NTNU

Using Bayesian Belief Network (BBN) approach in understanding of people's attitudes towards wild elephants and HEC

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NINA

Human-elephant conflicts (HEC)

- HEC occur when elephants and humans compete for limited resources and space, regarding:
  - Crop damage
  - Property damage
  - Elephant attacks
  - Elephant poaching

Human-elephant conflicts (HEC)

- HEC accounts for significant threat to wild elephant conservation
- Those who encountered HEC may reduce the tolerance for elephants and impact their attitudes

Understanding HEC attitudes using Bayesian Belief Networks

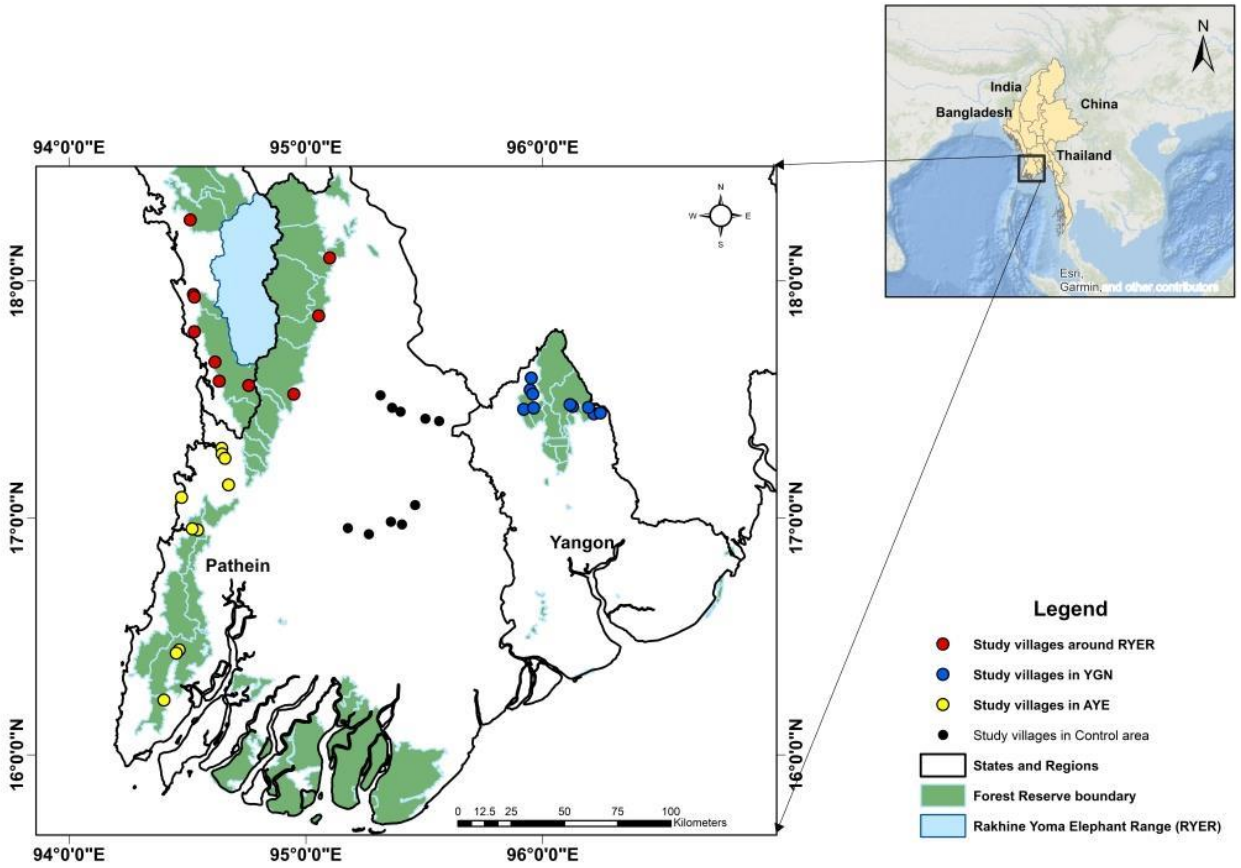
- Explore the interlinkages between HEC experiences and local peoples' attitudes to examine the most influential factors

- Graphically structure causal attitudinal determinants towards HEC
  - HEC attitude model
  - Full explanatory model
    - Gender, age group, education, occupation, ethnicity, religion, residency, household size, distance to the forest reserve boundary
  - Extended HEC attitude model

- Spatial determinants of HEC…

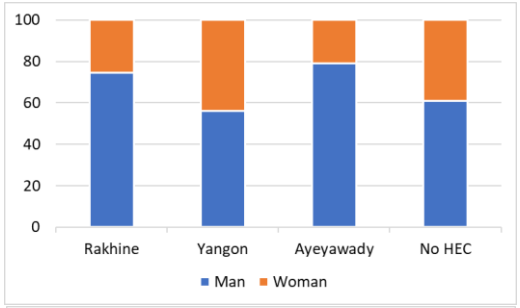
Questionnaire survey in 40 villages

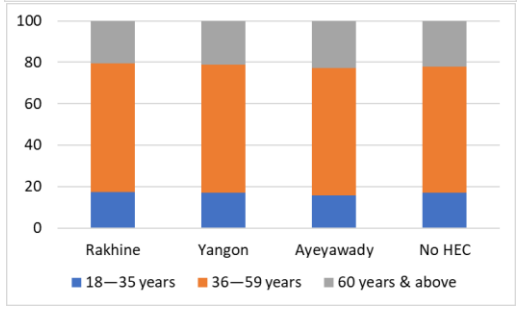
- 30 villages in conflict (HEC) regions
- 10 villages in non-HEC region
- 399 respondents

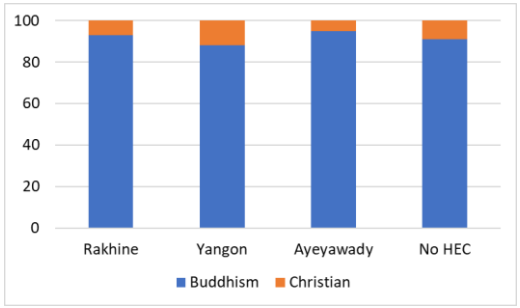


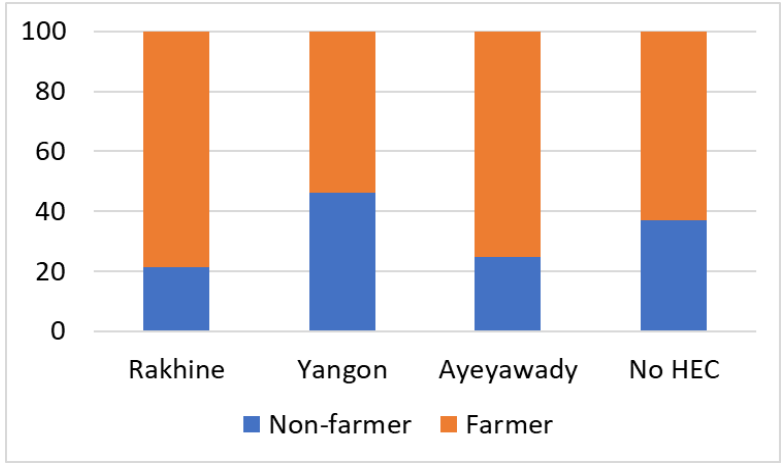
Questions for the respondents regarding their attitudes towards human-elephant conflicts

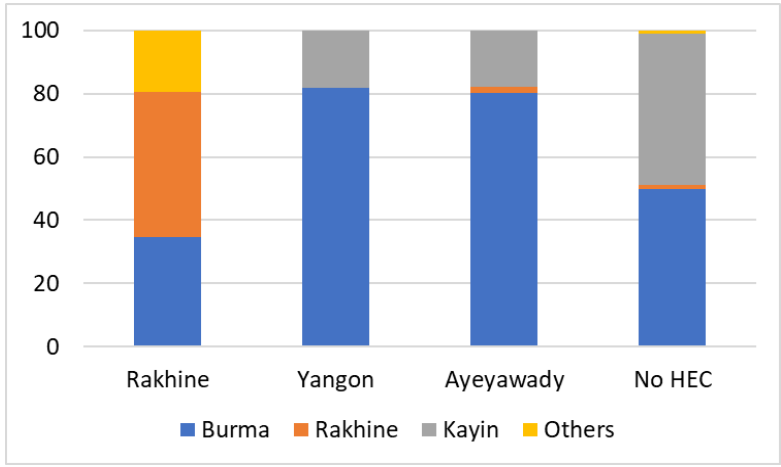
Questions	Node
Who helped you/villagers when you/villagers suffered HEC?	**Who_help**
Who should be the responsible organization to take care of HEC?	**Who_responsible**
How should the responsible organization handle problem elephants?	**How_handle**
Do you agree that interactions between humans and elephants are more intense today because the poaching pressure on wild elephant has increased?	**Poaching**
What is your personal feeling of wild elephants?	**Personal_feeling**
What was the behaviour of the wild elephants when you encountered them?	**Elephant_behaviour**
Would you like to support elephant conservation if tourism activities to watch wild elephants in your locality, will be implemented?	**Elephant_tourism**
Do you agree that wild elephants have the right to live in your area?	**Live_near**
Do you agree that wild elephants have the right to live in Myanmar?	**Live_in_Myanmar**
Do you agree with the following statement: Only a dead elephant is a good elephant?	**Dead_good**
Do you agree with the following statement: Elephants should be moved to rich countries?	**Move_to_othercountry**
If the elephants disappear from your area, what will happen?	**Elephant_disappear**

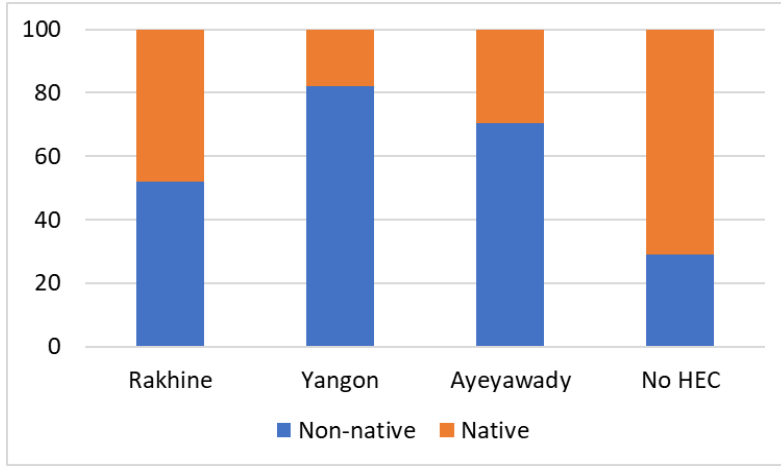

100
80
60
40
20
0
Rakhine
Yangon
Ayeyawady
No HEC
Man
Woman

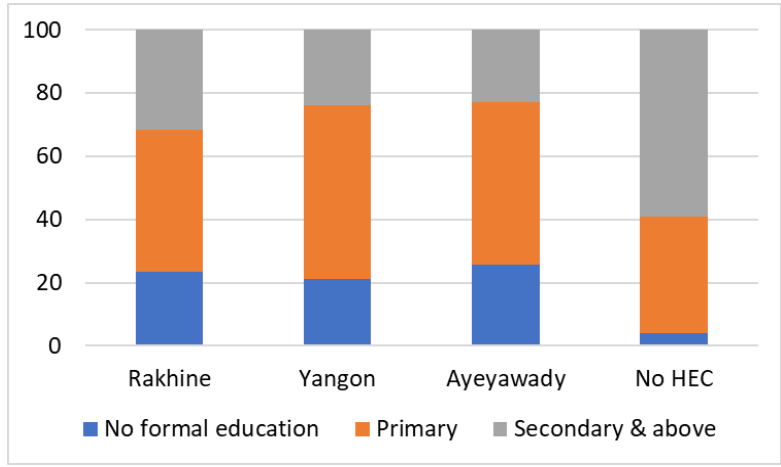

100
80
60
40
20
0
Rakhine
Yangon
Ayeyawady
No HEC
18—35 years
36—59 years
60 years & above


100
80
60
40
20
0
Rakhine
Yangon
Ayeyawady
No HEC
Buddhism
Christian


100
80
60
40
20
0
Rakhine
Yangon
Ayeyawady
No HEC
Non-farmer
Farmer

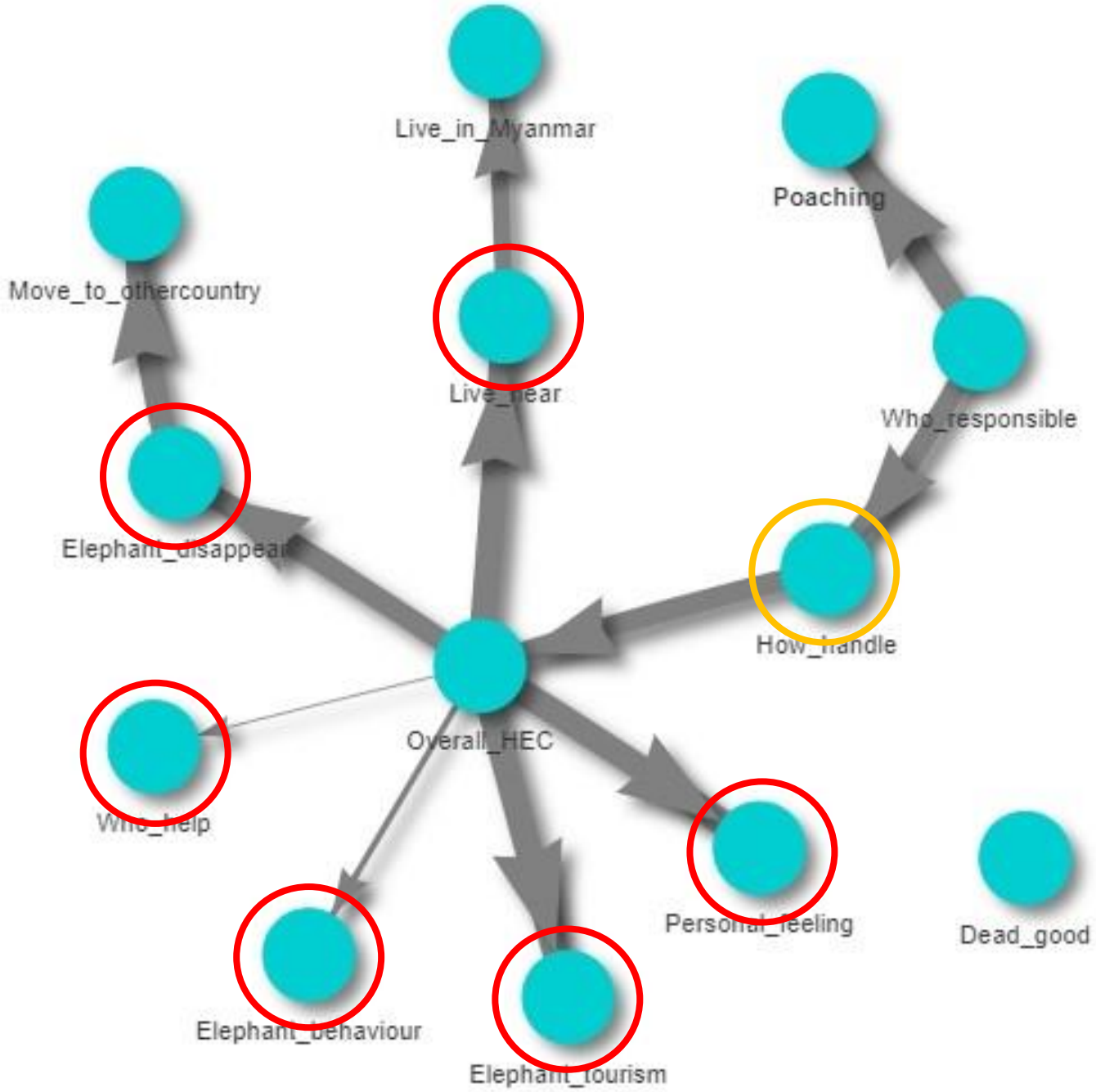

100
80
60
40
20
0
Rakhine
Yangon
Ayeyawady
No HEC
Burma
Rakhine
Kayin
Others


100
80
60
40
20
0
Rakhine
Yangon
Ayeyawady
No HEC
Non-native
Native


100
80
60
40
20
0
Rakhine
Yangon
Ayeyawady
No HEC
No formal education
Primary
Secondary & above

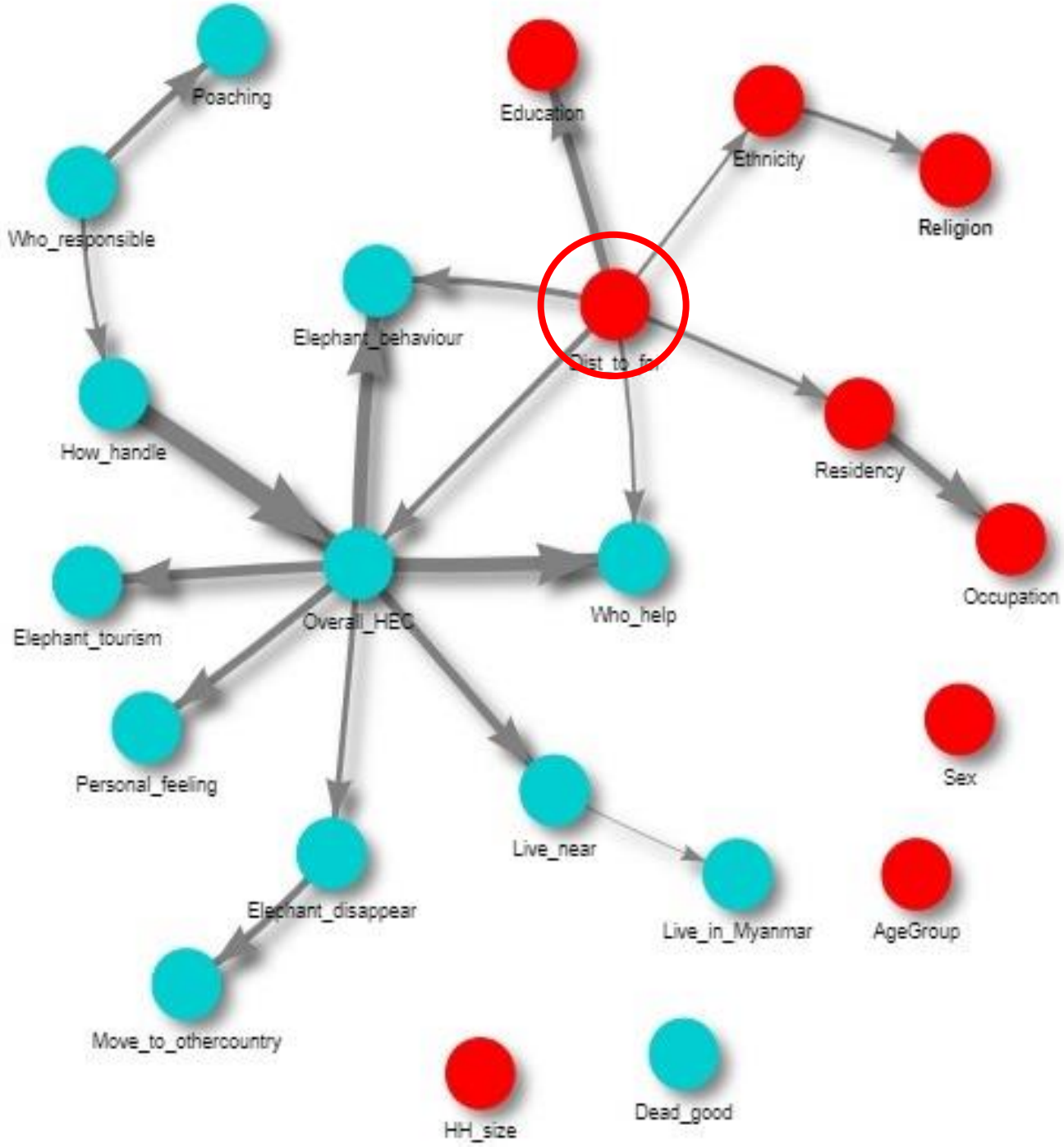
HEC attitude Bayesian Belief Network

- HEC affects attitudes on elephants
- Support affects perception of HEC



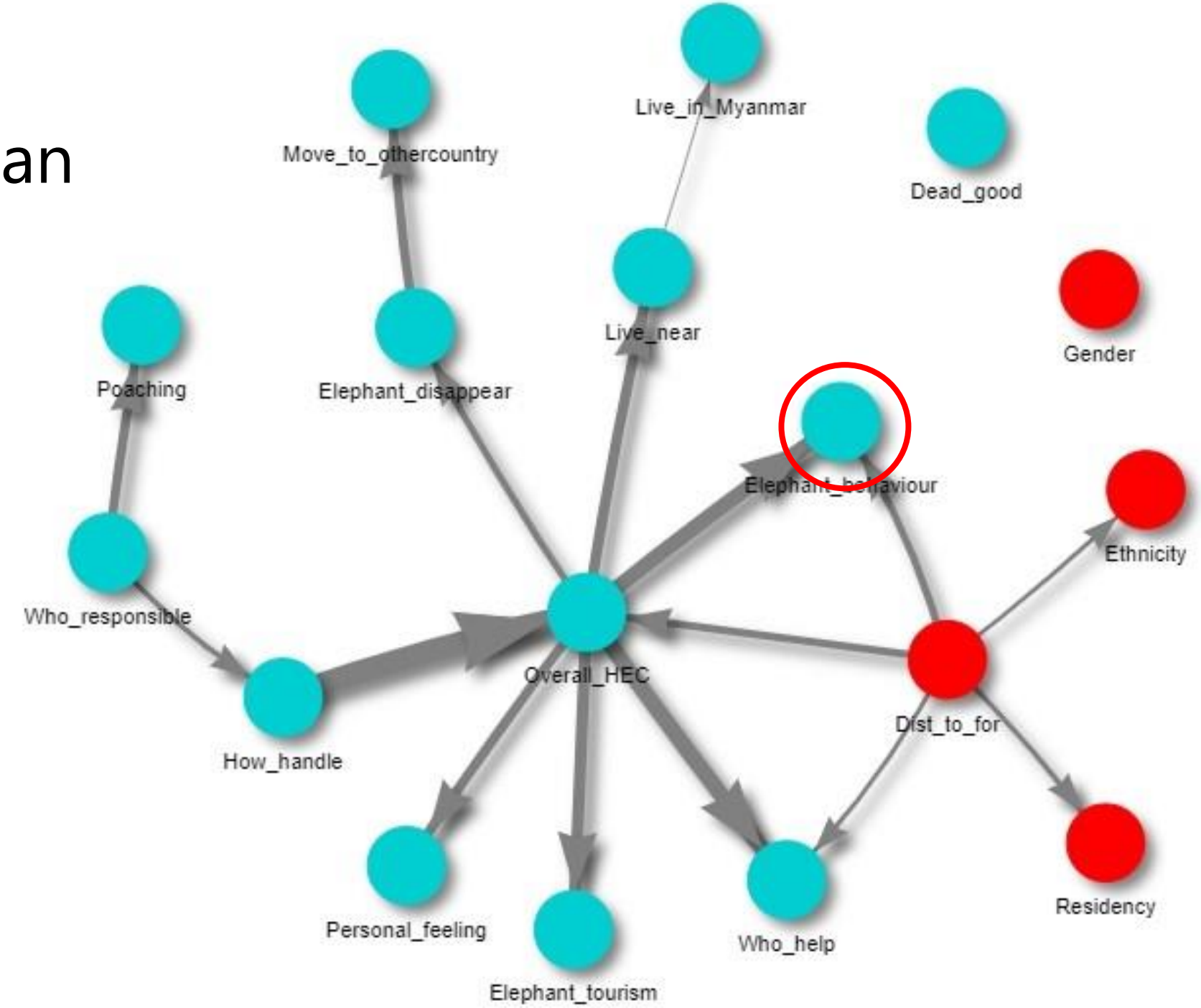
Full explanatory HEC attitude Bayesian Belief Network

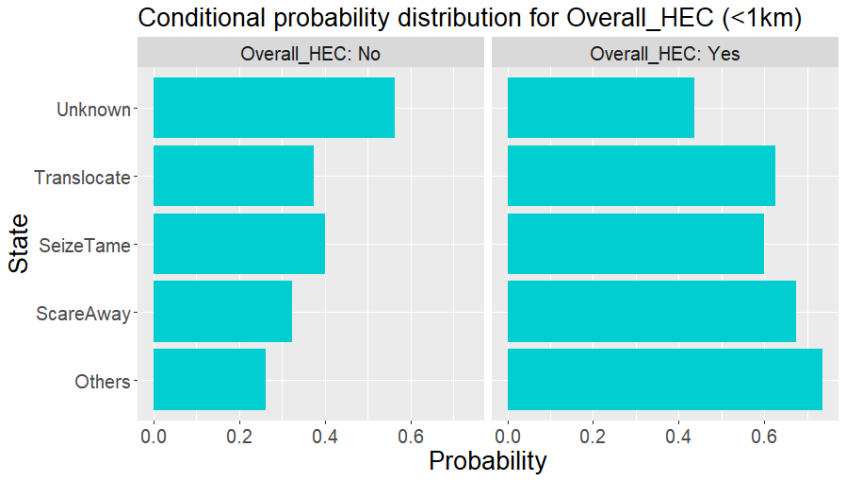
- Distance to forest

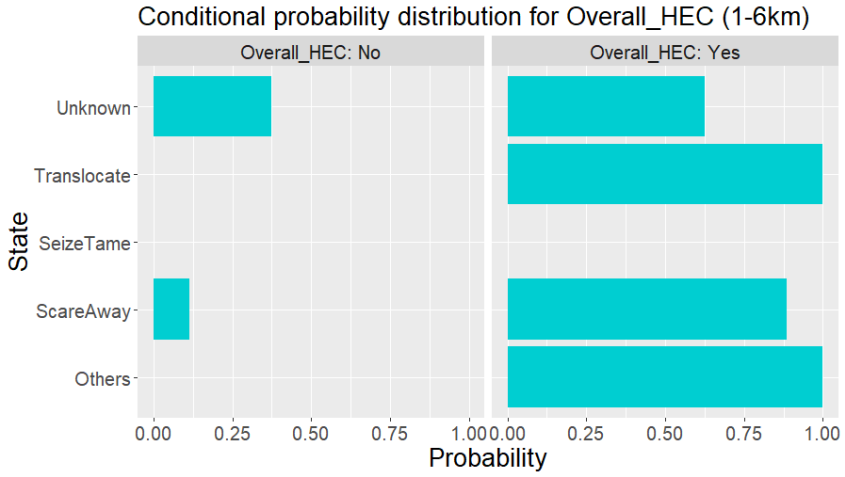


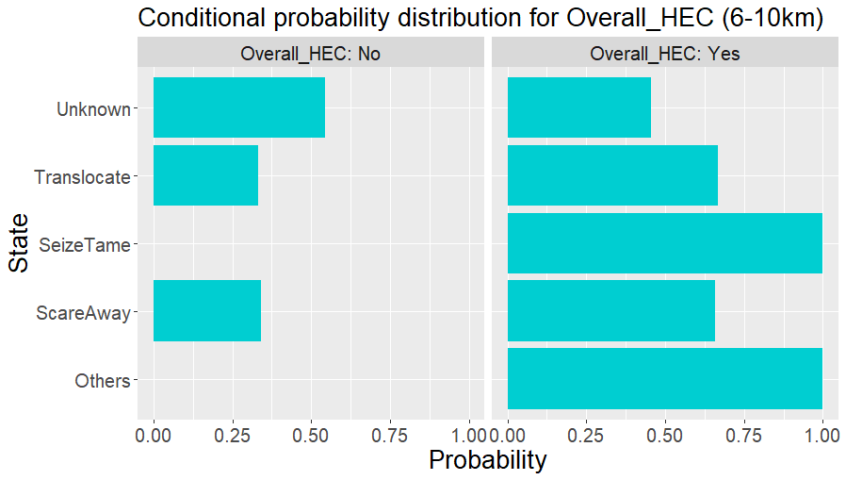
Extended HEC attitude Bayesian Belief Network

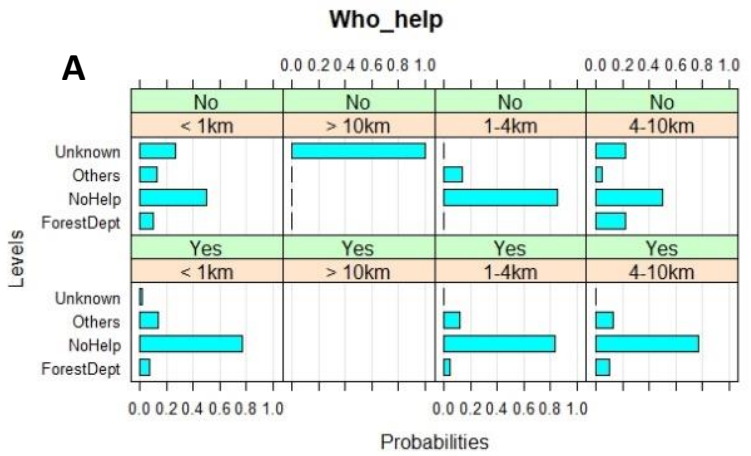
- Human encroachment?

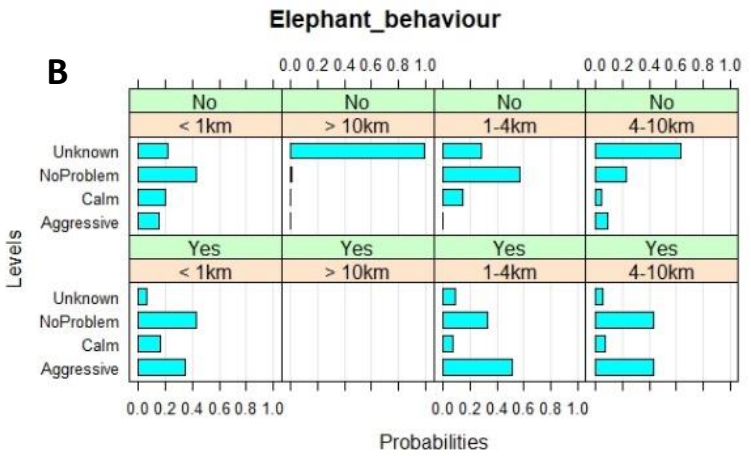


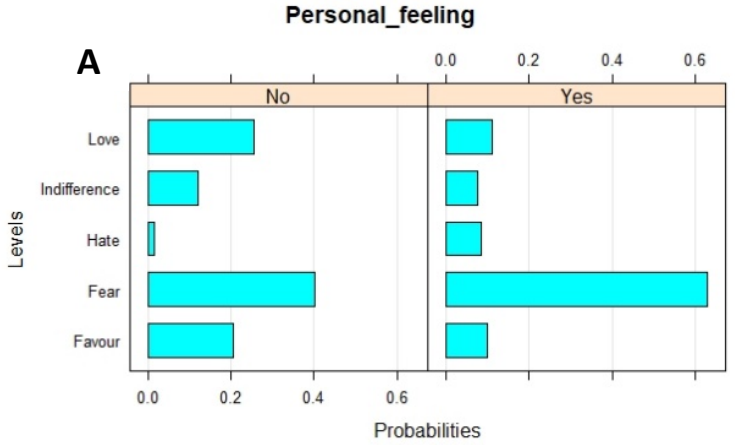

Conditional probability distribution for Overall_HEC (<1km)
Overall_HEC: No
Overall_HEC: Yes
Unknown
Translocate
SeizeTame
ScareAway
Others
State
0.0
0.2
0.4
0.6
Probability

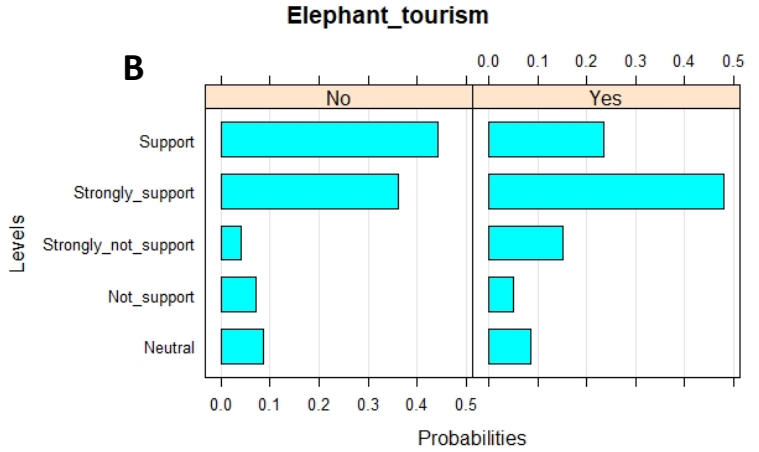

Conditional probability distribution for Overall_HEC (1-6km)
Overall_HEC: No
Overall_HEC: Yes
Unknown
Translocate
SeizeTame
ScareAway
Others
State
0.00
0.25
0.50
0.75
1.00
Probability

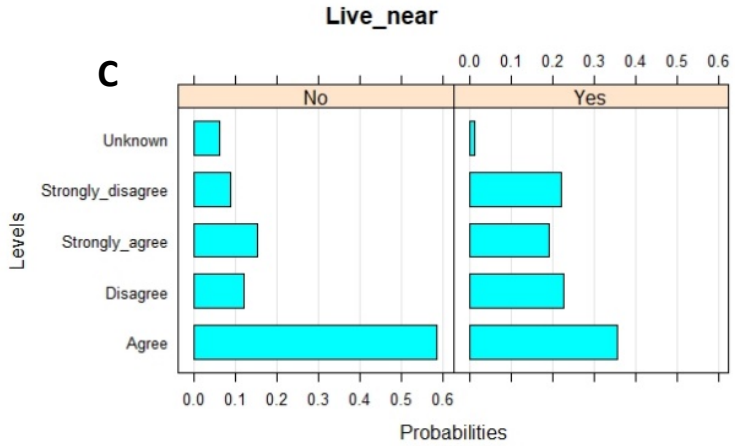

Conditional probability distribution for Overall_HEC (6-10km)
Overall_HEC: No
Overall_HEC: Yes
Unknown
Translocate
SeizeTame
ScareAway
Others
State
0.00
0.25
0.50
0.75
1.00
Probability

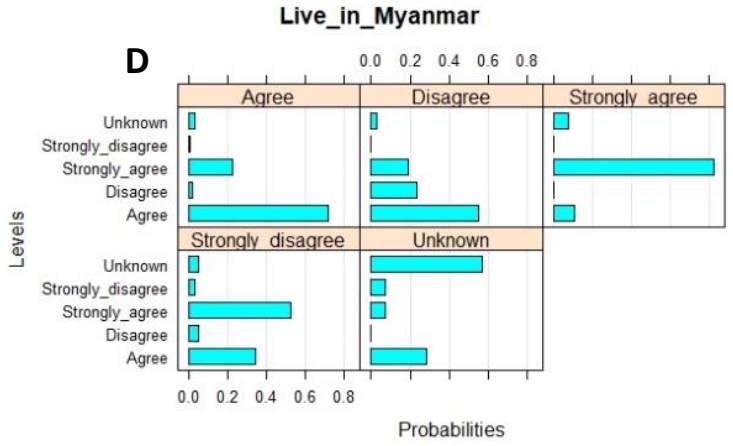

Who_help
A
No
< 1km
> 10km
1-4km
4-10km
Yes
Unknown
Others
NoHelp
ForestDept
Levels
0.0 0.2 0.4 0.6 0.8 1.0
Probabilities

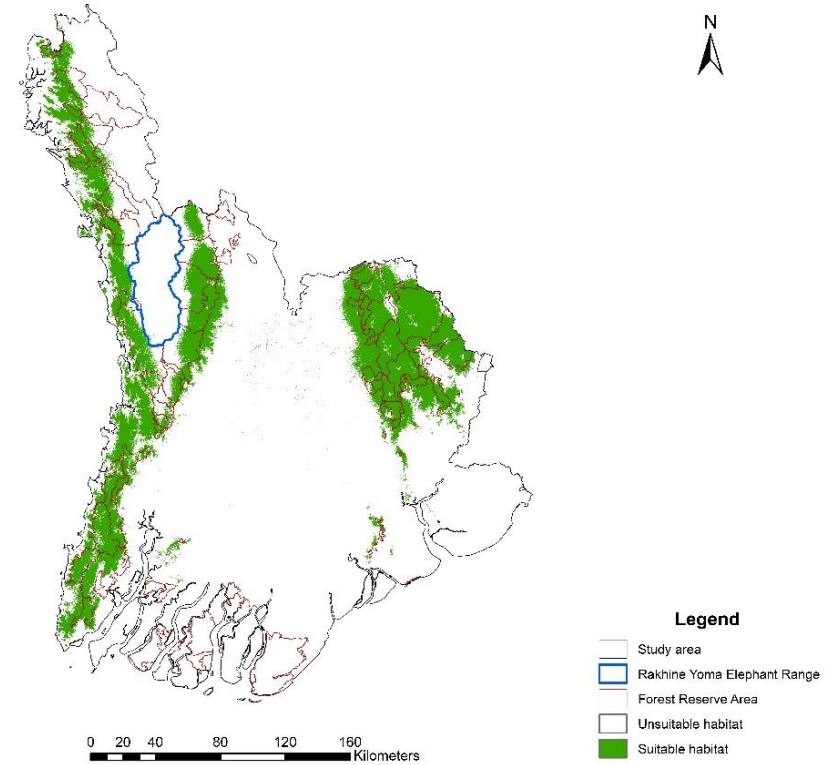

Elephant_behaviour
B
No
< 1km
> 10km
1-4km
4-10km
Yes
Unknown
NoProblem
Calm
Aggressive
Levels
0.0 0.2 0.4 0.6 0.8 1.0
Probabilities

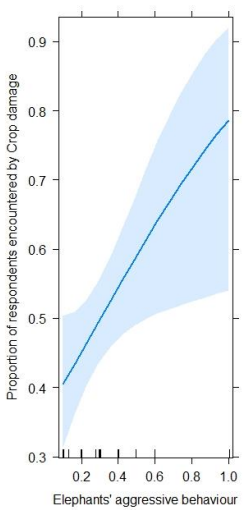

Personal_feeling
A
No
Yes
Love
Indifference
Hate
Fear
Favour
Levels
0.0
0.2
0.4
0.6
Probabilities

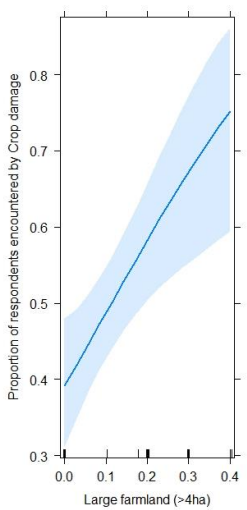

Elephant_tourism
B
No
Yes
Support
Strongly_support
Strongly_not_support
Not_support
Neutral
Levels
0.0
0.1
0.2
0.3
0.4
0.5
Probabilities

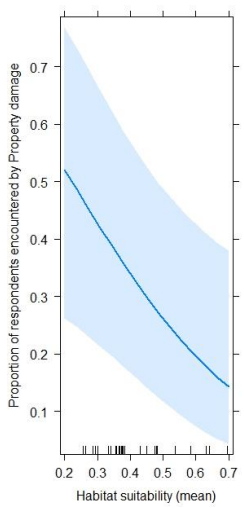

Live_near
C
No
Yes
Unknown
Strongly_disagree
Strongly_agree
Disagree
Agree
Levels
0.0 0.1 0.2 0.3 0.4 0.5 0.6
Probabilities

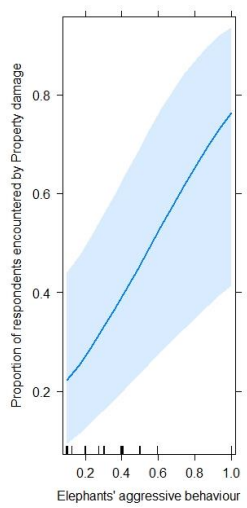

Live_in_Myanmar
D
Agree
Disagree
Strongly_agree
Strongly_disagree
Unknown
Levels
0.0 0.2 0.4 0.6 0.8
Probabilities

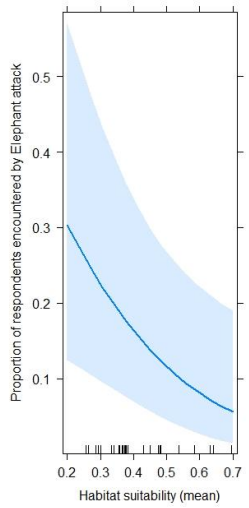

N
Legend
Study area
Rakhine Yoma Elephant Range
Forest Reserve Area
Unsuitable habitat
Suitable habitat
0 20 40 80 120 160
Kilometers

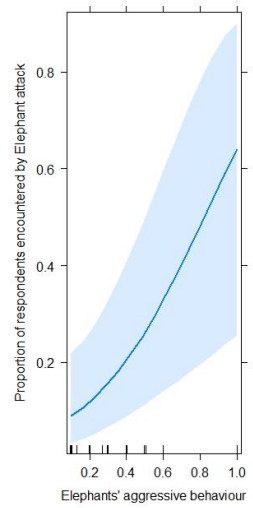

Proportion of respondents encountered by Crop damage
Elephants' aggressive behaviour

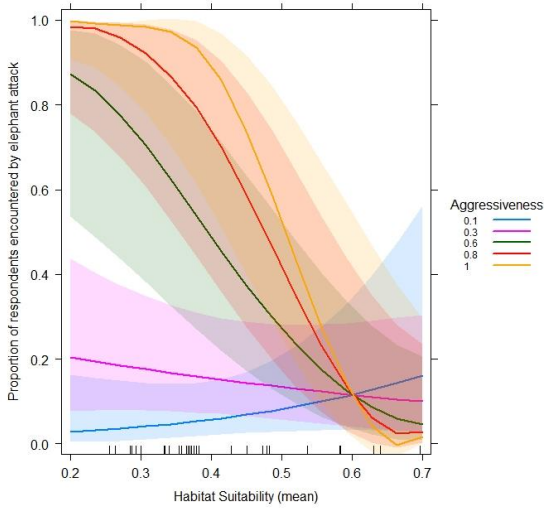

Proportion of respondents encountered by Crop damage
Large farmland (>4ha)


Proportion of respondents encountered by Property damage
Habitat suitability (mean)


Proportion of respondents encountered by Property damage
Elephants' aggressive behaviour


Proportion of respondents encountered by Elephant attack
Habitat suitability (mean)


Proportion of respondents encountered by Elephant attack
Elephants' aggressive behaviour


Proportion of respondents encountered by elephant attack
Habitat Suitability (mean)
Aggressiveness
0.1
0.3
0.6
0.8
1


Thank you for your attention!