Supplementary Materials

Annex 1. Household survey used to assess human-wildlife conflicts and social conflicts in Chyulu Hills, Kenya.

Consent form

[Enumerator greets the household member and asks whether the household head is available. In case household head is not available, the enumerator asks whether the spouse of household head is available].

My name is_____(enumerator name) working with Conservation International, the organization that, with Maasai Wilderness Conservation Trust and Big Life, is implementing the Chyulu Rangeland Restoration Program, which has the objective of restoring grassland in this area to improve livestock production and the livelihoods of pastoralists.

As part of a complementary project named "Restoring Nature and Peace threatened by Climate Change", Conservation International is conducting surveys to gather perceptions on the existence, types and frequency of conflicts community members may face related to access to fodder and water for livestock and on the potential impacts of rangeland restoration. This information will be then used to understand how rangeland restoration may be helping communities, as well as to design, modify and improve additional restoration efforts in Chyulu Hills and in Kenya. The survey should take about an hour of your time to answer 40 questions.

Are you interested in helping us by participating in this survey? *[If the person says yes, please continue reading this information. If the person says no, please thank him/her for his/her time so far].*

Thank you for agreeing to participate. Participation is entirely voluntary, and you may stop talking at any time. If you feel uncomfortable regarding any question you do not have to answer it. If you want to stop the survey at any time, just please let me know and I can disregard your answers.

The information you share will be treated as confidential and your name will not be recorded. The results will be presented in such a way that the location of your home will not be identified.

If you now or later have any other questions, complaints or concerns about this assessment, or about the way I am conducting it, you can talk to Josephat Nyongesa jnyongesa@conservation.org. If you have any questions regarding your rights as a research subject or if you have a grievance related to the research, you may contact CI's Ethics Hotline at 503-748-0567 in Kenya.

Do you have any questions about the survey?

To be completed by the enumerator

Statement of Consent

☐ I have read the project information dated (_____) to the household member as described in page 1 and gave the opportunity for the household member that will participate in the survey to ask questions.

☐ The household member has voluntarily consented to be a participant in this survey

_____ _____

Enumerator Signature Date

Name of the enumerator: _____

County: **Sub-county:**

Interview Time : Start_____End_____

Household code:_____ (to be provided by project team)

Group ranch or area name:_____

1. Loosikitok (Mbirikani)
2. Ilchalai/Olibili (Mbirikani)
3. Motikanju (Kuku B)
4. Kanzi (Kuku A)

Gender of the respondent:_____

1. Male
2. Female
3. Other

To be asked to the participant

Demographics

1. Do you consider yourself the household head or the spouse of the household head? _____

Household head=1
Spouse of the household head=2

2. How many years have you lived in this community? _____

1. <1 year
2. 1-5 years
3. 6-10 years
4. >10 years

3. What is your age?_____

1. 18-30
2. 31-40
3. 41-50
4. 51-60
5. 61-70
6. >70

4. How many family members, including you and all children, live in your household?

Men: _____ Women: _____

5. What is you highest level of education achieved by you? _____

1. Has never gone to School
2. Pre-Primary School
3. Primary School
4. Secondary School
5. Technical/Vocational Training
6. College/University

Livelihoods

6a. In this season (August-now), what has been the most important source of income for your household?_____

1. Animal Husbandry/Livestock – Pastoralism
2. Animal Husbandry/Livestock – Enclosure
3. Crop Cultivation – Agriculture
4. Business owner
5. Employee – Informal Sector
6. Employee – Formal Sector
7. Trade
8. Other_____

6b. In this season (August-now), what has been the second most important source of income for your household? *[if the respondent answers the same for questions 6a and 6b, the enumerator can remind*

*the respondent that it must be the second most important source of income after whatever she/he responded for question 6a. If there is no additional source of income, please list the answer as "none"]*_____

1. Animal Husbandry/Livestock – Pastoralism
2. Animal Husbandry/Livestock – Enclosure
3. Crop Cultivation – Agriculture
4. Business owner
5. Employee – Informal Sector
6. Employee – Formal Sector
7. Trade
8. Other: [list here]_____
9. None

7a. What type of livestock do you raise?

- ☐ Cattle
- ☐ Sheep
- ☐ Goats
- ☐ Chickens
- ☐ Bees
- ☐ Donkeys
- ☐ None of the Above
- ☐ Other: [list here]_____

7b. How many animals do you currently own?

Cattle n. of animals: _____
Sheep n. of animals: _____
Goats n of animals: _____
Chickens n. of animals: _____
Bee hives n. of hives: _____
Donkeys n. of animals: _____
Other: _____ n of animals: _____

9. During this season (August-now) where have you usually taken your livestock to pasture?

- ☐ Tsavo
- ☐ Chyulu
- ☐ Iltilala
- ☐ Esampu
- ☐ Isinet
- ☐ Ilchalai
- ☐ Olchurrai
- ☐ Lopolosis
- ☐ Imbouti
- ☐ Nkatetema
- ☐ Olkeri
- ☐ Mukao
- ☐ Noombaluani

- ☐ I feed them at home
- ☐ Other

10. During this season (August-now), what is the usual distance between your home and the area where you take your livestock to pasture in kilometers?_____

11. Have you grown any crops this season (August-now)?_____

1. Yes
2. No

11a. (if the answer is no, enumerator moves to question 12).

If yes, which crops are you growing this season (August-now)?

- ☐ Maize
- ☐ Watermelon
- ☐ Green pepper
- ☐ Beans
- ☐ Leaf Vegetables (such as Kales, Spinach, Sukumawiki)
- ☐ Tomatoes
- ☐ Other vegetables e.g french beans, cucumber, capsicum, coriander, eggplant, carrots, okra etc
- ☐ Others: [list all here]_____

11b. Has your production been sufficient to:

Crop	**Production (kg/harvest)**
Maize	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income for the household
Watermelon	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income for the household
Green pepper	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income for the household needs
Beans	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income for the household
Leaf Vegetables (such as: kale, spinach, cabbage, etc)	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income that is higher than household needs

Tomato:	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income for the household
Other:_____ _____	☐ Production has been insufficient to feed all members of my household \ ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income that is higher than household needs
Other:_____ _____	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income for the household
Other:_____ _____	☐ Production has been insufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household ☐ Production has been sufficient to feed all members of my household and non-household members and/or sufficient to generate income for the household

Frequency of interactions with wildlife

12.During this season (August-now), has your livestock suffered from diseases that you believe were transmitted from wildlife?_____

1. Yes
2. No

13.(if the answer is "no" or "I do not know", enumerator moves to question 14).
If yes, from August-now, how many of your livestock were sick or died from diseases that you believe were transmitted from wildlife?

Number of animals sick: _____
Number of animal deaths: _____

14.During this season (August-now), have you or any household members experienced attacks by wildlife?_____

1. Yes
2. No

15a. (if the answer is "no", enumerator moves to question 16).

If yes, the attacks were from what type of wildlife?

- ☐ Elephants
- ☐ Lions
- ☐ Hyena
- ☐ Buffalos
- ☐ Elands

- ☐ Leopards
- ☐ Giraffe
- ☐ Other species [list here]:_____

15b. In this season (August-now), how many people from your household, including you, experienced attacks by wildlife?_____

15c. How severe were injuries from the attacks by the wildlife? *[if "other species" are mentioned, please list the type of wildlife]*.

Non-lethal attacks on you or household members by	**N. of people attacked**	**Severity of injuries (1=light, 2=moderate, 3=severe)**
Elephants	____people attacked	
Lions	____people attacked	
Hyena	____people attacked	
Buffalos	____people attacked	
Elands	____people attacked	
Leopards	____people attacked	
Giraffe	____people attacked	
Other species: [list here]:_____	____people attacked	

16. During this season (August-now), how frequently have you or household members encountered wildlife in your property or communal land?_____

1. Every day
2. Several times a week
3. Once a week
4. Once, twice or thrice in a month
5. Once, twice or thrice in this season
6. Never

16a. During this season (August - now), has your household experienced any damage of property items caused by wildlife?

1. Yes
2. No

(if the answer is "no", enumerator moves to question 16e).

If yes, during this season (August-now), how frequently has your household experienced any destruction of property caused by conflict with wildlife?_____

1. Rarely
2. Frequently
3. Very frequently

16b. During this season (August-now) what property item was damaged?

- ☐ water pipes
- ☐ grain stores

- houses
- fences
- water tanks
- trees
- boma (Kraaal)
- other [list here]: _____
- other [list here]: _____
- other [list here]: _____

16c. How severe would you rate the damage caused? (1= light, 2 = moderate, 3 = severe)?

If yes, No. times property items were damaged	Damage caused	Severity of damage (1= light, 2 = moderate, 3 = severe)?
	water pipes	_____
	grain stores	_____
	houses	_____
	fences	_____
	water tanks	_____
	trees	_____
	boma (Kraaal)	_____
	other_____	_____
	other_____	_____
	other_____	_____

16d. During this season (August-now), what do you believe were the 2 most common causes of damage to property items by wildlife?

1. _____
2._____

16e. During this season (August-now), has conflict with wildlife caused damages to the crops you grow?_____

1. Yes
2. No

16g. During this season (August-now), what was the perceived damage to your crop production caused by wildlife, based on total production?_____

1. Most
2. About Half
3. Just a Few

16h. During this season (August-now) what do you believe were the 2 most important causes of crop destruction by wildlife?

1. _____
2._____

16i. During this season (August - now), has any of your livestock been killed by wildlife?_____

1. Yes
2. No

16j. (if the answer is "no", enumerator moves to question 17).

If yes, how many of your livestock was killed by wildlife?_____

16k. During this season (-now) did you lose any of your livestock due to droughts?

1. Yes
2. No

How many of your livestock did you lose due to droughts?

What was the total number of livestock you had at the time of those losses:

16l. If you have experienced Human-wildlife conflicts, did they increase, decrease or remain the same in the past 2 years?

1. Increase
2. Decrease
3. Remain the same

Now we are going to talk about frequency and severity of conflicts with other members of the community

17. During this season (August-now), has your household experienced any damage to property items caused by conflicts with people outside your household?

1. Yes
2. No

18a. (if the answer is "no", enumerator moves to question 20).

If yes, how frequently has your household experienced any damages to property items by people outside your household?_____

1. Rarely
2. Frequently
3. Very frequently

18b. What property item was damaged?

- ☐ water pipes
- ☐ grain stores

- ☐ houses
- ☐ fences
- ☐ water tanks
- ☐ trees
- ☐ boma (Kraaal)
- ☐ other [list here]: _____
- ☐ other [list here]: _____
- ☐ other [list here]: _____

18c. How severe would you rate the damage caused? (1= light, 2 = moderate, 3 = severe)?

If yes, No. times property items were damaged	Destruction caused	Severity of damage (1= light, 2 = moderate, 3 = severe)?
	☐ water pipes	_____
	☐ grain stores	_____
	☐ houses	_____
	☐ fences	_____
	☐ water tanks	_____
	☐ trees	_____
	☐ bomas (Kraal)	_____
	☐ other_____	_____
	☐ other_____	_____
	☐ other_____	_____

19.During this season (August-now), what do you believe were the 2 most common causes of the conflict with other people/groups that resulted in damage to property items?

1. _____
2._____

20.During this season (August-now), has conflict with people outside your household resulted in the injury of any persons in your household?

1. Yes
2. No

21a. (if the answer is "no", enumerator moves to question 23).

If yes, how frequently has conflict with people outside your household resulted in the injury of any person/people in your household?

1. Rarely
2. Frequently
3. Very frequently

21b. During this season (August-now), how many people from your household were injured from conflicts with people outside your household?____

22. During this season (August-now), what do you believe were the 2 most common causes for the conflict with people outside your household that resulted in injury of any person in your household?

1. _____
2._____

23. During this season (August-now), has conflict with people outside your household resulted in the death of any persons in your household? _____

1. Yes
2. No

24. What do you believe were the 2 most common causes of the conflict with people outside your household that resulted in the death of any persons in your household?

1. _____
2._____

25. During this season (August-now), has conflict with people outside your household affected your household's livestock or crop production?

1. Yes
2. No

27a. (if the answer is "no", enumerator moves to question 29).

If yes, during this season (August-now), how many times was your household's livestock stollen or killed or were your crops damaged or stollen by people outside your household ?_____

27c. During this season (August-now), what was the perceived damage to crops or livestock caused by people outside your household based on total production?

Impact on livestock or crops	**If yes, number of times it has happened**	**Damage caused per time that the conflict occurred**	**Perceived damaged to livestock or crops based on total production (1=most, 2=about half, 3=just a few)**
Crop damaged by people outside the household		Leave blank	_____ _____ _____ _____ _____ _____
Crop theft by people outside the household		Leave blank	_____ _____ _____ _____ _____ _____
Livestock theft by people outside the household		____ (number) of livestock stolen ____ (number) of livestock stolen	_____ _____

		____ (number) of livestock stolen ____ (number) of livestock stolen ____ (number) of livestock stolen	_____ _____ _____ _____
Livestock killed by people outside the household		____ (number) of livestock killed ____ (number) of livestock killed ____ (number) of livestock killed ____ (number) of livestock killed ____ (number) of livestock killed	_____ _____ _____ _____ _____ _____

28. What do you believe were the 2 most important causes for the conflict with people outside your household that resulted in livestock killing or crop damage?

1. _____
2._____

29.During this season (August-now), has conflict with people outside your household affected the productivity or health of your livestock? _____

1. Yes
2. No

30. (if the answer is "no", enumerator moves to question 31).

If yes, we would like to know more details on the causes and impact. For the following causes of livestock productivity loss, how many times did conflicts with people outside your household affect your livestock productivity, what was the damage caused, and how severe would you rate the decrease in livestock productivity (1= low, 2 = moderate, 3 = high, 4=extremely high)?

Impact on livestock productivity	**If yes, number times it has happened**	**Perceived decrease in livestock productivity**
a) Livestock productivity decreased due to lost access to water or grazing resources through the imposition of physical barrier or boundary		
b) Livestock productivity decreased due to lost access to water or grazing resources because of fear of violence during livestock migration or movement		
c) Livestock lost/harmed because of greater competition for water or grazing resources due to restricted migration or movement of livestock		
d) Livestock productivity decreased due to other reason (please specify reason):_____ _____ _____		

31.During this season (August-now), has conflict with people outside the household impacted your household by weakening or damaging intercommunal or social relationships? _____

1. Yes
2. No
3. I don't know

32a. (if the answer is "no" or "I do not know", enumerator moves to question 33).

If yes, please specify (how has it impacted?)_____
_____

32b. Explain how your household is coping with the change:_____
_____
_____

33. During this season (August-now), has conflict with people outside your household impacted your household through the loss of a longstanding economic relationships (I.e., someone you exchanged goods, services, or money with; someone who sold you things or purchased things from you , etc.)?

1. Yes
2. No
3. I do not know

34a.(if the answer is "no" or "I do not know", enumerator moves to question 35).

If yes, please specify:
_____
_____

34b.Explain how your household is coping with the change:_____
_____
_____

35. During this season (August-now), has conflict with people from outside your household made you feel insecure or unsafe?_____

1. Yes
2. No

35a. If you have experienced conflicts with people outside your household (in your community or beyond), did they increase, decrease or remain the same in the past 2 years?

1. Increase
2. Decrease

3. Remained the same

36.**During this season (August-now), has conflict with people outside your household had any other impact on your household that we haven't already asked about?**

1.Yes
2.No

***If yes*, please explain.**

_____
_____
_____

36a. Has your home area experienced a decrease, increase or remained the same on vegetation cover in the past 2 years?

1. Increase
2. Decrease
3. Remained the same

Strategies to mitigate conflicts

37.During this season (August-now), have you or members of your household used any mitigation strategies to deal with or prevent conflicts with people outside your household? _____

1. Yes
2. No

38.(if the answer is "no", enumerator moves to question 39).

If yes, during this season (August-now) which strategies have you or members of your household used to deal with or prevent conflicts with people outside your household? [Allow respondent to list strategies and mark which ones to follow up about in subsequent questions. If they state a strategy that is not already in the list, please list it following "Other:___" at the end of the list.]

a. **For each strategy listed, please follow up and ask the following:**
    i. **How frequently did you use [strategy listed]? It's ok if you don't know.**
    ii. **How effective was [strategy listed] in preventing or dealing with conflicts with people outside your household? Not effective, somewhat effective, or highly effective? [In the corresponding column, please mark based on the coding: 1 = not effective, 2 = somewhat effective, 3= highly effective.]**
b. **Repeat i and ii for all the mitigation strategies originally mentioned by the respondent.**

Strategies to deal with or prevent conflicts with people outside your household	If yes, how frequently did you or members of your household do or use this strategy from August to now? (1. Rarely, 2. Frequently 3. Very frequently)	How effective was the strategy in preventing or dealing conflicts with people outside your household? (1 = not effective, 2 = somewhat effective, 3= highly effective)
☐ Through communal land tenure arrangements		
☐ Through individual/household land tenure arrangements		
☐ Hiring guards as deterrents		
☐ Building/maintaining fencing		
☐ Keeping property, including livestock, closer to home		
☐ Changing movements/restricting mobility of livestock herd		
☐ Changing our own movements/restricting our own mobility		
☐ Engaging community leaders/elders		
☐ Engaging traditional institutions		
☐ Engaging law enforcement		
☐ Engaging local NGO		
☐ Obtaining or keeping weapon(s)		
☐ Keeping guard dogs as deterrents		
Others (please list): _____		
Others (please list): _____		

39. During this season (August-now), have you or members of your household used any mitigation strategies deal with or prevent conflicts with wildlife? _____

1. Yes
2. No

40.(if the answer is "no", survey ends here).

If yes, during this season (August-now), which strategies have you or members of your household used to deal with or prevent conflicts caused by wildlife? [Allow respondent to list mitigation strategies and mark which ones to follow up about in subsequent Qs. If they state a mitigation strategy that is not already in the list, please list it following "Other:_____" at the end of the list.]

a. For each strategy listed, please follow up and ask the following:

ii. How frequently did you or members of your household use [strategy listed]? It's ok if you don't know.

iii. **How effective was [strategy listed] in dealing with or preventing conflicts with wildlife? Not effective, somewhat effective, or highly effective? [In the corresponding column, please mark based on the coding: 1 = not effective, 2 = somewhat effective, 3= highly effective.]**

a. **Repeat i and ii for all the mitigation strategies originally mentioned by the respondent.**

Strategies to deal with or prevent conflicts with wildlife	**If yes, how often did you or members of your household use this strategy from August to now? (1. Rarely, 2. Frequently 3. Very frequently)**	**How effective was the strategy in dealing with or preventing conflicts with wildlife? (1 = not effective, 2 = somewhat effective, 3= highly effective)**
☐ Human guardians		
☐ Livestock guarding dogs		
☐ Boma/Kraal livestock at night		
☐ Fix or install fences		
☐ Chilli grease		
☐ Security Light/Fire lightning at night		
☐ Other:_____ ___		

Enumerator thanks the respondent:

Thank you so much for your participation. This is very much appreciated and thank you so much for your time.