An Ecological Economic Review of the Environmental Impact Assessment of Conserving or Mining the St Lucia Dunes

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The *Environmental Impact Assessment of the Eastern Shores of Lake St Lucia Kingsa / Tojan Lease Area* (EIA) argues that "From an economic perspective, there is significant advantage to be gained by proceeding with mining at the Kingsa/Tojan lease areas." [Vol 3: 7.9] Our analysis of the EIA demonstrates that this conclusion at best remains unsubstantiated and mostly likely is incorrect.

Our analysis covers several essential areas relevant to the economics of conserving or mining the dunes. These include ownership of the dunes, returns from the two land use options, employment opportunities, foreign exchange earnings and tax revenues. We analyse both what is in the EIA and what is missing.

Ownership of the dunes

To conduct a resource economics analysis of utilisation of the dunes, ownership must be determined. A specialist report (SR) states clearly that "Legal ownership will not change at least in the short and medium terms. The land is owned by the State." [Vol 1: 1.3.1] The dunes are "unalienated state land" which means that it is "land which the state owns and in which it holds the mineral rights." [Vol 1: 22.2.1] The dunes being owned by the State means that they are owned by the people of South Africa and the State holds them as guardian on behalf of the people.

Over the years the government has however allocated overlapping use rights to the dunes, that is "the area remained under divided control." [Vol 3: 2.5.2] These rights were, inter alia, assigned to the government authorities responsible for forestry, conservation and mining.

Forestry

"In the mid 1950s, the then Directorate of Forestry initiated a large-scale afforestation programme on the Eastern Shores…The [1960s] Kriel Commission recommendations [to conserve the dunes] were largely ignored by Government. Afforestation continued and the area remained under control of the Department of Water Affairs and Forestry, but with joint management by the NPB [Natal Parks Board]." [Vol 2: 9.4.1] Use rights were granted for commercial pine plantations. The existing forests are to be phased out and thus play only a minor role in the economic components of the EIA.

Conservation

"The management of the Eastern Shores State Forest (ESSF) was transferred in August 1992 to the Natal Provincial Administration for management by the NPB." [Vol 3: 2.5.2] As discussed further below, the conservation status of the St Lucia area had been acknowledged by Government many years earlier. The NPB has now been granted clear conservation use rights to the dunes.

Mining

"RBM holds prospecting leases for a portion of unalienated land" [Vol 1: 1.3.3] which they acquired in the 1970s and 1980s. There is extensive discussion in the EIA consrning whether RBM has a legal right to turn its prospecting leases into a mining authorization. The introduction to the SRs states that according to a chief inspector of mines "RBM has a legal right to mine." [Vol 1: 1.1] This is supported by a statement in one of the SRs that "the holder of a prospecting permit has virtually an unassailable right to a mining authorization." [Vol 1: 22.2.4]

One of the key issue reports (KIRs) on economics [Vol 2: No 7], even discusses in detail the matter of compensation if RBM is not given permission to mine. It states that "If mining did not occur, mitigatory action to deal with the costs could involve the payment of compensation by the State to the mining company." It estimates that "the value of compensation to be paid out by the State would be between R270.7 million and R767.8 million, depending on the rate of discount used." [Vol 2: 7.4] Interestingly this amount significantly exceeds the discounted estimated net present value of R153.5 million presented in the final Environmental Impact Report (EIR). [Vol 3: xviii]

Such a requirement for compensation would be based on the assumption that RBM has a legal right to mine the dunes. As explained in the KIR on plans, policies and laws, however, "the use of the word 'may' in section 9(2) of the [1991 Minerals] Act makes clear that mining may be refused." [Vol 2: 9.5.3] Furthermore, the new Minerals Act "does not provide for payment of compensation should mining be refused." [Vol 3: 2.6.2.1] Thus RBM has no legal use rights to mine the dunes. The Eastern Shores remains unalienated State land owned by the people of South Africa with forestry rights being phased out and conservation rights clearly assigned to the NPA/NPB.

Thus the key economic question asked by the EIA—what are South Africans willing to pay to prevent the mining and conserve the dunes?—is incorrect. With the property rights to the dunes clearly in the hands of the people of South Africa, the economic question the EIA should address is what South Africans are "willing to accept" or willing to be compensated. ["Environmental Economics: A Survey" by M L Cropper and W E Oates, *Journal of Economic Literature*, June 1992, p 701] The key economic question should be—what are South Africans willing to be compensated in exchange for granting RBM the right to mine *their* dunes?

Value of the dunes

A resource economist would in the first instance be interested in assessing the value of the resource in question. The EIA makes no attempt to place a land value on the dunes. The closest it comes is a SR reference to land values for forestry. It notess that "The most recent purchase of land for forestry…indicates a bare land value of around R3 500 per ha." [Vol 1: 15.2.5] Further on the SR also notes that "The current price of available plantable land in Northern Natal with a potential MAI of 16/ha/year is around R1 400/ha." [Vol 1: 15.3.2]

If we are interested in assessing the return that the people, meaning the owners of the dunes, can expect from either conserving or mining the dunes, it would be necessary to estimate the value of the dunes. At the very least the EIA should review the various values that the owners can attach to the dunes.

These values come from both consumptive and non-consumptive utilisation of the dunes. The consumptive use values would include the direct use of the dunes from forestry, ecotourism or mining. The non-consumptive use values would include the indirect value, being the contribution made by the dunes to the greater St Lucia ecological and economic systems. It would also include the preservation values of the dunes which economists divide into option value, bequest value and existence value.

Option value is the value people place on having an option to use the resource in the future. Bequest value is the value people place on future generations having the option to use the resource. Existence value is the value people place on pure existence or preservation of the resource irrespective of any desire to utilise it directly.

Only direct use values from ecotourism and mining are addressed in the EIA, and then only partially. Indirect and preservation values are either ignored or underplayed. Most importantly, existence value is established in the EIA in the discussion of the sense of place, but is not incorporated into the economic assessment of conserving or mining.

Alternative sites for conserving or mining

To evaluate the alternative development options for the Eastern Shores, a basic economic question that has to be asked is what is the net return from investing money to develop this resource versus investing the money elsewhere. This has to be done for both the conservation/tourism option and the mining option.

For example, what are the expected net returns from mining the Eastern Shores versus mining elsewhere? Such an analysis is linked to a need and desirability assessment for mining or conservation at any particular location.

The need and desirability for conserving the dunes

The EIA is filled with references to the long-standing indirect and intrinsic value of conserving the Eastern Shores. It notes that in 1897 “the St Lucia Game Reserve…was established, making it the third oldest conserved area in Africa.” [Vol 3: 2.5.2] Thus for at least a century South Africans have placed a high conservation value on the area.

The importance of the conservation status of the area, including the Eastern Shores, was reasserted after the announced afforestation plan in the 1950s. “This action provoked a public outcry which led to the Kriel Commission of Inquiry of 1964-1966. The Greater St Lucia-Mkuzi Reserve was recommended…This report described the Lake as a ‘unique environment' with great potential for conservation and tourism.” Regretfully, “the Kriel Commission recommendations were largely ignored by the Government.” [Vol 2: 9.4.1]

In 1986 the area's international conservation status—that is, its existence value not only to South Africans but to the international community—was acknowledged in the designation of the greater St Lucia area as a Ramsar wetland site. The recent Ramsar report (15 March 1993) on the possibility of mining the Eastern Shores explains that the St Lucia wetland system is of “undoubted international importance.” It further states [pages 7-8] that “the extensive dune forest must be regarded as a unique feature…there can be few coastal dune forests anywhere in the world where the trees grow so high, cover such a large area and exhibit such variety. It must also be emphasized that the dunes of the Eastern Shores and their covering of trees form an integral part of the wetland system.”

In short, from a conservation perspective the Eastern Shores are a unique resource with a long-standing existence value among South Africans and indeed the international community. The EIA ignores this uniqueness and in its emphasis on tourism revenues from conserving the dunes argues that “rational economic alternatives” are available and “facilities could be developed elsewhere.” [Vol 3: 7.3] Even overlooking the obviously fallacious assumption that ecotourism destinations are homogeneous goods, the EIA fails to recognise that conserving the Eastern Shores dunes cannot be replaced by conserving elsewhere.

The need and desirability for mining the dunes

Little effort is made in either the SRs or the KIRs to establish the need and desirability of mining. In fact, the initial SRs viewed the entire EIA as “essentially a mitigation report” because it assumed that RBM had a legal right to mine. [Vol 1: 1.1]

In the final EIR report need and desirability is based on the desire by RBM to keep a smelter operating at full capacity for a certain number of years. The report explains that “RBM's smelting plant at Richard's Bay processes, at full capacity, one million tons of slag per year. The Kingsa/Tojan deposit will allow RBM to continue smelting at full capacity for an additional five years.” [Vol 3: 5.1.1]

From the perspective of the people of South Africa, the owners of the dunes, RBM's future excess capacity in a smelter does not determine a need and desirability to mine the Eastern shores. If this rationale were to be accepted, then South Africans and the international community who value the conservation of South Africa's coastal dune systems can only be grateful to RBM for not having built a smelter with two, three or even four million tons of annual capacity. Had they built a larger smelter they would have “needed” to strip mine even more of South Africa's coast.

Alternative ore reserves

The EIA attempts to make conservation, especially tourism based on conservation, a substitutable good. The intention is to show that the dunes are not a unique conservation resource. As noted above, this is simply not the case. Regarding mining, on the other hand, in support of the conclusion that there is a real need and desirability to mine the dunes, the EIA must dismiss the possibility of mining elsewhere.

In response to the comments on the original SR on economics (SR-21), the author states that "alternative domestic supplies (either from mining at Zulti-South or from obtaining raw materials from Rhoex-Shell) would clearly mitigate the effects of not mining the St Lucia reserve immediately." [Vol 1: p617] In the original draft of the report (as noted in the review comments by Vorhies [Vol 1: Part 2]), the author indicated that if mining was refused on the Eastern Shores, RBM would mine Zulti South. In the redrafted version, the position changes to read: "If permission to mine at St Lucia is refused, the company would continue to mine its existing leaseholds, including that at Zulti South." [Vol 1: 21.2.2.3.2]

Then in the same author's KIR, the position again changes, now stating that "two ore reserves are available: the Kingsa/Tojan lease area in the eastern shores and the Zulti South lease area south of Richards Bay…it is intended that both ore reserves would be mined, probably simultaneously." [Vol 2: 7.2.1] By the writing of the final EIR, Zulti South is to be mined "as a supplementary operation and concurrently with the other deposits." [Vol 3: 5.1.2] Thus in the course of the study Zulti South changes from an "alternative" mining site to a "concurrent" mining site.

As for alternative supplies of ore whether from local or overseas sources the EIA reviews several alternatives. [Vol 3: Table 5.2] It nevertheless assumes that RBM either has no other source or is not interested in any other source. For example, the second KIR on economcs states that "RBM asserts strongly…that no other mining area would represent an alternative to them." [Vol 2: 12.2] On this basis the SRs, KIRs and the final EIR do not consider mining elsewhere.

To conclude, if one accepts that RBM have proved sufficient need based on feeding their smelter, then other sources, such as Anglo's project on the west coast or even un-prospected reserves, should be considered. On the other hand, if one does not accept that they have adequately proved sufficient need, then the issue of alternative sites falls away and for that matter so does the issue of mining the Eastern Shores of Lake St Lucia.

Environmental benefit-cost analysis

SR-21, the SR on economics, does not include a benefit-cost analysis of mining versus conserving the dunes. It clearly states that "At no stage in this report has any attempt been made to compare the monetary values of contributions of the two land-use options." [Vol 1: 21.5] In response to strong objections from the NPB and others a second economics study was commissioned.

Many believed that this new study would conduct a comprehensive environmental benefit-cost analysis that incorporated conservation values. As the title of this KIR [Vol 2: No 12] indicates, the focus shifted from mining versus conserving to mining versus ecotourism. This shift in emphasis was carried through to the final EIR in no small part because no one except RBM was allowed to review and comment on this KIR-12 study before it was incorporated into the EIR.

So the EIA consists of two KIRs on economics—KIR-7 which was partially subject to public review and KIR-12 which was not. The latter which was not subject to public review and which failed to carry out the requested environmental benefit-cost analysis forms the basis of the economic assessment in the final EIR. Thus the final EIR is completely inadequate in that it does not incorporate conservation values into its economic evaluation of mining or conserving the dunes.

At this point one is tempted to conclude that given that the owners of the dunes —the people of South Africa—do not stand to benefit from mining, that the need and desirability of mining has not been established, and that the benefit-cost analysis carried out in the EIA is clearly biased in that it does not account for conservation values, there is nothing more to be said. The EIA has failed to make an economic case for mining. Nevertheless there are several other problem areas in the EIA that should be brought to the attention of the decision-makers.

Assumptions in the benefit-cost analysis

KIR-12 states that "Intuitively, we would expect that the NPV of mining would exceed the NPV of not mining, but that the environmental impact of mining would be worse than the environmental impact of not mining. Hence there would be a trade-off between the NPV of the economic effects and the environmental effects" [Vol 2: 12.3.1] Our intuition differs. We suspect that a properly conducted environmental benefit-cost analysis would very likely show that there would be no trade-off, but rather that conserving the dunes makes good environmental sense and good economic sense.

Our major concerns regarding the assumptions in the economic evaluations come out below in our comments on the main EIA conclusions. In addition, there are several other concerns, such as setting a shadow price for labour at “30% of the actual wage.” [Vol 2: 12.4.1] Still other concerns include the estimation of producer surplus for mining but not for conserving [Vol 2: 12.2] and the decision to use a shadow exchange rate [Vol 2: 12.3.4].

In order to comment fully on all our concerns about the numerous assumptions made, we would need to have complete access to the economic model and to the data that went into it. The CSIR supplied us with some user-unfriendly spreadsheets and we were not allowed access to financial information on the mining option. In a fax dated 26 April 1993, RBM stated “that this information cannot be passed on to reviewers of the EIR.”

Also as a matter of interest, RBM stated in the same fax that the information made available to the economic consultants “was audited and certified to its correctness by external auditors.” This contradicts the statement in KIR-12 that “an external audit of the RBM-generated figures was not conducted.” [Vol 2: 12.1] Thus our suspicions about the information supplied from RBM remain, but without access to the numbers we have no way of confirming or rejecting them.

Assessing the RBM and NPB plans

The EIA in general accepts the plans and associated numbers supplied by RBM for mining the dunes. For example, KIR-12 explains that “we assumed that these figures reasonably reflect the economic reality of the proposed mining operation.” [Vol 2: 12.1]

When it comes to the plans and associated numbers supplied by NPB for conserving the dunes, the EIA in general rejects them. For example, they are labelled “ambitious” in both KIR-12 [Vol 2: 12.5.5] and the final EIR [Vol 3: 7.3]. The final EIR further describes the NPB plans as “a highly improbable scenario” [Vol 3: 10.4] that are “unlikely to be realised” [Vol 3: 7.3].

The final EIR rationalises its rejection of NPB's plans on the grounds that there are “constraints on capital funding”, that “the management and skills needed to support such a growth rate are scarce” and that there will be “probable resistance to the perceived impact of such intense development.” [Vol 3: 7.3] None of these arguments are substantiated.

Because the authors of the EIA do not like the development plans proposed by NPB they discount them significantly. For example, the EIR discounts the maximum number of beds provided for tourists from NPB's planned 2 774 to 1 500 without providing any substantial justification. [Vol 3: 7.3] Thus the decision-makers are unable to compare the economic return from NPB's conservation plan with that of RBM's mining plan.

It might be acceptable for EIA to include scenarios with rationalised adjustments to either the mining or the conserving plans. The fact that the EIA accepts RBM's plans without question and then simply rejects NPB's plan and does not even present it, however, is completely unacceptable and clearly shows bias in the assessment. In addition, as we shall see below, the returns estimated from the down-scaled operations of NPB are also suspect.

“Aggregate discounted revenue”

The final EIR lists seven major economic indicators of the impacts of mining or conserving the dunes. [Vol 3: Table 9.3] The first of these, “aggregate discounted revenue”, is reviewed in this section. The others are reviewed in the following sections.

Mining

The final estimate of the gross returns from the mining option is “a discounted revenue of R196 million for ecotourism, as well as R460 million for the life of the mine.” [Vol 3: xviii] Note that the returns from the mining option include returns from projected associated tourism activities. Mining is explicitly not assessed on its own. [Vol 3: 7.1]

Furthermore, the EIA provides no information on how the number of R460 million was determined. All we are told is that an 8% discount rate was used to determine a loss of mining revenues of R460.7 million from the no-mining alternative. [Vol 3: Table 7.2] Does the no-mining alternative account for possible revenues from mining elsewhere? Or does it account for revenues from merely putting the capital in the bank and earning the market rate of interest? Does it account for potential subsidies from the State, such as possible Section 37E tax benefits? The answers to such questions are not provided.

Conserving

The EIR concludes that the aggregate discounted revenue from conserving the dunes will be R265.7 million. [Vol 3: Table 9.3] Unlike the estimate for mining, the EIR reveals more information on how this figure was determined.

Most importantly, the EIR and KIR-12 on which it is based excludes virtually all sources of revenue from conserving the dunes. The exclusions include expenditures by tourists on gate fees; food and drink; transport costs including airfares, car hire and petrol; organised tours such as boat trips and nature walks, entertainment; ecotourism clothing and supplies; books and maps; souvenirs and curios; photographs and videos; professional services such as travel agents, banking, insurance and medical care; and post and telecommunications. In addition, "income from day visitors was not taken into account." [Vol 3: 7.4.1] Also any revenues from sustainable utilisation of wildlife and other renewable resources were excluded. [Vol 2: 7.1.2]

According to the EIR the only revenue of significance that apparently will be generated from conserving the dunes will come from the accommodation provided by the NPB. Accommodation by the private sector is also excluded. KIR-12 then determines the revenue from projected NPB tourist accommodation as follows. [Vol 2: 12.5.6] First, the maximum number of beds is assumed to be 1 500, well below NPB plans. The justification is a spurious comparison to available bed nights in the Kruger National Park. Second, the occupancy is assumed without justification to average at 55%. Third, the bed rate per night is assumed to be R80. The rationale is that "this is the break-even level calculated to be necessary to finance the expansion in accommodation, the NPB being a non-profit organisation." [Vol 2: 12.5.6]

The last assumption on the bed rate is especially strange in that the final EIR stated that "the current NPB proposal is unlikely to be realised because of constraints on capital funding." [Vol 3: 7.3] Now, as the EIR explains, the bed rate is "estimated to be sufficient to cover running and capital costs" [Vol 3: 7.4] Therefore, the NPB does not have enough capital to realise its plan, but the economic model shadow prices bed rates so that capital costs are covered! We fail to follow the logic here.

The exclusion of revenues from private sector tourism is especially odd in light of the EIR's recommendation "that the development of the ecotourism operations within the Park be devolved to the private sector to ensure greatest financial and economic value" [Vol 3: 10.5] By its own admission therefore the revenues from conserving the dunes would be enhanced by including the private sector.

In addition to completely underestimating the tangible revenues that could arise from conserving the dunes, as mentioned previously, the intrinsic values to South Africans and to the international community from conserving the dunes are also excluded. If all the returns from conserving the dunes were included in an economic comparison of mining versus conserving, then this comparison would look very different indeed.

"Discounted net present value"

Mining

The EIR concludes that mining "would realise a discounted net present value of R153.5 million for the life of the mine." [Vol 3: xviii] The same type of criticisms as discussed above hold. Most importantly, the decision-makers are given no indication of the nature, magnitude and timing of the flows of revenues and costs that determine this figure.

In addition, the EIR misleadingly explains that "the net present benefits for the mining alternative represent economic value, which reflects value to the country after all social values have been taken into account." This assertion directly contradicts a statement made earlier in the same section of the EIR that the KIR on which the EIR is based "could not incorporate a full range of social costs and benefits." [Vol 3: 7.4] Most importantly, from a conservation perspective, the NPV of mining does not incorporate the loss in existence value from the destruction of the dunes. Furthermore the phrase "value to the country" implies that, in some way, the NPV will be distributed to the owners of the resource, i.e. the people of the country. The EIR does not explain in any way how the proposed distribution, if any, is to be effected.

Conserving

When the EIR turns to the NPV from conserving the dunes, it makes the completely ridiculous assertion that "The NPB is not a profit-making organisation, and its goal is to balance income and expenditure…Therefore, no net value accrues." [Vol 3: 7.4] Whether NPB is profit-making or not is irrelevant to the calculation of net present value.

NPV studies are conducted as a matter of course for not-for-profit projects set up by the World Bank, the African Development Bank, the Development Bank of Southern Africa, various departments of the South African government, not to mention various departments of governments throughout the world. There is no reason why a NPV study cannot be conducted for NPB involvement in conserving the dunes, let alone for all the private sector activity that would be generated and is not accounted for in the EIA.

NPV estimates present value of the surplus of revenue over cost. The reason that the EIR does not consider the conservation of the dunes to generate a positive NPV is because it assumed the NPV to be zero in the first place. It did this by only accounting for public sector provided accommodation, and also shadow pricing that accommodation to generate a zero surplus. This is patently unrealistic.

If all revenues and costs were taken into account, intuitively, we would expect that the NPV of conserving would exceed the NPV of mining.

"Jobs created: direct"

Mining

KIR-7 states that "a work force of 159 would be needed in the work area for the 17 to 20 years that it would take to mine." It also noted that mining "could impose costs in terms of loss of jobs of people currently employed in St Lucia town." [Vol 2: 7.3.5] If the RBM facilities elsewhere, most notably the smelter in Richards Bay, are included, then if mining was not allowed "the cost would be the loss of potential employment and wages of about 2 700 people for five years." [Vol 2: 7.3.5]

KIR-12 also sets the number of direct jobs at 159. It does not discuss the loss of direct jobs due to mining nor does it discuss the jobs created in other RBM facilities.

The final EIR, however, increases the number of direct jobs from mining to "313 life-time jobs." [Vol 3: xviii] This estimate does not build on the KIRs' estimates of the 159 jobs created by mining the dunes. Rather the EIR recalculates the maintenance of RBM's total employment, now set at 2 500, for an additional five years into 313 so-called "life-time" jobs. [Vol 3: 7.8] This number comes from multiplying 2 500 jobs by the 5 additional years and then dividing by 40 years as a proxy for life-time employment.

The estimate of 313 "life-time" jobs is misleading for two reasons. First, the jobs are not life-time. A worker cannot be employed by RBM to work 8 5-year jobs. Second, if mining were not allowed, for the last years in question "production would fall to 60% of the capacity of the smelters." [Vol 3: 7.4.2] Assuming a constant employment/output ratio, only 1000 5-year jobs or 125 so-called "life-time jobs" would be lost. In short, the EIR's contention that there are more direct jobs than the 159 stated in the KIRs is wrong.

Conserving

KIR-7 states that "The full 20-year development plan for the Eastern Shores State Forest and environs provides for the potential creation of 446 jobs." [Vol 2: 7.3.5] KIR-12 does not estimate job creation from conserving the dunes.

The EIR gives a presumably revised estimate of 392 jobs associated with implementation of the full NPB plan. It then assumes a constant job/accommodation ratio and with its down-scaling of accommodation by 46% it down-scales direct job creation to 212. Thus the EIR presents a range from 212 to 392 jobs. [Vol 3: 7.8 and Table 7.5]

The result is misleading for two reasons. First, real sustainable life-time jobs from conserving are equated to imitation unsustainable "life-time" jobs from mining. Second, all the jobs created from the other aspects of conserving the dunes as detailed above are ignored. Thus the real direct employment opportunities from conserving the dunes are grossly underestimated.

"Jobs created: indirect"

Mining

KIR-7 concludes that "In a remote area, the multiplier effect of the new operation is likely to be negligible…At the macroeconomic level, the employment benefits of the operation could be argued to be small." [Vol 2: 7.3.5] KIR-12 uses an industrial employment multiplier of 1.7 to estimate 111 "additional jobs created in the economy." [Vol 2: Table 12.9]

The EIR, on the other hand, ignores the two KIRs on economics and uses the "approach followed by the Development Bank of South Africa [which] suggests that the 30% contribution to RBM's earnings over the 17 years of the Eastern Shores mine…would provide between 3 000 and 11 000 jobs in the country (including those created locally)." The theory behind this macroeconomic job/earnings multiplier is not explained. Nevertheless, the EIR pushes on and using the same transformation as above turns these indirect jobs into "1 275 and 4 675 life-time employment opportunities." [Vol 3: 7.8] This is voodoo economics at its best. A 17-year mining operation does not create any life-time jobs.

Even if one accepts the EIR's methods, its estimate has to be corrected for the double-counting of jobs "created locally" which must include the EIR estimate of 313 direct "life-time" jobs and for the operation of the smelter at 60% capacity for the five years in question. After these adjustments the so-called "life-time employment opportunities" would be reduced to a range of 520 to 2 358. Once again, however, we must emphasise that the EIR's approach to estimating the creation of indirect jobs is highly questionable and completely at odds with the two KIRs on economics.

Conserving

The EIR's treatment of indirect job creation from conserving the dunes is even more shocking. It states that "There is little point in attempting to quantify indirect job creation arising from nature conservation and tourism at the local and regional levels, since the information necessary to do so is not available. The number of jobs created at the national and regional levels are unlikely to be different from the mining option, as ecotourism developments would continue elsewhere." [Vol 3: 7.8]

First, information on job creation multipliers from tourism are available. For example, a recent article by M Hugo, "A Quantification of the Role of Foreign Tourism in the South African Economy" [*Journal of Studies in Economics and Econometrics*, 1992, 16(2)] estimates that approximately seven to nine foreign tourists are "needed to create one job in the formal sector." Another example is the book *Tourism and Economic Development* edited by A M Williams and G Shaw [London: Belhave Press, 1988] which also reviews the direct and indirect job creation from tourism. Both of these works cite further studies on the topic.

Second, the EIR makes no attempt to review the path-breaking developments in rural community participation from wilderness conservation. Some of these are reviewed in *Living with Wildlife: Wildlife Resource Management with Local Participation in Africa* edited by A Kiss [The World Bank, 1990]. Developments in the St Lucia area, such as those of the Phinda Resource Reserve and the Kwazulu Bureau of Natural Resources, are completely ignored.

Third, the EIR assumes that ecotourism destinations are in surplus supply and are perfect substitutes. In short, the EIA ignores most of the formal and informal, direct and indirect job opportunities that would be arise from conserving an unique coastal dune system.

"Net incremental tax revenues (discounted)"

Mining

The EIR uses KIR-12's estimate that taxes of "R157.1 million would be paid during the life of the mine." [Vol 3: xviii] It further states that "At the national level, RBM's contribution is best reflected through its contribution…to the financial resources of the country through annual taxes amounting to about R76 million per year including taxes, royalties and regional services levies." [Vol 3: 2.5.5] Interestingly the EIR references KIR-12 as the source of this figure, but it cannot be found there. Also, the R76 million figure appears to refer to RBM's total tax contribution for all activities, but it is not clear whether this includes taxes from mining the Eastern Shores.

KIR-12 presents what it calls "net incremental taxes" discounted at various rates. The R157.1 million figure is for taxes net of "the amount of incentives paid or the amount of subsidies allowed." [Vol 2: 12.4.5.2] The type and amount of incentives and subsidies to RBM from the Government are not explained.

The taxes calculated include a mining royalty with a nominal value of R102 million, a small regional services levy and "incremental increase from tax payable" which appears to refer to company tax. [Vol 2: Table 12.8] The determination of this mining royalty—which is important because the royalty is essentially the rental fee that the people of South Africa are charging RBM to mine their dunes—is not discussed. Nor for that matter are the determination of the regional services levies and company tax discussed. Finally, all other sources of tax revenue are ignored.

The decision-maker is left with a very unclear picture of the expected composition of subsidies to and taxes from mining the dunes.

Conserving

Regarding the net incremental tax revenues arising from conserving the dunes the EIR concludes bluntly "None. The Natal Parks Board does not pay tax." [Vol 3: xviii] This is conclusion is simply incorrect. NPB pays indirect taxes such as VAT, petrol tax and tariffs. Indirect taxes are a significant and growing source of revenue for the Government. NPB also collects PAYE for the personal income tax paid by its employees.

In addition, private-sector economic activity associated with conservation will pay company tax in addition to personal income tax and indirect taxes. Thus the conclusion that there will be zero taxes revenues arising from conserving the dunes is ludicrous.

"Net incremental foreign exchange earnings (discounted)"

The EIR contends that "economic growth in the country…is currently constrained by foreign-exchange availability" and that mining the dunes "would contribute to the positive balance of the balance-of-payments account." [Vol 3: 7.5] The contention that economic growth is constrained by a lack of foreign exchange is debatable and the EIR makes no attempt to defend it. We do not subscribe to the neo-mercantilist use of foreign exchange earnings as a yardstick for economic success. Nevertheless for the purposes of this review, we will limit our remarks to commenting on the EIA conclusions with respect to foreign exchange earnings.

Mining

The EIR concludes that "R606 million in foreign exchange would be gained during the life of the mine." [Vol 3: xviii] This amount is arrived at by discounting net exports at 8%. [Vol 2: Table 12.7] How these foreign exchange earnings are to be distributed is not discussed.

Conserving

Regarding conserving the dunes, the EIR concludes "The effects of mining on foreign exchange earnings from ecotourism have not been quantified, but would not be affected at the national scale." [Vol 3: xviii] The conclusion that they would not be affected at the national scale is based on the false assumption that conservation areas and ecotourism destinations are perfect substitutes. Furthermore, if the EIR believes foreign exchange earnings are so important to the national economy, why were these not quantified for conserving as well as mining the dunes?

"Social responsibility"

The EIR makes much of the declaration that "RBM would invest R8 million per year in social responsibility programmes." [Vol 3: xviii] This amount, as the EIR itself explains [Vol 3: 2.5.5], is the gross amount RBM has spent on social responsibility annually to date and not the net contribution to this spending that would arise from mining the Eastern Shores dunes.

The EIR further explains that this “social investment expenditure would have a net present value of R95.2 million.” [Vol 3: 7.6] Assuming that mining is not allowed (and that RBM acquires no other supplies to feed its smelter), we estimate that the present value of the loss in social investment expenditure to be R4.5 million. In other words, mining the dunes would contribute R4.5 to RBM's social responsibility programme.

We should also remember that RBM's social responsibility programme is voluntary and could be cut back or suspended at any time. As KIR-7 notes, “There is no guarantee that the [social responsibility] facilities described…would in fact be provided in the sub-region.” [Vol 2: 7.3.6]

Conserving

The EIR argues that “NPB's commitments to social responsibility are not clearly formulated.” [Vol 3: 7.6] The statement is odd in light of the fact that “The NPB's primary objective is ‘to promote nature conservation in Natal and to assist all other public and private groups in promoting wise use of the biosphere” (from the NPB mission statement).” [Vol 2: 9.2] We feel that it would not be an overstatement to say that Natal Parks Board is a social responsibility programme and that conserving the dunes would be the socially responsible land-use option.

Recommendation

Countless hours of labour and many thousands of rands have gone into the economic assessment of mining or conserving the dunes on the eastern shores of Lake St Lucia. Nevertheless, for the many reasons presented in this report, the EIA's conclusion that mining offers significant economic advantages has not been substantiated. Our recommendation is that no more time and money be wasted trying to prove the case for mining. Let the people of South Africa begin now to enjoy the sustainable benefits of conserving their dunes.