Supplemental materials

Supplemental Appendix

Appendix S1: Questionnaire items used to measure level of compliance with wildlife regulation in the Cross River region of south-eastern Nigeria. Questionnaire were based on based on direct questions and Randomize Response Technique.

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| SN | HOUSEHOLD INFORMATION | RESPONSE TYPE | HOW OFTEN |
| 1 | Which village are you from | Exact name |  |
| 2 | what is your occupation | Exact name |  |
| 3 | What sex do you identify | Male/Female |  |
| 4 | What age class do you identify with | Choose from 4 categories |  |
| 5 | How many wives do you have | Exact number |  |
| 6 | How many children do you have | Exact number |  |
| 7 | How many other dependents to you have | Exact number |  |
| 8 | How much is your annual income | Exact number |  |
|  | RANDOMIZED RESPONSE TECHNIQUE (TO TEST THE DEGREE OF COMPLIANCE) |  |  |
| 9 | Have you hunted in a protected area in the last 3 years | Yes/No | Code |
| 10 | Have you collected bush mango from a protected area in the last 3 years | Yes/No | Code |
| 11 | Have you collected afang from a protected area in the last 3 years | Yes/No | Code |
| 12 | Have you collected timber from the protected area in the last 3 years | Yes/No | Code |
| 13 | Have you ever been arrested in a protected area | Yes/No | Code |
| 14 | Have you ever sighted a ranger while in a protected | Yes/No | Code |
| 15 | Have you ever been chased by rangers while in a protected area | Yes/No | Code |
| 16 | Have you ever been charged for trespassing in a protected area | Yes/No | Code |
| 17 | Have you ever paid a fine to the government because you were arrested in a protected area | Yes/No | Code |
| 18 | Have you ever paid a fine to your community because you were arrested in a protected area | Yes/No | Code |
| 19 | Has anyone in your household been arrested in a protected area in the last 3 years | Yes/No | Code |
| 20 | Has any friend of yours been arrested in a protected area in the last 3 years | Yes/No | Code |
| 21 | Has anyone in your household hunted in a protected area in the last 3 years | Yes/No | Code |
| 22 | Do you have any friend that have hunted in a protected area in the last 3 years | Yes/No | Code |
| 23 | Will you hunt in a protected area if you know you will be arrested by rangers | Yes/No | Code |
| 24 | Will you hunt in a protected area if you know you will be arrested by community leaders | Yes/No | Code |
| 25 | Will you hunt in a protected area if you know you will be fined by community leaders | Yes/No | Code |
| 26 | Will you hunt in a protected area if you know you will be fined by government rangers | Yes/No | Code |
| 27 | Do you know anyone that have been arrested in a protected area in the last 3 years | Yes/No | Code |
| 28 | Do you know anyone that have collected NTP from a protected area in the last 3 years | Yes/No | Code |
| 29 | Do you know anyone that have hunted in a protected area in the last 3 years | Yes/No | Code |
|  | HYPOTHETICAL QUESTIONS |  |  |
| 30 | Do you believe you can be arrested in protected  | Yes/No |  |
| 31 | What will you do if you sight a ranger in the protected area while hunting | run, hide, confront, surrender, other |  |
| 32 | What will you do if you sight a ranger in the protected area while collecting NTP | run, hide, confront, surrender, other |  |
| 33 | Do you think hunting should be permitted in a protected area  | Yes/No |  |
| 34 | Do you think NTP collection should be allowed in a protected area | Yes/No |  |
| 35 | Do you think rangers are effective at arresting people that hunt in the protected area | Yes/No |  |
| 36 | Do you think community regulation will be effective at arresting people that hunt in the protected area | Yes/No |  |
| 37 | Will you hunt if the village law prohibits hunting in a protected area | Yes/No |  |
|  | INCENTIVES |  |  |
| 38 | Have you ever received incentives in the last 3 years | Yes/No |  |
| 39 | from whom have whom received incentive in the last 3 years | Name group |  |
| 40 | What did you receive as incentive | Exact name |  |
| 41 | Are you satisfied with the incentive you received  | Yes/No |  |
| 42 | Are you still using the incentive you received | Yes/No |  |
| 43 | Has any member of your household ever received incentive as motivation to stop going to the forest | Yes/No |  |
| 44 | Do you know any one that has received incentive in your community | Yes/No | Exact number |
|  | KNOWLEDGE OF PROTECTED AREA STATUS |  |  |
| 45 | Do you know the boundary between personal land and protected area | Yes/No |  |
| 46 | From your knowledge is hunting in a protected area prohibited | Yes/No |  |
| 47 | From your knowledge is collecting timber in a protected area prohibited | Yes/No |  |
| 48 | From your knowledge is collecting NTP in a protected area prohibited | Yes/No |  |

Supplemental Table

Table S1: Summary of results from GLMM for predictors of non-compliance with wildlife regulations in southeast Nigeria. Shown are models' degrees of freedom(df), Log likelihood, ΔAICc and Akaike model weights (ωi) for 10 *apriori* models. CLS = fear of community level sanctions; CFF = complicit family member or friend; and GLS = Government level sanction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Models | df | logLik | AIC | weight |
| CLS+dependents+CFF+income | 6 | -75.59 | 186.00 | 0.93 |
| dependents+CFS+income | 5 | -81.22 | 191.50 | 0.06 |
| CLS+CFF+income+age+dependents+GLS | 8 | -75.17 | 196.80 | 0.00 |
| CLS+dependents+income+age | 6 | -88.41 | 211.70 | 0.00 |
| income+dependents+GLS | 5 | -92.83 | 214.70 | 0.00 |
| income+age | 4 | -99.01 | 221.30 | 0.00 |
| CLS | 3 | -162.46 | 342.30 | 0.00 |
| CFF | 3 | -164.88 | 347.20 | 0.00 |
| Null | 1 | -179.11 | 364.00 | 0.00 |
| GLS | 3 | -175.72 | 368.90 | 0.00 |

Supplemental Figure

Figure S1: Mean number of respondents with compliance vs non-compliance behaviors in villages surrounding each protected area in Southeastern Nigeria.