

## Supplemental Information

Section S1: The Dinokeng Game Reserve questionnaire

Dear Landowners of Dinokeng Game Reserve,

My name is Antoinette van de Water and I am a PhD student from the University of KwaZulu-Natal, and I am currently living at Kaallagte road in Dinokeng Game Reserve which has allowed me the pleasure of meeting some of you already. I would like to invite you all to please participate in a study that I am conducting with the aim to gain a deeper understanding of the added value of elephants to the Dinokeng Game Reserve and the surrounding communities as well the variety of ways in which humans and elephants can coexist. My research "Living with elephants" is supervised by Prof. Rob Slotow (University of KwaZulu-Natal), Dr. Michelle Henley (Elephants Alive) and Dr. Kevin C. Matteson (Miami University) and has been approved by the management of DRG. The study is expected to enrol a diverse range of people living with elephants from various cultural and social groups.

Your experience as a landowner in a reserve with elephants is invaluable to this study as you have first-hand experience of living with elephants and the challenges this may bring. The findings will contribute to the development of an integrated human-elephant coexistence strategy and will provide valuable information for the Dinokeng Game Reserve and for South Africa's National Elephant Strategy. The questionnaire will only take about 15 minutes to complete. Your participation is completely voluntary, and all of your responses are anonymous. None of the responses will be connected to identifying information, that I can assure you. I will make every effort to protect the confidentiality of personal information, and the limits of confidentiality if applicable. This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSS/0036/019D). Your involvement in this study is much appreciated! You may skip questions and withdraw at any time. Results will only be presented publicly as aggregate summaries, of which a copy will be shared with the participants.

Thank you so much for providing this important information!

Kind regards,

*Antoinette van de Water*

## Consent form

"I have been informed about the study entitled "Living with elephants" by Antoinette van de Water of the University of KwaZulu-Natal. I understand the purpose and procedures of the study. I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I normally am entitled to. I understand that my personal details will be held as confidential.

I understand that by clicking yes below, I give informed consent to participate in this study."

Do you agree to the terms above?

- Yes
- No

If you have any questions or concerns about your rights as a study participant, or about an aspect of the study or the researchers or if you need more information prior to completing this survey, you can contact me, Antoinette van de Water, at antoinette@bring-the-elephant-home.nl, or 072 5683704 or Prof. Rob Slotow at slotow@ukzn.ac.za or at +27 33 260 8026. If you have questions or concerns about the rights of research subjects, you can contact the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION  
Research Office, Westville Campus, Govan Mbeki Building  
Private Bag X 54001, Durban, 4000  
KwaZulu-Natal, SOUTH AFRICA  
Tel: 27 31 2604557- Fax: 27 31 2604609  
Email: HSSREC@ukzn.ac.za

## THE POTENTIAL VALUE OF ELEPHANTS FOR SOCIETY

1. What are the first three words that come to mind when you think of elephants?
  - 1) \_\_\_\_\_
  - 2) \_\_\_\_\_
  - 3) \_\_\_\_\_
  
2. Are you aware of any benefits that elephants bring to society, for example, tourism, jobs, culture, traditions? List as many as you feel are relevant (in order of most important to least important)  
  
\_\_\_\_\_  
  
\_\_\_\_\_  
  
\_\_\_\_\_
  
3. Does your household or company provide any benefits for people living in neighbouring communities (e.g. Kekana Gardens or Hammanskraal)? You can select multiple answers
  - Yes, through employment. Please specify the number of people employed by you or your company per month: \_\_\_\_\_
  - Yes, by supporting companies in the local community (crafts, restaurant, shops, cultural performances, professional services)
  - Yes, by supporting community development initiatives (orphanage, training, in-kind donations, etc)
  - No
  - Other forms of community support or comments:  
  
\_\_\_\_\_
  
4. Over the last three years have you or your family members gained any benefits from living with elephants? You can select multiple answers.
  - Yes, financial benefits through tourism
  - Yes, financial benefits through employment
  - Yes, through feelings of pride, joy or excitement to live with wild elephants
  - Yes, through appreciation of cultural or spiritual values of elephants
  - No, I have not experienced any benefits from living with elephants
  - Other (please specify): \_\_\_\_\_
  
5. Please read the following aspects about the economic or commercial value of elephants carefully and rate on a scale of 1 "Not important" to 5 "Very important" based on how important you believe they are.



8. Please read the following aspects about the potential values of elephants for nature carefully and rate on a scale of 1 "Not important" to 5 "Very important" based on how important you believe they are.

	1 Not important	2 Slightly important	3 Medium Important	4 Important	5 Very important	6 I don't know
The role of elephants in maintaining biodiversity and ecological balance is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The role of elephants in maintaining biodiversity through seed dispersal is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The role of elephants in maintaining biodiversity through their dung or as composting agents is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The role of elephants as a keystone species (a species that plays a particularly important role in an ecosystem) is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The role of elephants as an umbrella species (species that indirectly protect other species) is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Please read the following potential socio-cultural values carefully and rate on a scale of 1 "Not important" to 5 "Very important" based on how important you believe they are.

	1 Not important	2 Slightly important	3 Medium Important	4 Important	5 Very important	6 I don't know
The role of elephants in religious, spiritual or cultural display is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The role of elephants in research for human health (e.g. discovery that elephant genes suppress cancer tumors) is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The contribution of elephants to human well-being through enjoying observing them is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The contribution of elephants to human well-being through recognizing and appreciating their intelligence and sensitivity is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The contribution of elephants to human well-being through the comfort of knowing that elephants may exist for future generations is:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Do you think that elephants have a right to exist regardless of their value to humans?

- Yes
- No

## HUMAN-ELEPHANT COEXISTENCE

11. Please read the following statements carefully and rate on a scale of 1 “Not at all concerned” to 5 “Extremely concerned”.

How concerned are you that:

	1 Not at all concerned	2 Not so concerned	3 Somewhat concerned	4 Very concerned	5 Extremely concerned
Elephants can cause property damage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elephants can cause physical harm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elephants can attract poachers and can cause militarization of an area.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elephants can cause loss of biodiversity and disrupt ecological balances if their habitat is too small.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Over the past three years, have you experienced a significant negative impact from elephants?

- Yes  
 No

13. Have you done anything to mitigate the negative impact of the elephants (e.g. changing your behaviour to and with the elephants, upgrading your fence or gate, removing specific plants or trees, using a method to deter elephants, etc.) and what was the result of this?

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14. Overall, over the past three years, do you think that the negative impact of elephants has decreased, increased or stayed the same?

- Increased  
 Decreased  
 Stayed the same  
 I haven't experienced any negative impact

15. How do you feel about the benefits of having elephants in the reserve versus the costs they may be associated with?

- The benefits of having elephants in the reserve outweigh the costs.  
 The costs of having elephants in the reserve outweigh the benefits.  
 Other (please specify):

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16. What issues (e.g. social or political) do you think affect the development

of effective elephant management? Please list as many as you feel are relevant, in order of most important to least important.

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17. Do you feel it is important to invest in elephant conservation?

- Yes
- No
- Why? \_\_\_\_\_

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18. In your opinion, who is responsible for elephant conservation or management?

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19. If a transparent and appropriate program were to be established to conserve elephants, with a goal of reducing human-elephant conflicts, would you be willing to contribute financially to this program?

- Yes, I would be interested
- No, I would not be interested
- I am only willing to pay to have elephants removed from my area

20. For the next three years, how much would you be willing to contribute to such a program per month? (your answer serves for academic purposes only).

- 0 ZAR per month
- 1 - 50 ZAR per month
- 51 - 100 ZAR per month
- 101 - 249 ZAR per month
- $\geq$  250 ZAR per month

If 0 ZAR, please specify why: \_\_\_\_\_

## ATTITUDE TOWARDS ELEPHANTS

21. Which statement describes your attitude towards elephants most accurately?
- I tolerate elephants because of their intrinsic value (value in their own right).
  - I tolerate elephants because of their value to people (economic, social, cultural).
  - I tolerate elephants because they do not cause any significant damage to me.
  - I would tolerate elephants only if they would stop causing damage.
  - I would prefer the elephants to be eradicated.
22. Which answer best describes your feelings towards elephants before they were introduced to the game reserve? For example, how did you feel about elephants during an encounter in Kruger National Park or any other location before they were introduced to Dinokeng Game Reserve (max 2 options)?
- |                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/> Awe        | <input type="checkbox"/> Concern                 |
| <input type="checkbox"/> Admiration | <input type="checkbox"/> Frustration             |
| <input type="checkbox"/> Happiness  | <input type="checkbox"/> Fear                    |
| <input type="checkbox"/> Excitement | <input type="checkbox"/> Anger                   |
| <input type="checkbox"/> Neutral    | <input type="checkbox"/> Other (please specify): |
- 
23. Which answer best describes your current or recent feelings towards elephants? For example, how do you feel during an elephant encounter in Dinokeng Game Reserve (max 2 options)?
- |                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/> Awe        | <input type="checkbox"/> Concern                 |
| <input type="checkbox"/> Admiration | <input type="checkbox"/> Frustration             |
| <input type="checkbox"/> Happiness  | <input type="checkbox"/> Fear                    |
| <input type="checkbox"/> Excitement | <input type="checkbox"/> Anger                   |
| <input type="checkbox"/> Neutral    | <input type="checkbox"/> Other (please specify): |
- 
24. If you were to write a vision statement for the future of the elephants in Dinokeng Game Reserve, what elements would you like to include?
- 
- 
25. Did your vision for elephants in Dinokeng Game Reserve change after the elephants were introduced to the reserve? If so, please specify how it changed.
- 
- 
26. In your opinion, what are the main issues of concern for the elephants in DGR and how could these issues be addressed?
-

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27. Do you share the vision of Dinokeng Game Reserve?

- Yes
- No
- Please specify: \_\_\_\_\_

28. Do you have any additional suggestions or comments? This can be about any question in the survey, your feelings about elephants in general or any experience with the elephants in DGR that you would like to share.

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### DEMOGRAPHIC QUESTIONS

29. What is your gender?

- Male
- Female

30. What year were you born? \_\_\_\_\_

31. What is your native language?

- Afrikaans
- English
- IsiNdebele
- Sepedi
- SeSotho
- SiSwati
- XiTsonga
- SeTswana
- TshiVenda
- IsiXhosa
- IsiZulu
- Other (please specify): \_\_\_\_\_

32. What is your primary source of income?

- Business owner: tourism
- Business owner: other
- Employed in tourism
- Reserve Management, conservation
- Hunting
- Non-profit organisation
- Crop farming
- Cattle farming

- Government officer, medical profession, teacher, or management
- General labour
- I am unemployed
- Other (please specify): \_\_\_\_\_

33. Do you have a source of income related to the DGR?

- No
- Yes

Please specify: \_\_\_\_\_

34. What is the highest level of school you have completed? If currently enrolled, please indicate the highest level completed.

- No schooling completed
- Nursery school completed
- Primary school completed
- High school diploma
- College diploma
- Bachelor's degree
- Honour's degree
- Master's degree
- Doctorate degree

35. How long have you lived in Dinokeng Game Reserve? \_\_\_\_\_ years

36. Are you a (multiple answers possible)

- Owner of land that is part of DGR
- Owner of land that is fence out of DGR (island property)
- Product owner
- Tenant of a rented property in DGR
- Employed within DGR
- Member of the management of DGR

37. If you own an island property, would you consider becoming part of DGR and drop your fences in the near future?

- Yes
- No

Please specify your reason for being fenced out of DGR

\_\_\_\_\_

38. What were your reasons, objectives or vision for becoming part of DGR?

\_\_\_\_\_

\_\_\_\_\_

## **Thank you for participating!**

Please leave the completed questionnaire at the Ndlovu or Tau gate, the Dinokeng Coffee and Curio shop or contact me and I will pick it up.

Your participation is completely anonymous so I can't contact you. If there is anything related to the topics of this questionnaire that you would like to share in person, please contact me at:

Antoinette van de Water

PhD Researcher - University of KwaZulu-Natal

antoinette@bring-the-elephant-home.nl

+66 72 5683704

In case you, or other residents of DGR, would like to fill in the questionnaire online please use this link <https://www.surveymonkey.com/r/DGRelephants> or scan this QR code:



**Thank you for participating!**

Your participation is completely anonymous so I can't contact you. If there is anything related to the topics of this questionnaire that you would like to share in person, please contact me at:

Antoinette van de Water - PhD Researcher - University of KwaZulu-Natal  
antoinette@bring-the-elephant-home.nl - antoinette@bteh.org  
+27 72 5683704

Dear Community Members,

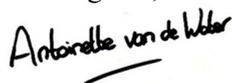
My name is Antoinette van de Water and I am a PhD student at the University of KwaZulu-Natal. I am conducting a study on the value of elephants for the people of Southern Africa. I would like to invite you to please participate in my research called 'Living with Elephants', which is supervised by Prof. Rob Slotow (University of KwaZulu-Natal), Dr. Michelle Henley (Elephants Alive) and Dr. Kevin C. Matteson (Miami University). I am planning to communicate with many people living close to elephants.

Your experience as a resident of a community near a reserve with elephants is invaluable to this study as you have first-hand experience of the potential risks and benefits elephants may bring to your community. The findings will contribute to the development of a strategy in which elephants provide benefits to the people living near them and to the sustainable development goals.

The questionnaire will take about 20 minutes to complete. Your participation is completely voluntary and all of your responses are anonymous. I will make every effort to protect the confidentiality of personal information, and the limits of confidentiality if applicable. This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSS/0036/019D). Your involvement in this study is much appreciated! You may skip questions and withdraw at any time. Results will only be presented publicly as aggregate summaries, of which a copy will be shared with the participants.

Thank you so much for providing this important information!

Kind regards,



**Consent form**

"I have been informed about the study entitled "Living with elephants" by Antoinette van de Water of the University of KwaZulu-Natal. I understand the purpose and procedures of the study. I declare that my participation in this study is entirely voluntary and that I may withdraw at any time. I understand that my personal details will be held as confidential.

I understand that by ticking 'yes' below, I give informed consent to participate in this study."

1. Do you agree to the terms above?

- Yes
- No

If you have any questions or concerns about your rights as a study participant, or about an aspect of the study or the researchers or if you need more information prior to completing this survey, you can contact me, Antoinette van de Water, at antoinette@bring-the-elephant-home.nl, or 072 5683704 or Prof. Rob Slotow at slotow@ukzn.ac.za or at +27 33 260 8026. If you have questions or concerns about the rights of research subjects, you can contact the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

**PART I: THE VALUE OF NATURE**

*Nature in general – rivers, forest, grasslands, trees, all animal species, ecosystems.  
 Are they important to you? What is your view on Nature?*

Please read the following statements carefully and rate on a scale from ‘Strongly Disagree’ to ‘Strongly Agree’ based on how much you agree with each statement.

1. Nature conservation means the protection of plants, animals and natural areas.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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2. Nature conservation should ensure the sustainable use of animals, plants and ecosystems.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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3. For nature conservation, I agree with the saying ‘If it pays it stays’.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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4. Win-win outcomes of nature conservation for people and nature are nearly impossible.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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5. Nature conservation will only succeed if it provides benefits for people.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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Please specify why or why not: \_\_\_\_\_

6. The best way for nature conservation to contribute to human wellbeing is by promoting economic growth.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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7. It is acceptable to displace people to make way for protected areas.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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8. Nature conservation should include the interests of local people.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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9. Environmental protection is more important than economic growth.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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10. All natural beings and ecosystems have rights regardless of their value to humans.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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11. To save nature for our children, human population growth must be reduced.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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12. As people, we visit nature. We are not part of it.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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13. As people, we control nature.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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14. Nature should be conserved for nature's sake.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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*Focus on elephants in particular*

15. Elephants are worth protecting.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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16. Local people should have access to elephants in nature reserves.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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17. Local communities should take part in the management of elephants.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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18. Giving a voice to those affected by elephants improves elephant conservation outcomes.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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19. Elephant conservation should contribute to community development.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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20. Private property rights are more important than protecting elephants.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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21. Elephants that cause damage should be killed.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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22. If an elephant attacks a person, that elephant should be killed regardless of the circumstances.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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23. Elephants should have rights regardless of their value to humans.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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24. An elephant that has caused damage to my property still has a right to live.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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25. Elephants should have the same rights as children or other voiceless people

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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Please specify why you believe so: \_\_\_\_\_

\_\_\_\_\_

26. Global trade in live elephants should be banned.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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27. Global trade in elephant parts should be banned.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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28. Elephants in general should have more space.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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29. Animal welfare considerations must play an important role in elephant management decisions.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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30. Elephants are important for the ecosystem they are part of.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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31. By protecting elephants, we also protect other species.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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32. Strictly protected areas are required to keep elephants safe.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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33. Elephant conservation should bring in money.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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34. Economic arguments for elephant conservation are risky because they can lead to unintended consequences (for example consequences of trophy hunting).

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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35. Ecological arguments for elephant conservation are risky because they can lead to unintended consequences (for example when elephants damage large trees).

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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36. Elephant conservation will only be a durable success if it has the support of commercial companies.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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37. Even if elephants don't provide benefits to people, they still have value.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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38. Elephants are important in my culture.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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If so, in what way? \_\_\_\_\_

39. Elephants are important for physical human health (e.g. discovery that elephant genes suppress cancer tumours)

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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40. I feel good when I can observe elephants.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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41. I appreciate the intelligence and sensitivity of elephants.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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42. The thought that elephants will exist for future generations makes me happy.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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43. Elephants attract tourists and contribute to job creation.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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44. Elephants are important as a source of meat.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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45. Elephants are important as traditional medicine (eg. body parts, dung).

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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46. Elephants contribute to economic development through the sale of non-lethal elephant-related industry (eg. crafts, jewellery).

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
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47. Elephants contribute to economic development through trophy hunting.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------	--------------

48. Elephants contribute to economic development through the sale of body parts (eg. ivory, hides, meat).

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------	--------------

49. Elephants are important because they attract (international) donations.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------	--------------

50. The reserve in my neighbourhood is important for the development of my community

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------	--------------

Please specify: \_\_\_\_\_

\_\_\_\_\_

51. Win-win outcomes for people and elephants living together are nearly impossible.

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	I don't know
-------------------	----------	-------------------	----------------------------	----------------	-------	----------------	--------------

## PART 2

1. How often do you see elephants?

- I have never seen one
- Daily
- Weekly
- Monthly
- A few times a year
- A few times in my life

2. Which answer best describes your feelings towards elephants (max 2 options)?

- Awe
- Admiration
- Happiness
- Excitement
- Neutral
- Concern
- Frustration
- Fear
- Anger
- Other (please specify):

\_\_\_\_\_

3. Are you aware of any benefits that elephants may bring to the people of South Africa? Please list as many as you feel are relevant (in order of most important to least important)

\_\_\_\_\_  
\_\_\_\_\_

4. Over the last three years, have you or your family members gained any benefits from elephants? You can select multiple answers.

- Yes, financial benefits through tourism
- Yes, financial benefits through employment
- Yes, through feelings of pride, joy or excitement of seeing wild elephants
- Yes, through appreciation of cultural or spiritual values of elephants
- No, I have not experienced any benefits from elephants
- Other (please specify):

\_\_\_\_\_

5. Over the last three years, have you or anyone in your family gained any benefit from a Reserve / Park with elephants?

- Yes
- No

If yes, in what way: \_\_\_\_\_

\_\_\_\_\_

6. Did you ever experience any significant negative impact from elephants?

- Yes

No

Please specify: \_\_\_\_\_

7. How should elephant conservation in the future be funded? You can select multiple answers.

By hunting license fees

By tourism

By public tax funds

Other: \_\_\_\_\_

7. I  have hunted before  have an interest in future hunting  am an active hunter.

8. I  have viewed elephants in the wild  am interested in future viewing of elephants in the wild

9. What change is needed for the reserves to contribute more to social development? In other words, what would enable more benefits of the reserve to flow to your family or community?

\_\_\_\_\_

\_\_\_\_\_

10. How would you like to see the future of elephants in South Africa?

\_\_\_\_\_

\_\_\_\_\_

11. What do you hope to see in your own ideal future?

\_\_\_\_\_

\_\_\_\_\_

12. Do you have any suggestions or comments? This can be about any question in the survey, your feelings towards elephants or the Reserves that you would like to share.

\_\_\_\_\_

\_\_\_\_\_

### PART III DEMOGRAPHIC QUESTIONS

1. What is your gender?  Male  Female

2. What year were you born? \_\_\_\_\_

3. What is your native language?

Afrikaans

XiTsonga

English

SeTswana

IsiNdebele

TshiVenda

Sepedi

IsiXhosa

SeSotho

IsiZulu

SiSwati

Other (please specify): \_\_\_\_\_

4. What is your primary source of income?

- |   |   |
|---|---|
| <input type="checkbox"/> Business owner   | <input type="checkbox"/> General labour             |
| <input type="checkbox"/> Crop farming   | <input type="checkbox"/> Employed in a Game Reserve |
| <input type="checkbox"/> Cattle farming   | <input type="checkbox"/> I am unemployed            |
| <input type="checkbox"/> Hunting / gathering  | <input type="checkbox"/> Other (please specify):    |
| <input type="checkbox"/> Government officer, medical<br>profession, teacher or management | _____   |

5. What is the highest level of school you have completed? If currently enrolled, please indicate the highest level completed.

- |   |  |
|---|--|
| <input type="checkbox"/> No schooling completed   | <input type="checkbox"/> Bachelor's degree |
| <input type="checkbox"/> Nursery school completed | <input type="checkbox"/> Honour's degree   |
| <input type="checkbox"/> Primary school completed | <input type="checkbox"/> Master's degree   |
| <input type="checkbox"/> High school diploma      | <input type="checkbox"/> Doctorate degree  |
| <input type="checkbox"/> College diploma          |  |

6. How many people are in your household? \_\_\_\_\_ people.

Section S3: Assessment of trade-offs related to HEC and HHC decision that occurred in Dinokeng Game Reserve and examples of potential solutions to reduce barriers and promote enablers of human-elephant coexistence and enlarge common ground.

TRADE-OFF TYPE	POTENTIAL SOLUTIONS & OUTCOMES
<p><b>Routine trade-off (secular principles countered by secular principles:</b></p> <p>The reserve’s proposal to introduce elephants to generate economic benefits from ecotourism was countered by arguments about elephants' basic needs, which may not be met in a high-density reserve. This has resulted in HEC and may subsequently require invasive elephant management interventions that can result in negative unintended consequences arising from public outcry, division of stakeholders, and reputational damage.</p> <p>For example, questionnaire data showed that over the past three years, 41.9% of the Dinokeng Game Reserve respondents had experienced negative impacts from elephants. To mitigate the negative impact of elephants, most respondents indicated to have implemented measures to prevent future damage (81.3%), which mostly consisted of improving property fences (78.6%), for example, by adding electric wires, beehives, or layers of rocks, or by removing plants and trees that attract elephants (e.g., citrus, Marula trees (<i>Sclerocarya birrea</i>), aloes) (28.8%).</p> <p>During the semi-structured interview, a community leader stated that people’s negative attitudes towards elephants and the reserve may be caused by a negative experience of elephants breaking out into the community area. About a third (31.5%) of the Kekana Gardens respondents reported having experienced a negative impact from elephants, which referred to two specific incidents when an elephant broke into the community, damaging property and causing fear.</p>	<p>Solutions:</p> <ul style="list-style-type: none"> <li>● Share knowledge and organise workshops on how to maintain hard (electric fences) and soft barriers (beehives etc) and use range expansion to prevent HEC to both Kekana Gardens and Dinokeng Game Reserve stakeholders simultaneously.</li> <li>● Organise inclusive workshops on elephant behaviour and how to behave around elephants for both Kekana Gardens and Dinokeng Game Reserve stakeholders simultaneously.</li> <li>● Ensure that people have access to the benefits of elephants, so that those who carry the costs of elephants also experience benefits. For instance, provide discounted access for community members, organise days that community members can access for free (e.g., youth, elders, teachers), or encourage lodges to make their guides available for educational programs at local schools.</li> </ul> <p>Outcomes:</p> <ul style="list-style-type: none"> <li>● Both stakeholder types acquire knowledge while realising they have the same goals of keeping people and elephants safe and that there is equal room for learning (find common ground in a shared vulnerability).</li> <li>● Increased knowledge about wildlife and the importance of conservation</li> <li>● Increased knowledge about elephants, less human-elephant conflicts, increased elephant well-being.</li> <li>● Improved attitudes towards elephants and the reserve.</li> </ul>

**Taboo trade-offs: (secular principles countered by sacred principles:**

Rational decisions to introduce elephants to boost ecotourism can infringe on the intrinsic value of elephants. Several comments in the questionnaire revealed concerns of residents about the way elephants were treated (e.g., inexperienced management, fear that more elephants would get killed/hurt, the fact that elephants are lured to lush gardens or waterholes on private properties which causes fence-breaking or chasing elephants with vehicles).

For instance:

Decisions to kill a damage-causing elephant were countered by arguments based on the rights of nature and our moral duty to provide for the needs of elephants.

Dinokeng Game Reserve respondents identified a lack of good governance concerning elephant management (e.g., irresponsible human behaviour towards elephants, inadequate regulations, unprofessional management, low-quality fences at some private properties, and limited elephant space) as barriers to allowing elephants to thrive.

**Solutions:**

- Prioritise range expansion to ensure that elephants have the place they need and sufficient refuge areas away from human disturbances.
- Increase knowledge about the conservation and management of elephants: collaborate with scientists, organise workshops on elephant behaviour, causes of HEC (e.g., chasing elephants with vehicles or luring elephants) and mitigation methods.
- Co-develop and test solutions for HEC together and share learning experiences.
- Incentivise upgrading fences around private properties, removing elephant attractants from gardens, and creating indigenous gardens that are not attractive to elephants.
- Improve reserve-community governance structures. Communicate how the reserve is contributing to the community and explain the reasons why some expected benefits may take longer to generate.
- Develop labour standards for land and business owners in the reserve to prevent unfair labour practices.
- Create a database to match Dinokeng Game Reserve's job requirements and Kekana Gardens' availability of skills.
- Increase community participation in reserve management, decision-making and benefit-sharing.

**Outcomes:**

- Reduced HEC, reduced elephant stress, less conflict between people. Common ground replaces judgement.
- Enhanced awareness of Dinokeng Game Reserve's initiatives aimed at job creation, the specific skill sets required to fill these positions, and a commitment to local recruitment. This approach is expected to bolster community trust, stimulate local employment, and mitigate social tensions.
- Increased positive attitudes towards the reserve. Less localised crime or social unrest.

**Tragic trade-offs: (sacred principles countered by sacred principles:**

The reasons to open a Big Five game reserve to decrease inequality and contribute to human rights and environmental justice (sacred principles) were countered by other sacred principles held by residents of adjacent communities who stated they had lost access to land where they used to gather natural resources for religious and cultural purposes (also an environmental justice issue), which caused feelings of exclusion and mistrust. The sacred principles behind the goal of increasing land for conservation and as elephant habitat conflicted with concerns about animal welfare issues of introducing elephants to a high-density reserve.

The planned contributions to human rights can be countered by a lack of good governance (e.g., lack of transparency and communication, missed opportunities to engage local community leaders), which can negatively affect reserve-community relations. For instance, during the semi-structured interview, the community leader stated: *“Communication of the right message and transparency is vital. Otherwise, it will create unrest”, and “People in Dinokeng Game Reserve do provide support for people in Kekana Gardens, but nobody knows about it. Communicate this to the community, and people will have more positive attitudes towards the reserve”*. This was confirmed in the Kekana Gardens questionnaire, where respondents mentioned the lack of communication about the benefits of the reserve for the community (*“There is no communication, so we have no idea”*).

**Solutions:**

- Appoint a reserve-community relations manager and host regular reserve-community meetings to ensure inclusion and that people are informed about the reserve.
- Organise monthly events to harvest e.g., medicinal plants, firewood, or thatch for community members to join.
- Establish a community-run Dinokeng Game Reserve indigenous plants nursery that provides indigenous plants free of charge or for a donation to local schools and people living in and around Dinokeng to encourage indigenous gardens.
- Organise events (e.g., sports, music, or cultural events) for both stakeholder groups to join.
- Improve communication at all levels.
- Educate stakeholders about guidelines on how to behave around elephants to improve animal welfare.
- Increase space and refuge areas for elephants.

**Outcomes:**

- Increased human well-being and social cohesion.
- Motivation to remove exotic plants and plants that attract elephants from gardens inside the reserve, which contributes to biodiversity and reduced HEC.
- Increased understanding to the reserve, and positive attitudes towards the reserve.
- Reduced risks of localised crime or social unrest.

**Marginalising trade-offs: (sacred principles countered by secular principles:**

Communication about how reserve would reduce poverty and inequality, which creates expectations among local people in terms of human rights, dignity, and environmental justice. A marginalising trade-off occurred when community members felt that this objective was only partially fulfilled through the creation of jobs that were not perceived as fair or dignifying.

For instance, Kekana Garden respondents believed that many employees in the reserve were not from the local community (semi-structured interview and respondent of the Kekana Gardens questionnaire stating “*Dinokeng Game Reserve provides jobs in villages far away and foreigners*”). Perceived unfair labour practices also increased the gap between the reserve and the community and caused feelings of distrust, lack of community spirit, and negative attitudes. This may subsequently have led to incidents such as poaching, break-ins, and other crime (semi-structured interview).

Arguments to open a Big Five game reserve adjacent to a marginalised community to decrease poverty and unemployment (a secular objective) overruled sacred principles held by Kekana Garden residents related to issues of governance, such as unfair labour practices and the lack of transparency (feelings related to fairness, dignity, trust). This marginalising trade-off has created poor reserve-community relations, caused anger, and has led to crime and reduced social cohesion.

Solutions:

- Instead of focusing on creating jobs, focus on creating meaningful jobs.
- Invest in inclusive training to develop skills that are needed in the reserve.
- Encourage community ownership in social development, e.g., through cultural tourism experiences or the development of community enterprises to supply the reserve.
- Increase knowledge and appreciation of people’s historical relationship with the land of Dinokeng Game Reserve.

Outcomes:

- Increased skills and opportunities to generate income in a fair and dignifying way,
- Increased local buy-in for the reserve and social cohesion.