

Quantifying Household E-waste Generation through Statistical Modelling

Dear Participant, My name is Samuel Amoakoh, a final year Bsc Mathematics student at the University of Mines and Technology. I am conducting this research as part of my final year capstone research study aimed at understanding and quantifying household e-waste generation in Tarkwa, Ghana. Your responses will contribute significantly to our understanding of the factors influencing e-waste generation and disposal practices. Please take the time to answer the following questions as accurately and honestly as possible. Your responses will be kept confidential and used solely for research purposes.

Consent form

Section 1: Demographics and Socio-economic Information

1. Residential Area/Community:

For Clustering Purposes

- ☐ Brahabobome
- ☐ Effuanta
- ☐ Tamso
- ☐ Market Circle
- ☐ Tebrebe
- ☐ Cyanide
- ☐ Camp City
- ☐ Karekwanho
- ☐ Bankyim
- ☐ Kwabedu
- ☐ Akon

2. How long have you been in this community?

- ☐ Less than a year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ Above 10 years

3. How many people live in your household (including yourself)?

Give a range of household residents

- ☐ 1-2
- ☐ 3-4
- ☐ 5-6
- ☐ 7 or more

5. What is the age range of the head of your household?

- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ 65+

6. What is the highest level of education completed by the head of your household?

- ☐ No formal education
- ☐ Primary school
- ☐ Junior high school
- ☐ Senior high school
- ☐ Vocational training
- ☐ University/College
- ☐ Postgraduate

7. What is the primary occupation of the head of your household? (Select all that apply)

- ☐ Formal employment (Government, Private Sector)
- ☐ Self-employed (Trader, Artisan, etc.)
- ☐ Unemployed
- ☐ Student
- ☐ Retired

8. What is the monthly income range of your household (in Ghanaian Cedis)?

- ☐ Below 500 GHS
- ☐ 500-1000 GHS
- ☐ 1001-2000 GHS
- ☐ 2001-3000 GHS
- ☐ 3000 GHS and above
- ☐ Prefer not to answer

9. Household Group

Type of housing

- ☐ Group 1 (detached, semi-detached, flat/apartments)
- ☐ Group 2 (compound houses)
- ☐ Group 3 (wooden structure, uncompleted building, kiosk, hut, metal container, living quarters, tent, others)

Section 2: E-Waste Generation Background

10. Type of electronic devices that are currently in your household

Number of EEE

In-Use

Years-in-Use

EOL (e-waste)

Years -in-storage

In what condition when purchased?

Small HH Equipment(Irons&Electric Kettles)

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

Screens(CRT - Atikopo&FPD - flat screen)

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

Microwaves

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

ACs

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

Kitchen grinder (blenders)

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

Fridges and freezers

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

Audio Video Equipment(Audio Speakers)

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

Other Cooling Devices(Including dispensers)

☐ New Not Working (NNW)

☐ Used Not Working(UNW)

☐ New Working(NW)

☐ Used Working(UW)

Mobile phones including tablets

☐ New Not Working (NNW)

☐ Used Not Working(UNW)

☐ New Working(NW)

☐ Used Working(UW)

Computers(Desktop&Laptop)

- ☐ New Not Working (NNW)
- ☐ Used Not Working(UNW)
- ☐ New Working(NW)
- ☐ Used Working(UW)

Small IT (incl. game console)

☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

Dish Washers

☐ New Not Working (NNW)

☐ Used Not Working(UNW)

☐ New Working(NW)

☐ Used Working(UW)

Washing Machines

☐ New Not Working (NNW)

☐ Used Not Working(UNW)

☐ New Working(NW)

☐ Used Working(UW)

Lamps(Table Lamps& LED bulbs)

- ☐ New Not Working (NNW) ☐ Used Not Working(UNW) ☐ New Working(NW) ☐ Used Working(UW)

11. What is the typical lifespan of electronic devices in your household before replacement?

how many years do you use electronic device before replacing it

- ☐ Less than once a year
- ☐ Once a year
- ☐ Every 2-3 years
- ☐ More than 3 years
- ☐ We never replace electronics until they stop working completely

12. How often do you access the internet in your household?

internet usage timelines

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Rarely/Never

13. Do you consider your household to be an early adopter of new electronic devices?

do you buy new trending electronic device?

- ☐ Yes
- ☐ No

14. What factors influence your decision to purchase a new electronic device? (Select all that apply)

What makes you buy new electronic device?

- ☐ Need for replacement due to malfunction
- ☐ Desire for the latest features/technology
- ☐ Improved functionality/performance
- ☐ Price/affordability
- ☐ Sales/promotions
- ☐ Other (Please specify below)

If Other (Please specify below)

15. At what point do you stop using your EEE?

when do you stop using your electronic device?

- ☐ I can afford a better one
- ☐ A better one becomes available
- ☐ It stops working

Section 3: Disposal Practices

16. When disposing of unwanted electronics, what factors influence your decision-making?

what's more/less important when disposing of waste electronic device?

Environmental impact of disposal method

Most
Important

Very
Important

Neutral

Somewhat
Important

Least
Important

☐☐☐☐☐

Convenience (distance, ease of access)

☐☐☐☐☐

Potential income from selling or recycling fees

☐☐☐☐☐

Fear of data leakage from old devices

☐☐☐☐☐

Cultural beliefs or practices regarding e-waste

☐☐☐☐☐

Regulations or policies (if any)

☐☐☐☐☐

17. What is the typical way that you dispose of E-waste devices in your household? (Check all that apply)

How do you normally get rid of waste electronic device?

- ☐ Recycle electronics at a designated facility
- ☐ Sell to electronics scrap yard/recycler
- ☐ Sell to electronics repair shop/refurbisher
- ☐ Donate to a charity that accepts electronics
- ☐ Landfill/Dump
- ☐ Burning
- ☐ Put in bin (with general waste)
- ☐ Put in bin (with recycling waste)
- ☐ Give to waste collectors
- ☐ Store at home
- ☐ Leave with repair shop
- ☐ Kept in storage
- ☐ Other (Please specify below)

If Other (Please specify below)

If you selected "Recycle them at a designated facility" in Q17, please specify the name of the facility (if known)

Name of recycle facility

5. If you selected "Recycle them at a designated facility" in Q17, please specify the distance from your home to the facility (in kilometers)

distance in kilometers from your home to recycle facility

If you selected "Recycle them at a designated facility" in Q17, please specify your level of satisfaction with the facility's services

Tell us about the services you received from the recycle facility

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neutral
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied

If you selected "Sell them to scrap collectors" in Q17, how do you typically find scrap collectors?

How did you find the scrap dealer?

- ☐ Friends/family referrals
- ☐ Through advertisements
- ☐ Approach them directly at your home
- ☐ Other (Please specify below)

If you selected "other" , how do you typically find scrap collectors apart from above?

If you selected "Sell them to scrap collectors" in Q17, are you satisfied with the prices offered by scrap collectors for your e-waste?

Is the price given for your waste electronic device okay?

- ☐ Yes
- ☐ No

If no, please elaborate on why you are not satisfied.

18. Are there any concerns you have about selling e-waste to scrap collectors? (Select all that apply)

why you wouldn't or don't like selling your waste electronic device to scrap dealers

- ☐ Unfair/low prices offered
- ☐ Lack of transparency in the recycling process
- ☐ Environmental impact of their practices
- ☐ Data security risks from devices not being properly wiped
- ☐ Other (Please specify below)

If you selected "Other " Please specify below

20. Are you aware of what happens to the equipment you have disposed?

Do you know what happens to the waste electronic device that you get rid off?

- ☐ Yes
- ☐ No

21. Do waste collectors come and pick-up waste at your door? Do they take out e-waste too?

Do waste come to your neighborhood? Do they pick up all your waste or do they remove the waste electronic devices?

- ☐ Yes, everything
- ☐ Yes, but no E-waste
- ☐ No

22. Do you know where you can take your e-waste for proper disposal in Tarkwa?

knowledge about waste electronic device disposal in Tarkwa

- ☐ Yes
- ☐ No

If yes, where do you take your e-waste for disposal?

Give out the location or place of disposal

If no, would you be interested in learning more about where to take e-waste for proper disposal?

Are you willing to know where you can dispose off your waste electronic device?

☐ Yes

☐ No

Section 4: Awareness and Attitudes

24. Are you aware of any e-waste collection or recycling programs in your area?

awareness

☐ Yes

☐ No

If yes, have you participated in any of these programs?

participation eagerness level

☐ Yes

☐ No

If no, what are the reasons for not participating? (Select all that apply)

reasons for no participation

☐ Lack of information

☐ Inconvenient location

☐ Lack of time

☐ Other (Please specify below)

If you selected "Other " Please specify below

25. Are you aware of any health or environmental risks associated with improper e-waste disposal?

risks associated with improper e-waste disposal

- ☐ Yes
- ☐ No

26. How concerned are you about the environmental impact of e-waste?

Level of concern about environmental effects caused by waste electronic devices

- ☐ Very Concerned
- ☐ Somewhat Concerned
- ☐ Neutral
- ☐ Slightly concerned
- ☐ Not at all concerned

27. How concerned are you about the following potential consequences of improper e-waste disposal (Rate from 1= Not at all concerned to 5= Very concerned):

Specific concern levels associated with some improper disposal of e-waste

	Very Concerned	Somewhat Concerned	Neutral	Slightly concerned	Not at all concerned
Environmental pollution (air, water, soil)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health problems in humans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Damage to wildlife and ecosystems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of valuable resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. In your opinion, what are the biggest challenges to responsible e-waste disposal in Tarkwa? (Select all that apply)

Challenges facing proper or responsible e-waste disposal in your opinion

- ☐ Lack of awareness about proper disposal methods
- ☐ Limited access to recycling facilities
- ☐ Unattractive prices offered by scrap collectors
- ☐ Inconvenience of formal recycling options
- ☐ Cultural beliefs or practices regarding e-waste
- ☐ Other (Please specify below)

If you selected Other from q28 (Please specify below)

29. How important is responsible e-waste disposal to you?

Level of importance with regards to responsible e-waste disposal

- ☐ Very important
- ☐ Somewhat important
- ☐ Neutral
- ☐ Least important
- ☐ Not important

30. Would you be willing to pay a small fee to ensure your e-waste is recycled responsibly?

Are you willing to pay premium for responsible e-waste recycling?

- ☐ Yes
- ☐ No

31. If yes, what is the maximum fee you would be willing to pay (in Ghanaian Cedis)?

How much in Ghana Cedis do you want to start with?

Section 5: Knowledge of E-waste Management:

32. Do you think there is adequate infrastructure (e.g., collection points, recycling facilities) for proper e-waste management in your area?

Do you think the systems in place to check proper e-waste management in your area is enough?

☐ Yes

☐ No

33. Have you ever heard of any government initiatives or programs related to e-waste management in Tarkwa?

knowledge about government led programs on e-waste management in Tarkwa

☐ Yes

☐ No

If yes, please describe what you know about these initiatives/programs.

Tell us more about such program

34. In your opinion, what role should the government play in promoting responsible e-waste management in Tarkwa? (Select all that apply)

What do you think the government should do in propmoting responsible e-waste management in Tarkwa?

- ☐ Public education and awareness campaigns
- ☐ Establishing and supporting recycling facilities
- ☐ Implementing regulations for e-waste collection and disposal
- ☐ Providing financial incentives for responsible disposal
- ☐ Collaborating with private sector and NGOs

Thank you for your participation in this study. Your input is invaluable not just in helping me carry on my final year capstone project but also to gain a better understanding of the factors that influence e-waste generation in peri urban cities like Tarkwa. If you have any questions or concerns, please feel free to contact Samuel Amoakoh at ma-samoakoh1820@st.umat.edu.gh.

Thank you so much for your time and attention.
