

The spatial and agricultural basis of crop raiding by the Vulnerable common hippopotamus *Hippopotamus amphibius* around Ruaha National Park, Tanzania

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Appendix Questionnaire used to interview farmers from the villages of Tungamalenga, Mapogoro and Itunundu, south-east of Ruaha National Park (Fig. 1), about their experiences of crop-reading by wild animals.

- Verbal consent received to conduct interview
- Consent received to record interview

Date	Questionnaire #	Interviewer(s)	Other people present
Village	GPS of house	GPS of farm	GPS of raided site
	S	S	S
	E	E	E

Habitat surrounding farm (was this verified by interviewer? Yes No):

- Forest
- River
- Housing
- Other Farms
- Other (specify) _____

Distance to the river? _____ Which river? _____

Socio-economic information (of interviewee)

Age:

- 18–24 years
- 25–34 years
- 35–44 years
- 45–54 years
- 55 years or older

Gender: Male Female

Tribe: _____

1. Are you the head of the household?

- Yes No

2. What is the size of your household? _____

3. What is your highest level of education? _____

4. What are your main sources of income?

- Agriculture
- Livestock
- Fishing
- Selling things
- Job
- Other (specify) _____

5. Who owns the land where you farm?
 Interviewee
 Other (specify whom) _____
6. How many sacks of crops do you grow each year? _____
 How much do you sell? _____
 Purpose _____
 How much do you and your family eat? _____

Agricultural characteristics

7. How many acres is your land? _____
8. How long does it take to walk to your farm from your home (minutes)? _____
9. What types of crops do you grow?
 How much of the field is each crop (acres)?
 How much is a sack of each crop worth?

Crop grown	Value per sack	How much of the field?

10. Are your crops irrigated?
 Yes No
 How much is irrigated? _____
11. Are you the primary worker on your fields?
 Yes No
 If yes, during the planting up to harvest time, how many hours a day do you spend in the fields?
 < 1 hour
 1–5 hours
 6–10 hours
 11–15 hours
 16–20 hours
 > 20 hours
 If no, who is the primary worker on your fields? _____

Crop damage

12. What problems do you encounter when growing your crops?

13. Of the following animals, which are problems in terms of crop damage in your crops?
- Elephant Yes No
 - Zebra Yes No
 - Warthog Yes No
 - Buffalo Yes No
 - Hippo Yes No
 - Monkey/Baboon Yes No
 - Birds Yes No
 - Bush pig Yes No

Are there any other animals that cause problems in the field?

14. Which animal causes the most crop damage? _____

Hippos

15. What do you think about hippos?

- Like
- Dislike
- Indifferent
- Unsure

Why? _____

16. When was the last time hippos damaged or raided your crops?

- This year
- Last year
- 2–5 years ago
- > 5 years ago

If not this year or last year, skip to Q. 24.

17. How often do/did hippos raid your crops this year/last year (depending on answer to Q. 16)?

- Once
- Twice
- Three times
- More than three times

18. How much of your crops are/were lost to hippos this year/last year (depending on answer to Q. 16) in acres? _____

19. How do you know it was hippos that raided your crops?

- Footprints
- See the hippo
- Hippo dung
- Appearance of damaged vegetation
- Other (specify) _____

20. What time of day does crop damage from hippos occur?

- Morning
- Afternoon
- Evening
- Night
- No specific time
- Unsure

21. Are there particular months when crop damage from hippos has occurred more often in the last 5 years?

22. When crop damage from hippos occurs what age are the crops?

- Seedlings (1.5 feet from ground or less)
- Intermediate (2–3 feet from ground)
- Mature (taller than 3 feet, harvestable)

23. Of the crops you grow, which do hippos feed on?

- Rice
- Maize
- Millet
- Groundnut
- Other (specify) _____
- No specific crop is preferred
- Unsure

24. Have the number of crop raids by hippos on your farm increased, decreased, or stayed the same in the last 5 years?

- Increased
- Decreased
- Stayed the same
- Unsure

25. Have the number of hippos near your village increased, decreased, or stayed the same in the last 5 years?

- Increased
- Decreased
- Stayed the same
- Unsure

Deterrent Techniques

26. What do you do to keep animals away from your crops?

Method	For which animal?	Effective?
Build fence		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
What material? _____		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Create ditch/moat		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Make noise		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Guard crops (day)		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Guard crops (night)		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Pepper plants/pepper oil		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Scarecrow		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
With soap? <input type="radio"/> Yes <input type="radio"/> No		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
What soap? _____		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Burn		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
What do you burn? _____		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Other (please specify)		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> Sometimes <input type="radio"/> No
Nothing		

If Nothing, ask Q. 27.

27. Why don't you protect your crops?

- Not enough time/energy
- Not enough money

- No need
- Protecting crops is not effective
- Dangerous
- Other (specify)

28. What else could be done to protect crops?.....

29. How much time per day in planting to harvest time do you spend trying to keep animals away from your crops?

- < 1 hour
- 1-5 hours
- 6-10 hours
- 11-15 hours
- 16-20 hours
- > 20 hours

30. How much money do you spend trying to keep animals away from your crops each year?

31. What should happen when hippos damage crops?

- Nothing
- Trap and move them
- Shoot them
- Farmers should be compensated
- Other (specify) _____

If answered shoot to Q. 31, then ask Q. 32 and skip Q. 33 and 34. If answered otherwise, skip Q. 32.

32. If shot would you eat the meat of a hippo?

- Yes No

If shoot, what else could you use hippos for?

33. If don't shoot why use other solution?

Any benefits of having hippos? Yes No

What?

34. What do you want to see happen to the number of hippos in the area in the next 5 years?

- Increase
- Decrease
- Stay the same
- Unsure

35. Do you have other problems with hippos besides crop damage? Yes No

Are hippos a threat to human life? Yes No

What are the other problems? _____

36. Have people ever been attacked by hippos? Yes No

If no, finish survey here.

37. When was the last known attack?

Date _____

Time of day _____

Location _____

What happened _____

Result of attack _____

Are hippo attacks on people preventable?

- Yes No

How? _____

What should happen when hippos attack people? Nothing

Trap and move them

Shoot them

Compensation

Other (specify) _____

If answer shoot for Q. 39, but not for Q. 31, then ask Q. 32.

Thanks for your help and participation!