

Supplement Table S1: Structured Questionnaire

Confidentiality and Consent

Thank you for the opportunity to speak with you. I am Opedes Hosea, a PhD Student from Wageningen University & Research and Makerere University. I am conducting research entitled "Analyzing land cover changes, land degradation and the responses to restoration and conservation practices in the Manafwa watershed - Uganda". Specifically, this research seeks to critically examine land cover change, soil erosion processes, restoration and conservation practices at a local level using the hotspot-hopespot concepts and guide MWARES Project implementation on sustainable land utilization in the upper Manafwa watershed on the slopes of Mount Elgon.

Your household has been selected to participate in an interview that includes questions on topics such as your family background, land cover, land degradation (soil erosion), farmers' restoration and conservation practices / activities. Some photographs will be shown to you at an appropriate moment to guide this interview. The survey includes questions about the household activities on land resources generally, and questions about community activities in general, if applicable. With your permission, some photos (concerning land use in your gardens) may be taken. These questions in total will take approximately 45 minutes to complete and your participation is entirely voluntary. If you agree to participate, you can choose to stop at any time or to skip any questions you do not want to answer. Your answers will be completely confidential; we will not share information that identifies you with anyone.

Background Information

101. Sub County

- | | | |
|---------------------------------|----------------------------------|---|
| <input type="radio"/> Bubiita | <input type="radio"/> Bududa | <input type="radio"/> Bududa Town Council |
| <input type="radio"/> Bukalasi | <input type="radio"/> Bukibokolo | <input type="radio"/> Bukigai |
| <input type="radio"/> Bulucheke | <input type="radio"/> Bumasheti | <input type="radio"/> Bumayoka |
| <input type="radio"/> Bushika | <input type="radio"/> Bushiribo | <input type="radio"/> Bushiyi |
| <input type="radio"/> Buwali | <input type="radio"/> Nabweya | <input type="radio"/> Nakatsi |
| <input type="radio"/> Nalwanza | | |

102. Telephone Number of the Respondent

Upto 10 digits

103. Gender of the Household head

- ☐ 1: Male
☐ 2: Female

104. How old is the Household head?

- ☐ 1: Below 18 years
☐ 2: 18 - 30 years
☐ 3: 31 - 64 years
☐ 4: Above 65 years

105. What is the highest level of formal Education completed by household head?

- | | | |
|--|-------------------------------------|------------------------------------|
| <input type="radio"/> 1: No Formal Education | <input type="radio"/> 2: Primary | <input type="radio"/> 3: Secondary |
| <input type="radio"/> 4: Tertiary/vocational | <input type="radio"/> 5: University | |

Household Size and Gender Composition

201. What is the total household size?

Household Characteristics

202. What are the THREE major sources of income for your entire household?

- ☐ 1: Farming (crops/animals)
☐ 2: Casual labor / piece work (leja-leja)
☐ 3: Mining / Quarrying

☐ 4: Formal job / employment ☐

5: Business / Self Employed ☐

Other

Specify other.

203. For how long have you stayed in Bududa District?

- ☐ 1: Less than 10 years
- ☐ 2: 10 - 19 years
- ☐ 3: 20 - 29 years
- ☐ 4: 30 - 39 years
- ☐ 5: More than 40 years

204. If less than 10 years, where did you live before?

- ☐ 1: Manafwa
- ☐ 2: Namisindwa
- ☐ 3: Mbale
- ☐ 4: Bulambuli / Sironko
- ☐ 5: Outside Mt. Elgon region (Districts)
- ☐ Other

Specify other.

205. What was the main reason for shifting / relocating / migrating?

- ☐ 1: Farming
- ☐ 2: Family / Marriage
- ☐ 3: Employment / Work
- ☐ Other

Specify other.

206. What is your main energy cooking source?

- ☐ 1: Charcoal / Firewood (Fuel wood)
- ☐ 2: Kerosene
- ☐ 3: Electricity (HEP)
- ☐ 4: LPG / Biogas
- ☐ 5: Crop residues (maize kobs, stocks)
- ☐ Other

Specify other.

207. What type of domestic cooking stove does your household MAJORLY use for preparing food?

- ☐ 1: Three stones open fire
- ☐ 2: Ordinary charcoal stove
- ☐ 3: Energy saving stove / Lorena
- ☐ Other

Specify other.

208. How much land does your household own in total?

in acres

Forest use and product extraction

301. Do you or your household member(s) extract any product from the forest (Mount Elgon National Park)?

- ☐ 1: Yes
☐ 2: No

302. If No, why do you not extract anything from the forest?

- ☐ 1: Restrictions from park authority officials
☐ 2: Long distance from the park
☐ 3: Lack of interest on forest products
☐ Other

303. If Yes, what products do you extract from the forest?

- ☐ 1: Timber & poles (for house construction)
☐ 2: Honey & or bee keeping
☐ 3: Fodder for livestock
☐ 4: Firewood / Fuelwood
☐ 5: Bamboo shoots (Maleewa)
☐ 6: Medicinal herbs
☐ Other

Specify other.

304. What form of understanding do you have with park authority in regards to extraction of those products from the forest?

- ☐ 1: Legal agreements / MoUs
☐ 2: Informal permission from park authority
☐ 3: Illegally / No permission
☐ Other

Specify other.

305. How often are you allowed to go to the park to extract forest products?

- ☐ 1: Everyday
☐ 2: Once a week
☐ 3: Twice a week
☐ 4: Once in two weeks
☐ 5: Monthly
☐ 6: Never

Land Degradation and Soil Erosion processes

401. Do you experience any form of land degradation and / or soil erosion in your farmland?

- ☐ 1: Yes
☐ 2: No

402. If YES, What forms of land degradation occur in your farm land?

show the respondent the pictures of these processes and Kindly request him/her to later on allow you to take a picture of any of these processes in the nearest garden from where you're conducting the interview.

- ☐ 1: Riverbank erosion
☐ 2: Soil erosion
☐ 3: Landslides / mass movements
☐ 4: Offsite degradation effects e.g. at lower stream
☐ 5: Surface sealing & crusting
☐ 6: Reduction of vegetation cover
☐ 7: Flash floods, Flooding & Siltation
☐ 8: Loss of soil fertility / nutrients / organic matter
☐ Other

Specify other.

403. Specifically, what forms of soil erosion are prevalent in your farmland?

show the respondent the pictures of these processes and Kindly request him/her to later on allow you to take a picture of any of these processes in the nearest garden from where you're conducting the interview.

- ☐ 1: Gullies
☐ 2: Rill
☐ 3: Sheetwash / surface
☐ 4: Rain splash
☐ 5: Pediments
☐ Other

Specify other.

Land Use and Management

501. What are the major crops you grow in your farmland?

- ☐ 1: Bananas
☐ 2: Maize
☐ 3: Potatoes (sweet/irish)
☐ 4: Vegetables (cabbage, onions, tomatoes, carrots)
☐ 5: Beans
☐ 6: Coffee
☐ 7: Tobacco
☐ 8: Cotton
☐ Other

Specify other.

502. What major land preparation methods do you employ in your farm land?

- ☐ 1: Handled tools
☐ 2: Ox-plough
☐ 3: Tractor
☐ Other

Specify other.

503. How often in a year do use this method to till /prepare your land before planting crops?

- ☐ 1: Never
- ☐ 2: Once
- ☐ 3: Twice
- ☐ 4: Thrice
- ☐ 5: Frequently (> thrice)

504. Why do you use these methods (selected in 505) of land preparation?

- ☐ 1: Size of land
- ☐ 2: Type of crops
- ☐ 3: Cost of the method
- ☐ 4: Land tenure security / safety
- ☐ 5: Nature of the locality (terrain)
- ☐ 6: Land ownership
- ☐ 7: Household size
- ☐ Other

Specify other.

Soil and Water Conservation (SWC) measures

601. Do you practice any forms of soil and water conservation practices in your household or farmland?

- ☐ 1: Yes
- ☐ 2: No

602. Why don't you practice any Soil and Water Conservation measures?

- ☐ 1: Its expensive
- ☐ 2: Inadequate knowledge
- ☐ 3: Nature of landscape
- ☐ 4: Lack of labor required
- ☐ 6: Time wasting
- ☐ 99: Not sure
- ☐ Other

Specify other.

603. If YES, Which Soil and Water Conservation (SWC) practices are on your farmlands?

Show pictures of these forms and Kindly request him/her to later on allow you to take a picture of these practices in the nearest garden from where you're conducting the interview.

- ☐ 1: Vegetation / soil cover; - Better soil cover by vegetation (selection of species, higher plant density), Early planting (cropland), Relay cropping, mixed cropping / intercropping, contour planting / strip cropping, cover cropping, retaining more vegetation cover (removing less vegetation cover), mulching (actively adding vegetative / non-vegetative material or leaving it on the surface), temporary trash lines (and in 1b. as "mobile compost strips"), others (please specify)
- ☐ 2: Organic matter / soil fertility; - legume inter-planting (crop and grazing land; induced fertility), green manure (cropland), applying manure / compost / residues (organic fertilizers), including "mobile compost strips" (trash lines), applying mineral fertilizers (inorganic fertilizers), applying soil conditioners (e.g. use of lime or gypsum), rotations / fallows (associated with M), waste recycling, re-use & reduce, others (please specify).
- ☐ 3: Soil surface treatment; - conservation tillage: zero tillage, minimum tillage and other tillage with reduced disturbance of the top soil, contour tillage, contour ridging (crop and grazing land), done annually or in rotational sequence, breaking compacted top soil: ripping, hoeing, ploughing, harrowing; pits, redone annually or in rotational sequence, others (please specify).
- ☐ 4: Subsurface treatment; - breaking compacted subsoil (hard pans): deep ripping, "subsoiling", deep tillage / double digging, others (please specify).
- ☐ 5: Tree and shrub cover; - dispersed (in annual crops or grazing land), aligned (in annual crops or grazing land) (e.g. live fences, hedges, barrier hedgerows, alley cropping).
- ☐ 6: Grasses and perennial herbaceous plants: dispersed, aligned (grass strips): - on contour - graded - along boundary - linear - against wind - in blocks
- ☐ 7: Clearing part of the vegetation; - Inform of mowing or slashing are examples of clearing parts of the vegetation without necessarily removing whole plants. Especially to allow crops growing space
- ☐ 8: Bench terraces: constructed with soil or soil enforced with other materials or entirely from other materials such as stone, wood, cement, others.
- ☐ 9: Bunds / banks; - level - tied - non-tied, graded - tied - non-tied, semi-circular, v-shaped, trapezoidal, others
- ☐ 10: Graded ditches / waterways; - (to drain and convey water), cut-off drains, waterways
- ☐ 11: Level ditches / pits, infiltration retention, sediment / sand traps
- ☐ 12: Dams / pans: store or harvest water for irrigation, human or animal consumption
- ☐ 13: Reshaping surface: (reducing slope, ...) / top soil retention (e.g. in mining, storing top soil and re-spreading
- ☐ 14: Walls / barriers / palisades; - constructed from wood, stone concrete, others, not combined with earth
- ☐ 15: Change of land use type: - enclosure / resting, protection, change from crop to grazing land, from forest to agroforestry, from grazing land to cropland, etc.
- ☐ 16: Change of management / intensity level: - from grazing to cutting (for stall feeding); from mono-cropping to rotational cropping, from continuous cropping to managed fallow, from "laissez-faire" (unmanaged) to managed, from random (open access) to controlled access (grazing land forest land e.g. access to firewood), from herding to fencing.
- ☐ 17: Major change in timing of activities: - land preparation, planting, cutting of vegetation
- ☐ 18: Control / change of species composition; - (not annually or in a rotational sequence: if annually or in a rotational sequence as done e.g. on cropland; - reduction of invasive species, selective clearing, encouragement of desired species, controlled burning / residue burning

Specify other.

604. How much percentage surface area of your total farm land do you implement these SWC practices?

- ☐ 1: Less than 25% (a quarter)
- ☐ 2: 25% - 50% (a half)
- ☐ 3: 50% - 75% (three quarters)
- ☐ 4: 75% - 100% (All)
- ☐ 99: Not sure

605. Specifically, for which crops do you implement these SWC practices?

- ☐ 1: Bananas
☐ 2: Maize
☐ 3: Potatoes (sweet/irish)
☐ 4: Vegetables (cabbage, onions, tomatoes, carrots)
☐ 5: Beans
☐ 6: Coffee
☐ 7: Tobacco
☐ 8: Cotton
☐ 9: All crops
☐ Other

Specify other.

Any other comments from the research assistant based on observation

Do this as you request for his/her permission to take the other photos

Record your current GPS location

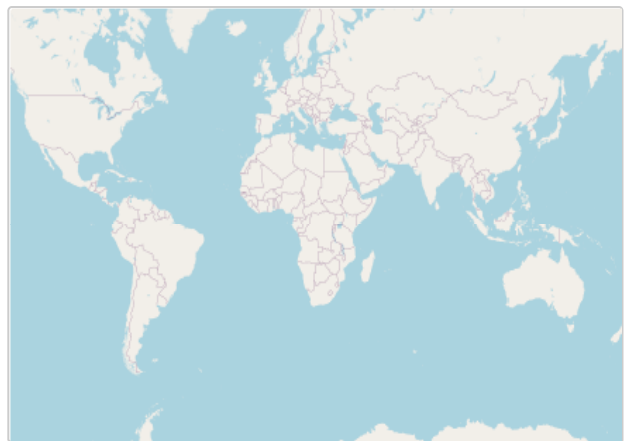
Do this as you request for his/her permission to take the other photos

latitude (x.y °)

longitude (x.y °)

altitude (m)

accuracy (m)



Thank you a lot; we are now in the last stage of the survey

Request, him/her to show you the nearest farmland affected by erosion, land degradation and where he/she is implementing conservation and restoration practices

Take photograph of any visible form of erosion in the nearest farmland of the respondent

Before doing this seek his consent

Click here to upload file. (< 100MB)

Take farm photo displaying any conservation practices in the respondents farmland

Before doing this seek his consent

Click here to upload file. (< 100MB)

Thank you a lot for you time and ideas

WANYAALA NAABI