

Appendix 3: Questionnaire

Semi-Structured Guide for Surveys, Interviews, and Focus Group Discussions

1. Introduction

Hello, my name is Mary Wanjiru Kanyiru, a Master's student in Sustainable Agriculture (Specializing in Agricultural Systems Management) at Nelson Mandela African Institution of Science and Technology (NM-AIST). This questionnaire aims to document and describe the current Rainwater Harvesting (RWH) and Soil Moisture Conservation (SMC) techniques used by maize farmers in Dareda Kati and Gajal villages of Ayalagaya Ward, Babati District, Manyara Region, Northern Tanzania. The target respondents include:

- Small-scale maize farmers
- Community leaders
- Agricultural extension officers

The data collected will help to understand:

- Adoption of RWH and SMC techniques
- Effectiveness of these practices
- Challenges faced by farmers

Your participation is **voluntary**, and all responses will be treated **confidentially**. You may decline to answer any question or withdraw at any time without any consequences.

We value and appreciate your insights.

Thank you for your participation.

Section A: Background Information of Respondents

1. Role in the Community

- Farmer
- Community Leader

- Agricultural Extension Officer
- Other (please specify) _____

2. Village

- Dareda Kati
- Gajal

3. Years of Experience in Maize Farming

- Less than 1 year
- 1-5 years
- 6-10 years
- More than 10 years

4. Farm Size and Production

(a) Approximate Size of Your Maize Farm (Acres)

- Less than 1 acre
- 1-5 acres
- More than 5 acres

(b) How many bags of maize do you harvest from the farm size indicated above in a season?

Section B: Rainwater Harvesting and Soil Moisture Conservation Techniques

5. Are you aware of any rainwater harvesting and soil moisture conservation techniques for maize cultivation?

- Yes
- No

6. If yes, which rainwater harvesting and soil moisture conservation techniques are you aware of?
(Select all that apply)

- Mulching
- Contour bunds (Fanya juu)
- Supplementary irrigation
- Minimum tillage
- Water diversion structures (Kinga maji)
- Cover cropping
- Swales and berms (Fanya chini)
- Other (please specify) _____

7. Which rainwater harvesting and soil moisture conservation techniques do you currently use?
(Select all that apply)

- Mulching
- Fanya juu
- Supplementary irrigation
- Minimum tillage
- Kinga maji
- Cover cropping
- Swales and berms
- Other (please specify) _____

8. How often do you monitor soil moisture on your farm?

- Daily
- Weekly
- Monthly
- Occasionally
- Never

Section C: Effectiveness and Challenges of Rainwater Harvesting and Soil Moisture Conservation Techniques

9. How effective are the rainwater harvesting and soil moisture conservation techniques used in your maize fields?

- Very effective
- Effective
- Neutral
- Ineffective
- Very ineffective

10. What challenges do you face when implementing these techniques? (Open-ended)

11. On average, how much do you invest annually (in TZS) in rainwater harvesting and soil moisture conservation techniques?

- Less than 50,000 TZS
- 50,000-100,000 TZS
- 100,000-200,000 TZS
- More than 200,000 TZS

Section D: Observations and Perceptions

12. In your opinion, how important is soil moisture conservation for maize productivity in your area?

- Very important
- Important
- Neutral
- Not important

13. Which of the following factors has the greatest impact on soil moisture retention in your area?

- Soil type
- Rainfall patterns
- Slope/Topography
- Farming practices

- Other (please specify) _____

14. In your experience, which rainwater harvesting and soil moisture conservation technique has been most effective in increasing maize yield? (Open-ended)

15. Cropping Calendar

(a) When do you usually plant maize (months of the year)? (Open-ended)

(b) How many maize growing seasons do you cultivate per year? (Open-ended)

Section E: Focus Group Discussion (FGD) and Key Informant Interviews

(For community leaders and agricultural extension officers)

16. What are the common rainwater harvesting and soil moisture conservation techniques practiced by maize farmers in this area? (Open-ended)

17. How would you describe the adoption rate of these techniques among farmers? (Open-ended)

18. What additional resources or support would help farmers improve rainwater harvesting and soil moisture conservation practices? (Open-ended)

Section F: Documentary Review (Agricultural Data)

19. Please provide any available data on maize productivity trends and rainfall in Dareda Kati and Gajal villages.

(To be provided by district agricultural officers)

Section G: Observational Data

(To be completed by researchers during field visits)

20. Observation of Rainwater Harvesting and Soil Moisture Conservation Practices

Practice	Yes	No
Mulching	☐	☐
Contour bunds (Fanya juu)	☐	☐
Supplementary irrigation	☐	☐
Minimum tillage	☐	☐
Cover cropping	☐	☐
Swales and berms	☐	☐
Kinga maji	☐	☐

Other practices observed

21. Notes on General Agricultural Conditions Observed

Follow-Up and Probing Questions

- Could you please elaborate further?
- Can you provide an example of a challenge you face with a specific practice?
- How does this affect your yield or farming experience?

Closing Questions

- Is there anything else you would like to add regarding rainwater harvesting, soil moisture management, or agricultural practices?
- Do you have any recommendations for researchers or policymakers working in agricultural development?

Thank You for Your Participation

Data collected through this questionnaire will be analyzed using:

- **R software** for quantitative analysis
- **MAXQDA** for qualitative thematic analysis

This analysis will help identify patterns, trends, and insights regarding rainwater harvesting and soil moisture conservation practices among maize farmers in the study area.