed to the ravages of AIDS, although the disease is now stated to be under control.

### **2.2.1 Challenges**

Arising out of interviews in Mokhotlong, it became apparent that there are three main challenges facing Lesotho users of the Sani Pass road. These are dealt with below.



### **2.2.1.1 Roads**

The quality and reliability of the Sani Pass road were stated to be problems. It was estimated that the road is closed for perhaps 15-20 days per annum because of snow and washaways.

Equally important, however, is the quality of the road from Mokhotlong to the border as well as the road from Oxbow to Mokhotlong. The road between Mokhotlong and the border post is unpaved, but a feasibility study is being undertaken of upgrading the road to a bitumen surface. According to the Roads Directorate, the road from Butha Buthe to Oxbow Lodge consists of a double seal and is in reasonable condition. However, between Oxbow and Mapholaneng, the tarmac surface has been removed in parts, but the gravel is in good condition, being maintained on a monthly basis by a contractor. A major problem at present on the Oxbow-Mokhotlong road is a stretch of about 20km from roughly the diamond mine at Letseng le Terae towards Mapholaneng which is in a deplorable condition, being severely potholed. The stretch between Mapholaneng and Mokhotlong has been recently upgraded, the work only being completed in December 2010. The main problem apparently is that the very high temperature range experienced in the mountainous areas, together with the quantity of water runoff after rains, requires special designs for roads. A Scandinavian design was used as far as Oxbow, but thereafter a typical design for lowlands roads was used and has proved to be inadequate.

The observations of the consultants broadly accord with the views of the Roads Directorate. Of particular concern, however, must be the presence of heavy-vehicle combinations (six-axle combinations were seen) on a winding and mountainous road which was clearly not designed for such traffic. The 20-km stretch referred to above is a manifestation of the damage to the road surface being inflicted by heavy vehicles. The entire road from the lowlands to Mokhotlong is, in fact, in serious danger of being severely damaged by such traffic.

### **2.2.1.2 Restrictions on Trade**

Restrictions on the value of goods purchased by Lesotho traders on any one trip from South Africa through Sani Pass were generally regarded as a major problem. The restriction was explained by the Bureau of Statistics as follows: in 2003 a new arrangement was reached between the Lesotho Revenue Authority (LRA) and the South African Revenue Service (SARS). Before July 2003 there were no distinctions between the border posts and no limits on value of goods imported at any one time. From July 2003 the five commercial border posts (Caledonspoort, Maputsoe, Maseru Bridge, Van Rooyen's Gate and Qachas Nek) had no limit on the value, but all other border posts including Mokhotlong had a limit of R5,000 imposed on them. The problem for Mokhotlong traders is that SARS operates only at the five commercial border posts, and therefore a distinction had to be made between border posts based on the presence of SARS. The situation at border posts such as Sani Top is that Lesotho traders who purchase goods in South Africa surrender their invoices at the border post to the LRA, the LRA claims VAT, and SARS endorses the invoices provided the value is over R5,000. Importers may apply for exemptions in the way of a Concession Certificate; if granted, they may then import goods to the value of over R5,000 through Sani Top, but such a trader would need to be a resident of the Mokhotlong District with a good record of compliance.

For Mokhotlong traders wishing to bring in goods worth more than R5,000 at a time, the nearest commercial border post is Caledonspoort, the use of which involves a longer distance and corresponding transport costs.

According to interviewees in Mokhotlong, the 2003 restriction limits the geographic catchment area of Sani Pass for cross-border trade over and above road and distance problems.

### 2.2.1.3 Border Opening Times

The opening hours of the border post at Sani Pass are 6am-6pm. This puts Sani Pass at a disadvantage compared with Caledonspoort (6am-10pm) and Maputsoe (open 24 hours/day). According to the District Administrator, Mapholaneng would make greater use of Sani Pass if the opening hours were more favourable.

### 2.2.1.4 Catchment Area for Sani Pass

Although it was stated during meetings in Mokhotlong that traders from as far afield as Butha Buthe would use an upgraded Sani Pass for imports from Pietermaritzburg and Durban, this does not seem likely as the route through the Free State on the N3 and N5 would be much shorter and quicker. Irrespective of its condition, the road from Butha Buthe to Sani Pass would be slow given the topography and low average speeds.

It was stated that traders from Thaba-Tseka also use Sani Pass, although it would appear that Ramatseliso's Gate could be an alternative for their trade with the Underberg area in KwaZulu-Natal. It is likely that a surfaced Sani Pass road would not serve a catchment area in Lesotho beyond Letseng le Terae and Thaba-Tseka at a maximum. The bulk of commercial traffic on the pass would be likely to emanate from Mokhotlong, Mapholaneng and Linakaneng. However, it would seem that such traffic would be generated by independent firms rather than chain stores: Frasers is the largest store in Mapholaneng and is one of 28 stores in the company's Lesotho chain which is served from a distribution centre in Maseru. All the company's imports enter the distribution centre through Maseru Bridge and other western border posts, and none of the branch stores do their own purchasing. Thus, the branch in Mapholaneng makes no use of Sani Pass.

## 2.2.2 Economic Activities

### 2.2.2.1 Sani Pass Trade

The Lesotho Revenue Authority provided trade statistics for the Sani Top border post which are shown in Table 2.1.

**Table 2.1: Imports and Exports through Sani Top Border Post, Financial Years (April-March) 2005/06-2010/11**

Year	Imports		Exports <sup>a</sup>	
	Value (Rm)	% Lesotho	Value (Rm)	% Lesotho
2005/06	5.9	0.13	...	...
2006/07	6.7	0.14	...	...
2007/08	5.2	0.09	...	...
2008/09	3.9	0.04	5.4	0.25
2009/10	3.9	0.04	6.5	0.32
2010/11 <sup>b</sup>	...	...	2.4	0.14

**Notes:** (a) Excluding textiles exports to the US and EU, diamonds and wool; (b) Only for April-December 2010; ... indicates not available

**Source:** Lesotho Revenue Authority

The table shows that the Sani Top border post is very small in Lesotho's total international trade. In 2005/06, for example, Lesotho's exports totalled R4.4bn of which Maseru Bridge accounted for R2.5bn and Maputsoe for R1.1bn. The third most important border post was

Caledonspoort which handled imports worth R281m. Sani Top, however, is the only border post for wool exports apart from Maseru Bridge. The volume of wool and mohair exports is not included in Table 2.1 but is shown in Table 2.2

The table also shows that the value of imports through Sani Top has declined. This is probably a reflection of the global economic recession which hit the region in the second half of 2008. However, the District Administrator states that the restrictions imposed on the value of imports by the LRA has led to importers in the Mokhotlong District making any large purchases in Ficksburg instead of Underberg, Pietermaritzburg or Durban.

#### **2.2.2.2 Traders and Hawkers**

Basotho used to dominate the retail trade in Mokhotlong but have lost considerable ground in the last few years, first to Indians and then to Chinese. It was estimated by interviewees in Mokhotlong that Chinese today account for about 40% of retail outlets, being mostly concentrated in large shops in the centre of Mokhotlong. While Basotho still comprise about 60% of retailers, this consists mainly of small shops and hawkers. The average number of jobs per retail establishment was estimated at between 2-5 depending on the type of business, and no estimate was available of total employment in this sector.

Hawkers tend to use local taxis to Underberg, then continuing to Pietermaritzburg in a South African taxi. Approximately 60% of the hawkers are said to be using Sani Pass, but it was stated that the use of Sani Pass was declining because of the condition of the road, and that this has led to more business being done in Butha Buthe and the Free State border towns. Hawkiers deal mainly in clothing, shoes and school supplies, and compete with retail traders in these lines. Chinese traders were said to purchase goods mainly from the Free State rather than KwaZulu-Natal.

Another reason advanced by a retail chain for the declining use of Sani Pass was that the road was outside cellphone range and that this had encouraged armed robberies.

Statements by the District Administrator corroborate the views of Underberg traders (Section 2.1.3) to the effect that trade between Mokhotlong District and Underberg-Himeville has fallen. However, a meeting of Mokhotlong traders convened on the consultant's behalf by a local businessman reiterated that Underberg was considered to be the cheapest source of goods for the Mokhotlong District. The meeting estimated that at present 70% of Mokhotlong trade was with Underberg-Himeville, and that this could increase to 90% if the road projects on both sides of the border were to go ahead.

#### **2.2.2.3 Wool and Mohair**

The major economic activity in the Mokhotlong District relates to wool and mohair production. The volume and value of production are shown in Tables 2.2 and 2.3.

**Table 2.2: Wool and Mohair Output, Lesotho and Mokhotlong, 2005/06-2009/10 ('000 kg per annum)**

Year	Wool			Mohair		
	Lesotho (kg)	Mokhotlong (kg)	(%)	Lesotho (kg)	Mokhotlong (kg)	(%)
2005/06	2149	436	20.3	311.0	73.5	23.6
2006/07	2154	448	20.8	362.0	82.9	22.9
2007/08	2573	559	21.7	391.2	93.9	24.0
2008/09	3080	642	20.8	387.0	88.1	22.8
2009/10	2943	636	21.6	410.4	93.6	22.8

Source: BKB, Port Elizabeth

**Table 2.3: Wool and Mohair Value, Lesotho and Mokhotlong, 2005/06-2009/10 (Rmill)**

Year	Wool			Mohair		
	Lesotho	Mokhotlong	(%)	Lesotho	Mokhotlong	(%)
2005/06	34.9	8.0	22.9	13.4	3.3	24.6
2006/07	61.7	14.3	23.2	17.9	4.2	23.5
2007/08	84.1	19.4	23.1	14.7	3.8	25.9
2008/09	61.3	13.3	21.7	13.4	3.4	25.4
2009/10	96.1	20.8	21.6	17.1	4.3	25.1

Source: BKB, Port Elizabeth

Mokhotlong is the second most important wool-producing district in Lesotho, its output being marginally lower than that of Thaba-Tseka, and is by far the most important mohair-producing district. Moreover, Mokhotlong is regarded as the most advanced wool and mohair producer in Lesotho, the quality of its product competing with the best in South Africa. Whereas Mokhotlong in 2009/10 had 18.6% of Lesotho's total number of sheep and 15.7% of the total number of wool producers, it accounted for 21.6% of output both by volume and value. In the case of mohair, Mokhotlong had 17% of the total number of goats in Lesotho and 17.4% of the total number of producers, but they accounted for 22.8% of total output by volume and 25.1% of total output by value of mohair.

All wool and mohair produced in Lesotho is handled by the South African firm, BKB. Approximately 80% of Lesotho's wool has been sold in Port Elizabeth and 20% in Durban, but Durban is being phased out as a wool port. The policy is now to concentrate all exports from Port Elizabeth where there is a wool scouring plant. The position with regard to mohair producers is the same as for wool in terms of transport and sales.

Sheep in the Mokhotlong District are taken to a shearing centre, and then the wool is taken to a woolshed, of which there are 12 in the district. Four new woolsheds are being built. After shearing, the wool is baled in the woolsheds and then transported down the Pass in 8-ton trucks hired from local firms, each carrying 21 bales with each bale weighing between 165-180 kg. The distribution hub for Lesotho's wool is Underberg. The trucks offload the wool and mohair into the shed of a local transporter in Underberg who then reloads onto bigger trucks carrying an average payload of 18 tons for conveyance to Port Elizabeth.

Wool from other districts in Lesotho is transported to Port Elizabeth via Maseru where it is reclassified in a central woolshed which also issues permits for transporting the wool to Port Elizabeth. If Sani Pass is kept open and surfaced, the plan is to create a similar wool centre at Sani Top which would also issue export permits and reclassifying the wool. A small laboratory would be necessary in order to conduct phyto-sanitary tests. It would employ

approximately 30 persons, some of whom would require special training as laboratory technicians and analysts.

There is some overgrazing in Mokhotlong, and the plan is to reduce the size of the flock by culling presently unproductive animals. The quality of sheep has in fact been improving over the years because of technical cooperation with the South African wool industry from which Basotho farmers purchase an estimated 4,000 rams per annum. Breeders in Lesotho are being trained to improve the quality of stock which would be better adapted to the local environment. The quality of goats is also being improved in partnership with established processors of mohair in South Africa. It is estimated that the quality and quantity of wool and mohair produced could increase by as much as 40% despite flocks falling by 20% once the non-productive animals are culled. With transport costs being the main costs for farmers, the improvement of Sani Pass is extremely important to wool and mohair producers in Mokhotlong District.

With regard to the impact of Sani Pass on the wool industry, Lesotho Product Management Services (LPMS), a state-owned enterprise facilitating wool and mohair exports, stated that it was important for farmers to have improved access to the Port Elizabeth market. LPMS was helping farmers to reduce their marketing costs, of which transport was a major item. It is more expensive for Mokhotlong farmers to send their wool to Port Elizabeth via Maseru, and therefore their net profit would be reduced if Sani Pass were not improved, i.e., if it were closed. The views of LPMS were backed by the Lesotho National Wool and Mohair Growers' Association who felt that a surfaced Sani Pass is critical for economic activity in Mokhotlong District, embracing farming, tourism and traders.

A major complaint by farmers is the long time period between shearing and receipt of payment for their clips. Electronic payment after auctions has been introduced and therefore the post-auction payment period has been cut and the cash flows speeded up. However, delays in the pre-auction period are a problem. If the period between shearing and the wool auctions could be reduced, this would overcome the problem. The delays are due to transport because of the unreliability of the Sani Pass road. According to BKB, rains in the 2010/11 summer caused substantial delays in Lesotho wool reaching the auction floors, and approximately 15-20% of market value was lost because of price changes between the auction date and the date when the wool should have arrived in Port Elizabeth. Improving Sani Pass is essential for the Mokhotlong wool industry.

Wool and mohair prices have been high in recent months. In the November 2010 sales in Port Elizabeth, mohair from kids fetched R92/kg as compared with only R3/kg a few years ago. Cape Wools, the South African wool growers' body, stated that production should increase because of expected higher wool prices over the next few years which were encouraging farmers in South Africa to convert from meat to wool production, increasing the size of their flocks and reducing the area devoted to crops. The situation in Lesotho should be similar.

#### **2.2.2.4 Tourism**

Table 2.4 shows visitor arrivals to Lesotho through Sani Top border post.

**Table 2.4: Visitor Arrivals, Sani Top Border Post, 2009**

	Africa	Americas	Europe	Asia	Middle East	Unspec.	Total	Lesotho
Jan	516	50	688	31	3	-	<b>1,288</b>	23,988.00
Feb	467	70	825	41	-	-	<b>1,403</b>	21,053.00
Mar	461	169	1,028	30	-	-	<b>1,688</b>	21,048.00
Apr	746	112	855	80	-	-	<b>1,793</b>	29,658.00
May	475	82	459	58	-	-	<b>1,074</b>	18,908.00
Jun	581	96	427	59	1	-	<b>1,164</b>	23,017.00
Jul	855	113	649	95	-	-	<b>1,712</b>	31,901.00
Aug	930	88	891	64	-	-	<b>1,973</b>	32,000.00
Sep	602	94	987	50	-	-	<b>1,733</b>	29,287.00
Oct	676	121	1,643	56	-	-	<b>2,496</b>	32,053.00
Nov	465	125	2,155	57	-	7	<b>2,809</b>	30,132.00
Dec	788	122	849	37	-	-	<b>1,796</b>	50,471.00
<b>Total</b>	<b>7,562</b>	<b>1,242</b>	<b>11,456</b>	<b>658</b>	<b>4</b>	<b>7</b>	<b>20,929</b>	<b>343,516.00</b>
<b>%</b>	<b>36.13</b>	<b>5.93</b>	<b>54.74</b>	<b>3.14</b>	<b>0.02</b>	<b>0.03</b>	<b>100.00</b>	

Sani Top contributed 6.1% of all visitor arrivals to Lesotho in 2009. There are nine entry points in total, by far the most important being Maseru Bridge followed by Maputsoe, Caledonspoort and Van Rooyen's Gate, with Sani Top in fifth place. Table 2.4 shows that most tourists originate in Europe and Africa; the major countries are Germany and the United Kingdom in Europe while South Africa accounts for the overwhelming majority (about 98%) of arrivals from Africa. Sani Pass attracted only 2.4% of all arrivals from Africa but 58.1% of all European and 30.1% of all American arrivals. Thus, Sani Pass was proportionately more attractive to Europeans and Americans rather than to visitors from Africa. The main months for Europeans and Americans were March, October and November while South Africans favoured July and August (the coldest months when ski slopes were most likely to be open) as well as December.

### 2.2.2.5 Transport

Taxis are the most common form of transport in the district. Information from the District Administrator was that four taxis (4x4 vehicles) plied the Sani Pass route each day, mainly carrying hawkers to shop in Underberg. These taxis were stated to carry full loads each day. This information was confirmed in an interview with a taxi operator during the site visit to Sani Pass.

### 2.2.2.6 Crops

The communal land tenure system is a problem for crop production. It discourages individual enterprise and innovation, farmers tending to adhere to old-established ways of agriculture. Feed crops such as maize are grown in the Senqu River valley. Mokhotlong District used to export canned beans and asparagus to EU markets, but production has fallen because of drought. Most crops are consumed locally, but there is a potential to export potatoes. The output of berries and asparagus could be improved were land tenure to be reformed. One greenhouse has been established and another is being built; these will produce tomatoes, peppers, lettuce and peas. Altogether, 14,629 hectares of arable land are found in the area. The Langeberg Coop has been the major market for products available for sale, and it is possible that such traffic could be routed via a surfaced Sani Pass. However, data were sparse, and this traffic is not taken into account in this report.



### **2.2.2.7 Livestock**

The commercial value of sheep and goats at present is related to wool and mohair, but there are some informal markets for these animals as well as cattle. There is no meat industry in the district as the government abattoir has not functioned for a considerable time.

In 2010, 1,171 goats from Mokhotlong District were exported through Sani Top. Export permits are issued by the District Veterinary Officer in Mokhotlong, who states that sales are highest in summer. The goats are herded down the Pass on foot in order to reduce costs because of the high quoted costs from truck operators. However, if Sani Pass were surfaced, these quotes would fall, and the goats would be transported by truck. There are good markets for goats, especially in Pietermaritzburg, and the animals are consolidated into bigger loads in Underberg for trucking to Pietermaritzburg. During fieldwork, herders on the Pass were questioned, and were positive about the benefits to them from surfacing the road.

## **2.2.3 Development Projects and Potential**

### **2.2.3.1 Lesotho Highlands Water Project**

Perhaps the major development project in the Mokhotlong District at present is the construction of the Polihali Dam under the aegis of the Lesotho Highlands Water Project (LHWP). This dam will generate 1000mw of hydro-electric power per day, and will be 20 minutes drive from Mokhotlong. Construction work is to begin in 2011 and will be completed in 2017. It will have considerable potential for recreation but no specific plans in this regard have yet been prepared.

At existing LHWP dams such as Khatse, the water agreement with South Africa limits development around the dam. The agreement has been revised twice and is apparently being examined again with a view to reducing the limitations on development as many investors are interested in recreation projects. The agreement in respect of existing dams only makes provision for integrated development in later phases, and this has held back the exploitation of the tourism potential of these dams, the only activities being in respect of ferries. The Ministry of Tourism has introduced a cruise boat on Mohale Dam, there is a similar vessel at Khatse but it is not used, and private investors were said to be keen to run a 100-passenger ferry with a restaurant and bar on Khatse Dam. In the case of Polihali Dam, however, the Lesotho government is keen on having integrated development from Phase 1 onwards, and thus investment in accommodation and recreation could be attracted at an early stage after completion of the dam.

### **2.2.3.2 Tourism and Environment**

It was reported during discussions in Maseru that three large tourism projects are being investigated in the Sani Top area. One investment of approximately R310 million is for a ski resort while the other two relate to the hotel and golf estate fields.

The first of the proposed hotel developments comprises a range of activities including a hotel plus villas plus backpackers' accommodation totalling 500 beds in all, a golf estate, academies for hospitality, equestrianism and fly fishing, and the introduction of wildlife. The proposed golf course would be the highest-altitude course in Southern Africa. This development would entail an investment of about R850 million. The second hotel project comprises an eco lodge and villas, providing 150-200 beds in the first instance but rising to 400 beds, with a total investment of R500 million. As feasibility studies are still being done

for these projects, no employment figures are available. Apparently local investors would be drawn into these projects.

In addition to these three projects in the Sani Top area, an equivalent to the South African 1-stop filling station complex has been proposed about 20km from Mokhotlong on the Sani Top road. This project would provide local communities with opportunities for selling crafts, providing horse stables for pony trekking, and camping and picnicking facilities.

According to the Lesotho Tourism Authority, the surfacing of Sani Pass road is a requirement for the proposed investment projects. Sani Pass has been perceived as a scenic and in part as a 4x4 route, and has therefore attracted a different type of tourist to that in the market which would be developed by the proposed new investments in the Sani Top area. Visitors to a golf estate, for instance, would not have the same interests as adventure tourists. However, the Ministry of Tourism, Environment and Culture is giving consideration to incorporating off-road vehicles in tourism plans, and alternative extreme 4x4 routes apparently are envisaged in the Sehlabatheba National Park and Qachas Nek areas.

The Ministry believes that Lesotho benefits very little from tourists brought in by the Underberg 4x4 tour operators, and a strategic plan is being developed to train local tour operators and guides at Sani Top for them to handle the tourists in Lesotho.

The Sani Top area is planned as a tourism destination, but is also in a biosphere reserve containing wetlands. The Ministry of Tourism, Environment and Culture has declared that no construction will be allowed in the wetlands: all developments will be subjected to strict environmental impact assessments, and land will be zoned accordingly. The government, has requested funds from sources in South Africa for road construction under the Maluti-Drakensburg Trans-Frontier project (coordinated from its Howick office). The Ministry of Public Works and Transport has been asked to pay particular consideration to wetlands when constructing roads as the preservation of the environment in order to enhance the tourist attractions of the region is considered paramount.

## 2.3 Conclusion

The following are the main conclusions from this section:

- In the Underberg-Himeville area, the group most vulnerable to a change in the surface and alignment of Sani Pass appears to be the four 4x4 tour operators. However, the views of inbound tour operators encountered were that Sani was not regarded as a hard 4x4 adventure tour, and did not corroborate the contention that the 4x4 tour operators were so threatened that they would necessarily go out of business. With mitigation measures, they should be able to retain all or most of their business.
- Trade between Mokhotlong District and Underberg-Himeville could increase by 20 percentage points if a surfaced, all-weather road were provided.
- Such a road would be instrumental in enabling wool and mohair production – the major economic activity – in Mokhotlong District to rise by 40%, and in the implementation of proposed tourism projects in the Sani Top area.
- Three large tourism (hotel and recreation) projects in the Sani Top area are being discussed with investors, the surfacing of Sani Pass road being a requirement for these investments to go ahead.

### 3. RESOURCE ECONOMICS

#### 3.1 Background and Introduction

FutureWorks undertook a succinct ecosystems services assessment as part of the economic impact assessment for Phase 2 of the proposed upgrading of the Sani Pass road. The purpose is to assess the changes in condition and relative value of ecosystem services for the various scenarios as an input to the economic assessment.

#### 3.2 Ecosystem Services

An ecosystem service is one that is generated by the natural environment, enhances human well-being and is directly used by people. It is important to note that ecosystem services are not the same as ecosystem functions: whereas functions are the biological, chemical and physical processes associated with natural environments, services are the outputs of ecological processes which society uses for various purposes (see Figure 3.1 below). We are familiar with built services like electricity, roads and piped water. Ecosystems also supply services to make our lives better. In the past, large natural areas in the upper catchments of rivers have provided a regular supply of clean water but that has changed. For example, many of the natural assets in KwaZulu-Natal's catchments have been transformed through settlement, forestry or agriculture. The transformation or change in condition of these areas changes the supply of ecosystem services. Today, most rivers have reduced winter flows and poor water quality.

#### 3.3 Why Use an Ecosystem Services Approach?

Indicators of ecological conditions, such as turbidity in a river, do not help decision-makers choose between allowing the status quo, upgrading to a high-quality gravel road, and upgrading to a road with a hardened surface. The statement that a quality environment is good for society is too broad as trade-offs with development will be made, and the decision-maker needs to know the degree to which different sectors of society will be better or worse off with each trade-off they face. An analysis of ecosystem services can show which services change, for whom, and what the implications for these people will be. FutureWorks employs ECO-FUTURES© software that uses a consensus-based social learning process to develop new knowledge with regard to the supply and demand of ecosystem services. An ECO-FUTURES assessment is able to:

- build on existing knowledge and wisdom from experts (and does not require complete data);
- develop consensus of the nature of supply and demand, and changes thereof;
- make a systemic analysis of the condition, size, landscape context and functionality of the natural assets;
- identify provisioning, regulatory, supporting and cultural services supplied, and score the relative capabilities of the assets to supply these services;
- identify the magnitude of demand for services, and the relative dependence on access to services;
- identify the role of the assets and associated services in society and the economy;
- identify likely changes in supply (% changes) and demand (magnitude of numbers) in scenarios,
- build the capacity of all the participants in regard to ecosystems, the services they supply, the roles they play in society and the possible changes in supply; and
- build stakeholder ownership of the outcomes as they are generated in open discussion and through consensus.

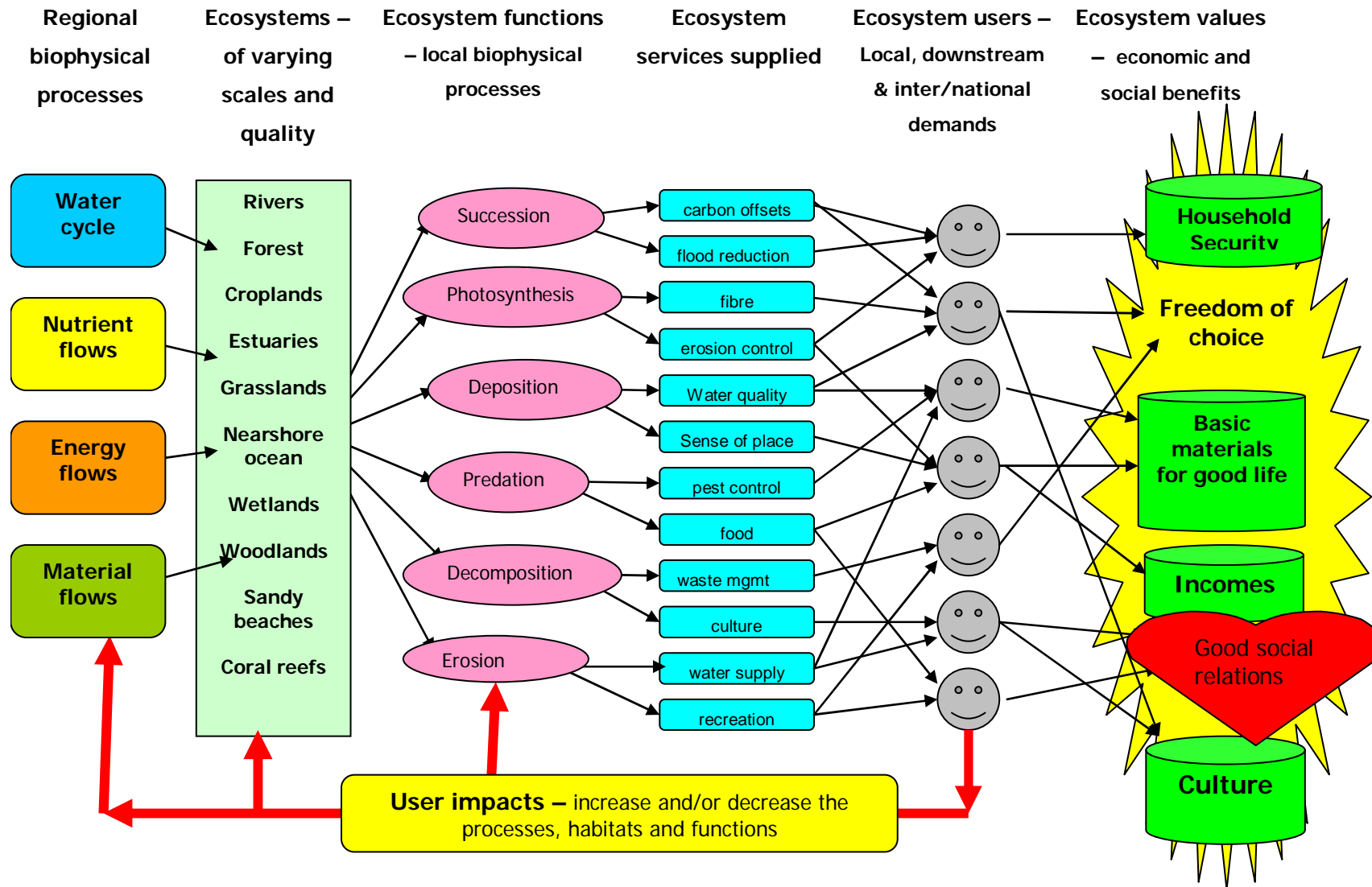
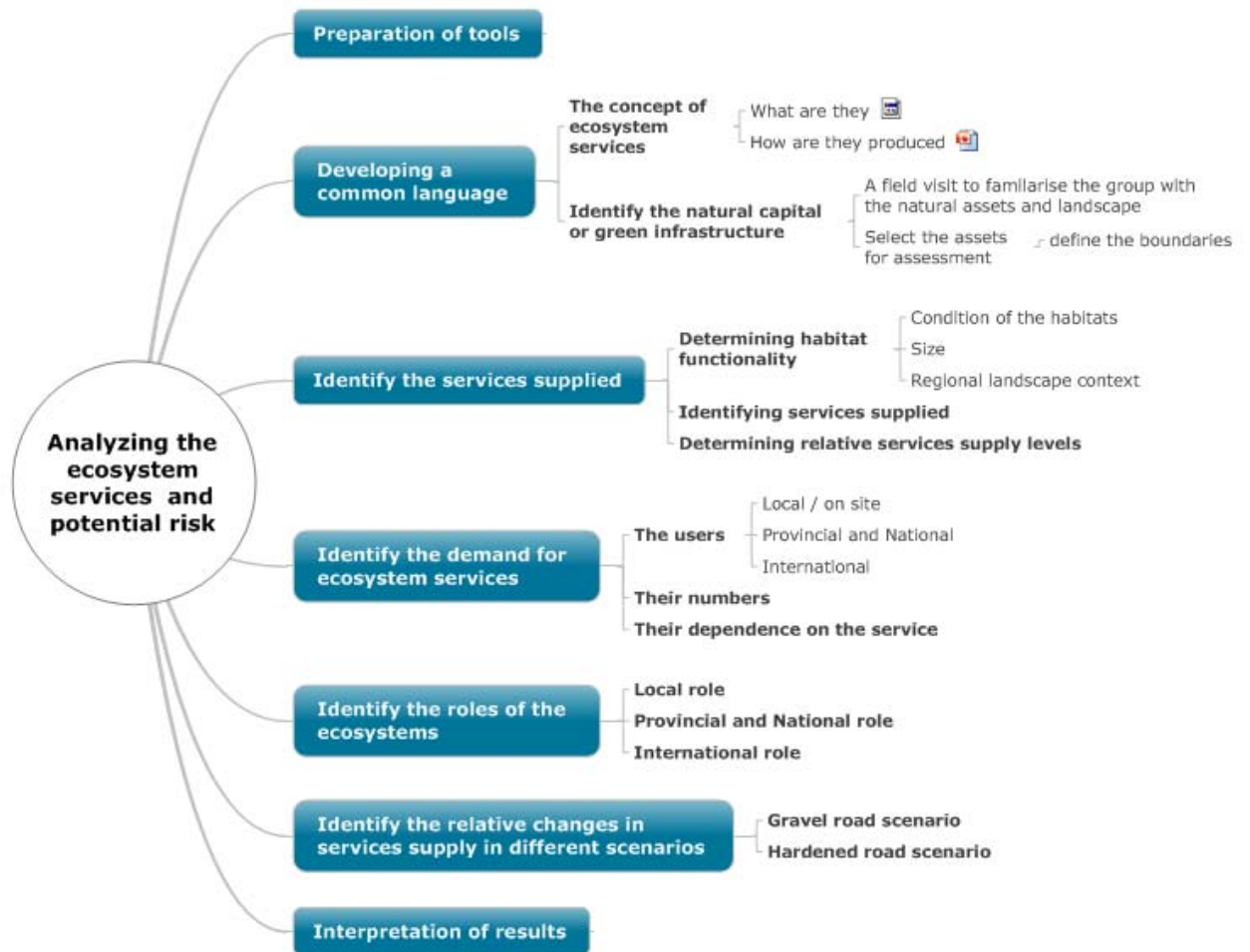


Figure 3.1: Ecosystem functions, such as decomposition, generate a range of ecosystem services, such as soil fertility, which we require to maintain human well-being.

### 3.4 The ECO-FUTURES Approach

The approach employed in order to assess the changes in condition and relative value of ecosystem services with the various scenarios for upgrading Sani Pass road is shown in Figure 3.2.

**Figure 3.2: The ECO-FUTURES approach used to assess the supply and demand for ecosystem services**



#### 3.4.1 Site Visit

A site visit was undertaken on 11 February 2011 to better understand the status quo of the Sani Pass road, the different ecosystems and their current condition, the users and the key ecosystem services generated.

#### 3.4.2 A Workshop with a Panel of Experts

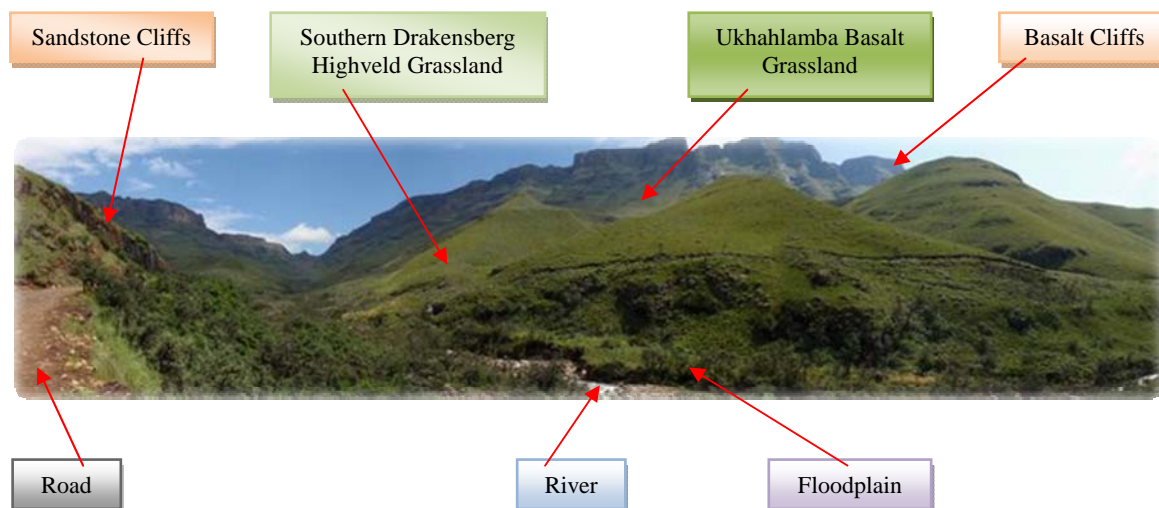
A workshop was held with panel of experts at the SSI offices in Pietermaritzburg on 8 March 2011. The participants are listed in Appendix Table A1.

The first step of the workshop process was to identify the main landcover types occurring within the Sani Pass valley (Table 3.1 and Figures 3.3-3.4).

**Table 3.1: Landcover Types**

Southern Drakensberg Highveld Grassland
Ukhahlamba Basalt Grassland
Afroalpine Heathland
Wetlands
Rivers
Floodplains
Basalt Cliffs
Sandstone Cliffs
Road (this asset was added as a land cover in order to address the issues arising with regard to the nature of the road surface)

The size of these areas, their current condition and landscape context was then estimated and/or scored.



**Figure 3.3: Sani Pass Showing Landcover Types**



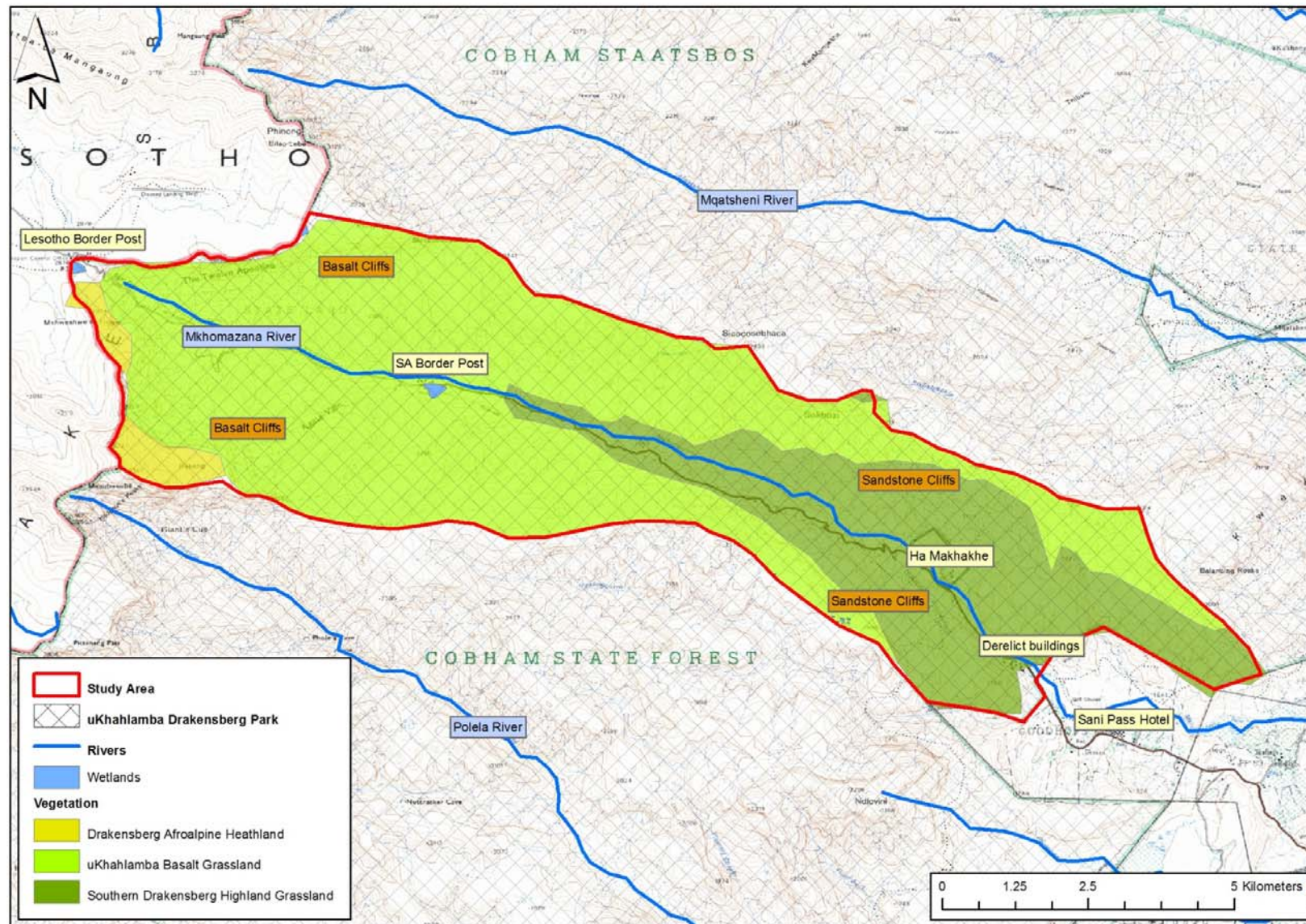


Figure 3.4: Defined study area for the ecosystem services assessment showing main rivers, wetlands, and vegetation types, as well as important features

The key ecosystem services generated within the Sani Pass valley were then identified (Table 3.2):

**Table 3.2: Key Ecosystem Services Supplied**

Access between RSA / Lesotho	Medicinals
Adventure sports events	Mountain biking/running
Birding and other animals (e.g. ice rats)	Natural heritage
Botanising	Pest control (incl. alien plants)
Carbon sequestration	Refuge or nursery for wild plants and animals
Cultural heritage	Seed dispersal
Disease control	Sense of place
Fire damage control	Self drive touring
Flood attenuation	Soil formation and fertility
Fodder	Soil stability
Four-wheel drive guided adventure tours	Spiritual wellbeing
Genetic vigour	Waste dilution and assimilation (incl. ecoli)
Hiking	Water supply regulation
Marketing icons	

The next step was to estimate the levels at which these landcover types could supply the above services. Supply of services was rated as 1 (low), 2 (medium) or 3 (high). This estimation was based on the assumption that the landcover areas or habitats were in pristine condition. This assumption is critical as the service levels (either current or future) are calculated by multiplying the functionality (effectively a weighted score based on size, condition and landscape context) with supply potential.

The final step was to estimate the demand for these services at a local, provincial, national and international level. This estimation included the downstream demand for some of the water-related services. Demand was based on two criteria: number of users and dependence on access to the service. Number of users was generally based on magnitudes of tens, e.g., 100, 1,000, 10,000.....etc, while dependence was rated as 1 (low), 2 (medium) or 3 (high).

### 3.5 Results

The following section presents the outcomes of the workshop. Note that supply scores are relative and consequently it is critical to consider the colour of the cells (greenest is highest and reddest is lowest).

#### 3.5.1 Supply and Demand for Service

Sani Pass is in a World Heritage Site which was designated by UNESCO for the world population on the basis of globally significant features such as the Drakensberg Mountains and San rock art. The scores are indicators of magnitudes: in Table 3.3 the area is of significance to the world population for natural and cultural heritage, to the South African population for carbon sequestration, and to smaller populations for other ecosystem services. The scores were arrived at by consensus at the workshop, and are indicators of relative change, not the results of an exact process. Table 3.3 outlines the status quo scores.

**Table 3.3: Total current supply of and demand for ecosystem services (ordered from highest to lowest demand)**

Ecosystem Services	Total Supply	Total Number of Beneficiaries	Average Dependency
Cultural heritage	73,681	7,040,010,000	1.8
Natural heritage	73,613	7,040,010,000	2.3
Carbon sequestration	66,684	40,000,000	0.3
Spiritual wellbeing	73,658	810,000	1.8
Flood attenuation	66,944	150,200	2.0
Sense of place	68,396	55,500	2.0
Four wheel drive adventure tours	61,799	28,100	2.3
Access between RSA/Lesotho	23	20,200	1.5
Water supply regulation	66,554	20,000	0.3
Soil stability	55,627	20,000	0.3
Disease control	46,527	20,000	0.3
Self drive touring	61,753	12,400	2.0
Adventure sports events	55,546	10,000	0.8
Fire damage control	25,012	10,000	0.3
Birding and other animals (e.g. ice rats)	73,635	8,100	2.3
Mountain biking/running	55,546	5,000	0.5
Botanising	68,656	4,100	2.3
Refuge or nursery for wild plants and animals	50,258	3,000	1.0
Hiking	68,786	2,100	2.3
Marketing icons	63,203	2,100	1.3
Genetic vigour	73,613	1,000	0.5
Pest control (incl. alien plants)	63,083	1,000	0.7
Soil formation and fertility	49,647	1,000	0.5
Waste dilution and assimilation (incl. ecoli)	23,472	1,000	0.5
Medicinals	51,103	200	0.5
Fodder	49,257	200	0.5
Seed dispersal	49,166	200	0.5
<b>Total</b>			

Table 3.3 illustrates that:

- Cultural and natural heritage are the two biggest services in terms both of supply and demand. The supply of these two services is large because all the different landcover types within Sani Pass valley contribute to cultural and natural heritage, i.e., large area = large supply of services.
- The demand for these services is very large because the upper end of the Sani Pass valley is situated in a World Heritage Site which is of international importance, i.e., 7 billion people internationally and 40 million people in South Africa.
- Carbon sequestration, while being in high demand and having high supply capabilities, is of limited importance due to the low dependence score, i.e., there are many alternative opportunities to sequester carbon.



- The supply of some services, such as access between South Africa and Lesotho, is very low, while the demand for these services is very high. This indicates a need for improving supply.
- The supply of some services, such as birding, hiking, and botanising, is very high, while the demand for these services is very low. This indicates a potential for increased use.

### 3.5.2 Changes in Supply with Different Scenarios

**Table 3.4: Relative changes in supply of services with different scenarios (%)**

Ecosystem Services	Gravel Road (%)	Hardened Road (%)
Cultural heritage	99.9	105.3
Natural heritage	99.8	105.1
Carbon sequestration	99.8	105.4
Spiritual wellbeing	100.0	105.3
Flood attenuation	99.8	105.4
Sense of place	99.9	104.0
Four wheel drive adventure tours	100.0	102.1
Access between RSA / Lesotho	400.0	975.0
Water supply regulation	99.7	105.3
Soil stability	99.8	106.5
Disease control	99.9	102.7
Self drive touring	100.0	102.4
Adventure sports events	100.0	107.0
Fire damage control	100.2	101.2
Birding and other animals (e.g. Ice rats)	99.9	105.3
Mountain biking / running	100.0	106.9
Botanising	99.9	104.0
Refuge or nursery for wild plants and animals	99.9	105.1
Hiking	100.0	104.0
Marketing icons	100.0	102.3
Genetic vigour	99.8	105.1
Pest control (incl. alien plants)	99.8	102.1
Soil formation and fertility	99.7	107.2
Waste dilution and assimilation (incl. ecoli)	99.9	105.8
Medicinals	99.8	107.1
Fodder	99.7	107.2
Seed dispersal	99.9	105.4
<b>Total</b>	<b>111.4</b>	<b>138.3</b>

Note: % reflects the % service remaining after the development

As shown in the Table 3.4:

- There is an average increase of 11.4% in the supply of ecosystem services with the upgrading of the existing road to a high-quality gravel road – largely due to a 400% increase in access between South Africa and Lesotho.
- There is a small decrease (0.1-0.2%) in the supply of ecosystem services, such as cultural heritage, natural heritage, and carbon sequestration – largely due to a decrease in the coverage of natural areas with the upgrading and widening of the existing road to high-quality gravel road.

- There is an average 38.3% increase in the supply of ecosystem services with the upgrading of the existing road to a surfaced road – largely due to a 975% increase in access between South Africa and Lesotho.
- There is a small increase (5%) in the supply of other ecosystem services, such as flood attenuation and water supply regulation, with the upgrade to a surfaced road. This increase is due to the improved condition of habitats such as wetlands, rivers and floodplains with the reduced stormwater runoff and sediment yield from the road.
- There is a small increase (4-7%) in the supply of ecosystem services such as adventure sports events, mountain biking/running, hiking and botanising with a surfaced road.
- In summary, the gravel road will lead to a slight decline in ecological processes with a minor decrease in service levels, with the exception of access services which improve dramatically. A hardened road will lead to an improvement in ecological processes, with a small increase in ecosystem services but a large increase in access.

### 3.5.3 Change in Demand for Services with Different Scenarios

#### 3.5.3.1 Local Role

Table 3.5 outlines the possible changes in local demand that may result from different road surfaces. Local demand refers to the local district or region.

**Table 3.5: Relative Changes in Demand for Services at a Local Level with Different Scenarios**

Ecosystem Services	Status Quo		Gravel Road		Hardened Road	
	Users	Dependence	Users	Dependence	Users	Dependence
Disease control	20,000	1	20,000	1	20,000	1
Spiritual wellbeing	10,000	3	10,000	3	10,000	3
Sense of place	500	3	1,100	3	10,000	3
Natural heritage	10,000	3	10,000	3	10,000	3
Cultural heritage	10,000	2	10,000	2	10,000	2
Fire damage control	10,000	1	10,000	1	10,000	1
Refuge or nursery for wild plants and animals	1,000	2	1,000	2	1,000	2
Genetic vigour	1,000	2	1,000	2	1,000	2
Self-drive touring	400	3	1,000	3	1,500	3
Access between RSA/Lesotho	200	3	200	3	200	3
Flood attenuation	200	3	200	3	200	3
Fodder	200	2	200	2	200	2
Medicinals	200	2	200	2	200	2
Four-wheel drive adventure tours	100	3	100	3	50	3
Hiking	100	3	100	3	100	3
Marketing icons	100	3	100	3	100	3
Birding and other animals (e.g. ice rats)	100	3	100	3	100	3
Botanising	100	3	100	3	100	3

Table 3.5 shows that:

- In terms of the sense of place of Sani Pass, the number of local users increases from 500 to 1,100 with upgrading to a high-quality gravel road, and from 500 to 10,000 with upgrading to a surfaced road. Sense of place refers to the distinctiveness or uniqueness of a place when compared to other places. In this context, what makes Sani Pass distinct or unique is that it is the only road in KwaZulu-Natal that provides vehicular access to the top of the Drakensberg Mountains. The increase in the accessibility of the Pass will therefore increase the demand for that service.

- The number of local users of Sani Pass for self-drive touring increases from 400 to 1,000 with upgrading to a high-quality gravel road, and from 400 to 1,500 with the upgrading to a surfaced road. These increases are largely due to the improved accessibility.
- The number of local four-wheel drive adventure guided tours remains unchanged with the upgrading of the existing Sani Pass road to a high-quality gravel standard, but decreases from 100 to 50 with the upgrading to a surfaced road. It is possible that many operators will stop offering four-wheel drive adventure tours to the top of Sani Pass with the hardening of the road surface.

### 3.5.3.2 Provincial/National Role

**Table 3.6: Relative changes in demand for services at a provincial or national level with different scenarios**

Ecosystem Services	Status Quo		Gravel Road		Hardened Road	
	Users	Dependence	Users	Dependence	Users	Dependence
Cultural heritage	40,000,000	3	40,000,000	3	40,000,000	3
Natural heritage	40,000,000	3	40,000,000	3	40,000,000	3
Carbon sequestration	40,000,000	1	40,000,000	1	40,000,000	1
Spiritual wellbeing	400,000	2	400,000	2	400,000	2
Sense of place	35,000	3	50,000	3	73,000	3
Self drive touring	12,000	3	17,000	3	40,000	3
Adventure sports events	10,000	3	15,000	3	15,000	3
Four wheel drive adventure tours	8,000	3	8,000	3	8,000	3
Birding and other animals (e.g. ice rats)	5,000	3	7,000	3	9,000	3
Mountain biking/running	5,000	2	10,000	2	10,000	2
Botanising	2,000	3	3,000	3	3,000	3
Refuge or nursery for wild plants and animals	2,000	2	2,000	2	2,000	2
Marketing icons	2,000	2	2,000	2	2,000	2
Hiking	1,000	3	1,000	3	1,000	3
Access between RSA/Lesotho	0	0	0	0	500	2

Table 3.6 illustrates that:

- In terms of the sense of place of Sani Pass, the number of provincial/national users increases from 35,000 to 50,000 with upgrading to a high-quality gravel road, and from 35,000 to 73,000 with upgrading to a surfaced road. Once again, the increase in the accessibility of the Pass increases the demand for that service.
- The number of provincial/national users of Sani Pass for self-drive touring increases from 12,000 to 17,000 with upgrading to a high-quality gravel road, and from 12,000 to 40,000 with upgrading to a surfaced road. It is expected that, with the improvement in the condition and safety of the road, particularly with the hard surface the number of users will increase significantly.
- The number of provincial/national users of Sani Pass for adventure sports events increases from 10,000 to 15,000 with upgrading to either a high-quality gravel or a surfaced road - due to improved condition of the road.
- The number of provincial/national users of Sani Pass for birding (and other animals) increases from 5,000 to 7,000 with upgrading to a high-quality gravel road, and from 5,000 to 9,000 with upgrading to a surfaced road – due to improved accessibility. For the

same reason, botanising increases from 2,000 to 3,000 with upgrading to either a high-quality gravel or a surfaced road.

- The number of provincial/national users of Sani Pass for mountain biking/running increases from 5,000 to 10,000 with upgrading to either a high-quality gravel or a surfaced road – due to improved condition and safety. It is expected that, with the hardening of the road surface, there may a shift in users from predominantly mountain bikers and trail runners to cyclists and road runners.
- There will be an increase in the number of regional users who will visit Lesotho for business purposes due to the improved accessibility.

### 3.5.3.3 International Role

**Table 3.7: Relative Changes in Demand for Services at an International Level with Different Scenarios**

Ecosystem Services	Status-Quo		Gravel Road		Hardened Road	
	Users	Dependence	Users	Dependence	Users	Dependence
Natural heritage	7,000,000,000	3	7,000,000,000	3	7,000,000,000	3
Cultural heritage	7,000,000,000	2	7,000,000,000	2	7,000,000,000	2
Spiritual wellbeing	400,000	2	400,000	2	400,000	2
Flood attenuation	50,000	3	50,000	3	50,000	3
Access between RSA/Lesotho	20,000	3	25,000	3	25,000	3
Four-wheel drive adventure tours	20,000	3	20,000	3	20,000	3
Sense of place	20,000	2	20,000	2	20,000	2
Birding and other animals (e.g. ice rats)	3,000	3	3,000	3	4,000	3
Botanising	2,000	3	2,000	3	3,000	3
Hiking	1,000	3	1,000	3	1,000	3
Self-drive touring	0	0	0	0	10,000	3

As shown in Table 3.7:

- The number of international users of Sani Pass for access between Lesotho and South Africa increases from 20,000 to 25,000 with upgrading to either a high-quality gravel road or a surfaced road. It is likely that more people from Mokhotlong will travel to Underberg and Himeville via Sani Pass to purchase supplies with the improved accessibility. This figure is likely to increase substantially in the long term with the proposed upgrading of the road between Sani Pass and Mokhotlong.
- The number of international users of Sani Pass for birding (and other animals) remains unchanged with upgrading of the existing road to a high-quality gravel standard. The number of international users, however, increases from 3,000 to 4,000 with upgrading to surfaced road due to the improved accessibility.
- The number of international users of Sani Pass for botanising remains unchanged with upgrading to a high-quality gravel road, but increases from 3,000 to 4,000 with upgrading to a surfaced road due to the improved accessibility.
- The number of international users of Sani Pass for self-touring remains unchanged with upgrading of the existing road to a high-quality gravel road as most the international tourists will continue to use the four-wheel drive tour operators (as the road will still require 4x4 vehicles). However, the number of users increases to 10,000 with the upgrading of the existing road to a surfaced road. This is because more international tourists will prefer to take their own or hired vehicles up Sani Pass with the improved accessibility.



### 3.6 Conclusions

The ECO-FUTURES assessment provides a clear indication of the direction and magnitude of change in ecosystem services in different scenarios. The main findings are:

- The supply of ecosystem services will increase with the upgrading of the existing road to one with a hard surface. This is due to improved stormwater attenuation as well as the decreased deposition of sediment which is eroded from the road and deposited in the streams and rivers. It is likely that these changes will result from improved ecological conditions.
- The demand for many of the cultural ecosystem services, such as sense of place, spiritual well-being and recreation, will change with the upgrading of Sani Pass to either a high-quality gravel road or a surfaced road.
  - In terms of sense of place, the number of users, and therefore demand, will increase slightly (from 35,000 to 50,000) with upgrading to a high-quality gravel road, but more so (to 70,000), with a hard surface, due to the improved accessibility and more people enjoying the high-mountain sense of place.
  - In terms of spiritual well-being, the number of users, and therefore demand, remains unchanged for a gravel road. However, the upgrading of Sani Pass to a hard surface will detract from the feeling of being near nature or in a wilderness area. The workshop discussions indicated that spiritual well-being was likely to be affected less by the nature of the road surface than by the nature of the road use. Traffic volumes, types of use (trucks), speed of travel and noise are likely to be key detractors. This implies that road use management is likely to be a key determinant of the quality of tourist experiences.
- There are currently some ecosystem services for which there is a high demand but a low supply, an example being access between Lesotho and South Africa. It is likely that the number of people travelling from Mokhotlong to Underberg and Himeville for supplies will increase with the upgrading of the existing road to either high-quality gravel or hard surface due to the improved accessibility.
- There are currently some ecosystem services for which there is a high supply but a low demand, examples being birding (and other wildlife) and botanising in the Sani Pass valley. It is likely that the demand for these services will increase slightly with upgrading to a high-quality gravel road but more so with a surfaced road due to the improved accessibility.
- Upgrading to a high-quality gravel road will increase self-drive users slightly (from 12,400 to 18,000), but with a surfaced road the number of self-drive users of Sani Pass will increase substantially (to 51,500) due to the improved safety and drivability of the road.
- The upgrading of the existing road to a hard surface will have a negative effect on the four-wheel drive tour operators who will have to either stop offering four-wheel drive tours to the top of Sani Pass or offer a different package. Given that the approaches to the South African border post will be able to accommodate tour buses, but that the Pass will not be able to accommodate large buses, there is a potential market for guides to take these tourists up the Pass and into Lesotho.
- The upgrading of the existing road to a high-quality gravel or surfaced road will increase the number of users, and therefore demand, for recreational purposes such as hiking, mountain biking and running, due to the improved accessibility.

## 4. FINANCIAL COSTS AND BENEFITS

### 4.1 Costs

#### 4.1.1 Capital

The capital costs of construction in South Africa and Lesotho are shown in Table 4.1.

**Table 4.1: Capital Costs of Construction (R) (constant 2010 prices)**

Year	South Africa	Lesotho
2011/12	35,786,300	-
2012/13	88,143,000	69,701,000
2013/14	108,951,700	118,372,000
2014/15	127,160,000	161,287,000
2015/16	33,161,370	112,761,000
2016/17	-	24,879,000
<b>Total</b>	<b>393,202,370</b>	<b>487,000,000</b>

Source: SSI; Roads Directorate, Lesotho

#### 4.1.2 Maintenance

Maintenance costs in each country over a 25-year period are reflected in Table 4.2.

**Table 4.2: Maintenance Costs, South Africa and Lesotho (R) (constant 2010 prices)**

Year	South Africa	Lesotho
2013	705,000	-
2014	705,000	-
2015	705,000	-
2016	705,000	-
2017	705,000	150,000
2018	705,000	150,000
2019	705,000	150,000
2020	705,000	150,000
2021	705,000	150,000
2022	705,000	416,666
2023	2,930,980	416,666
2024	705,000	416,667
2025	2,133,000	416,667
2026	705,000	416,667
2027	705,000	4,583,320
2028	705,000	4,166,670
2029	705,000	4,166,670
2030	705,000	4,166,670
2031	705,000	4,166,670
2032	705,000	4,166,670
2033	2,930,980	800,000
2034	705,000	800,000
2035	2,133,000	800,000
2036	705,000	800,000
2037	705,000	800,000
<b>Total</b>	<b>24,932,960</b>	<b>32,100,000</b>

Source: SSI; Roads Directorate, Lesotho

## 4.2 Benefits

As mentioned in Section 1, the two options being compared in this study are (i) closure of the Sani Pass road and (ii) providing a hard surface on the road.

The implications for enterprises in the Underberg area are that, under Option 1, all existing business relating to Sani Pass would be permanently lost, whereas Option 2 would allow the enterprises to retain at least some and perhaps all of their existing business and to expand their businesses by tapping into increased traffic on the Pass.

### 4.2.1 Option 1 – Closure of Sani Pass

There are no benefits to enterprises in the study area from closing the Pass. A financial cost-benefit balance sheet would consist only of costs which are listed in Table 4.3.

**Table 4.3: Closure of Sani Pass – Financial Costs (constant 2010 prices)**

Item	Rmill
Decommissioning of road – Engineering works	15.00
Losses to existing business – accommodation (Underberg)	41.70 (per annum)
accommodation (Lesotho)	5.97 (per annum)
trade	47.22 (per annum)
4x4 tour operators	11.45 (per annum)

Lesotho taxi operators are not included in this table as they would presumably replace the Sani Pass services by moving to the Mokhotlong-Buta Buthe route.

Losses to existing businesses in the Underberg-Sani Top areas would amount to R106.34 million per annum. These losses would be a severe blow to accommodation establishments in the Underberg area, would be less vital but nonetheless significant for trading enterprises, and would represent the entire turnover of the Sani Top Chalet and the Underberg-based 4x4 tour operators which would presumably have to close.

The costs of engineering and other related works that would be involved in the decommissioning of the road were estimated by SSI (pers. com. 29 March 2011) at R15 million. This would consist of stabilising the cut (switchbacks) at the top of Pass, and ripping up and topsoiling 19 km of road, and would be a one-off cost.

### 4.2.2 Option 2 – Surfacing of Sani Pass

The financial costs of providing a hard surface on Sani Pass are shown in Tables 4.1 and 4.2 above, and are summarised together with the benefits in Table 4.4.

**Table 4.4: Financial Costs and Benefits of Surfacing Sani Pass-Mokhotlong Road (constant 2010 prices)**

Costs		Benefits	
Item	Rmill	Item	Rmill
Capital costs of construction - South Africa - Lesotho	393.2 487.0	<u>Retention of existing business</u> • Accommodation, trade and 4x4 tour operators, Underberg (lose 50% of foreign visitors or retain 100%) – R72.4 million-100.37 million p.a. for 25 years • Accommodation Lesotho	72.4-100.4 p.a  6.0 p.a
Maintenance costs - South Africa - Lesotho	24.9 32.1	<u>New business generated</u> • Accommodation and trade, Underberg (domestic tourism doubles, foreign returns to original level) phased in over 3 years at an additional R22.25 million p.a. to reach R66.7 million p.a thereafter.  Normal business growth 5% p.a. • In Year 4 after opening .05 x (72.4 + 66.7) or .05 x (100.4 + 66.7) • In Lesotho .05 x 6.0	66.7 p.a.      7.3-8.7 0.3
		<u>Wool Production</u> • Savings in main cost item (transport) would encourage farmers to improve the quality of wool and mohair. Output could rise by 40%.	25.1 p.a.
		<u>New Investment</u> • A surfaced road would make possible investment in new <b>hotels</b> – 500 beds and golf course 400 beds eco-lodge Dam resort 100 beds and ferry • The establishment of a wool centre for re-sorting at Sani Top depends on the Sani Pass road being surfaced. Costs not available.	850.0 500.0 100.0  N/A
		<u>Value of hotel turnover</u> Hotel/golf course Eco-lodge Dam resort	54.53 p.a 66.26 p.a. 11.48 p.a.
		<u>Salaries and wages</u> Hotel Hotels – construction Wool centre	32.00 p.a. N/A 1.452 p.a.
		<u>Employment</u> Hotels – construction phase over 2 years 2,000 jobs Hotels – operating phase 700 jobs Wool centre 30 jobs	
		<u>Water bottling plant</u> Surfaced road would save transport costs and enhance profitability.	

In summary, the surfacing of Sani Pass and the upgrading of the Mokhotlong-Sani Top road would lead to the following benefits which would not have occurred in the absence of surfacing and which are therefore dependent on surfacing:

- Proposed new hotel and tourism investment of R1,450 million in Lesotho.
- Increased wool production in Lesotho of R25.1 million per annum.
- Retained tourism business in Lesotho of R6.0 million per annum.

- Normal tourism growth of 5% per annum – minimum R0.3 million per annum in Lesotho.
- Hotel and tourism turnover from new projects in Lesotho of R132.27 million per annum.
- Salaries and wages in new tourism projects and wool centre in Lesotho of R33.452 million per annum.
- Employment in new tourism projects and wool centre in Lesotho of 2,000 jobs (minimum) in the construction phase and 730 permanent jobs.
- Retained tourism and trade in the Underberg area of between R72.4-100.4 million per annum.
- Generated new business in the Underberg area of R66.7 million per annum (phased in over 3 years after completion of the road)
- Normal business growth in the Underberg area of between R7.0-8.4 million per annum in Year 4 after opening of the road, growing at 5% per annum thereafter.

For Lesotho, therefore, total capital and maintenance costs of R519.1 million over a 25-year period lead to new investments of R1,450 million, annual financial benefits of at least R197.122 million, and the creation of at least 2,000 temporary (construction) and 730 permanent jobs.

For the Underberg area, total capital and maintenance costs of R417.1 million over a 25-year period lead to retained business worth between R72.4-100.4 million per annum, and generated business (phased in over 3 years) of R66.7 million per annum, and thereafter business growth of at least R7.0-8.4 million per annum, resulting in annual financial benefits of between R146.1-175.5 million per annum from the fourth year after the road is completed.

Table 4.4 compares the public costs of construction and maintenance of the road with the public benefits in the way of new investment and employment in a developing country (Lesotho) and the pecuniary benefits accruing to producers and enterprises in the Mokhotlong District and Underberg-Himeville. It is clear that the benefits exceed the costs.

## 5. MACRO-ECONOMIC IMPACT

### 5.1 Project Background

The purpose of this section is to calculate the possible macro-economic impact of the proposed construction on the current economic activities in the area and the impacts on KwaZulu-Natal (KZN) and Lesotho.

### 5.2 Approach and Modelling

#### 5.2.1 Approach

All the data used for interpretation purposes were obtained from reports that are part of the overall Environmental Impact Report, official documents or from the engineering group responsible for the planning of the Sani Pass road project.

Economic activities in the area immediately influenced by the Sani Pass and Mokhotlong-Sani Top roads, namely, Underberg-Himeville in KZN and Mokhotlong District in Lesotho, were evaluated in terms of possible impacts of the proposed construction, both in the short and longer term. From an examination of these activities, it appears that tourism activities together with the 4x4 tour operators and taxi operators would be the ones that would be most directly affected by the project.

### 5.3 Modelling

#### 5.3.1 Micro Modelling

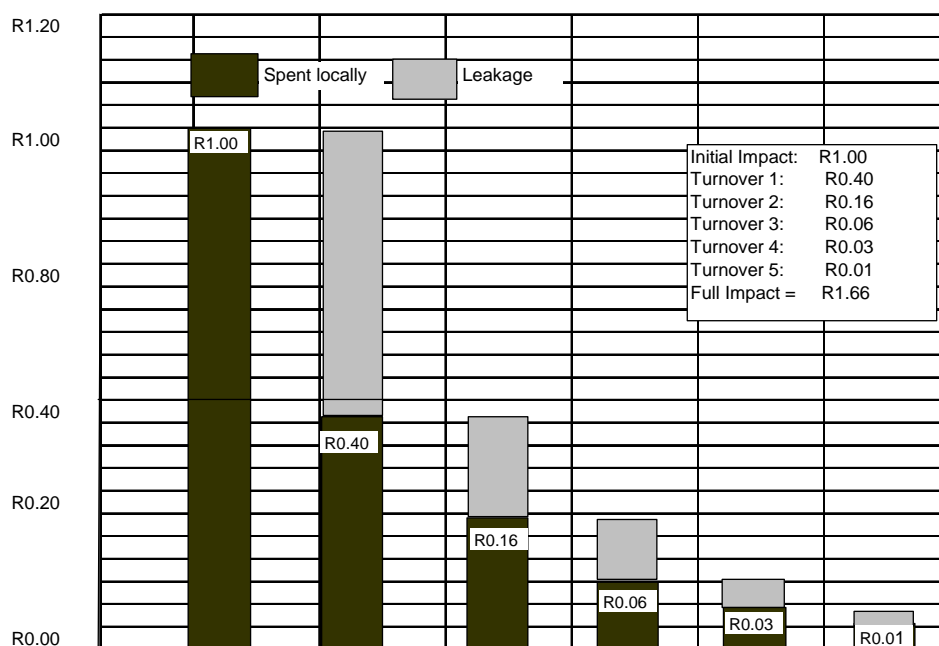
In calculating the macro-economic parameters of the identified local economic activities, a multiplier model was used that has previously been developed for projects in KZN. The model is based on the provincial Social Accounting Matrix (SAM). The magnitude of current activities in the project area has been calculated according to the method explained below. In the appropriate sections current economic activities are expressed in terms of the following macro-economic parameters:

- Gross Domestic Product (GDP) – direct and indirect/induced impacts;
- Employment – direct and indirect/induced impacts;
- Payments to households – low-income, medium-income and high-income.

Possible impacts of road construction and improvement on current economic activities were estimated and converted to the macro-economic parameters to show the impacts.

The KwaZulu-Natal SAM was used to synthesise appropriate multipliers to be used in the Macro-Economic Impact Model (MEIM) to calculate the macro-economic impact of the different activities. All economic models incorporate a number of “multipliers” which form the nucleus of the modelling system. The nature and extent of the impact of a change in a specific economic quantity, e.g. exports, on that of another economic quantity or quantities, e.g. production output or employment, is determined by a “multiplier”. A multiplier summarises the total impact that can be expected from a change in a given economic activity. For illustrative purposes, Figure 5.1 below shows the multiplier concept used in assessing the change in economic activity.



**Figure 5.1: Multipliers and Turnover**

In this example, R1 is received into the local economy of the area from sales beyond the route borders. Of this, 40 cents is spent on goods and services within the region. The economic sectors and individuals who receive the 40 cents spend 16 cents while en route. Of this 16 cents, only six cents is spent locally, and so on. The total amount of money received by local firms and residents as a result of the initial R1 in added exported earnings is R1.66. Therefore, the multiplier is R1.66.

The change in economic activity resulting from the change in one factor of production, such as water resources, is measured by different multipliers. Four multipliers are commonly used to assess the impacts of an initial increase in production resulting from an increase in sales, usually called final demand in multiplier analysis. The four multipliers are: (1) output, (2) employment, (3) income, and (4) value added services.

Sectoral multipliers are calculated using information contained in the provincial national SAM as well as data obtained from the South African Reserve Bank and Statistics South Africa. These inverse matrices capture all the direct and indirect relationships among the inputs and outputs of the various entities included in the applicable provincial SAM.

Direct GDP, labour and capital multipliers for each sector are calculated using the following formulae:

$$\text{GDP multiplier} = \frac{\text{Value added}}{\text{Production}}$$

$$\text{Labour multiplier} = \frac{\text{Employment}}{\text{Production}}$$

$$\text{Capital multiplier} = \frac{\text{Capital stock}}{\text{Production}}$$

These multipliers were incorporated in the MEIM and used to calculate the macro-economic impacts. By using a SAM for the applicable region, the above multipliers can be calculated. The multipliers that were used in this study to determine the economic impacts are as follows:

- Economic growth, i.e., the impact on GDP.

- Employment creation, i.e., the impact on labour requirements.
- Income distribution, i.e., the impact on low-income/poor households and total households.

A breakdown of the different effects of the agricultural sector multipliers used in this study is as follows:

- Direct impacts: the effects occurring directly in the agriculture sector.
- Indirect impacts: those effects occurring in the different economic sectors that link backwards to agriculture due to the supply of intermediate inputs, e.g., fertilisers, seeds, etc.
- Induced impacts: the chain reaction triggered by the salaries and profits (less retained earnings) that are ploughed back into the economy in the form of private consumption expenditure.
- Total impacts: the direct, indirect and induced summed effects.

## **5.3.2 Macro Modelling**

### **5.3.2.1 Overview of Macro-Economic Impact Analysis**

As indicated previously in the report, the main purpose of this section of the study is to estimate the impact of the proposed construction of Sani Pass on the national economies of South Africa and Lesotho and the provincial economy of KwaZulu-Natal. It is important to note that national, provincial and local macro-economic impact results are shown in a separate format for the construction and operational phases. For purposes of the impact analysis, Conningarth Economists has compiled and updated the Social Accounting Matrices (SAMs) for the South African and KZN economies which formed the basis of the impact model, namely, a general equilibrium model. This model will quantify the direct, indirect and induced impacts over time.

The compilation of the updated South African and KZN SAMs was part of a major initiative by the Development Bank of Southern Africa (DBSA), Department of Provincial and Local Government (DPLG), Statistics South Africa (StatsSA) and the South African Reserve Bank (SARB) to compile nine comparable provincial SAMs which have all been updated to 2006 prices and have been benchmarked with the new South African SAM of 2006. The KZN SAM was finalised in October 2009, and was overseen by a group of experts from the KZN provincial administration, chaired by the KZN Department of Economic Development.

The benchmarking exercise was necessary to ensure that all control totals add up to the national account figures as reflected in the SARB Quarterly Bulletin of June 2008 and the relevant figures reflected in StatsSA publications, especially P0144 which reflects the 2006 Supply and Use Matrix.

The provincial SAMs compiled by Conningarth Economists were converted into user-friendly macro-economic impact models which can be used by each province to calculate the economic impact of “interventions” by way of programmes and projects on the economy of the relevant province.

The model makes use of Excel spreadsheets and is driven by a set of “macros” which are used to eliminate the need to repeat the steps in a simple task more than once. For a specific project or a policy intervention, the model provides the size of the macro-economic impacts, the values of which are then also used to calculate key economic performance or efficiency indicators at national, provincial and local government level. Such key macro-economic performance indicators can be produced for both the construction and operational phases of a specific project.

It is also important to highlight the fact that the macro-economic impact model is robust enough to cater for varying degrees of input data qualities and availability. This could be, if the impacts are required at local government level, the model lends itself well to adjusting relevant provincial coefficients to realistically portray the situation at lower levels.

### **5.3.2.2 The Social Accounting Matrix**

In layman's terms a Social Accounting Matrix (SAM) represents a mathematical matrix depicting the linkages that exist in financial terms between all the major role players in the economy, i.e., business sectors, households and government. It is very similar to the input/output table in the sense that it also reflects the inter-sectoral linkages in an economy. The development of the SAM provides a logical framework within the context of the national accounts in which the activities of households are accentuated and distinguished prominently. The households are indeed the basic economic units where significant decisions are taken affecting economic variables such as consumption expenditure and personal saving. By combining households into homogeneous groups in the SAM, it is possible to study how the economic welfare of these groups is affected by changes in the economy.

To summarise, the SAM serves a dual purpose. First, it is a reflection of the magnitude of financial linkages which exist between the major stakeholders in an economy, and secondly, it becomes a powerful econometric tool that can be used to conduct various economic analyses such as calculating the impact of investment projects on the economy.

By applying the general tenets of the general equilibrium economic model to the SAM structure, the so-called direct, indirect and induced effects emanating from the various levels of value-adding, i.e., primary (including mining), manufacturing, commercial services, etc., are quantified.

The direct impact that occurs, for example, in the mining industry, is measured through changes in production/turnover, payment of remuneration to employees and profit generation. The indirect impacts refer to impacts on industries that provide inputs to the mining industry and other backward linkages. The induced or income effect, refers to a further round of economic activity that takes place in the economy because of additional consumer spending as a result of the additional salaries and wages that occur throughout the economy. The impact will be based on standard economic aggregates.

### **5.3.3 Data source assumptions**

Modelling the macro-economic impact of the operational phase of the development project in total requires certain detailed information regarding the project.

#### **5.3.3.1 Construction and Operational Data**

The data used for the construction and operational period of the roads both in KZN and Lesotho were supplied by the responsible consulting engineers and the Lesotho Roads Directorate respectively, and have already been shown in Tables 4.1 and 4.2.

For the Sani Pass road, during the construction period the anticipated skilled labour expenditure is R32 million, estimated job opportunities created are 9,609, and the estimated man-days are 20,103 at a cost of R28,269,000. The data provided by the Lesotho Roads Directorate show that the estimated average number of unskilled and skilled jobs per year during construction are 300 and 88 respectively.

### 5.3.4 Current Local Activities

In this section the current local tourism economic activity is analysed and the possible impact of the construction project is calculated.

### 5.3.5 Tourism – Accommodation and Trade

For analytical purposes the tourist activities are divided into two separate groups, namely, the accommodation section and the trading section, the latter including food, souvenirs and fuel where appropriate.

#### 5.3.5.1 Data Collection

The two documents used as sources – the existing economic and social reports – often use different data, and it was necessary to make a choice between the two. To give an example, the economic report states that in the Underberg-Himeville area 2,820 beds are available while the social report quotes 2,500 beds, both using different sources. In the above case the difference is not really important, but is used to highlight the fact that the numbers used in this report are often the result of a choice between the two sources.

#### 5.3.5.2 Underberg-Himeville

The data used differentiate between tourists visiting the area for holiday, festival and sport purposes and visitors coming to the area to drive up Sani Pass and in some cases enter Lesotho. Table 5.1 presents the baseline number of beds, bed occupancy rates and average bed and breakfast (B&B) tariffs with the estimated turnover for the Underberg-Himeville area.

**Table 5.1: Number of Beds, Bed Occupancy and Annual Accommodation Turnover in the Underberg-Himeville Area (2010 prices)**

Accommodation	Number of beds	Bed occupancy rate (%)	Annual number of bed-nights	Rate per night (R)	Annual turnover (Rmill.)
Hotels	787	57.30	164 597	505.00	83.12
Lodges	607	55.80	123 634	490.00	60.58
Bed & breakfast	1106	50.73	204 792	205.00	41.98
<b>Total</b>	<b>2500<sup>2</sup></b>		<b>493 023</b>		<b>185.68</b>

The bed occupancy figures were adapted to balance with the total estimated number of annual bed-nights in the area as estimated and applied in the social report. This figure is higher than the 413,000 used in the economic report, but both reports settle for an annual turnover of R185 million.

In Table 5.2 which breaks bed-nights into tourist numbers and origin, the following appellation was used:

- Domestic Sani – South African visitors driving up Sani Pass
- Foreign Sani – foreign visitors driving up Sani Pass
- Unrelated Sani – visitors not linked to Sani Pass at all.

<sup>2</sup> Social Report Figure used.

**Table 5.2: Annual Number of Tourists, Underberg-Himeville**

Category	Bed-nights		Tourists (no.)
	%	No.	
Domestic - Sani	13.1	64,803	22,754
Foreign - Sani	9.3	45,922	22,961
Unrelated -Sani	77.5	382,298	134,234
	100	493,024	179,949

The foreign and domestic tourists visiting the area to drive up Sani Pass were estimated in the social report as staying for two nights in the area while other visitors were staying an average of 2.85 nights each. The above numbers were used to calculate the accommodation contribution of the Sani-destined visitors; a figure of R41.70 million was arrived. However, this figure only represent accommodation, it was also necessary to estimate the spending on food, souvenirs and fuel in the area. The following figures are quoted from the existing economic study for the total tourist component:

- Food and beverages – R103.3 million, R574 per tourist per visit
- Fuel R82.64 million, R460 per tourist per visit
- Souvenirs R41.32 million, R230 per tourist per visit
- Total R227.26 million, R1264 per tourist per visit.

If these figures are applied to the estimated “self-drive” component of the visitors and without the fuel component for the 4x4 tour operators, the following figures are obtained:

- Food and beverages - R26.24 million
- Fuel - R10.47 million
- Souvenirs - R10.51 million
- Total - R47.22 million.

The amount of R47.22 million was therefore used as the trading contribution of Sani Pass visitors to total trading in the area.

### 5.3.5.3 4x4 Tour Operators

The 4x4 tour operators are an important element of tourism in the area. According to information extracted from the social and economic reports, they annually transport as many as 19,000 visitors up the Pass with a percentage entering Lesotho. Their total annual turnover is estimated at over R11.45 million, and they employ 34 people permanently and another 41 temporarily.

### 5.3.5.4 Lesotho

As previously stated, the official Bureau of Statistics document referring to tourism statistics has been used, where necessary being supplemented with data from the social report. The first row in the table refers to data for an accommodation establishment at the top of the Pass collected during fieldwork by Imani. In the calculations, it was assumed that Sani Pass-related tourists only use this facility in Lesotho.

**Table 5.3: Number of Rooms, Beds and Occupation Rate Available in Mokhotlong**

Accommodation	Number of Rooms	Number of Beds	Occupation Rate <sup>3</sup> (%)	Annual Number of bed-nights
Sani Top	(30)	(60)	(51.0)	(11,169)
Hotels	82	179	24.5	15,987
Lodges	48	109	15.85	6,311
Bed & Breakfast	71	196	14.53	10,393
<b>Total</b>	<b>201</b>	<b>544</b>	<b>18.3</b>	<b>32,691</b>

The 2009 Lesotho Tourism Development Corporation report stated that, in terms of accommodation income, the facilities in Mokhotlong District receive 4.1% of the total Lesotho figure. This proportion would result in R4.71 million being allocated to the relevant establishments. Using this figure, and based on Sani tourist entries, it is estimated that their contribution to the accommodation turnover is R3.48 million (or 73%) of the total District figure reflecting the importance of Sani visitors to the local accommodation sector.

#### 5.3.5.5 Mokhotlong Taxi Operators

Mokhotlong taxi operators move about 150 passengers daily up and down the Pass. In Underberg they are transferred to KZN-based taxis for onward transport to their final destinations. It is estimated that the Mokhotlong taxis move around 45,000 passengers annually, employ 10 permanent drivers, and have an annual turnover of around R4.7 million<sup>4</sup>

## 5.4 Other Activities

As previously indicated, Conningarth is of the opinion that other economic activities will not be affected by the construction and improvement of the road surface, although it will be easier to move agricultural crops from Lesotho to KwaZulu-Natal. However, the road will not necessarily stimulate agricultural production in a communal rural area, the reasons for this being complex. A number of areas in South Africa are silent witnesses to this phenomenon.

## 5.5 Results

The results for the construction and maintenance phase of the road are first presented, followed by the estimated impacts on the tourism industry in the area.

## 5.6 Construction Phase Impacts

This section discusses the macro-economic impact of the construction phase. The results are presented separately for KZN and Lesotho.

<sup>3</sup> Lesotho Tourism Statistics

<sup>4</sup> Conningarth Estimation



## 5.6.1 KwaZulu-Natal Results

**Table 5.4: Macro-economic Impact of the Construction Phase**

	Direct	Indirect	Induced	Total
<b>Impact on Gross Domestic Product (GDP) [R millions]</b>	<b>149</b>	<b>53</b>	<b>59</b>	<b>261</b>
<b>Impact on capital formation [R millions]</b>	<b>290</b>	<b>99</b>	<b>135</b>	<b>524</b>
<b>Impact on employment [numbers]:</b>	<b>755</b>	<b>490</b>	<b>711</b>	<b>1,955</b>
Skilled	93	42	56	191
Semi-skilled	163	77	118	358
Unskilled	498	372	537	1,406
<b>Impact on households [R millions]:</b>				<b>140</b>
Low-income				21
Medium-income				26
High-income				93
<b>Fiscal Impact [R millions]:</b>				<b>57</b>
National government				52
Provincial government				0.5
Local government				4.4
<b>Impact on balance of payments [R millions]</b>				<b>-265</b>

The above figures are totals over the entire construction period and not annual averages. Once the construction of Sani Pass reaches completion, these impacts will cease.

### 5.6.1.1 Impact on GDP

GDP is a good indicator of economic growth and welfare as it represents, among other criteria, remuneration of employees and gross operating surplus (profits) as components of value added at different levels of the economy. According to Table 5.4, the impact on GDP for KZN is approximately R261 million (in constant 2010 prices) over the construction period, of which the direct impact is estimated at R149 million.

### 5.6.1.2 Impact on Capital Investments

Productive capital assets are required to support or generate any given amount of economic activity, i.e., GDP. These capital assets, together with labour and entrepreneurship, form productive factors needed for production. Obviously the effectiveness and efficiency with which these factors are combined will determine the overall level of productivity and profitability of such assets. Table 5.2 indicates that the construction phase capital stock that needs to be employed to sustain this project amounts to R524 million, of which R290 million is attributed directly to Sani Pass.

### 5.6.1.3 Impact on Employment Creation

Labour input is a key element of the production process. It is one of the main production factors in any economy, and employment levels are indicators of the extent to which labour is effectively absorbed in the economy. The study determines the number of new employment opportunities that will be created through the impact of the road construction. A total of 1,955 employment opportunities will be created over the construction period. Of this number, 755 jobs are associated directly with the project.

#### 5.6.1.4 Impact on Households

The construction phase impact on low-, medium- and high-income households will respectively be R21 million, R26 million and R93 million, which translates to a total impact of R140 million.

#### 5.6.1.5 Fiscal Impact

According to the table, total government revenue is expected to increase on an average annual basis of approximately R57 million. The main sources are direct and indirect taxes. Examples of direct taxes are those on personal incomes and companies, while indirect taxes include value added tax and customs and excise duties.

#### 5.6.1.6 Impact on Balance of Payments

It is estimated that a negative impact on the South African balance of payments will amount to approximately R265 million in the construction phase. The methodology used in this particular calculation is elementary, but does at least indicate that a negative impact on the balance of payments can be expected.

### 5.6.2 Lesotho

Table 5.5 shows totals over the entire construction period.

**Table 5.5: Macro-economic Impact of the Construction Phase**

	Direct	Indirect	Induced	Total
<b>Impact on Gross Domestic Product (GDP) [R millions]</b>	<b>184</b>	<b>65</b>	<b>73</b>	323.0
<b>Impact on capital formation [R millions]</b>	<b>359</b>	<b>123</b>	<b>168</b>	649.0
<b>Impact on employment [numbers]:</b>	<b>935</b>	<b>607</b>	<b>881</b>	2,422.0
Skilled	115	51	70	236.0
Semi-skilled	202	95	146	443.0
Unskilled	617	460	664	1,742.0
<b>Impact on households [R millions]:</b>				174.0
Low-income				26.0
Medium-income				32.0
High-income				116.0
<b>Fiscal impact [R millions]:</b>				70.0
National government				64.0
Provincial government				0.6
Local government				5.4
<b>Impact on balance of payments [R millions]</b>				-328.0

Once the construction of the Sani Pass is completed, these impacts will cease.

#### 5.6.2.1 Impact on GDP

According to Table 5.5, the construction phase impact on GDP for Lesotho is approximately R323 million, of which the direct impact is estimated at R184 million.

#### 5.6.2.2 Impact on Capital Investments

Table 5.5 indicates that the construction phase capital stock that needs to be employed to sustain this project amount to R649 million, of which R359 million is attributed directly to the Sani Pass project.

### 5.6.2.3 Impact on Employment Creation

The impact on employment amounts to 2,422 jobs that will be sustained over the construction period.

### 5.6.2.4 Impact on Households

The construction phase impact on low-, medium- and high-income households will respectively be R26 million, R32 million and R116 million respectively, which translates to a total impact of R174 million.

### 5.6.2.5 Fiscal Impact

Total government revenue is expected to increase on an average annual basis of approximately R70 million.

### 5.6.2.6 Impact on Balance of Payments

It is estimated that a negative impact on the balance of payments will amount to approximately R328 million in the construction phase.

## 5.7 Tourism Results

In this section tourism activities are expressed as macro-economic parameters. The baseline (current) situation is first presented, followed by the estimated impact on the industry of road closure or surfacing.

### 5.7.1 Baseline

#### 5.7.1.1 Underberg-Himeville

The macro-economic parameter results for total tourism activity in the Underberg-Himeville area, together with the contribution of the Sani-related visitors, are shown in Table 5.13. GDP and employment impacts for direct, indirect and induced values, and payments to low-, medium- and high-income households, are also shown.

**Table 5.6: Tourism Activity in Underberg-Himeville expressed in Macro-economic Parameters, Rmill (2010 prices)**

		All Visitors			Sani-destined			4x4 Operators
		Accom	Trade	Total	Accom	Trade	Total	
<b>GDP (Rmill)</b>	<i>Direct</i>	84.28	125.53	209.75	18.93	26.08	45.01	5.20
	<i>Indirect</i>	44.23	56.91	101.14	9.93	11.82	21.75	2.73
	<i>Induced</i>	54.06	69.55	123.61	12.14	14.45	36.59	3.34
	<i>Total</i>	182.58		434.54	41.00	52.34	93.34	11.26
<b>Employment (numbers)</b>	<i>Direct</i>	723	531	1254	162	110	272	41
	<i>Indirect</i>	178	212	390	42	44	86	12
	<i>Induced</i>	237	282	519	51	58	109	13
	<i>Total</i>	1 138	1 025	2153	256	213	469	67
<b>Households (Rmill)</b>	<i>Low</i>	15.08	20.56	35.64	3.39	4.27	7.66	0.93
	<i>Medium</i>	20.82	27.80	48.62	4.68	5.77	10.45	1.28
	<i>High</i>	23.47	31.35	54.82	5.27	6.51	11.78	1.45
	<i>Total</i>	59.37	79.71	139.08	13.33	33.55	66.88	3.66

In the table, the Sani-destined visitors are included in the total, and the 4x4 results are included in the Sani-destined figures.

Tourism is a very important element of the economic structure of the Underberg-Himeville area. Its contribution to the area's GDP is R434.54 million, it supports 1,254 direct jobs and a further 390 indirect and 519 induced jobs. In total it supports 2,153 jobs. It also pays out R35.64 million to low-income households annually which, together with the direct jobs created, is important for poverty alleviation in the area.

The Sani destined tourists contribute R93.34 million (21%) of the total tourist contribution to GDP, and support in total 469 jobs with an annual payment of R7.66 million to low-income households. The 4x4 operators are responsible for R11.26 million (or 2.54%) of tourism's total contribution to GDP in the area.

### 5.7.1.2 Lesotho

Table 5.7 shows the baseline (current) tourism activities in the Mokhotlong District expressed in macro-economic parameter. The Mokhotlong figures exclude the Sani Top visitors for which category separate figures are shown.

**Table 5.7: Tourism Activity in Mokhotlong expressed in Macro-Economic Parameters, Rmill (2011 prices)**

		Mokhotlong Visitors			Sani Top Visitors		
		Accommodati	Trade	Total	Accommodati	Trade	Total
<b>GDP (Rmill)</b>	<i>Direct</i>	2.17	2.47	4.64	1.77	1.11	2.88
	<i>Indirect</i>	1.14	1.12	2.26	1.14	0.50	1.64
	<i>Induced</i>	1.39	1.37	2.76	1.14	0.62	1.74
	<i>Total</i>	4.69		9.64	3.84	2.23	6.07
<b>Employment (Numbers)</b>	<i>Direct</i>	19	10	29	15	5	20
	<i>Indirect</i>	5	4	9	4	2	6
	<i>Induced</i>	6	6	12	5	2	7
	<i>Total</i>	30	20	50	24	9	33
<b>Households (Rmill)</b>	<i>Low</i>	0.39	0.40	0.79	0.32	0.18	0.50
	<i>Medium</i>	0.53	0.55	1.08	0.44	0.25	0.69
	<i>High</i>	0.60	0.62	1.22	0.49	0.28	0.77
	<i>Total</i>	1.53	1.57	3.09	1.25	0.70	1.95

Tourism is not such an important element of the economic structure of the Mokhotlong area. Its total contribution to the District's GDP is R9.64 million, it supports 29 direct jobs and a further nine indirect and 12 induced jobs. In total it supports 50 jobs. It also pays R0.79 million to low-income households annually, which together with the direct jobs created is important for poverty alleviation in the area.

The Sani-origin tourists account for R6.07 million (39%) of the total tourist contribution to District GDP, and support in total 33 jobs with an annual payment of R0.50 million to low-income households. Although the tourism industry is small, the Sani-origin visitors play a very important role in the current situation.

### 5.7.2 Tourism Scenarios – Underberg-Himeville Area

There are two options regarding the future of Sani Pass:

- (i) Close it, or
- (ii) Provide it with a hard surface.

These are the two options that need to be compared. The comparison should not be between a surfaced road and the current road.

#### Option 1 – Close Pass

The consequence is that all Sani Pass-related business in the Underberg-Himeville area and the Sani Top area will be lost. Tourism will be reduced to zero, and trade between Mokhotlong District and KZN will be rerouted to the Butha Buthe-Ficksburg areas.

The consequences for the economic impact analysis are that the existing contributions to the Underberg and Mokhotlong economies shown in Section 3.2.1 will be entirely lost. In the Underberg-Himeville area, this would mean a loss of R93.34 million (21%) of the total tourist contribution to GDP, 469 jobs, and an annual payment of R7.66 million to low-income households. In the Mokhotlong District, there would be a loss of R6.07 million (39%) of the total tourist contribution to District GDP, 33 jobs and an annual payment of R0.50 million to low-income households.

#### Option 2 – Surface Road

In both the Economic and Social Report it emerges that the local tourism industry players in Underberg and Himeville are not very keen on the improvement of Sani Pass to a hard (all-weather) surface standard. Specifically, the 4x4 operators have expressed fear of being forced out of business.

If the tourism industry at Underberg is correct, and Sani Pass-related tourism is entirely lost, the consequences will be exactly the same as that of Option 1 (closing the Pass). There will be no Sani Pass-related business, and this scenario therefore has the same economic impact consequences as Option 1 discussed in the previous paragraph.

However, there is unlikely ever to have been a case where an upgraded road fails to generate new opportunities and new traffic. It is therefore highly unlikely that surfacing the road would lead to a worst-case scenario. Thus, we limit this analysis to two scenarios, i.e., medium and growth.

**Medium Scenario:** We assumed that existing 4x4 tour operator traffic up Sani Pass will fall by 50% but that other tourism numbers will be retained and that there will be growth. It is possible, of course, that the true position may lie somewhere between the Option 1 results and the loss of 50% of 4x4 operator traffic. Interviews with inbound tour operators lead us to believe that the retention of 50% of 4x4 operator traffic is a realistic minimum.

**Growth Scenario:** The same set of interviews, together with the outcome of the stakeholder workshop reported on in Section 3, lead us to believe that it is possible that the 4x4 operators could retain 100% of their business. We believe that the most likely outcome could well be 100% but it should be at least somewhere between 50-100%.

Thus, a medium scenario with a 50% loss of 4x4 operator traffic and a best-case scenario with 100% retention of such traffic appear to be reasonable.

The following scenarios should be compared:

- Option 1 with medium.
- Option 1 with growth.

If the realistic and best-case scenarios are compared with Option 1, the impact on the growth on the Underberg and Mokhotlong economies is positive. Clearly, any growth must yield a positive result when compared with the loss of all existing business which is inherent in Option 1. In the following tables, the impact of the growth scenario is shown for Underberg-Himeville and Mokhotlong.

The motivation for the Growth Scenario is built on three cornerstones. First, the bed occupancy rate of just over 50% is relatively low if compared to other Drakensberg areas, and there is scope for increased occupancy. Secondly, the availability of an all-weather surface will make it possible for many more visitors to travel the route, keeping in mind that it will be the only all-weather access between KZN and Lesotho and the high mountains. Thirdly, the possibility exists to expand 4x4 routes into the Sehlabatheba National Park with a circular road from there through either Ramatsiliso's Gate or Qachas Neck. The highest mountain peak in Southern Africa, Thabana Ntlenyana, at 3,482 metres, is also on that route.

**Table 5.8: Tourism Growth Scenario in KZN, Rmill (2010 prices)**

		<b>Impact</b>
<b>GDP (Rmill.)</b>	<i>Direct</i>	31.04
	<i>Indirect</i>	15.08
	<i>Induced</i>	18.71
	<i>Total</i>	64.83
<b>Employment (numbers)</b>	<i>Direct</i>	196
	<i>Indirect</i>	88
	<i>Induced</i>	49
	<i>Total</i>	334
<b>Household payments (Rmill.)</b>	<i>Low-income</i>	5.32
	<i>Medium-income</i>	7.28
	<i>High-income</i>	8.21
	<i>Total</i>	20.81

Thus, the incremental impacts are R64.83 million on GDP, 334 jobs and household payments of R20.81 million per annum.

### **5.7.3 Tourism Scenarios – Lesotho**

In evaluating the possible impact of construction on the all-weather surface in Lesotho the same scenarios were used as for Underberg-Himeville. The results are represented in the following table.



**Table 5.9: Tourism Growth Scenario in the Mokhotlong Area in Lesotho, Rmill (2010 prices)**

		<b>Impact</b>
<b>GDP (Rmill.)</b>	<i>Direct</i>	2.60
	<i>Indirect</i>	1.24
	<i>Induced</i>	1.52
	<i>Total</i>	5.37
<b>Employment (numbers)</b>	<i>Direct</i>	15
	<i>Indirect</i>	5
	<i>Induced</i>	6
	<i>Total</i>	26
<b>Household (Rmill.)</b>	<i>Low-income</i>	0.44
	<i>Medium-income</i>	0.60
	<i>High-income</i>	0.68
	<i>Total</i>	1.71

The growth scenario shows an enhancement of GDP by R5.37 million, employment by 26 jobs, and household payments by R1.71 million per annum.

#### 5.7.4 Road Maintenance

The present road on both sides of the border is according to reports not very well maintained. However, in the projected spending schedule that was presented, provision is made for annual maintenance and regular major maintenance on the new road but, because present maintenance figures were not provided, it was impossible to compare the present with the future (upgrading) situation. The following employment numbers represent an indication of the projected future annual employment if maintenance is kept at the envisaged level:

- KwaZulu-Natal - 15 per annum
- Lesotho - 23 per annum

## 5.8 Conclusion

The above analysis shows that the construction phase will have positive macro-economic impacts for both the KZN and Lesotho economies. The impacts on GDP, employment and households will be felt in the Underberg-Himeville area and Mokhotlong District. For both the realistic and best-case scenarios for the tourism sectors in both of these areas, the impacts on GDP, employment and household incomes are positive.

Bearing in mind the possibility of the 4x4 tour operators losing some of their existing business, it is important that ways be found to soften such an impact. The following mitigation measures could be considered for implementation:

- Intensive marketing campaign – the reason for this proposal is that the current occupancy rate is just over 50%, while a good norm is 60% plus. The scope therefore exists to attract more visitors to the area as only the road surface will change while the rest of the natural environment in Underberg-Himeville remains unchanged.
- Develop alternative routes for 4x4 vehicles – these would have to be over short distances and with strict controls in order to avoid degradation of the environment.
- Assist the operators to adapt their service range, e.g., by offering guided tours up Sani Pass and into Lesotho.

## 6. ECONOMIC COST-BENEFIT ANALYSIS

### 6.1 Purpose

An economic (also known as a social) cost-benefit analysis (CBA) differs from a financial CBA. Whereas the latter looks at a project from a commercial point of view, the former appraises it from the point of view of society as a whole. Financial prices are converted into economic prices through the use of shadow pricing which excludes transfers such as taxes and duties as well as interest which are not resource costs. An economic CBA reflects the costs and benefits to society of resources used.

### 6.2 Costs

The costs in a transport project relate to construction and maintenance. The financial costs have been depicted in Tables 4.1 and 4.2. The shadow prices used in this study are derived from the consultants experience in road project appraisal in various parts of Southern Africa over a period of 40 years. In South Africa the shadow price factor (SPF) has varied from 0.79-0.91, while in neighbouring countries it has been between 0.80-0.87. For the Sani Pass section of the road, therefore, a mid-point value of 0.85 has been adopted while for the Mokhotlong-Sani Top road in Lesotho, a rate recently calculated by the consultant's in Swaziland of 0.80 has been assumed. The Swaziland and Lesotho economies are broadly similar in terms of prices, given their position in the Southern African Customs Union vis a vis the dominant South African economy.

At the end of the study period, a road will retain some value. This is known to as residual value, and from discussions with engineers has been put at 45% of construction costs in South Africa and 25% in Lesotho in 2038. The reason for the difference is that the road in Lesotho will be designed for higher speeds and traffic volumes than Sani Pass, and is therefore likely to be due for improvement after 20 years of operation.

### 6.3 Benefits

The benefits derived from a road project are those which accrue to users. These are in the form of vehicle operating costs, time savings and accident costs. In this project accident costs have been omitted for the reason that Sani Pass is designed for relatively low volumes of traffic and low speeds, and is unlikely to have an effect on accident rates. Other benefits in the case of the present study arise from the comparison between road closure and road upgrading rather than from the usual comparison in project appraisal of a new or improved road with an existing road. These benefits consist of the retention of existing business and the potential for growth of new business.

In this analysis, a base case and a best case are identified. The only difference between the two is that the base case assumes that 4x4 tour operators lose 50% of their business whereas the best case assumes that after construction, they will retain all their current business. There will then be no loss in revenue generated by the 4x4 tour operators, and their business will grow at a rate of 5% per annum. There will also be no negative impact on the retention value of tourism, trade and accommodation.

#### 6.3.1 Vehicle Operating Costs

Data on vehicle operating costs (VOCs) were provided by the Cape Town office of SSI using the Roads Economic Decision (RED) model developed by the World Bank. The values used for VOCs are based on figures calculated by SSI for Sani Pass. The figures are broken down into four different vehicle types, namely, four-wheel drive (4 WD), light, medium truck and minibus, over three different terrain types, namely, Section P318-1 between Km14-25, P318-2 between

Km25-26.5 and P318-3 between Km26.5-33.18. The VOCs are given for the years 2012 to 2038, thus showing how they change over the duration of the project and how they are reduced as the road is upgraded. Included in the VOCs for Sani Pass is also a time savings figure. Accordingly, the total figures given include a time savings component and a VOC savings component, and refer to savings that accrue on the Sani Pass-Mokhotlong road.

In this report, average VOCs were used for four different vehicle types over the study period. This was done by taking the total VOC figure for each vehicle type for a specific section of road, dividing it by the study period and then multiplying by the length of the section of road under review divided by the total length of the road, in order to weight the VOC saving proportionately for the three different road sections (P318: 1-3). The results for Sani Pass are shown in Table 6.1.

**Table 6.1: Vehicle Operating Costs, Sani Pass (R/km)**

Vehicle Category	Present road	Surfaced road	Saving
Light	7.25	6.15	1.10
4WD	13.07	10.90	2.17
Medium truck	16.19	13.41	2.78
Minibus	11.45	9.55	1.90

These VOC savings figures are then multiplied by a distance of 38km so as to represent a vehicle travelling up and then down the Pass.

The same principle was used to determine VOCs for the Sani Top-Mokhotlong road, the P318-1 (Km 14-25 of Sani Pass) VOC saving figures were used as a proxy as this section of Sani Pass most closely resembled the Sani Top-Mokhotlong road. The same vehicle breakdown was used but calculated over the distance of 47km between Sani Top and Mokhotlong. The VOC saving/km is R0.68 for a 4WD, R0.27 for a light vehicle, R1.44 for a medium truck and R0.47 for a minibus, and is multiplied by a distance of 94km to represent a return trip. The values used for the Lesotho component of the road are very conservative, and may work out to be much higher once a detailed study is undertaken for the Sani Top-Mokhotlong section. The assumptions used in dealing with VOCs are set out in Table 6.2.

**Table 6.2 Vehicle Operating Cost Assumptions**

- The VOC value for Sani Pass uses the SSI estimate and includes time savings. It is an average based on the varying VOCs between Km 14 and Km 33 taking distance and surface condition into consideration.
- The VOC value is a saving figure and is based on the difference in VOCs comparing the road in its current condition to the resurfaced road.
- The number of vehicles used in the VOC calculations is based on vehicle return trips.
- The distance value used is 38km to account for the return trip.
- Total number of vehicles to undertake a return trip on the pass is 14,600 per annum.
- The number of vehicles on the road are allocated according to tourism numbers (24,961 foreign and 25,282 SA).
- Vehicle occupancy rate of 3.57 persons average.
- Decline of 50% in total tourists in the Base case during construction.
- After construction (2016) tour operators retain 50% of business with no annual growth.
- After construction (2016) the number of domestic tourism vehicles and self-drive foreign vehicles picks up to full potential by 2018, followed by an annual 5% growth rate.
- On road opening SA self-drive (22,754 people) tourists double by 2018. The increase in new vehicles is split between new 4x4 and new light vehicles.

- Non-tourism vehicles stay constant during construction, then increase by 5% per annum after construction.
- For the Lesotho section the SSI VOC values for the bottom section of Sani Pass were accepted.
- VOC looks at benefits on a specific section of road comparing a 'with' against 'without' scenario. This is different to distance and time savings where different routes are compared, with the difference in distance or time being counted as a benefit.

Under Option 1 with the road being decommissioned, certain traffic at present using Sani Pass would be diverted to routes through Fouriesburg, Ficksburg and Maseru. If Sani Pass were to be surfaced, the saving in distance and hence VOCs would be considerable. The VOC values under the distance savings calculations are those used by SSI for different vehicle types over different road types, gradients and conditions, derived by using the Highway Development and Management Model (HDM IV) developed by the World Bank. These values were multiplied by distances covered under current conditions and distances that would have to be covered as a result of Sani Pass being decommissioned. The differences in costs determine distance savings figures.

**Table 6.3: VOC Savings – Diverted Traffic**

- VOC figures used from SSI.
- Distance savings as follows:
  - imports from KwaZulu-Natal – round trip 266km.
  - wool exports to Port Elizabeth – round trip 382km.
  - exports of bottled water to Durban – round trip 930km.

### 6.3.2 Time Savings

A second set of time savings figures is based on the same principle as the distance saving calculations. In this case, the additional time spent on transportation as a result of the decommissioning of the road is multiplied by an average cost per hour for various vehicle types. These time savings figures are based on work done by Imani in a 2010 road construction project in Swaziland. Salaries and wages as well as labour market conditions are broadly comparable to those in Lesotho. Economic costs of time savings were R145.82 per hour for a medium truck and R31.56 per hour for a minibus.

Table 6.3 shows the assumptions used in calculating time savings for diverted traffic. As mentioned in Table 6.1, time savings on Sani Pass itself are included in VOCs for traffic on the Pass.

**Table 6.4: Time Savings for Diverted Traffic**

- Hours saved one way -
  - imports from KwaZulu-Natal 3 hours
  - wool exports to Port Elizabeth 4 hours
  - bottled water to Durban 7 hours
- Cost per hour is based on studies in Swaziland in 2010.

To the extent that some of the goods reflected in Table 6.3 might be transported by South African rather than Lesotho carriers, the values would be understated since salaries and wages are higher in South Africa than in Lesotho.

### 6.3.3 Other Benefits

Other benefits from the project relate to the retention of tourism and trade by existing enterprises, the value of new tourism and trade, the expansion of wool and mohair production, and the growth of tourism in Mokhotlong District.

**Table 6.5: Other Benefits**

#### Retained Tourism and Trade

- Takes into account the contribution of tourists and the impact of changing tourism numbers.
  - Shadow price factor: 0.25-in cost-benefit analysis of tourism projects it is usually found that between 30-50% tourist expenditure remains in the host area. A lower percentage has been assumed in order to be conservative – these benefits comprise revenue to the fiscus (taxes and company profits), salaries and wages.
  - Foreign tourists: 24,961 per annum.
  - Domestic tourists: 22,754 per annum.
  - Total tourists: 47,715 per annum.
  - Spending contribution to area:
    - Accommodation: R41.7 million per annum
    - Trade: R47.22 million per annum
  - R1,864 per tourist.
  - Construction decreases total tourism by 50% therefore R10.6 million is retained.
  - All 4x4 operator clients are assumed to be foreigners based on previous reports.
  - There is a loss of 9,500 tourists using 4x4 operators.
  - Foreign self-drive tourists revert to 3,961 once the road is completed, and this value grows at 5% per annum.
  - Domestic numbers revert to 22,754 and grow by 5% per annum once the road is completed.
- Note: A portion of this number is attributed to new tourism but, for the sake of keeping numbers consistent, was included under retained tourism. i.e., retained tourism should be 17,066 and new tourism should be 28,443.
- New domestic tourism: 22,754 per annum. A doubling of the original amount, then 5% growth per annum.
  - For Lesotho the tourism, trade and accommodation contribution was R1.8 million per annum. This value decreases by half during construction, then reverts to R1.8 million per annum after the new road is opened, followed by 5% growth per annum.
  - New tourism: R1.8 million per annum with 5% growth.

#### Wool and Mohair

- The new road results in an increase of 40% in wool and mohair production.
- The growth rate is 5% per annum.
- A wool centre will open as a result of the new road that will generate R1.5 million per annum, SPF 0.25.

#### New Hotels

- New hotels will open (2018) as a result of the new road, generating R16.5 million per annum, SPF 0.25. The growth rate per annum is 5%.
- In 2026 there will be additional hotel investment resulting in a further R16.5 million being generated per annum with a growth rate of 5% per annum.

## 6.4 Results

The economic CBA takes into account the Underberg-Himeville area on the South African side of the border and Mokhotlong District on the Lesotho side. The CBA shows the overall benefit of the road projects between Km 14 on Sani Pass and Mokhotlong and the significant role of the route in connecting KwaZulu-Natal and Lesotho.

The discount rate used in the CBA was 10% with sensitivity analysis undertaken at the 8% and 12% levels. Under the base case, it is expected that the 4x4 operators would retain 50% of their business with mitigation. It is further assumed that this loss of business will result in

approximately 9,500 fewer foreigners visiting the area with the resultant impact on tourism, trade and accommodation. Under the best case it is expected that the 4x4 operators with mitigation will retain all of their business.

Vehicle operating cost (VOC) savings are determined by comparing the difference in cost of travelling the new road against travelling the current road. The VOCs are significant for Sani Pass and represent a saving of R51 million between 2012 and 2030. The VOC saving figure in Lesotho for the Sani Top-Mokhotlong component over the same period is R100,000.

The distance saving figure used in the CBA reflects the effect of a surfaced road connecting Lesotho to South Africa via Sani Pass. The result of not having this road is that all traffic that would have used Sani Pass is now diverted to one of the other border crossings in Lesotho. For diverted wool and mohair the closest border is Maseru Bridge, and for other trade Fouriesberg. The distance saving figure is calculated by comparing the distance on the Sani Pass route to other routes that will have to be used if Sani Pass was decommissioned. The value of distance saving for wool and mohair is R700,000 per annum, for trade R2.7 million per annum, and for other traffic R540,000 per annum.

The time saving figure follows the same principle as the distance saving figure, and is calculated by multiplying the additional time spent travelling by not having a Sani Pass road by the hourly cost. The time saving for current traffic per annum is R570,000 and for new traffic R300,000.

The retained tourism, trade and accommodation figure is the value of business retained as a direct result of not decommissioning the Sani Pass road but converting it to a surfaced road. This amounts to R17.4 million in the base case and R22.3 million in the best case, and occurs from 2018 at a growth rate of 5% per annum. This value would be entirely lost if Sani Pass was decommissioned, and takes into account the change in tourism, trade and accommodation that would result from greater accessibility on a surfaced road.

The new tourism, trade and accommodation value reflects to new business that would be generated as a result of a new, accessible surfaced road. It amounts to R10 million per annum at a growth rate of 5% per annum by 2018.

A surfaced road should result in 4x4 tour operators being able to retain 50% of their current business in the base case and 100% in the best case. This amounts to R1.4 million per annum with no growth assumed in the base case. No trade is lost in the best case, the figure being R2.3 million per annum with a growth rate of 5% per annum after construction.

On the Lesotho side of the border retained tourism, trade and accommodation will be R1.8 million on completion of the Pass, i.e., a retention of all previous business. New tourism, trade and accommodation will be a further R1.8 million per annum from 2016.

The surfaced road would result in an increase in wool and mohair output of 40%. This value of R2.5 million per annum will occur on the completion of the road in 2016, and grow at a rate of 5% per annum.

The new road would result in the construction of a wool classification centre. The benefits will occur on completion of the road, and amount to R1.5 million per annum with no growth expected.



New investment in hotels and accommodation in the area would result in a benefit of R16 million per annum occurring in year 2018 with a growth rate of 5% per annum. An additional investment in year 2026 would result in a further R16 million per year with a growth rate of 5% per annum.

The results are shown as net present value (NPV) and internal rate of return (IRR) in Table 6.6. NPV is a primary investment decision criterion. It is defined as the difference between the present value of a stream of benefits and that of a stream of costs. A positive NPV occurs when the sum of the discounted benefits exceeds the sum of the discounted costs. A positive NPV indicates that the project is viable while a negative NPV indicates the opposite.

The IRR is the discount rate at which the discounted values of cost and benefit streams are equal to zero. If the IRR is higher than the rate of return required from the development (10% in this case), then the project is viable. The IRR is an indicator of the net benefits expected from a project over its lifetime, expressed as a percentage comparable to the opportunity cost of capital or the interest rate prevalent in the market.

**Table 6.6: CBA Results**

Scenario	Discount rate (%)	NPV (Rm)	IRR (%)
Base case	10	3.5	10
Best case	10	56.0	11

Under the base case at a 10% discount rate, the NPV is positive at R3.5 million with an IRR of 10%. Under the best case at a 10% discount rate the NPV is R56 million with an IRR of 11%. At the preferred discount rate of 10%, the results for the NPV are positive, indicating that the project is viable, and for the IRR are acceptable for project implementation. An IRR of 11% provides the funding agency with a result that exceeds the prime interest rate as well as the inflation rate.

Sensitivity analysis was conducted by (i) varying the discount rate to 8% and 12% to take account of possible shifts in the cost of capital, (ii) assuming that only 50% of development projects in Mokhotlong District occur, and (iii) combining a hard-surfaced road on Sani Pass with the status quo (gravel road) from Sani Top to Mokhotlong and excluding development projects in Mokhotlong District. The effect on NPV is shown in Table 6.7.

**Table 6.7: Sensitivity Analysis**

Scenario	Discount rate (%)	NPV (Rm)
<u>Varying discount rate</u>		
Base case	8	153.2
	12	-96.5
Best case	8	223.0
	12	-55.0
<u>50% development projects</u>		
	10	-82.4
	8	36.6
	12	-160.8
<u>Gravel/no dev projects</u>		
	10	108.5
	8	216.3
	12	33.9

The results of the three sensitivity analyses show that for (i), the NPV is negative in both the base and best cases at a 12% discount rate, for (ii) it is positive only at an 8% discount rate, and



for (iii) it is positive at all three discount rates. Thus, if only 50% of the development projects in Lesotho go ahead, an 8% discount rate would be required for viability, whereas in the case of a gravel road in Lesotho and no development projects occurring, the project would be viable at the three discount rates applied in the analysis.

## 6.5 International Relations

The economic CBA for the Sani Pass-Mokhotlong road project provides positive results. Thus, the implementation of the project is justified on economic grounds. However, there are also non-economic factors that need to be taken into account. These concern international relations in the Southern African Customs Union (SACU) and Southern African Development Community (SADC). South Africa and Lesotho are members of both these regional organisations.

Successive SACU agreements in 1969 and 2002 have stressed the need for the adoption of policies to promote economic development in the smaller member states (now comprising Botswana, Lesotho, Namibia and Swaziland). The SACU is the only complete trade integration arrangement in the region, and has always recognised that the free flow of goods across borders depends on good transport links and systems.

One of the major fields on which the SADC has concentrated is the improvement of cross-border transport systems in order to stimulate intra-regional trade and promote exports from landlocked countries to the nearest ports. To this end, the SADC has identified cross-border road routes for improvement and upgrading. In the case of the route between South Africa and Lesotho, the Sani Pass-Mokhotlong road is one of the remaining links that requires upgrading; it represents the shortest route from Mokhotlong District to its major import and export ports of Durban and Port Elizabeth.

In 2001 the governments of South Africa and Lesotho issued a Declaration of Intent on Technical and Financial Cooperation in the area of road construction and transportation. The Declaration recognised the situation of Lesotho as a landlocked country and its relationship with KwaZulu-Natal as well as with Durban and Port Elizabeth. It is clear that the economic development of one of the most remote districts in Lesotho would be enhanced by the improvement of its only direct link with KwaZulu-Natal which, in turn, would improve its connections with the major ports for its export traffic.

The international relations aspect, therefore, provides strong grounds for justifying the Sani Pass-Mokhotlong road project.

## 7. MITIGATION MEASURES

The analyses conducted for this study have shown that the provision of a hard surface on Sani Pass would be justified on economic grounds. However, a number of mitigation measures have been identified by the study team which would cushion any possible negative impacts on existing enterprises in the area of influence of the Sani Pass-Mokhotlong road. The mitigation measures recommended require certain actions to be taken by the authorities and/or other stakeholders.

- In order to restore and maintain the sense of place, the design engineers should consider the aesthetics of the area when the new road is under construction. Aesthetics does not relate so much to the road surface as to the environment that goes with the road. It includes, for example, visual and noise factors: the experience tourists want is a road with bends and speed controls.
- Road use management (traffic volumes, vehicle types, speed and noise) should be given particular attention as it is likely to be a key determinant of the quality of tourist experiences. The road is in a proclaimed trans-frontier conservation area and World Heritage Site, and therefore the behaviour of traffic should be commensurate with the land use which is nature conservation in order to safeguard the sense of place and ecological integrity. Thus, for example, hazardous cargo should not be carried, and there should be traffic calming measures to enforce the speed limit. Entry gates in South Africa and Lesotho should have clear signage relating to entry to a park, and nature conservation officials should manage the behaviour of traffic (as in Kruger National Park) with the ability to impose fines.
- In order to reduce the impacts on trade, tourism and accommodation, both the Lesotho and South African governments as well as the KwaZulu-Natal provincial administration should undertake aggressive marketing campaigns to promote the area for tourism. This is especially important for the 4x4 tour operators who might be adversely affected if a surfaced road on Sani Pass is perceived to change the ambience of the area to the extent that it loses some of its appeal, especially to foreign tourists.
- Another reason for an intensive marketing campaign is that the current occupancy rate in the Underberg-Himeville area is just over 50%, while a good norm is 60% plus. Scope therefore exists to attract more visitors to the areas, especially given the World Heritage Site status of the Sani Pass area.
- The Lesotho Tourism Authority should develop new tourism routes, not only in the valleys below the mountains but also in the highlands in Lesotho. There are a number of attractions with considerable potential; Sehlabatheba National Park is an example.
- As a large percentage of foreign tourists who visit the area are linked to inbound tour operators, marketing efforts should be made to assist those operators to continue to run tours to the Sani Pass area. This would help to reduce any possible negative impacts on the 4x4 tour operators.
- Similarly, the inbound and 4x4 tour operators should be persuaded to extend their tours into Lesotho rather than terminating at Sani Top. Large luxury coaches will not be allowed on Sani Pass, and there should be a receiving area for coaches at the bottom of the Pass from which point 4x4 operators would transport the tourists to Sani Top.
- The 4x4 operators should be assisted to develop new services such as guided tours (relating to flora and fauna as well as cultural tours into villages in Lesotho). Inside Lesotho there are tracks to homesteads and villages which could offer a rough off-road experience for tourists.
- Consideration should be given to extending the opening hours of the border post commensurate with safety requirements.

- SARS should consider upgrading the border post, once it has been relocated, to commercial status in order to allow trade between Mokhotlong District and KwaZulu-Natal to reach its potential.

## 8. CONCLUSION

### 8.1 Key Findings

The key findings of the study are:

- The contention that an all-weather surface would only have negative impacts goes against all experience in previous road projects. Experience has shown that the improvement of road infrastructure to make areas more accessible has always resulted in increased visitor numbers. In the case of Sani Pass, a number of new possibilities would be opened up once the road works are complete, e.g., the Polihali Dam could be exploited as a tourist resort, and hotel development could occur in the Sani Top area, attracting ordinary SUV vehicles which are not necessarily 4x4s.
- An all-weather road would generate new traffic, creating a tourism niche in the area.
- This new traffic would inject significant streams of revenue into an area that is currently underperforming.
- The new road would result in increased trade between the countries and the potential for new investment opportunities.
- The road plays a significant role in the facilitation of the wool and mohair industry in Lesotho with the new road creating the opportunity for a 40% growth in this industry.
- The decommissioning of the road would result in substantial distance and time saving costs due to traffic being rerouted.
- The surfaced road results in significant levels of trade, tourism and accommodation being retained in the area.
- A surfaced road would have a positive net effect on the ecology of the area with reductions in erosion and sedimentation.
- The economic cost-benefit analysis reveals that a surfaced road would have a positive net effect to the overall project area and is viable. Although a limited number of stakeholders may be negatively affected, the overall benefit of having a surfaced road outweighs the costs of not having a road at all.
- The macroeconomic impact analysis yielded positive results on GDP, employment, incomes and tourism.
- The economic CBA yielded a positive net present value and an internal rate of return of 11% which exceeds the current interest and inflation rates.

### 8.2 Impact Significance Ratings

The consultants were requested to apply the ranking scales based on the Guideline Documentation on EIA Regulations of the Department of Environmental Affairs and Tourism. These scales are based on the following:

- Occurrence
  - Probability of occurrence (how likely is it that the impact may occur?)
  - Duration of occurrence (how long may it last?)
- Severity
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?)
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

The consultants have examined these rating scales, and believe they are not entirely suited to an economic impact study. The guidelines have therefore been adapted in Table 8.1 below which, in

the opinion of the consultants, better reflects the findings of this study. In the table, various impacts that have been identified in this study are rated according to nature and significance. The table is based on a comparison of the two options considered in this study, namely, road closure and road surfacing.

**Table 8.1: Impact Assessment: Road upgrade versus road closure**

<b>Environmental impact</b>	<b>Nature</b>	<b>Significance</b>
GDP	Positive	High
Foreign tourism	Positive	High
Domestic tourism	Positive	High
Lodging facilities	Positive	High
4x4 Operators	Positive	High
Retail trade	Positive	Moderate
Wool and mohair industry	Positive	High
New investment in wool and mohair industry	Positive	High
Movement of supplies and equipment	Positive	Low
Movement of commercial stock supply	Positive	Low
Taxi operators	Positive	Moderate
Direct construction impacts	Positive	High
Construction impacts on tourism	Negative	High
Vehicle operating costs	Positive	High
Distance savings	Positive	High
Time savings	Positive	High
New investment in tourism sector	Positive	High
Ecosystem services	Positive	High
Employment	Positive	High
Payment to low-income households	Positive	Low
Net impact	Positive	High

Table 8.2 shows a comparison between road resurfacing and the status quo even though the status quo has been identified as an unfeasible alternative.

**Table 8.2: Impact Assessment: Road Upgrading versus Status Quo**

<b>Environmental impact</b>	<b>Nature</b>	<b>Significance</b>
GDP	Positive	High
Foreign tourism	Positive	Moderate
Domestic tourism	Positive	Moderate
Lodging facilities	Positive	Moderate
4x4 Operators	Negative	High
Retail trade	Positive	Moderate
Wool and mohair industry	Positive	High
New investment in wool and mohair industry	Positive	High
Movement of supplies and equipment	Positive	Low
Movement of commercial stock supply	Positive	Low
Taxi operators	Positive	Moderate
Direct construction impacts	Positive	High
Construction impacts on tourism	Negative	High
Vehicle operating costs	Positive	High
Distance savings	Neutral	Neutral
Time savings	Positive	Low
New investment in tourism sector	Positive	High
Ecosystem services	Positive	High
Employment	Positive	High
Payment to low-income households	Positive	Low
Net impact	Positive	High

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## APPENDIX A

**Table A1: Participants in Ecosystem Services Workshop, 8 March 2011**

<b>Name</b>	<b>Organisation</b>	<b>Role</b>	<b>Expertise</b>
Myles Mander	FutureWorks	Facilitator	Resource economist
Michael Van Niekerk	FutureWorks	Environment management	Environmental consultant
Russell Stow	Arcus Gibb	EIA project leader	Environmental consultant
Eduardus Gademan	SSI Engineers	Consulting engineer	Engineer
Frank Sturgess	Imani Development	Economist	Economist
Elsa Pooley	Indigenous Landscaping	Botanical Impact assessment	Botanist
Mark Graham	Ground-Truth	Riverine and aquatic impact assessment	Riverine and aquatic specialist
Steve McKean	Ezemvelo KZN Wildlife (EKZNW)	Regional resource ecologist	Resource ecologist
Bianca McKelvey	Wildlife and Environment Society of South Africa (WESSA)	Environment conservation	Conservation manager