

SOCIO-ECONOMIC ASSESSMENT FOR THE PROPOSED AMENDMENTS:

WIND GARDEN (PTY) LTD WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE IN THE EASTERN CAPE

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Rhodes University	Bachelor Degree in Geography and Economics
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University of Pretoria - 2011	MSc (Technology Management)
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This document serves as an amendment to the previous socio-economic basic assessment (BA) impact study for the proposed Wind Garden WEF, which was compiled in June 2021. This report should be read in conjunction with the previous BA report. This document serves only to corroborate and expand upon the previous BA findings and how they pertain to the proposed changes. Efforts have been made to not repeat any unnecessary information.

1. INTRODUCTION

In 2020, Urban-Econ Development Economists (Urban-Econ) was appointed by Savannah Environmental (Pty) Ltd (Savannah Environmental) to undertake a Socio-Economic Basic Assessment for the proposed Wind Garden Wind Farm which is located between Makhanda (formerly known as Grahamstown) and Riebeek East in the Cookhouse Renewable Energy Development Zone Three (Cookhouse REDZ 3) located in the Eastern Cape Province. As part of the specialist studies, it was identified that a **Socio-Economic Impact Assessment (SEIA)** was required. That basic assessment report addressed the assessment of impacts as set out in the guidelines in terms of the Environmental Impact Assessment Regulations of 2014. During the course of 2020 and 2022, a public participation process (PPP) has been ongoing and in this process a number of formal objections raised regarding the proposed project, particularly by neighbouring and nearby property owners.

Taking on board these objections and in an attempt to reduce some potential negative impacts identified by the various specialist reports, the client (Wind Garden **Pty** Ltd) wishes to make certain material changes to the proposed project in terms of the number, location layout, and specifications of the proposed turbines.

At the request of the Savannah Environmental, an addendum report is required to be prepared by Urban-Econ considering the acceptability of this reduced layout, together with any supporting information.

2. SCOPE OF STUDY

The changes proposed by the developer require that Urban-Econ Development Economists provide an Amendment Report to the previous Socio-Economic Basic Assessment (BA) for the proposed Wind Garden Wind Farm.

This Amendment Report to the Socio-Economic Basic Assessment forms an integral part of the supporting documentation required for the revised Basic Assessment Report required to be submitted to the Department of Forestry, Fisheries and the Environment (DFFE).

Specific objectives for this amendment are as follows:

1. An assessment of all impacts related to the proposed change, including a comparison with those impacts predicted in the original socio-economic impact report.
2. Advantages and disadvantages associated with the proposed change, including quantified impact changes (if applicable).
3. Measures to ensure avoidance, management and mitigation of impacts associated with the proposed change.

3. PROPOSED AMENDMENTS

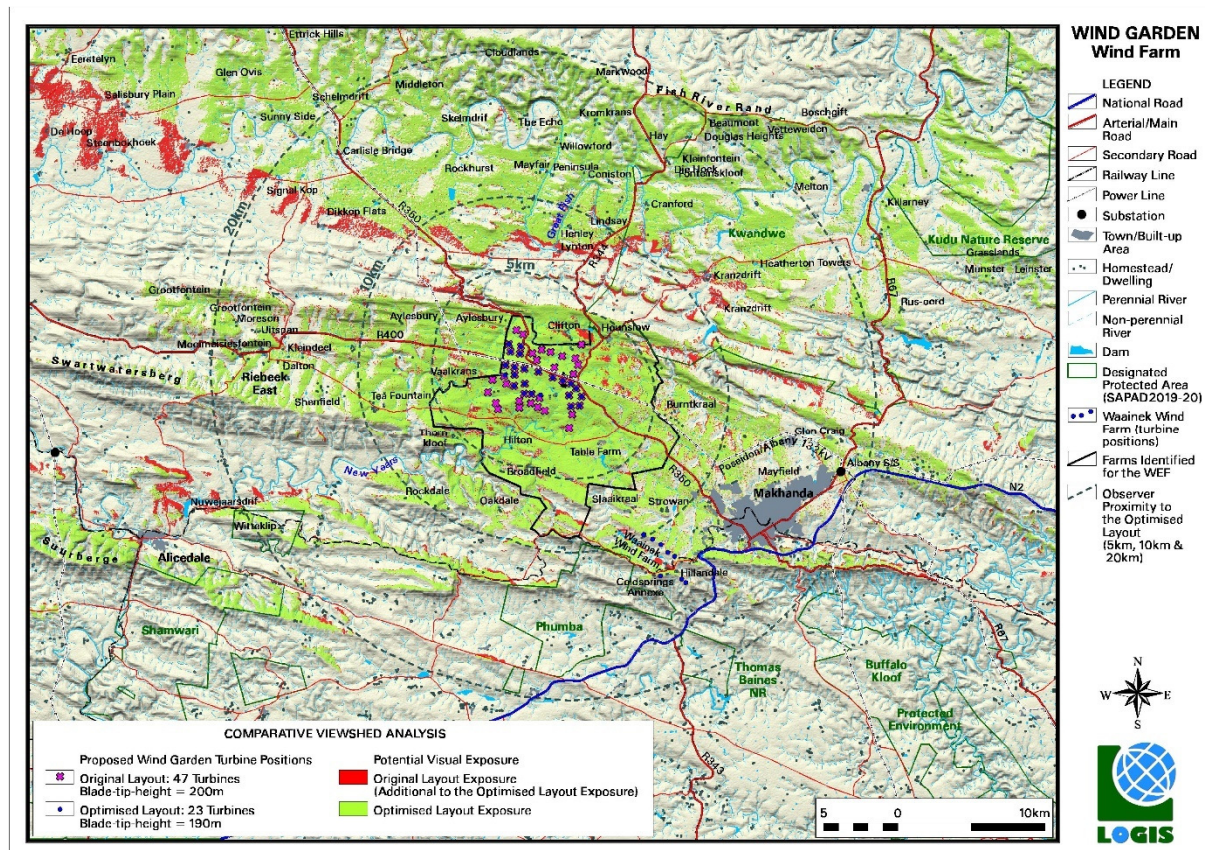
The details of the proposed amendments to the proposed windfarm layout and infrastructure for the Wind Garden Wind Farm are provided in Table 3-1 below.

Table 3-1: Proposed amendments to the layout

Technical Aspects to be Amended	Previous Report	Proposed Amendment
Total number of turbines (See Map 3-1 below)	47 turbines	23 turbines
Positioning of turbines	See Map 3-1 below – pink crosses	See Map 3-1 below – purple crosses
Technical specifications of individual turbines	Hub height of 120m, rotor diameter at 150m	Hub height of 115m, rotor diameter will remain at 150m

See below Map 3-1, providing for the location of the proposed development changes relative to surrounding spatial context. Map 3-1 also provides for an indication of the visual impact changes in comparison to the original layout. These can be directly compared with Map 4-1 in the original socio-economic basic assessment report. The shift in positions of the turbines has been undertaken by the developer in order for the project to remain feasible whilst still considering the I&AP comments which emerged during the SEIA and public participation process.

Map 3-1: Wind Garden WEF Amended Layout & Visual Impacts



(Source: Logis, 2022)

4. EFFECT OF THE PROPOSED AMENDMENTS

The following section presents an assessment of all impacts related to the proposed change.

4.1 ASSUMPTIONS

Given both the technical changes as well as the total number of turbines proposed for the amended layout, both the anticipated once-off capital expenditure as well as the annual operational expenditure for the project are set to change. Table 4-1 below, presents the expenditure assumptions for the amended layout in comparison to the original.

Table 4-1: Assumption changes

Investment assumption	Previous Report	Proposed Amendment
Total once-off local capital expenditure	R5.72 billion	R2.80 billion
Anticipated local annual expenditure (once fully operational)	R35.25 million	R17.25 million
Total SED spend commitment	0.5% contribution to the Just Energy Transition Fund 2% committed to community development initiatives	
Total number of direct FTE employment positions during construction (SA-based)	570	278
Total number of direct FTE employment positions once operational (SA-based)	27	13

(Source: Adapted from Vestas, 2020)

4.2 ASSESSMENT OF PROPOSED CHANGES ON IMPACTS

The revision of the assumptions as outlined above in addition to the resultant layout and visual impact changes shown in Map 3-1 will result in material changes to a number of impact indicators as previously presented in the final SEIA study. These are captured in three subsections below as follows:

- Quantified short and long-term economic impacts
- Quantified SED spend impacts
- Revised business tourism impacts
- Other revised SEIA impact indicators

4.2.1 Quantified short and long-term economic impacts

The following table outlines the potential economic impacts during the construction phase of the proposed Wind Garden Wind Farm based on the proposed amendments made to the

layout of the WEF. The total impact on production/business sales is likely to equate to R 5,9 billion (direct, indirect and induced) for the duration of construction and will largely be spent in the Eastern Cape. The total impact on GDP (direct, indirect, and induced) is likely to be R 1,40 billion and create 278 FTE employment positions over the construction period of two years with the total impact on employment being 282 FTE employment positions. These will largely be felt through the construction sector and through the value chains associated with the construction of a wind farm. Given the reduction in the proposed number of turbines, all positive economic impact indicators have reduced in magnitude from the originally proposed layout.

Table 4-2: Estimated impact on the national and local economies (R' million, 2020 prices) as well as employment (FTE positions) for the duration of construction

Indicator	Direct	Indirect	Induced	TOTAL
Impact on Production				
TOTAL	R 2 797	R 3 152	R 1 228	R 7 178
Impact on Gross Domestic Product				
TOTAL	R 869	R 382	R 144	R 1 395
Impact on Personal Income				
TOTAL	R 369	R 423	R 158	R 950
Impact on Employment				
TOTAL	278	358	192	828

Table 4-3 below provides the potential economic impacts during the operational phase of the proposed Wind Garden Wind Farm, this specifically relates to the impacts derived from the anticipated direct spend in the maintenance and upkeep of the facility (excluding SED spend). It should be noted that the reduction in the number of turbines proposed for development as a result of the amended layout will result in lower operational expenditure and therefore a reduction in the positive annual economic impacts once the project is fully operational.

Table 4-3: Estimated impact on the national and local economies (R' million, 2020 prices) as well as employment (FTE positions) for the operation phase

Indicator	Direct	Indirect	Induced	TOTAL
Impact on Production				
TOTAL	R 17, 3	R 13, 4	R 7, 7	R 38, 4
Impact on Gross Domestic Product				
TOTAL	R 9, 6	R 2, 6	R 1, 6	R 13, 8
Impact on Personal Income				
TOTAL	R 10, 6	R 3, 6	R 1, 7	R 16, 1
Impact on Employment				
TOTAL	13	15	2	30

4.2.2 Quantified SED spend impacts

As presented in the original report, the developer of the proposed WEF has communicated that their total forecasted SED spend for the fully operational Wind Garden WEF will be in order of 2.5% of the Gross Annual Revenue generated.

Of the 2.5%, 0.5% will be contributed to the Just Energy Transition Fund, with the remaining 2% being spent on community development initiatives within the immediate vicinity¹ of the proposed project.

The amendments to the proposed layout of the facility will mean that lower revenues are expected to be generated from the WEF, this will mean a directly proportional reduction in the anticipated spend within the immediate vicinity of the project. A summary of such is presented below.

- Given the planned amended 129 MW generation capacity of the Wind Garden WEF, the total estimated contribution to SED within the study area is estimated at R7,57 million per annum with the figure increasing annually by CPI. Over the first ten years of operation, this equates to a forecasted SED spend of R76,6 million, while over the full lifecycle of the project SED spend as anticipated to amount to R237,38 million.
- In addition to the planned employment creation during construction and 20-year operation of the WEF, the developer intends to make a positive contribution to employment opportunities in other non-wind related industries. Given the anticipated SED spend commitments related to the amended layout, it is assumed that up to R3,4 million could potentially be channelled towards both short- and long-term job opportunities on an annual basis.
- The proportional investment relative to total revenue generation and the resultant commitment to local communities remains unchanged from the original report findings.

4.2.3 Revised business tourism impacts

Based on secondary and primary research findings in the original study, the following observations and conclusion were made as to potential negative business tourism impacts that may arise as a result of the development of the Wind Garden WEF:

- From international literature it cannot be ruled with confidence whether wind farms have or do not have a negative impact on tourism but, those studies that pointed to the possible negative effects which reveal marginal and not detrimental impacts on tourism business performance (Aitchison, 2012; Moffatt Centre, 2008; The Tourism Company, 2012; Sæþórsdóttir & Ólafsdóttir, 2020; Broekel & Alfken, 2015).
- Local residents and businesses in close proximity to wind farms, are more likely to have negative perceptions and attitudes towards wind farms than tourists due to the NIMBY syndrome. This is particularly the case for those residents or stakeholders who are not involved and benefiting from the said project (Sæþórsdóttir & Ólafsdóttir, 2020).
- Studies that have applied spatial panel regression techniques such as that of Broekel & Alfken, 2015, reveal that there is a negative correlation between location of turbines and tourism demand i.e., the closer a tourism product is to a wind turbine, the less appealing the location is for a tourist.
- Further, based on secondary studies, it appears that many other factors such as the size and range of wind farms, the demographics of tourists (families with kids

¹ "immediate vicinity" is here referred to as the area that falls into the broader viewshed of the facility

are more accepting of wind farms), the landmarks, location of the wind farm in relation to the tourist destination, and other physical and environmental attributes of the destinations all contribute to the decision of tourists to visit or re-visit an area. One trend that seems to be common though is that the outcry against wind farms is generally considerably greater during the pre-construction stage than during operations suggesting that initially perceived negative impacts to be associated with wind farms do not always come to fruition.

- From the primary research carried out by Urban-Econ with other eco-tourism products around South Africa that are in close proximity to existing WEFs, it was found that:
 - No eco-tourism operator respondents interviewed indicated any material change in their business operations as a direct result of wind farm developments in their respective areas.
 - Engagements with established game farm and eco-tourism operators such as Kwandwe within the viewshed of the original layout of Wind Garden WEF revealed notable opposition to the proposed development with sentiments shared that the erecting of turbines within view of their properties would deter guests from visiting their facilities and result in potential revenue losses and job reductions within the broader eco-tourism industry.
 - The original SEIA findings concluded that there was a high probability with a medium level of magnitude in both the short and long term that there would be a negative impact on select tourism establishments and game farming enterprises located within a 0-20km radius.

Given the above research reflection and noting the revised layout proposed in the amended Wind Garden WEF turbine positioning (see Figure 3-1), the visual specialist has now concluded the following which will directly inform the revised findings of the SEIA:

- Of the originally proposed 47 turbines, 10 of the closest turbines to Kwandwe and Clifton properties have been removed from the intended layout design.
- In effect, the frequency of visual exposure (overall number of exposed turbines) will be halved and there will be a slight benefit from the reduced height of the turbines.
- As indicated on Map 3-1, the areas depicted in red will fall away, as visual impacted areas, with the optimised layouts.
- Certain point receptor sites (e.g., residences) may not be exposed any more, but large tracts of land will remain exposed (as shown by the green colouring).
- The visual impacts associated with the remaining (optimised layout) turbines will remain high, especially for observers located within a 5km radius of the wind turbine structures.
- For Kwandwe specifically, this means that very few portions of their property falling within a 0-10km radius will be exposed whatsoever. It is only on high-lying land further than 10km from the closest turbine that will still have distant views of Wind Garden WEF.

Subsequent to the submission of the original SEIA report, the following findings by DFFE should also be noted and are relevant to the findings of the amended report:

- There are no economic activities at Mr Nick Orphanides’s farm (Portion 5 of the Farm Van der Merwes Kraal 132) – note that this is within 5km radius of the amended layout with high impact visibility.
- Farm Vaale Krans 134 is currently on sale (at the time of the investigation) – note that this is within 5km radius of the amended layout with high impact visibility.
- The owner of the Farm Aylesbury 662 is actually Mr Mark Britstow not Mr Chris Pike. The owner of the farm is not staying on the farm. The farm is for buffalo breeding business.
- Kwandwe is not owned by a South African but an American who is also involved in renewable energy, oil and natural gas businesses.
- Kwandwe not only generates its income through wildlife tourism activities, but also generates notable income from buffalo breeding.

(Source: DFFE, 2022)

In interpretation of the above from a business tourism impact perspective, the following can be concluded based on the intended amendments:

- It cannot be ruled out that wildlife and eco-tourism businesses such as Kwandwe will still experience some negative impacts as a result on the construction and operation of the proposed Wind Garden WEF.
- Given the fact that the amended layout results in fewer visual impacts on receptors within a 10km radius of the Wind Garden WEF, potential negative tourism impacts are expected to reduce in probability and magnitude – specifically in reference to Kwandwe.
- Given the finding by DFFE that Kwandwe also derives notable income from Buffalo Breeding operations, this diversification in business activity would mean that as an entire business entity, the entity would be more resilient to potential negative tourism impacts than if it was entirely reliant on domestic and international visitor revenue. (Note: findings in Section 3.3.4 and 7.3 of the original report regarding agricultural business impacts as a result of wind farms.)

4.2.4 Other revised SEIA impact indicators

Table 4-1 below outlines certain key impacts previously identified in the original report and how these are likely to change as a result of the proposed amendments. All significance figures shown in the table below are provided ‘without enhancement,’ i.e., before implementation of applicable mitigation or management interventions.

Note: only impacts indicators that are deemed to change are listed below. All other impacts not listed from the original report should be assumed to stay as-is.

Table 4-1: Summary of Impacts per Phase

SEIA Ref.	Previous Report	Amendment Report
Construction Phase Impacts		
8.1.1 a	Temporary stimulation of the national and local economy (Medium Significance) 56	(Medium Significance) 52 <i>Magnitude reduced from 8 to 7</i>

8.1.1 b	Temporary increase employment in the national and local economies (Medium Significance) 52	(Medium Significance) 48 <i>Magnitude reduced from 8 to 7</i>
8.1.1 d	Temporary increase in household earnings (Medium Significance) 33	(Medium Significance) 30 <i>Magnitude reduced from 6 to 5</i>
8.1.1 e	Temporary increase in government revenue (Medium Significance) 40	Medium Significance) 36 <i>Magnitude reduced from 4 to 3</i>
8.1.2 a	Negative changes to the sense of place (Medium Significance) 48	(Medium Significance) 44 <i>Magnitude reduced from 8 to 7</i>
8.1.2 b	Negative impact on the local tourism, game industry and associated industries during construction (Medium Significance) 36	(Medium Significance) 32 <i>Magnitude reduced from 6 to 5</i>
8.1.2 e	Impact on property and land value in the immediately affected area during construction (Low Significance) 24	(Low Significance) 22 <i>Magnitude reduced from 6 to 5</i>
Operational Phase Impacts		
8.2.1 a	Sustainable increase in production and GDP nationally and locally (Medium Significance) 52	(Medium Significance) 48 <i>Magnitude reduced from 5 to 4</i>
8.2.1 b	Creation of sustainable employment positions nationally and locally (Medium Significance) 52	(Medium Significance) 48 <i>Magnitude reduced from 5 to 4</i>
8.2.1 d	Improved standards of living for benefiting households (Medium Significance) 48	(Medium Significance) 44 <i>Magnitude reduced from 5 to 4</i>
8.2.1 e	Sustainable increase in national and local government revenue (Medium Significance) 48	(Medium Significance) 44 <i>Magnitude reduced from 4 to 3</i>
8.2.1 f	Local economic and social development benefits derived from the project's operations (Medium Significance) 52	(Medium Significance) 48 <i>Magnitude reduced from 6 to 5</i>
8.2.1 g	Sustainable rental revenue for farms where the wind farm is located (Medium Significance) 35	(Medium Significance) 30 <i>Magnitude reduced from 2 to 1</i>
8.2.1 h	Sustainable increase in electricity available for the local region and South Africa (Medium Significance) 50	(Medium Significance) 45 <i>Magnitude reduced from 2 to 1</i>

8.2.2 a	Negative changes to the sense of place (Medium Significance) 56	(Medium Significance) 52 <i>Magnitude reduced from 8 to 7</i>
8.2.2 b1	Negative impact on select local tourism, game farming and associated industries (0-20km radius) (Medium Significance) 33	(Medium Significance) 30 <i>Magnitude reduced from 6 to 5</i>
8.2.2 b2	Negative impact on broader local tourism, game farming and associated industries (Medium Significance) 30	(Medium Significance) 27 <i>Magnitude reduced from 4 to 3</i>
Decommissioning Phase Impacts		
8.3	As noted in Section 8.3	Unchanged
Cumulative Impacts		
8.4	As noted in Section 8.3	Unchanged

From the above assessment it can be noted that for the eleven (11) positive impact indicators that are expected to change with the amendments, the average reduction in significance scoring is approximately four (4) points, this is predominantly attributed to a minor reduction in magnitude as a result of the smaller investment and revenue generation capacity of the WEF, given that fewer turbines will be developed. Significance weighting categories remain unchanged.

With regards to the six (6) identified negative impact indicators that are expected to change in their significance scoring, as with the positive impacts, all of these are also expected to reduce given the findings presented in section 4.2.3 above.

5. MANAGEMENT AND MITIGATION OF IMPACTS

It is important to note that the management and mitigations as recommended previously in the original report would remain applicable. The proposed layout changes and total number of turbines to be constructed would not warrant a change in the approach.

6. CONCLUSIONS AND RECOMMENDATIONS

As was determined in the original BA socio-economic report, the net effective impact from a socio-economic perspective, indicates that the project would generate greater socio-economic benefits during both the construction and operation phases than the potential losses that could occur as a result of its establishment. The positive and negative impacts will be distributed mostly amongst different receptors but will not result in inequality. Adherence to the proposed mitigation measures, however, would ensure that the offset of impacts is more balanced and that it also takes into account communities and businesses that will be negatively affected.

The proposed amendments by the developer have taken into account the opposition to the project from neighbouring and nearby property and business owners and have thus sought to reduce the potential visual disturbances and impacts of the project. As a result of the reduction in the number of turbines as well as the proposed layout changes it is anticipated

that various negative impacts will reduce in their overall significance as summarised in Table 4-1.

Concluding statement – It is hereby concluded that the proposed amendments will not present any fatal flaws from a socio-economic impact perspective. Various potential negative impacts will now be reduced in their significance which is particularly applicable to the immediate study area and surrounds. Some positive socio-economic impact indicators on a national and regional level will be reduced in their magnitude and significance given the smaller spatial and investment size of the project proposed within the amendment. The project though is expected to derive notable positive impacts in terms of economic productivity, employment and skills development at a local and national level.

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