



A Preliminary Economic Assessment of the Contribution of Fishing Lodges in the Caprivi Region to the Local Economy

April 2010

For submission to the Ministry of Fisheries and
Marine Resources



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Executive summary

A survey was carried out in 2009 in the Caprivi region of Namibia to establish the economic benefits that fishing lodges bring to local communities and the local economy. Five fishing lodges were surveyed and estimates for costs, revenues and fish catch were determined. These estimates were in turn used to inform an economic model designed to provide estimates for the net benefits of the operations. The model itself was derived from an economic model designed by Barnes (2006), which was used to assess the economic impact of tourist lodges more generally in the Caprivi region.

In addition to the quantitative survey, a qualitative survey was carried out to assess the current working relationships between lodges and local communities.

The results of the quantitative survey indicate that on average fish lodges generate around N\$1.80 million total financial benefit per lodge per annum (N\$852,000 net economic benefit), equating to N\$1,479 per kg of fish caught and not released or N\$1,563 per tourist per annum. It is estimated that N\$1.11 million of this total is generated on average in the form of wages, with N\$1.06 million wages directly paid to members of the local community. This compares very favourably with the income generated from the “next-best” activity for the area, local fishing, which was estimated to generate (for the equivalent number of employees) a maximum of N\$604,000 total financial benefit per annum (N\$412,000 net economic benefit) from fish sales. This equates to revenue of N\$11 per kg of fish, or less than 1% of the value of the fish caught and not released with fish lodges.

The qualitative results of the survey indicate that all of the fish lodges pay a concession to the local government, traditional authority, land board or conservancy. The lodges provided various examples of community support initiatives that were carried out and although incidents of conflict between lodges and other fishing groups were noted by three of the lodges, all but one was described as incidents with Zambian fishermen rather than with local Namibian community members. There was widespread concern regarding reduced fish stocks, which were almost unanimously attributed to over fishing.

Acknowledgements

This report has been produced as part of the Integrated Management of the Zambezi/Chobe River System Transboundary Fishery Resource Project. The project is an initiative of the Ministry of Fisheries and Marine Resources (MFMR) supported by the Namibia Nature Foundation (NNF). The ideas and proposals contained in this report are a combination of the authors' and those of various people interviewed during the course of this work. Particular thanks are due to the lodge owners and staff who provided information and data, to Mr Alfons Thaniseb who conducted the survey, to Dr Ben van der Waal, Mr. Denis Tweddle and Dr Clinton Hay who provided guidance and comments, to Dr Jon Barnes who provided economics advice, models and guidance, and to Antonia Baker and Luke Sweeney for designing, analysing and preparing this report.

Photograph on Title Page: Ichobezi River Lodges by R de Vries taken from website:
<http://www.zoover.co.uk/namibia/namibia/capriivi/ichobezi-river-lodges/lodge/photos#tabs>

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1. Introduction

“Given the anticipated growth of the tourism industry...the anticipated increase in the number of joint ventures and community tourism enterprises, it is estimated that employment and cash benefits from tourism will exceed N\$3,978,450,000 [per annum] by year 2030, of which more than N\$795,691,000 will be directly benefiting communities” (*Namibia Vision 2030*).

The benefits of tourism are recognized to extend far beyond the revenues received by front line businesses that cater for visitors. Through job creation and spin-off economic activities, tourism lodges in Caprivi are expected to contribute significantly to the rural economy of the region. In recent years however, instances of conflict between lodge owners and other fishing groups, who are often prevented from fishing on the river on or near the lodges, have been reported. The sustainability of the lodges may also be a concern, as information regarding fish stocks gathered as part of the Zambezi/Chobe Fisheries Project funded by NORAD/WWF, shows them to be declining (Tweddle, 2009).

In order to assess the magnitude of the direct and indirect contributions of fish lodges to the local and national economy, a survey of lodges was conducted in the Caprivi region by the Namibia Nature Foundation. In particular, the survey attempted to establish the potential socio-economic impacts from fish lodges in terms of employment and contributions to the local economy and to measure the environmental impacts in terms of the number of fish caught and not released. The survey also asked about existing social arrangements between lodges, local communities and fishing groups and conflicts and problems experienced as a result of being dependent on the same diminishing natural resource. Additionally, the survey asked about the possibility of further collaboration between lodges and conservancies and local groups to support the establishment of local organized community-based approaches to the management of the fisheries. Such

collaboration could create an enabling environment for eco-friendly fishing operations, which would further contribute to job creation and the local economy.

This report introduces the sampling methodology, explains the assumptions used to define the model, looks at capital, turnover, employment and fish consumption, describes the results as generated by the model and discusses the qualitative results from the survey.

2. Methodology

Five fishing lodges were surveyed in the Caprivi region in July 2009¹. Using a Caprivi game lodge model developed by Barnes (2006) as a base, a model was designed to assess the environmental, social and economic impacts of the fishing lodges on the local area. The lodge's responses were used to generate the underlying assumptions of the model regarding capital requirements, employment, income and financial turnover. Likewise, responses regarding angling catch-and-release patterns and survival were used to form the assumptions for average off-take rates per visitor. By inputting these assumptions and data into the model we were able to estimate the net economic contribution of fishing lodges to local areas.

The information gathered also enabled the derivation of the benefit per kg of fish caught and not released. This could then be compared with the economic value related to the 'next-best' use of traditional/commercial fishing, based on a further model developed by Barnes (2008) concerning traditional/commercial fishing in Kapako in the Kavango region of Namibia.

Note that throughout the text a distinction will be drawn between the concepts economic value and financial value, which are assessed differently in the model used. For our purposes here, the key differences between the two concepts relate to the impact of

foreign inflows and outflows, tax and the opportunity costs of labour and capital. Economic value takes stock of these impacts, assessing the value added to the economy from activities, whereas financial value does not, focussing on the returns to individual business: more information regarding these differences and concerning the model more generally can be found in Annex A.

2.1 Study Limitations

It should be noted that the benefits generated to local communities are primarily expressed in terms of the wages earned by employees directly. Expenditure by lodges on local provisions is considered a cost, when in reality for local communities this could represent a benefit in terms of market provision. Additionally, the study does not address the impact of tourism on local economies in terms of the further spending by tourists outside of the lodges. For example, spending by tourists on fishing supplies or crafts and curios is not included in the analysis.

3. Assumptions for the model

3.1 Capital

For the purposes of the model, capital was broken down into fixed capital and movable capital. Fixed capital refers to assets that are effectively non-movable, such as buildings, reservoirs, fencing, etc. A further distinction is made between those fixed capital assets that are tradable, such as fencing and those assets that are non-tradable, such as housing. Examples of movable capital include fishing equipment, boats and cars, and by their essence are all tradable items. Fixed capital is assumed to have a replacement life span of 40 years for non-tradable items and 15 years for tradable items. Moveable capital on the other hand is assumed to have a lifespan of 6 years only, with the exception of a houseboat, which is assumed to have a lifespan of 15 years.

¹ Seven lodges were originally surveyed, but it was discovered that two of these lodges were not specific fishing lodges and hence their survey data were excluded from the results.

The breakdowns of the individual costs of capital were not available from the lodges. Instead, estimates were provided for Investment Capital and Current Capital Value. Investment Capital was assumed to have been spent on fixed and movable capital equally; this assumption is corroborated by one of the lodges, which described their invested capital as half moveable, half immovable. The difference between Current Capital Value and Investment Capital was also assumed to be fixed capital only. For example, if a lodge indicated that its Invested Capital was N\$10 million and Current Capital Value N\$15 million, it has been assumed that fixed capital was N\$10 million $[(0.5*10) + (15-10)]$ and movable capital N\$5 million.

Since we do not have a breakdown of capital items, we assume a constant proportion between non-tradable and tradable items as for a standard lodge using Barnes' (2006) model, but including a cost for fencing perimeters and the large purchase item of a houseboat. A standard game lodge in the Barnes model is described as spending N\$5.47 million for non-tradable items and N\$124,000 for tradable items, suggesting that spending on tradable items is 2.3% that spent on non-tradable items. With the inclusion of fencing, this proportion changes to 6.2%. The economic cost of each item is assumed to be the financial cost adjusted for foreign exchange (assumed to be zero in the SADC region) and taxation (assumed to be 11%). The mean Investment Capital for the fish lodges is estimated to be N\$8.35 million; using the proportion taken from the Barnes (2006) model, this breaks down into N\$7.84 million domestic and N\$515,000 tradable capital.

According to the survey results, mean moveable capital is calculated to be N\$4.25 million, which is higher than moveable capital in a standard lodge, estimated to be N\$1.25 million. Although these lodges do not need game-drive vehicles, as in a standard lodge, they require fishing equipment and an assortment of boats and motors, some extending to the expensive item of a houseboat. For the model it was assumed that the N\$4.25 million was broken down into N\$465,000 for standard office equipment and lodge equipment minus trucks and land rovers, plus three boats and fishing equipment (rods, reels and other fishing equipment) coming to N\$145,000. The remainder was

assumed to be the average spent per lodge on a houseboat, which three of the five lodges surveyed indicated that they owned. Based on these rates of ownership and the estimated mean moveable capital from survey results, the average cost of a houseboat is calculated to be N\$5.42 million, which is marginally higher than the N\$5 million estimate provided by one of the lodges for their houseboat, but of a similar magnitude. Although this estimate is likely to be high - there are a range of “houseboats” on the market, some of which would cost significantly less than N\$5 million – the three boats per lodge assumed in the model is likely to be an underestimate. Given the total average figure for mean moveable capital, an increase in the number of boats would affect to reduce the estimated houseboat price accordingly.

Based on these estimates for the capital requirements of an average lodge, annual capital depreciation is estimated to be N\$613,000, which is a component of overhead costs and is important for calculating net value added.

3.2 Turnover

The mean daily rate charged was calculated as N\$843 per person per night, with catered accommodation averaging N\$1614 per night and camping averaging N\$70 per night. The total number of guests for each lodge was either listed directly or derived from occupancy rates and capacity. Occupancy rate, calculated as total number of guest nights divided by total number of bed spaces, was estimated to be 36%. This is surprisingly low but it should be noted that some lodges offered some form of camping accommodation, which was rarely booked to maximum, and that during low season occupancy was often very low. This low occupancy means that the potential for realising the benefits of the lodges have been hampered somewhat and that capacity exists for further development of this sector.

The mean income from activities (mainly fishing) and bar and restaurant sales per lodge was N\$934,000 per annum.

Total revenue was the sum of the total income derived from accommodation plus the mean income from activities and bar and restaurant sales. This was estimated to be N\$3.89 million per lodge (financial benefit) or N\$4.09 million per lodge when adjusted for the benefits of foreign exchange (economic benefit).

3.3 Employment

Tourism is a labour-intensive industry, which is reflected in these survey results; the total employment for the five interviewed lodges came to 174 people, nine of which were foreign nationals, 131 were Namibian full-time workers, five were Namibian part time workers and 29 were Namibian guides².

Table 1 - Total employment in Fishing Lodges

Position	Manager	Skilled	Unskilled	Part-Time	Guides	Total
Total Number employed	14	83	43	5	29	174
Average per lodge	3	17	9	1	6	35

Table 2 - Proportion of jobs going to local people

Position	Foreign	Local	Total
Total Number employed	9	165	174
Percentage of Total	5%	95%	

It should be noted that some Foreign Managers were not included in the survey, as an owner-manager is not described as ‘employed’ or drawing a wage. Yet in all probability these people receive a wage at least as high as a local manager does. Therefore in the model the base figure from Barnes’s model (2000) of 20% foreign employment and 80% national was used, for the purposes of calculating remuneration to non-nationals.

² The number of part time workers indicated by the lodges was low, but in part this may reflect a lack of clear definition during surveying as to what constituted a part time and full time worker. This lack of definition may however be reflected in the average wages paid to workers per annum.

Based on average wages (Table 3), the estimated total annual transfer of wages for all five lodges is N\$5.11 million, of which N\$4.83 million goes directly to local employees. Note that in terms of remuneration for employees this figure is likely to be an underestimate, as it does not include potential benefits in terms of bed and board and tips that may be additionally provided to employees.

Table 3 - Mean wage per annum

Position	Manager	Skilled	Unskilled	Part-Time	Guides
Mean Wage	\$102,143	\$39,642	\$9,133	\$4,800	\$36,279

3.4 Fish consumption

On average, 70% of guests visiting the five lodges went angling. By far the most common type of caught fish is the Tiger Fish, accounting for 807 of the 947 total fish caught and not released (85%) per lodge per annum.

Table 4 - Number of fish caught per year

Lodge	Total No. of Guests	Percentage of guests who go angling	Average No. Caught per visitor per day.	Average visit length	Total No. of fish caught
1	1,547	60%	6	3	16,709
2	1,200	80%	1	3	3,528
3	509	80%	5	6	11,850
4	1550	70%	8	3	26,040
5	954	60%	4	2	4,579
					72,534

The angling at lodges is mainly “catch and release”, i.e. that the vast majority of fish are carefully released alive after catching and thus not removed from the resource base. Most lodges reported 99-100% of fish being released with the exception of one of the lodges, which reported about 80% of Bream being released. Most lodges indicated that they give advice on the correct way to safely release fish and while released fish are likely to

survive, the Tiger Fish is apparently more likely than the others to be damaged by being caught and not survive. The exact proportion of survival is difficult to predict, but in this model it is assumed that 10% of Tiger and 1% of other fish do not survive capture and release. Despite these assumed low proportions, the sight of abandoned dead fish floating on the river may imply fish are ‘going to waste’ for fun. The negative impact of these dead fish on community opinion (welfare) may therefore be greater than the actual value of the lost fish.

Table 5 – Off-take numbers

	No. Caught	Percentage Released	Damage Rate	Survival Rate	Off-take Numbers
Tiger	38,614	99.50%	10.00%	89.55%	3,616
Barbel	5,621	99.50%	1.00%	98.51%	84.0
Bream	6,560	93.33%	1.00%	92.40%	498.6
Squeakers	4,179	100.00%	1.00%	99.00%	41.8
Humpback	3,866	100.00%	1.00%	99.00%	38.7
Thin Face	3,866	100.00%	1.00%	99.00%	38.7
				Total	4,308

Due to the high numbers of visitors angling, the off-take rates at the five lodges amount to about 4,737 fish per year, or about 947 fish (about 1,217 kg) per lodge per year. This is despite the average number of fish caught per visitor per day being only around five and the high release and survival rates.

4. Economic and Financial Results

The estimated revenue per lodge per annum is N\$3.89 million or N\$4.09 million when adjusted for the benefits of foreign exchange. Based on variable costs per lodge of N\$1.31 million per annum and overhead costs of N\$2.32 million per annum, both derived from the model, financial net cash income (essentially profit) per annum per lodge is estimated to be N\$260,000. Additionally, it should be noted that some of the manager-

owner's salaries would be paid directly to the owners and that the model includes a cost based on loan repayment, which none of the lodges indicated that they had.

The total financial benefits, which include the net cash income, salaries and wages, licenses and duties, rentals and royalties, come to N\$1.80 million per lodge. Based on an average size of site of 6.3 hectares (ranging from 1 to 15 hectares), this is equivalent to about N\$286,000 per hectare. Gross value added (net economic value) is estimated to be N\$852,000 per lodge per annum, a figure which is essentially gross income adjusted for foreign exchange, minus variable costs, overhead costs and opportunity costs of capital and labour. In terms of direct wage benefits to the community, the average financial benefit per local employee is estimated to be N\$28,200 per annum. Unskilled workers are estimated to earn on average N\$9,100 per annum (however these figures exclude the potential for non-monetised benefits of bed and board and tips). Clearly this figure represents a minimum benefit to the community. Additional benefits include for example capacity development through training and skills development of local employees, expenditure of guests elsewhere in the community e.g. on souvenirs, food and drink in towns, etc., and income diversification, which mitigates some of the risk in relying on natural resources for income.

Using the predictions of off-take of fish per lodge of 1,217 kg per year, this implies a financial benefit of N\$1,479 per kg of fish caught and not released. The benefit in terms of wages received by the local community is N\$1,403 per kg of fish caught and not released.

Compared to the next best alternative, traditional/commercial fishing, we find that the economic and financial value per kg of fish is much higher for tourism enterprises. Based on Barnes' traditional fishing model (2008), a traditional fishing enterprise comprising of one fisherman can expect a total catch of 1,568 kg of fish per year, which is about 30% higher than the estimated average lodge off-take. Barnes' (2008) Traditional Fishing model gives a commercial value of N\$11.00 per kg as an average of all species, and so a

typical traditional fish venture would thus generate an equivalent³ net cash income of N\$9,451 or a net economic benefit of N\$11,790 per year. Note that this is broadly comparable with the average unskilled wage of lodge workers. If all employees within a typical lodge (35) were able to generate this same net economic benefit each, the total equivalent net economic benefit would be N\$412,000 per annum, or around half that generated by a typical lodge. Note that in Table 7 the net value added (excluding depreciation) is higher for the equivalent number of traditional fishermen than for fishing lodges. This is a reflection of the relatively high capital costs associated with fish lodges, as net value added is simply net economic benefit minus the costs of capital depreciation.

It is perhaps worth remembering that this equivalent total value for the 35 fishermen would require the catch of 55,000 kg of fish, with the potential associated impacts on fish prices and fish stocks.

Table 6- Summary of Economic and Financial Benefits

Financial benefits	N\$/kg of fish		N\$/HECTARE		N\$	
	Lodges	Traditional	Lodges	Traditional	Lodges	Traditional (equivalent employee numbers)
Gross income	3,196	11	617,603	172	3,890,901	603,540
Net cash income	213	6	41,204	95	259,586	330,795
Total benefits	1,479	11	285,734	172	1,800,123	603,540
Economic benefits	N\$/Kilo of fish		N\$/HECTARE		N\$	
	Lodges	Traditional	Lodges	Traditional	Lodges	Traditional
Gross income	3.368	12	650,770	183	4,099,851	639,765

³ Not all fish would be sold directly, but for the purposes of valuing the fishing activity an equivalent value can be calculated based on catch and sale prices.

Net economic benefit (gross value added)	700	8	135,183	118	851,654	412,650
Net value added (excluding depreciation)	233	7	45,021	110	283,629	385,175

Table 7 -Economic and Financial Rate of Return

	Fish Lodges	Traditional Fishing
Net cash income/n\$100 total capital investment	1.97	286
"Total benefits"*/n\$100 total capital investment	13.64	286
Net value added/n\$100 total capital cost	2.27	340
Capital cost/employment opportunity created	359,708	5,972
Number of employment opportunities/1000 ha.	5,524	5

5. Results – Qualitative

The last section of the survey is based on qualitative questions giving interviewees the chance to describe what existing arrangements they have with local groups, what conflicts and challenges they experience and the potential for further collaboration.

5.1 Existing arrangements

All of the lodges surveyed had some form of formal concession. All had an agreement with the Traditional Authorities and one lodge had an agreement with the Ministry of Lands and Resettlement. Two lodges also had agreements with the Local Government, Land board and conservancies. The concession size ranged from 1-15 ha, with an average of 6 ha. A total of approximately N\$150,000 was paid yearly by all five lodges in lease and permission to occupy fees, with an average of N\$30,000 per lodge per year.

Lodges indicated that they contributed to local communities in the following ways (note that these benefits were not included in the quantitative section above):

- Donations to schools, furnishing a crèche, and in the case of one lodge, running a pre-school
- Providing water tanks for local schools
- Taking guests on educational tours of the local village, allowing people to see development programmes so raising awareness and encouraging donations.
- Providing Transport to the Traditional Authorities and other members of the local community, including transport for funerals
- Financial support to the Traditional Authorities
- Buying firewood and building materials from local community members
- Provide running water, electricity, and engineering services
- Providing medical and health support

5.2 Conflict

All but one of the fishing lodges actively prevents fishing in front of their lodge and there is no compensation given for this inconvenience. There was however very little reported conflict with Namibian fishing groups, with only one lodge reporting conflicts with traditional/subsistence fishing due to the use of net fishing. Similarly all reported conflict with commercial fishing was due to Zambian groups and illegal ‘bank to bank’ netting, drift netting and seine netting methods. Other conflicts with Zambians include ‘crossing the river illegally’ and one case of stolen property. There was no reported conflict between any of the lodges and local communities or any of the lodges and other tourist enterprises.

5.3 Challenges

All lodges reported declining fish stocks and most described the current stock as ‘insufficient’. One lodge also added that the fish were also declining in size. All but one lodge ascribed the decline in fish stocks to overexploitation. Other causes included: old fish nets being left in river still catching fish, birds eating small fish, the increased number of water activities e.g. an increased number of boats, too much net fishing and lack of monitoring and law enforcement by government and conflict with Zambian fishermen.

When asked what was needed to run a successful lodge some cited ‘ingredients’ include: sufficient fish stocks, well trained guides, good management, good boats and equipments, advertising, clear regulations and protocols.

It was suggested by most that the area needed better promotion by the government as a fishing destination, and as an ‘en-route’ destination to other places such as Victoria Falls in Zimbabwe, Chobe in Botswana, Mamili national park in Namibia and the Kariba Dam between Zambia and Zimbabwe. Also that improved regulation and border controls to prevent illegal fishing would be useful, especially as it would reduce the fuel and travel expenses needed to travel further away from the lodge when localized fish stock have been depleted.

Four lodges stated that they would like to expand their tourist fishing activities by, for example, encouraging more fishing activities in the rainy season, and expanding fly-fishing.

When asked if they would be willing to subsidize the local conservancy/community in its efforts to establish and manage fisheries reserves as breeding areas for fish where no netting would be allowed, but where anglers could enjoy catch-and-release fishing for an agreed daily rod fee, the reaction was generally positive. All river-side lodges said they would support such a scheme, with suggested daily rod fees ranging from between N\$5.00 and N\$25.00. There were some additional comments with one lodge saying that although it might be a problem to assist financially, they could assist with providing boats. Ideas for how such a system should be managed included: setting aside designated fish protection areas / reserves where no net would be allowed; establishing a closed season e.g. December and January to allow stocks to be build up; and employing local people as fish guards and monitors.

6. Conclusions

The economic and financial results show that lodges provide significantly higher returns both to the local and broader economies in terms of employment and financial transfers than traditional or commercial fishing practices. The off-take rates are very low proportionally meaning that environmental impact is minimized. The qualitative section of the survey showed that a number of agreements were already in place with local communities and Traditional Authorities and any conflict is primarily with fishermen coming into Namibian waters from Zambia. The low occupancy rate at the fishing lodges suggests that there is spare capacity in this region and national and regional policies should be assessed and refined to do more to promote this region as a foreign and domestic tourism destination.

There is also general agreement that fish stocks are declining making the future of fishing tourism uncertain and providing an incentive for lodges to invest in projects that would boost the local fish stocks, reduce the levels of exploitation and assist communities to better manage the resource. All lodges seem willing to consider some kind of collaboration agreement with both local communities and government but, as they demonstrate a low financial turnover, it might be unrealistic to depend on them for all the necessary financial investment. In kind support could be provided by fishing lodges, including sharing of expertise, making equipment available at strategic times such as boats and communication equipment.

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Appendix A

Financial and Economic Value

The 2000 Barnes Caprivi Lodge Model used in this study provides two estimates for the impact of lodges to the local area, based on the two concepts of Financial and Economic Value. Although each concept provides slightly different estimates overall, both concepts have value in this analysis.

Financial value

Financial costs and benefits are those that are typically felt and considered by the individual or business when making decisions. On the benefits side, gross income is simply revenues received. On the costs side, costs are broken down into variable costs and overhead costs. Variable costs refer to those costs that vary depending on the magnitude of production (or in this case, number of guests), such as advertising costs, fuel, food etc. Overhead costs are those costs that are more stable and typically can not vary depending on the magnitude of production, including operating overheads such as wages, maintenance and repairs, insurance costs etc. and other overheads such as interest on working capital or capital replacement costs (based on depreciation).

Subtracting these variable and operating costs from Gross Income provides an estimate of Net Cash Income, or profit. The total benefits from the operation include this Net Cash Income, together with the wages paid to employees, tax paid on sales and land rental or royalties. The total benefit is thus the total benefit to the area, *if there was no other use for the labour, land or capital used in the operation.*

Economic value

Unlike the Financial value concept, the Economic value concept includes consideration of the opportunity costs of capital and labour, foreign inflows and outflows and exchange rate and tax adjustments.

The Economic benefit pertaining to lodge operation is the Gross Income, as with the Financial Benefit, but with a positive adjustment (a 6% premium) for the foreign exchange brought in as a result of international tourism. Costs include: variable costs (increased by foreign exchange adjustments and decreased by an adjustment to account for sales tax), operating overhead costs, shadow unskilled wages costs to account for the opportunity cost of using this form of labour (i.e. so that it can't be used elsewhere productively), the opportunity costs of capital and the interest and remuneration costs associated with employing/ purchasing foreign workers / equipment.

Subtracting Economic costs from Economic benefit provides a value of net economic benefit (or Gross Value Added). Note that unlike Financial Value whereby wages, tax on sales, land rental and royalties can be added to Net Income, this is not the case with Economic Value. What is being measured is the benefit of the lodge itself *given the use of the factors of production (land, labour and capital)*. Put another way, in an economic sense, simply using the factors of production is not beneficial (i.e. providing employment, for instance), rather the additional value of a product (in this case tourism) beyond simply the factors of production is what is being measured.

Net value added additionally takes consideration of economic depreciation of capital assets.