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HOUSEHOLD ENERGY CONSUMPTION SURVEY REPORT 2023: MAINLAND TANZANIA

SEPTEMBER 2025

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LIST OF ABBREVIATIONS

CAPI Computer-Assisted Personal Interviews

CNG Compressed Natural Gas **D1** Lifeline Electricity Tariff EA **Enumeration Areas** EF **Expertise France**

EU European Union

EWURA Energy and Water Utilities Regulatory Authority

GWh Gigawatt-hour

HBS Household Budget Survey

HECS Household Energy Consumption Survey **IASES** Impact of Access to Sustainable Energy Survey

ICS Improved Cookstoves

kg Kilograms

Kilotons of oil equivalent ktoe

kWh Kilowatt-hour

LNG Liquefied Natural Gas LPG Liquefied Petroleum Gas

MW Megawatt

NBS National Bureau of Statistics

OSC Out of School Care

PBPA Petroleum Bulk Procurement Agency **PPS** Probability Proportional to Size

PURA Petroleum Upstream Regulatory Authority

PV Photovoltaic

REA Rural Energy Agency

RES Renewable Energy Sources SDG Sustainable Development Goal

SWH Solar Water Heaters

T1 General Domestic Electricity Tariff

TANESCO Tanzania Electric Supply Company Limited **TAREA** Tanzania Renewable Energy Association **TDV** Tanzania Development Vision 2025

TJ Terajoules

TPDC Tanzania Petroleum Development Corporation

TPES Total Primary Energy Supply

TZS Tanzanian Shillings

EXECUTIVE SUMMARY

he 2023 Household Energy Consumption Survey (HECS) represents a landmark step in Tanzania's national energy data system. Jointly implemented by The National Bureau of Statistics (NBS) and the Ministry of Energy, with support from Expertise France (EF) and funding from the European Union (EU), the survey provides the first comprehensive evidence on how households access, use, and pay for energy across Mainland Tanzania. It comes at a decisive moment when the country is intensifying efforts to achieve Sustainable Development Goal 7 (SDG 7) and the objectives of Tanzania's Development Vision 2025, which emphasize universal access to affordable, reliable, sustainable, and modern energy.

The survey successfully met its objectives by quantifying the types and quantities of energy used by households for cooking, lighting, water heating, and space heating. It measured the level of access to modern energy sources, identified barriers to adoption, analyzed affordability issues, and revealed regional and socio-economic disparities in access to clean energy. The findings provide actionable insights that can directly inform policy design, guide resource allocation, and accelerate the country's clean energy transition.

Results show that electricity access in Tanzania has significantly expanded, reaching 71.2 % of households. However, rural access remains considerably lower at 61 % compared to 84 % in urban areas. TANESCO continues to dominate electricity supply in urban centers, while 59.7 % of rural households depend on off-grid solar systems. Although the D1 lifeline tariff has improved affordability for low-income consumers, with 72.5 % of households spending less than TZS 10,000 per month on electricity, the low expenditure indicates constrained consumption rather than improved welfare. This suggests that many households remain "energy poor"—connected to power but unable to use it productively. Expanding access must therefore go hand in hand with affordability and reliability improvements. Policies should prioritize investments in decentralized solar and mini-grid systems through the Rural Energy Agency (REA), expand the D1 lifeline program, and strengthen partnerships with private operators to extend off-grid services to remote areas.

The survey findings underscore an urgent need to accelerate the transition from traditional biomass to modern cooking energy. Despite progress in urban centers, the majority of households still rely on firewood (65.5 %) and charcoal (44 %), while only 24.6 % use Liquefied Petroleum Gas (LPG) and 1.9 % use electricity. This heavy reliance on biomass contributes to deforestation, indoor air pollution, and gender-based time poverty. The data calls for a National Clean Cooking Acceleration Strategy that combines fiscal incentives for cleaner fuels, promotion of locally produced improved cookstoves, and targeted public awareness campaigns, particularly in rural areas. Reducing import duties and taxes on LPG cylinders, accessories, and improved stoves would lower entry barriers and stimulate market growth. Integrating women as distributors and entrepreneurs in clean cooking value chains would further strengthen adoption while promoting gender equality.

Heating and lighting patterns also reveal untapped opportunities for renewable energy integration. Over 97 % of households use biomass for water and space heating, while solar water heaters and biogas remain almost nonexistent. This highlights a policy gap that could be addressed through incentives for solar water heating systems in new housing developments, promotion of biogas plants in livestock-rich areas, and support for local manufacturing of renewable heating technologies. For lighting, although electricity has become the dominant source, many rural households still depend on kerosene and solar lanterns due to limited grid coverage and reliability. Policies should therefore promote the expansion of solar mini-grids and ensure that off-grid solar remains a key component of rural electrification.

EXECUTIVE SUMMARY

The findings also show that low household energy expenditure reflects limited purchasing power rather than efficiency gains. Average energy spending remains modest around TZS 10,000 per month for electricity and small amounts for biomass fuels. To address this, the government could introduce micro-finance programs to help households purchase efficient appliances and clean cooking equipment, coupled with campaigns to raise awareness about energy efficiency. Introducing progressive electricity pricing that encourages productive use among low-income users would also help translate access into improved livelihoods.

Social and demographic factors continue to shape energy use. With 72 % of households headed by men and 68.8 % of the population having completed only primary education, energy decisions are often constrained by income, education, and gender. Women are the most affected by reliance on biomass, facing exposure to harmful smoke and long hours spent collecting firewood. These findings call for gender mainstreaming and education driven approaches in energy policy promoting women's participation in clean energy entrepreneurship, expanding energy literacy programs, and linking adult education with household energy management training.

The 2023 HECS also demonstrated the critical importance of a reliable and integrated energy data system for evidence-based policymaking. To institutionalize data-driven energy planning, Tanzania should establish a coordinated national energy statistics system that brings together NBS, REA, TANESCO, and the Ministry of Energy under a unified platform. Regular household energy surveys should be institutionalized, and data should be harmonized to enable consistent tracking of SDG 7 indicators and to inform national energy balance updates.

In conclusion, the 2023 Household Energy Consumption Survey has not only achieved its intended objectives but has also provided a clear roadmap for action. Its findings underscore that while access to modern energy in Tanzania is expanding, affordability, equity, and sustainability remain major challenges. The evidence calls for urgent, coordinated, and well-targeted interventions expanding decentralized energy solutions, promoting clean cooking technologies, enhancing affordability through fiscal reforms, empowering women and youth in energy programs, and strengthening national data systems.

DEFINITION OF KEY TERMS

HOUSEHOLD

A person or a group of persons who live together, share the same plot and recognize one of them as the head of household.

REFERENCE PERIOD

The reference period covered by the survey was 2023.

RESPONDENT

Any responsible adult household or family member who provided reliable answers to the survey questions.

ENERGY

Energy is technically defined as the "capacity to do work." In the household context, it refers to the fuel or power used to operate electrical and non-electrical appliances, vehicles, equipment, and other devices whether for daily needs, convenience, or home-based economic activities. Energy can be generated from and provided by a variety of forms: electricity, petroleum products and renewable energy sources. Electricity covers not only those distributed by utilities but also those produced by generators and batteries. Petroleum products include kerosene, natural gas, LPG (or cooking gas), regular gasoline, premium gasoline, and diesel. Renewable energy sources include firewood, charcoal, biomass residues (such as forest products residues, wood waste, agriculture, and animal waste), solar PV, hydroelectricity, and others.

ELECTRICITY

This includes electricity from large and small power generation plants distributed to households by utilities like TANESCO or private providers, as well as electricity from generators and rechargeable batteries. Batteries are considered as an electricity source if they generate electricity for the household and not for transport purposes.

LIQUEFIED PETROLEUM GAS (LPG)

LPG is a flammable hydrocarbon gas composed primarily of propane (C_3H_8) and butane (C_4H_{10}). It is obtained as a byproduct during the refining of crude oil or the extraction of natural gas.

KEROSENE

Kerosene is a colorless liquid generally used for lighting, cooking, and starting a fire.

DIESEL/PETROL

Diesel and petrol are fuels normally used in transport but can also be used in households to run generators.

BIOETHANOL

Ethanol is a renewable, water-free alcohol produced from fermentation of sugar or converted starch.

NATURAL GAS

A mixture of gaseous hydrocarbons, primarily methane (70 to 90 percent), but generally also include ethane, propane and higher hydrocarbons in much smaller amounts and some non-combustible gases such as nitrogen and carbon dioxide. The separation process produces natural gas by removing or reducing the hydrocarbons other than methane to levels that are acceptable in the marketable gas. The natural gas liquids (NGL) removed in the process are distributed separately. Tanzania extracts natural gas from the Songo Songo and Mnazi fields. Currently, a few hundred households are connected to the natural gas grid in Dar es Salaam, Lindi and Mtwara.

COMPRESSED NATURAL GAS (CNG)

CNG is natural gas (primarily composed of methane, CH₄) that is compressed to less than 1% of its volume at standard atmospheric pressure. This makes it easier to store and transport in cylinders at high pressure, typically around 200-250 bar (2,900-3,600 psi). It is typically used to power vehicles or industrial processes. CNG is currently used in Tanzania.

LIQUEFIED NATURAL GAS (LNG)

LNG is natural gas (primarily methane, CH_a) that has been cooled to an extremely low temperature of approximately -162°C (-260°F) to convert it into a liquid state. This process reduces its volume by about 600 times, making it easier to store and transport over long distances where pipelines are not feasible. It is currently not in use in Tanzania.

RENEWABLE ENERGY SOURCES

Renewable energy sources are energy sources that are naturally replenished on a human timescale and include firewood, charcoal, biomass residues, biogas, hydro, geothermal wind and solar.

BIOMASS

Organic material derived from plants, animals, or microorganisms that can be used as a source of energy. It is a renewable energy source because it is replenished through natural processes like photosynthesis and biological cycles.

GEOTHERMAL

Heat that originates from within the Earth. This heat is generated by the natural radioactive decay of minerals, the residual heat from Earth's formation, and tectonic activity. Geothermal energy can be harnessed for various applications, including power generation and heating. It is currently not in use in Tanzania, although there are projects to develop several sites.

FIREWOOD

Also referred to as firewood, it is wood that is harvested and used as a fuel source for cooking, heating, or energy transformation into charcoal. It is one of the oldest and most widely used forms of biomass energy, particularly in rural and low-income areas where modern fuels are less accessible.

CHARCOAL

A solid, carbon-rich material derived from the thermal decomposition of organic matter, primarily firewood, in the absence of oxygen. This process, known as pyrolysis, removes moisture and volatile compounds, leaving behind almost pure carbon with a porous structure.

BIOGAS

The gaseous fuel formed when methane producing bacteria acts on organic matter in the absence of oxygen. It can be generated from animal manure, human feces, dead plants or animals and other materials into which plants and animals have been transformed.

SOLAR

Energy harnessed from the sun's radiation using various technologies. It is a renewable and sustainable source of energy. Solar energy can be converted into electricity, heat, or used directly for lighting and other applications. The two main technologies in use in Tanzania are solar photovoltaic (PV) panels and solar water heaters (SWH).

ACKNOWLEDGMENTS

he successful completion of the 2023 Household Energy Consumption Survey would not have been possible without the invaluable contributions and support of numerous individuals and institutions.

We extend our deepest gratitude to the households across the Mainland Tanzania who generously participated in the survey by providing essential information. Their cooperation and openness formed the backbone of this important survey.

We are also grateful to the dedicated team of field enumerators, supervisors, and data collectors whose commitment and professionalism ensured the quality and reliability of the data collected. Special thanks go to the regional and district administrative offices for their logistical support and coordination during fieldwork.

Our sincere appreciation goes to the technical team responsible for designing the survey tools, conducting data analysis, and preparing this report. Your expertise and tireless efforts made this publication possible.

We also acknowledge the support of our development partners and stakeholders whose financial and technical assistance was crucial throughout the planning, implementation, and reporting phases of the

Finally, we recognize the leadership and guidance provided by the management of the National Bureau of Statistics (NBS), whose vision and oversight ensured the smooth execution of the survey.

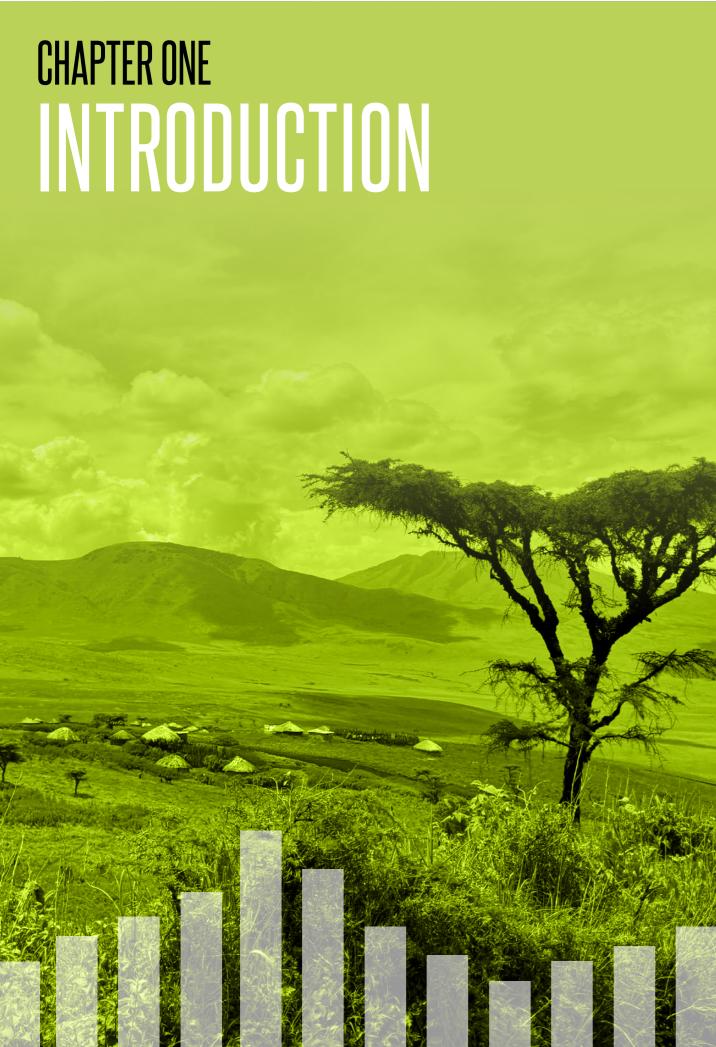
We say thank you to all who contributed to this important national effort.

Dr. Amina S. Msengwa

sengroa.

Statistician General National Bureau of Statistics

September 2025



1.1 BACKGROUND

The 2023 Household Energy Consumption Survey (HECS) was the first of its kind conducted in Mainland Tanzania. It was jointly implemented by the National Bureau of Statistics (NBS) and the Ministry of Energy, with technical assistance from Expertise France (EF) and financial support from the European Union (EU). The survey provides critical insights for monitoring progress towards Sustainable Development Goal 7 (SDG 7) — Affordable and Clean Energy — and supports the implementation of Tanzania's Development Vision 2025, which aspires to achieve a diversified and sustainable energy economy that ensures access to reliable, affordable, and modern energy for all. It also assesses barriers to adopting clean and renewable technologies, energy affordability, and disparities in access between rural and urban households.

1.2 SURVEY OBJECTIVES

The primary goal of this survey was to collect comprehensive data on energy consumption patterns across households in Mainland Tanzania with a view to support the country's energy planning and sustainability efforts. The data collected provides valuable insights that can inform policymaking, improve energy efficiency, and promote sustainable energy practices. Since many households, particularly in rural areas, rely heavily on biomass fuels such as firewood and charcoal, the survey focuses on energy use for cooking, lighting, and

The specific objectives of the survey were to:

- i. To identify and quantify the types and amounts of energy used by households for cooking, lighting, space heating, water heating, and other household activities.
- ii. To measure the availability and adoption of modern energy solutions, such as electricity, liquefied petroleum gas (LPG), and solar power in both rural and urban areas.
- iii. To provide evidence-based insights to support the formulation and implementation of energy policies that advance universal access, improve efficiency, and accelerate the transition to clean energy within the national development agenda.
- iv. To assess the needs and opportunities for expanding off-grid energy solutions, including solar PV systems, and to evaluate household awareness and usage levels of renewable energy technologies.

1.3 PRIMARY ENERGY SUPPLY IN TANZANIA

Total Primary Energy Supply (TPES) refers to the total amount of energy available to a country from various sources, including fossil fuels, nuclear, and renewable energy. according to the 2023 Energy Balance Report, the TPES in Tanzania amounted to 44,464 kilotons of oil equivalent (ktoe). Biofuels, encompassing primarily wood and charcoal, played a significant role in Tanzania's energy mix accounting for 85.7% of the total energy mix followed by oil 7.9 %, 4.5% natural gas, 1.3% coal, and 0.6% hydroelectricity and other renewable electricity sources. These figures reflect the country's reliance on traditional biomass and emphasize the need to diversify the energy mix by promoting renewable energy sources (Figure 1).

FIGURE 1.1: TOTAL PRIMARY ENERGY SUPPLY, TOTAL FINAL CONSUMPTION AND FUEL SHARES IN TANZANIA, 2023

Total Primary Energy Supply (44,464 ktoe)



Total Final Consumption (24,959 ktoe)

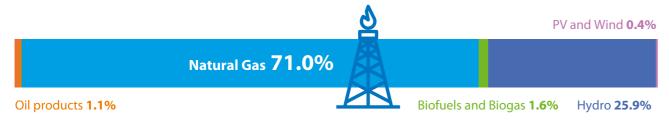


Source: Tanzania Energy Balance 2023

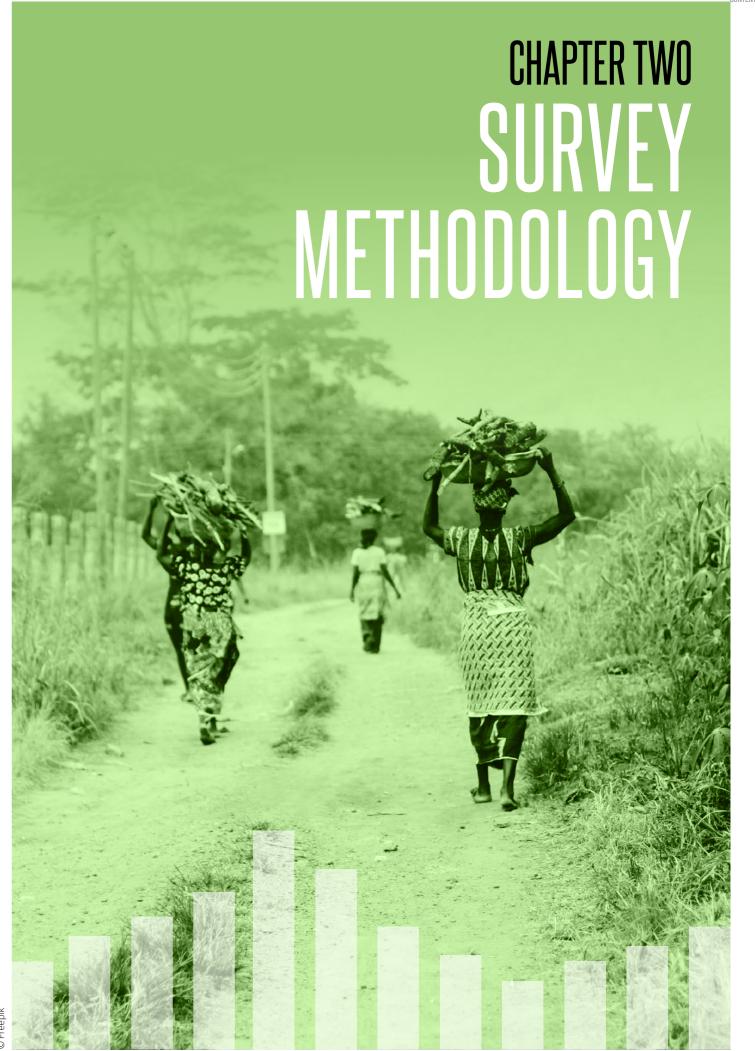
1.4 ELECTRICITY GENERATION

Electricity generation in Tanzania is derived from a mix of sources, reflecting the country's ongoing efforts to diversify its energy portfolio. The key components of Tanzania's electricity generation included natural gas, hydro power and other renewables such as wind, solar and biomass. In 2023, the country's grid electricity was mostly generated from natural gas (71.0%), hydro (25.9%), oil (1.1%), and biofuels and biogas (1.6%). Solar PV and wind are almost negligible at 0.4% (Figure 2).

FIGURE 1.2: SHARES OF SOURCES OF ELECTRICITY IN GRID SUPPLIED ELECTRICITY IN TANZANIA, 2023



Source: Tanzania Energy Balance 2023



2.1 INTRODUCTION

The 2023 HECS employed a structured and statistically sound methodology to ensure the reliability and representativeness of the data collected across Mainland Tanzania.

2.2 SURVEY SCOPE AND COVERAGE

The survey scientifically covered selected households across all regions in Mainland Tanzania, including both rural and urban areas, to capture diverse energy consumption patterns. The survey examines various energy sources used by households, including solid biofuels (firewood, charcoal), electricity (grid connected and offgrid including PV), liquefied petroleum gas (LPG), kerosene, biogas, and other sources that see minimal use.

2.3 SAMPLE DESIGN

The HECS used a cross-sectional design, collecting data from a nationally representative sample of households at a single point in time. The survey was designed to capture variations in household energy consumption across different geographic areas (urban vs. rural), socio-economic groups, and regions.

The domains cover 26 regions, which are Dodoma, Arusha, Kilimanjaro, Tanga, Morogoro, Pwani, Dar es Salaam, Lindi, Mtwara, Ruvuma, Iringa, Mbeya, Singida, Tabora, Rukwa, Kigoma, Shinyanga, Kagera, Mwanza, Mara, Manyara, Njombe, Katavi, Simiyu, Geita, and Songwe.

2.4 SAMPLING FRAMEWORK

A stratified two-stage sampling technique was applied. In the first stage, 845 Enumeration Areas (EAs) were systematically selected with probability proportional to size (PPS) from the national sampling frame based on the 2022 Population and Housing Census, ensuring both rural and urban areas were represented. In the second stage, a fixed number of 15 households were systematically selected within each EA to participate in the survey.

2.5 SAMPLE SIZE

The total sample size was calculated considering precision requirements of the estimates within each domain. The reference variables used to calculate the sample size were households connected to electricity as collected in the 2019/20 Energy Access and Use Situation Survey II. The total number of EAs selected was 845, resulting in 12,675 households. The sample size was determined to provide reliable estimates at the national and urban/rural levels, and to allow disaggregation by key demographic and socio-economic variables.

2.6 DATA COLLECTION TOOLS

In this survey, household questionnaires, interviews and other tools such as enumerator manual were used to collect information from private households. Scales were used to collect information on the weight of solid biomass consumed.

2.7 HOUSEHOLD QUESTIONNAIRE

A structured questionnaire was used to collect household-level information, covering the following areas:

- 1. Household demographic characteristics
- 2. Businesses operation
- 3. Electricity
- 4. Cooking
- 5. Water heating
- 6. Space heating
- 7. Lighting
- 8. Quantities used/related expenditures
- 9. Privately owned vehicles
- 10. Business related consumption

The questionnaire was pre-tested and translated into Kiswahili to ensure clarity and consistency.

2.8 ENUMERATOR'S MANUAL

The enumerator's manual guided data collectors, explaining key survey concepts, practical fieldwork approaches, and tips for gathering accurate, complete, and consistent data from respondents.

2.9 TABLET

Tablets were used by enumerators for listing and collecting data from the selected households.

2.10 EA MAPS

Digitized enumeration maps were used during surveys to clearly define the coverage areas, ensuring that enumerators remained within their assigned boundaries and preventing duplicate data collection by marking areas that had already been surveyed.

2.11 RECRUITMENT

Recruiting qualified field personnel was essential for ensuring quality data. A total of 120 experienced enumerators were engaged in the survey.

2.12 TRAINING

The 2023 HECS training took place for 3 days in Morogoro where 120 enumerators and 26 supervisors were trained. The training ensured a shared understanding of survey questions, EA identification, tablet use, and data collection techniques. It included class presentations, mock interviews, and field practice. Supervisors also received training in household selection and field coordination. The trainers were experts from NBS headquarters, the Ministry of Energy, TANESCO, REA, TPDC, EWURA, TAREA, PBPA and PURA.

2.13 ORGANIZATION OF FIELD WORK

A total of 26 field teams were deployed for data collection, with one team assigned to each region. Each team comprised 4 to 6 enumerators, a driver, and a supervisor—specifically, the Regional Statistical Manager.

2.14 DATA COLLECTION

Data was collected through face-to-face interviews by trained enumerators using Computer-Assisted Personal Interviewing (CAPI) devices to enhance data accuracy and reduce processing time. Enumerators received comprehensive training on the questionnaire content, interviewing techniques, and ethical considerations.

To collect reliable data on firewood and charcoal use for activities such as cooking, water heating and space heating, the enumerators had been equipped with scales to weigh the amount of wood and charcoal used for each activity.

2.15 QUALITY ASSURANCE

To ensure data quality, several measures were implemented:

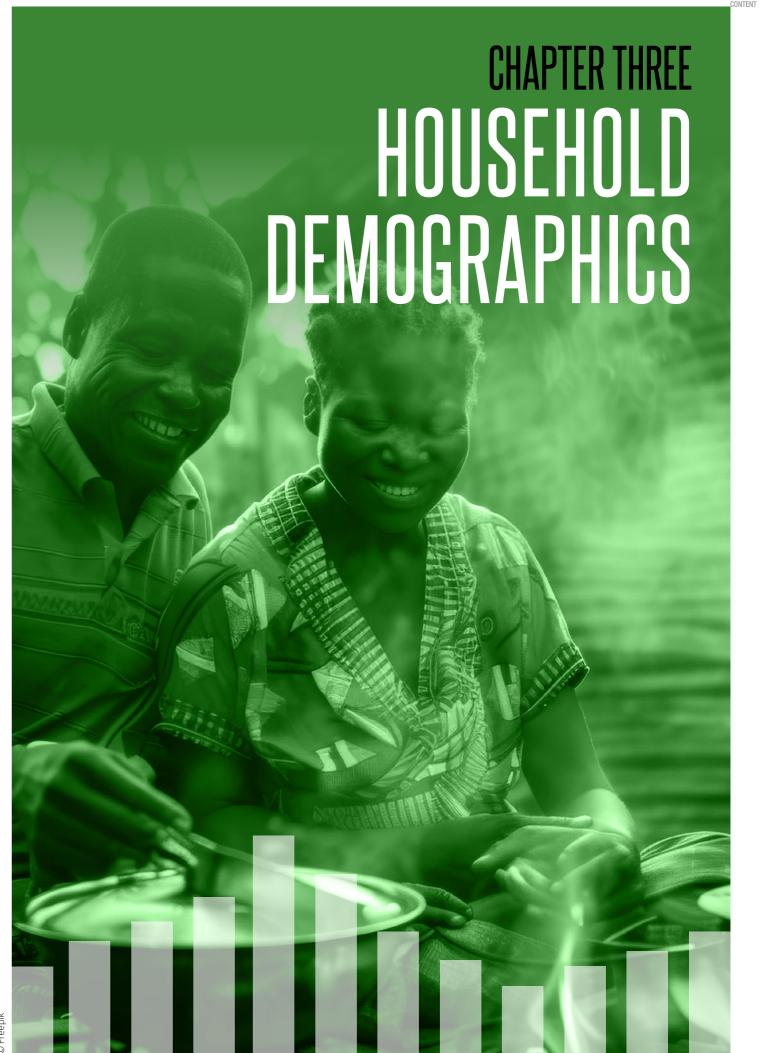
- i. Field supervision and spot checks
- ii. Real-time data validation through CAPI; and
- iii. Daily review and feedback mechanisms.

2.16 DATA PROCESSING AND ANALYSIS

The data was weighted to account for the survey design and non-response, enabling national-level aggregations. Analysis was conducted using statistical software (Stata), with results disaggregated by gender, location, and other relevant factors.

2.17 RESPONSE RATE

There were no refusals, resulting in a 100% response rate.



3.1 INTRODUCTION

In addition to offering insights into household energy access and consumption patterns, the 2023 HECS also presents valuable information on the demographic characteristics of households in Mainland Tanzania. This chapter covers the composition and status of private households, focusing on demographics. It includes details on family structure, age, sex, marital status and education levels.

3.2 COMPOSITION OF HOUSEHOLD MEMBERS

Household composition describes the members based on characteristics like age, sex, relationship to the head of household, and the number of marital pairs or nuclear families within it. Age and sex are key demographic variables forming the basis for classifications in censuses and surveys.

The entire population is almost evenly split, comprising 48% male and 52% female, with notable variations in the gender ratio across diverse age groups. In younger age groups (0–19 years), the gender ratio is relatively balanced, with slight male dominance in some groups (e.g., 5–9 years: 51% male). From ages 20–39, there is a noticeable shift, with females forming a larger proportion (e.g., 20-24 years: 43% male, 57% female). This could be due to factors such as migration or differing survival rates. In older age groups (60+), the male percentage increases in age ranges of 60-64 (51%). However, female dominate significantly at the oldest ages (80+), particularly within the age ranging from 80–84 (62%). This reflects higher female life expectancy. The population steadily decreases with age, reflecting mortality trends (Table 3.1).

TABLE 3.1: DISTRIBUTION OF HOUSEHOLD MEMBERS BY SEX AND AGE GROUP, MAINLAND **TANZANIA, 2023 HECS**

| A Course | | Sex | | |
|-------------------|----|-----|--------|--|
| Age Group | M | ale | Female | |
| 0 - 4 | 4 | 19 | 51 | |
| 5 - 9 | | 51 | 49 | |
| 10 - 14 | | 50 | 50 | |
| 15 - 19 | ۷ | 48 | 52 | |
| 20 - 24 | 4 | 43 | 57 | |
| 25 - 29 | ۷. | 14 | 56 | |
| 30 - 34 | ۷ | 48 | 52 | |
| 35 - 39 | ۷ | 17 | 53 | |
| 40 - 44 | ۷ | 19 | 51 | |
| 45 - 49 | | 50 | 50 | |
| 50 - 54 | ۷ | 19 | 51 | |
| 55 - 59 | ۷ | 19 | 51 | |
| 60 - 64 | Ę | 51 | 49 | |
| 65 - 69 | | 55 | 45 | |
| 70 - 74 | ۷ | 48 | 52 | |
| 75 - 79 | ۷ | 17 | 53 | |
| 80 - 84 | 3 | 38 | 62 | |
| 85+ | ۷. | 45 | 55 | |
| Mainland Tanzania | 4 | 18 | 52 | |

3.3 GENDER OF HOUSEHOLD HEAD

The results from the 2023 HECS indicate that 72% of households in Mainland Tanzania were male-headed, while only 28% were female-headed. This result highlights a significant gender disparity in household leadership, with nearly three-quarters of households being headed by men. It reflects broader socioeconomic patterns where men are more likely to be considered the heads of households, potentially due to traditional norms, inheritance structures, or income-generating roles (Figure 3.1).

FIGURE 3.1: DISTRIBUTION OF HOUSEHOLDS BY SEX OF HOUSEHOLD HEAD, MAINLAND **TANZANIA, 2023 HECS**

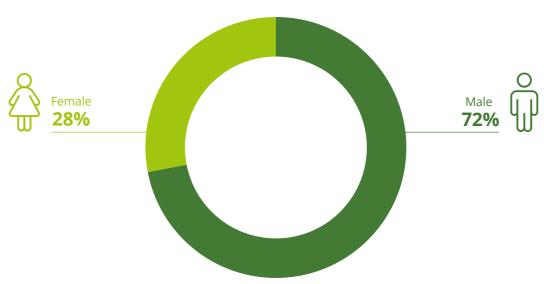


Table 3.2 provides a detailed breakdown of the number of households by the sex of the household head across different regions in Mainland Tanzania.

Results show the proportion of male household heads is significantly higher across all regions, with Katavi (81%) and Geita (78.9%) recording the highest percentages. The regions with relatively lower proportions of male household heads include Lindi (60.2%) and Mtwara (61.6%), suggesting a relatively more balanced gender distribution compared to other regions.

CHAPTER THREE /// HOUSEHOLD DEMOGRAPHICS CHAPTER THREE /// HOUSEHOLD DEMOGRAPHICS

TABLE 3.2: DISTRIBUTION OF HOUSEHOLDS BY SEX OF HOUSEHOLD HEAD AND REGION. **MAINLAND TANZANIA, 2023 HECS**

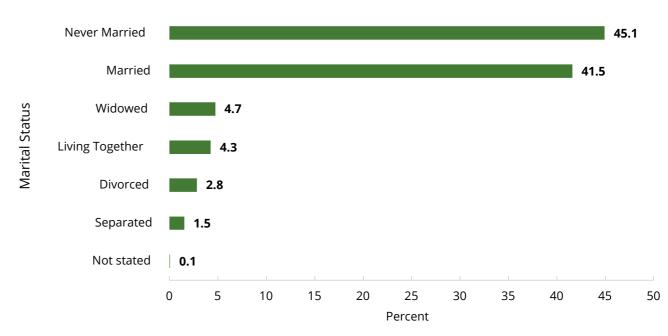
| | | Sex | | |
|-------------------|------|--------|--|--|
| Region | Male | Female | | |
| Dodoma | 65.0 | 35.0 | | |
| Arusha | 76.9 | 23.1 | | |
| Kilimanjaro | 68.2 | 31.8 | | |
| Tanga | 74.8 | 25.2 | | |
| Morogoro | 69.7 | 30.3 | | |
| Pwani | 70.3 | 29.7 | | |
| Dar es Salaam | 71.6 | 28.4 | | |
| Lindi | 60.2 | 39.8 | | |
| Mtwara | 61.6 | 38.4 | | |
| Ruvuma | 76.0 | 24.0 | | |
| Iringa | 63.9 | 36.1 | | |
| Mbeya | 75.6 | 24.4 | | |
| Singida | 75.7 | 24.3 | | |
| Tabora | 75.8 | 24.2 | | |
| Rukwa | 76.1 | 23.9 | | |
| Kigoma | 74.6 | 25.4 | | |
| Shinyanga | 73.1 | 26.9 | | |
| Kagera | 71.6 | 28.4 | | |
| Mwanza | 71.4 | 28.6 | | |
| Mara | 67.8 | 32.2 | | |
| Manyara | 75.7 | 24.3 | | |
| Njombe | 67.3 | 32.7 | | |
| Katavi | 81.0 | 19.0 | | |
| Simiyu | 75.4 | 24.6 | | |
| Geita | 78.9 | 21.1 | | |
| Songwe | 78.1 | 21.9 | | |
| Mainland Tanzania | 72.0 | 28.0 | | |

3.4 MARITAL STATUS

Marital status and energy consumption can be influenced by several socio-economic and behavioral factors. Generally, married individuals or households may experience differences in energy use compared to single individuals, due to factors like household size, shared living arrangements, and collective decision-making regarding energy usage.

This section analyses marital status of the household members aged 12 years and above. Figure 3.2 indicates that 45.1% of household members aged 12 years and above in Mainland Tanzania were never married, while 41.5% were married. A small proportion of 4.7% were widowed, 4.3% were living together without a formal marriage, 2.8% were divorced, and 1.5% were separated.

FIGURE 3.2: DISTRIBUTION OF HOUSEHOLDS BY MARITAL STATUS, MAINLAND TANZANIA, 2023 **HECS**



Dodoma, Dar es Salaam, Mwanza and Mara regions recorded highest number of never married individuals at about 48% compared to lowest (38.0%) recorded in Mtwara (Table 3.3). This could indicate socioeconomic factors such as economic instability, delayed marriage, or cultural influences that affect the timing of marriage. This trend could also be reflective of urbanization, where people delay marriage due to career or educational pursuits.

Songwe and Shinyanga regions stand out with the highest percentages of married individuals (52.6% and 50.7%, respectively). This could be due to regional cultural norms that prioritize marriage, or it could reflect a more traditional family structure that is common in rural or semi-urban areas.

Higher percentages of widowed individuals were notable in Kilimanjaro (9.2%), Iringa (7.0%) and Mara (6.8%) regions (Table 3.3 shows). This could be due to factors such as higher mortality rates in certain areas, reflecting a younger demographic.

TABLE 3.3: DISTRIBUTION OF HOUSEHOLDS BY MARITAL STATUS AND REGION, MAINLAND **TANZANIA, 2023 HECS**

| | Marital Status | | | | | | |
|-------------------|------------------|---------|--------------------|----------|-----------|---------|------------|
| Region | Never Married | Married | Living Together | Divorced | Separated | Widowed | Not stated |
| Dodoma | 48.8 | 40.3 | 2.2 | 2.5 | 1.3 | 4.8 | - |
| Arusha | 43.8 | 47.9 | 0.5 | 1.8 | 0.8 | 5.2 | - |
| Kilimanjaro | 40.3 | 44.2 | 1.2 | 2.6 | 2.5 | 9.2 | - |
| Tanga | 46.2 | 42.4 | 1.8 | 2.4 | 2.0 | 5.1 | - |
| Morogoro | 44.0 | 35.4 | 11.2 | 4.1 | 1.0 | 4.2 | 0.1 |
| Pwani | 40.4 | 46.1 | 6.0 | 3.7 | 1.3 | 2.4 | - |
| Dar es Salaam | 48.4 | 39.9 | 4.1 | 2.3 | 1.3 | 4.1 | - |
| Lindi | 40.5 | 40.3 | 4.2 | 8.1 | 1.3 | 5.6 | - |
| Mtwara | 38.0 | 45.0 | 1.1 | 6.9 | 3.1 | 5.8 | 0.1 |
| Ruvuma | 42.5 | 44.0 | 4.3 | 2.9 | 1.8 | 4.5 | - |
| Iringa | 47.4 | 40.9 | 2.1 | 0.9 | 1.6 | 7.0 | - |
| Mbeya | 42.6 | 43.5 | 4.8 | 2.0 | 2.3 | 4.8 | - |
| Singida | 47.9 | 30.7 | 13.3 | 2.8 | 1.3 | 4.0 | - |
| Tabora | 46.6 | 38.7 | 6.6 | 2.9 | 2.1 | 2.9 | - |
| Rukwa | 45.1 | 27.5 | 19.8 | 1.8 | 1.0 | 4.7 | 0.1 |
| Kigoma | 46.7 | 42.2 | 1.0 | 2.3 | 1.6 | 6.2 | - |
| Shinyanga | 43.7 | 50.7 | - | 1.9 | 0.4 | 3.2 | 0.0 |
| Kagera | 43.9 | 44.5 | 1.0 | 2.2 | 2.5 | 6.0 | - |
| Mwanza | 48.7 | 37.1 | 4.4 | 3.3 | 1.9 | 4.4 | 0.3 |
| Mara | 48.4 | 38.9 | 2.1 | 2.4 | 1.3 | 6.8 | 0.1 |
| Manyara | 44.3 | 46.9 | 0.6 | 1.0 | 1.1 | 4.9 | 1.2 |
| Njombe | 39.7 | 43.1 | 7.0 | 1.3 | 2.3 | 6.5 | - |
| Katavi | 44.3 | 39.2 | 9.1 | 2.9 | 1.9 | 2.4 | 0.2 |
| Simiyu | 47.4 | 45.9 | 0.8 | 2.3 | 0.4 | 3.2 | - |
| Geita | 47.0 | 39.0 | 5.9 | 4.1 | 1.1 | 2.8 | - |
| Songwe | 39.2 | 52.6 | 0.2 | 1.9 | 1.1 | 4.9 | 0.0 |
| Mainland Tanzania | 45.1 | 41.5 | 4.3 | 2.8 | 1.5 | 4.7 | 0.1 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

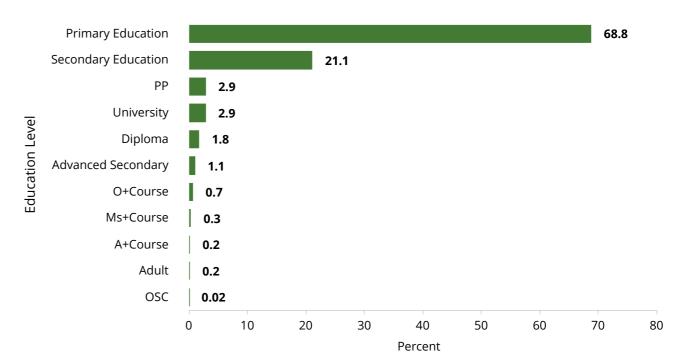
3.5 EDUCATION ATTAINMENT

The 2023 HECS results on the highest level of education attained by household members provides valuable insight into the educational landscape in Mainland Tanzania.

Figure 3.3 shows that most household members aged 5 years and above attained only primary education (68.8%), suggesting significant barriers to continued education. While 21.1% reached secondary education, only a small fraction progressed to higher levels. Advanced Secondary (1.1%), Diploma (1.8%), and University (2.9%) all together account for just 5.8%, indicating a sharp drop-off after basic education.

Pre-primary (2.9%) education is relatively low, although slightly better than other post-secondary categories. This suggests early childhood education is still underdeveloped. Adult education (0.2%) and out of school care (0.02%) are negligible, showing minimal investment in alternative education programs. Categories like A+Course, O+Course, MS+Course collectively account for 1.2%.

FIGURE 3.3: DISTRIBUTION OF HOUSEHOLD MEMBERS AGED 5 YEARS AND ABOVE BY HIGHEST LEVEL OF FORMAL EDUCATION REACHED, MAINLAND TANZANIA, 2023 HECS

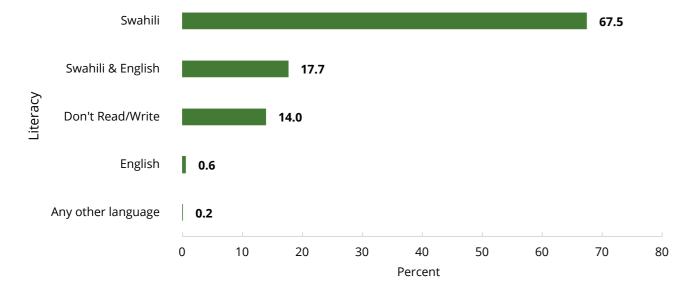


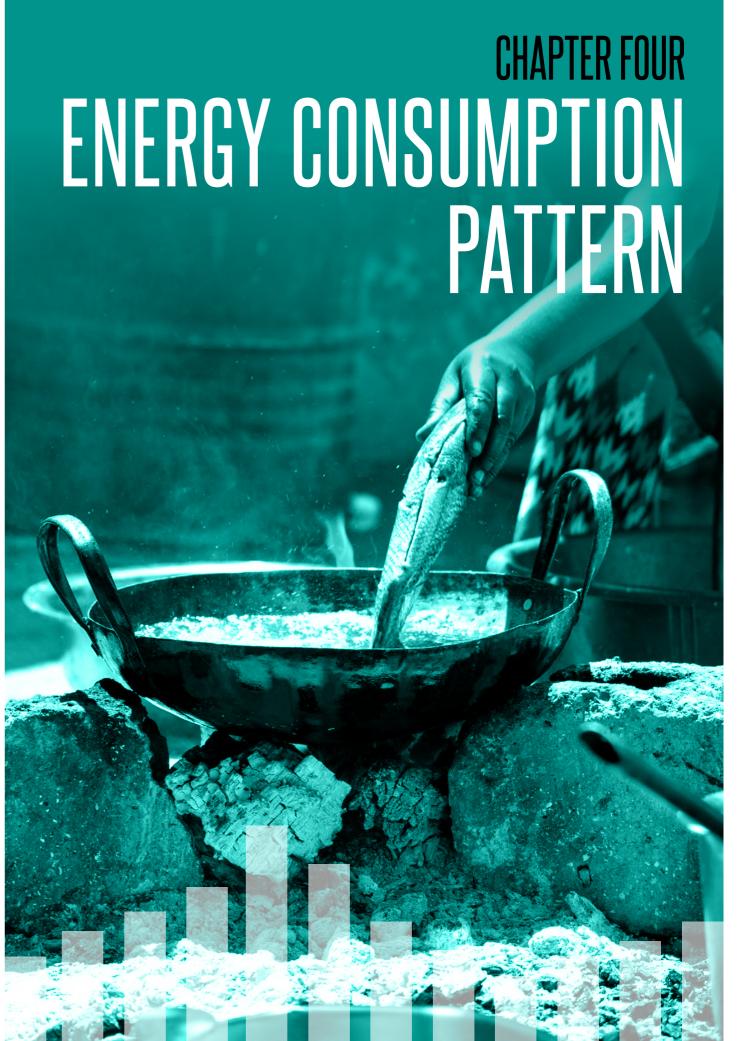
3.6 LITERACY

Literacy is the ability to read and write at a level that enables effective communication and understanding of written texts. It often includes not just basic reading and writing skills, but also the ability to understand, interpret, create, and use written information in various contexts such as at home, at work, or in the community.

The 2023 HECS provides valuable insights into the literacy profile of the population, showing that Swahili is the most widely used language for reading and writing. A significant 67.5% of people are literate in Swahili alone, reflecting its strong presence as the national language and its widespread use in early education. Meanwhile, 17.7% of individuals can read and write in both Swahili and English, indicating that a relatively smaller group has attained education levels where English is formally taught. On the other hand, 14.0% of respondents reported being illiterate, highlighting ongoing challenges in achieving universal literacy. English only literacy is minimal at 0.6%, and only 0.2% are literate in other languages (Figure 3.4 depicts).

FIGURE 3.4: LITERACY RATES (AGE 5+) BY LANGUAGE IN MAINLAND TANZANIA, 2023 HECS





4.1 INTRODUCTION

This chapter presents the results of the 2023 HECS on the energy consumption of households. It describes the types of fuel used by households for cooking, lighting, water, or space heating such as electricity, petroleum products (LPG, kerosene) and renewable energy sources (firewood, charcoal and solid biomass residuals).

4.1.1 Distribution of Households

In 2023, Mainland Tanzania had a total of approximately 14,525,300 households. Most of these households relied on traditional biomass fuels for cooking, with firewood being the most used. Specifically, about 9,564,726 households (66%) used firewood, 6,435,170 (44%) used charcoal, and only 3,608,965 (25%) used Liquefied Petroleum Gas (LPG).

Rural households made up the majority, with over 8,091,407 households. Among the households, 90% relied on firewood, 25% used charcoal, and only 8% used LPG. In contrast, urban households (6,433,894) had a different energy profile: 69% used charcoal, 47% used LPG, and just 36% used firewood. This shows that urban areas are more advanced in transitioning to cleaner cooking fuels compared to rural areas, where traditional biomass remains dominant.

Household size also significantly influenced fuel choice. Smaller households, particularly those with 1 to 4 members, showed a higher tendency to use LPG, especially in urban areas. Among single-person urban households, 59% used LPG, while 49% of urban households with 2-4 members also relied on LPG. However, as household size increased, the use of LPG declined noticeably. Among households with 8-10 members, only 13% used LPG, and for households with 11 or more members, the percentages dropped further to just 4%. In contrast, firewood and charcoal use remained dominant among larger households. For example, 86% of 8–10 member households and 94% of households with 11+ members used firewood. These patterns suggest that larger households face greater financial and logistical barriers to adopting cleaner fuels like LPG, leading them to continue relying on more accessible and affordable biomass sources.

Overall, the findings reveal significant disparities in energy access based on residence type and household size. The adoption of clean cooking fuels, especially LPG, remains limited and is predominantly concentrated in urban areas and smaller households (Table 4.1).

TABLE 4.1: NUMBER OF HOUSEHOLDS BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND FUEL TYPE, **MAINLAND TANZANIA, 2023 HECS**

| Place of Residence | Household Size | Total | Firewood | Charcoal | LPG |
|--------------------|----------------|------------|-----------|-----------|-----------|
| Rural | 1 | 687,075 | 564,125 | 155,064 | 72,979 |
| | 2-4 | 3,438,500 | 2,949,007 | 1,022,875 | 328,538 |
| | 5-7 | 2,806,193 | 2,623,836 | 638,471 | 186,367 |
| | 8-10 | 867,579 | 851,089 | 156,978 | 25,958 |
| | 11+ | 292,060 | 287,524 | 34,224 | 4,067 |
| | Total | 8,091,407 | 7,275,581 | 2,007,613 | 617,909 |
| Urban | 1 | 1,011,598 | 179,336 | 448,910 | 599,718 |
| | 2-4 | 3,036,706 | 911,508 | 2,229,381 | 1,489,649 |
| | 5-7 | 1,877,436 | 868,996 | 1,420,065 | 749,820 |
| | 8-10 | 424,749 | 261,796 | 290,052 | 140,357 |
| | 11+ | 83,405 | 67,510 | 39,151 | 11,513 |
| | Total | 6,433,894 | 2,289,146 | 4,427,558 | 2,991,056 |
| Mainland Tanzania | 1 | 1,698,673 | 743,462 | 603,974 | 672,697 |
| | 2-4 | 6,475,206 | 3,860,515 | 3,252,255 | 1,818,187 |
| | 5-7 | 4,683,629 | 3,492,831 | 2,058,536 | 936,187 |
| | 8-10 | 1,292,327 | 1,112,885 | 447,030 | 166,315 |
| | 11+ | 375,466 | 355,034 | 73,375 | 15,580 |
| | Total | 14,525,300 | 9,564,726 | 6,435,170 | 3,608,965 |

4.1.2 Overall Energy Consumption in Energy Unit

Total energy consumption in Mainland Tanzania is heavily dominated by firewood, which accounts for 436,266 terajoules (TJ), representing approximately 69% of the total energy consumed across the three major cooking fuels. Charcoal follows at 178,193 TJ (28%), while LPG contributes only 12,214 TJ, making up just 2% of the total (Table 4.2 shows).

The reliance on firewood and charcoal is particularly evident among larger households, with those in the 5–7 members category consuming 168,153 TJ of firewood and 60,194 TJ of charcoal. This underscores the continued dependence on traditional biomass fuels for cooking across both rural and urban areas. Despite being the cleanest option, LPG adoption remains limited; its use is largely concentrated among smaller urban households, particularly those with 2–4 members, who collectively account for 5,131 TJ of the total LPG consumed in Mainland Tanzania. This reflects ongoing disparities in access to clean energy, particularly for larger and rural households.

Rural areas account for the majority of firewood and charcoal consumption, highlighting a strong dependence on traditional biomass fuels. Rural households consume 348,803 TJ of firewood and 52,786 TJ of charcoal, while urban households use significantly less firewood at 87,463 TJ but considerably more charcoal at 125,407 TJ. In contrast, LPG consumption is substantially higher in urban areas, totaling 10,192 TJ compared to 2,023 TJ in rural areas.

Firewood consumption is highest among mid-sized households 2-4 and 5-7 members in both rural and urban areas. In rural areas, these groups consume 137,049 TJ and 133,356 TJ, respectively. Although firewood use is generally lower in urban areas, it follows a similar pattern, with mid-sized households consuming the most.

Charcoal consumption is also high among mid-sized urban households, with 62,834 TJ used by 2-4 members and 43,744 TJ by 5-7 members. In rural areas, however, charcoal use declines as household size increases beyond four members, suggesting that larger rural households may face limitations in accessing charcoal.

LPG consumption in urban areas rises with household size, reaching a peak of 5,131 TJ in households with 2-4 members before declining among larger groups. In contrast, LPG usage in rural areas remains minimal across all household sizes, indicating limited access and low adoption of clean cooking fuels (Table 4.2 indicates).

TABLE 4.2: ENERGY CONSUMPTION PER YEAR BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND **FUEL TYPE (TJ), MAINLAND TANZANIA, 2023 HECS**

| Place of Residence | Household Size | Firewood | Charcoal | LPG |
|--------------------|----------------|----------|----------|--------|
| Rural | 1 | 17,812 | 3,105 | 247 |
| | 2-4 | 137,049 | 28,684 | 1,124 |
| | 5-7 | 133,356 | 16,450 | 562 |
| | 8-10 | 44,761 | 3,729 | 74 |
| | 11+ | 15,825 | 817 | 15 |
| | Total | 348,803 | 52,786 | 2,023 |
| Urban | 1 | 5,304 | 9,100 | 1,311 |
| | 2-4 | 33,126 | 62,834 | 5,131 |
| | 5-7 | 34,797 | 43,744 | 3,031 |
| | 8-10 | 10,848 | 8,756 | 676 |
| | 11+ | 3,388 | 974 | 43 |
| | Total | 87,463 | 125,407 | 10,192 |
| Mainland Tanzania | 1 | 23,117 | 12,205 | 1,558 |
| | 2-4 | 170,175 | 91,518 | 6,255 |
| | 5-7 | 168,153 | 60,194 | 3,593 |
| | 8-10 | 55,609 | 12,485 | 750 |
| | 11+ | 19,213 | 1,792 | 58 |
| | Total | 436,266 | 178,193 | 12,214 |

4.1.2.1 FIREWOOD CONSUMPTION

Overall, the results show that firewood remains an essential source of energy in many areas of Mainland Tanzania, especially for cooking and water heating.

The results presented in Table 4.3 reveals regional disparities in the use of firewood across Mainland Tanzania for various household purposes such as cooking, water heating, space heating, and lighting. Cooking remains the dominant use of firewood, accounting for a total of 381,282 TJ across Mainland Tanzania. Three Mainland Tanzania regions with the highest firewood cooking consumption are Tanga consuming 25,979 TJ, Kagera (24,784 TJ), and Dodoma (22,769 TJ).

Water heating is the second purpose for firewood use, totaling 53,429 TJ. Kilimanjaro (5,705 TJ), Arusha (4,754 TJ), and Tanga (3,631 TJ) are leading Mainland Tanzania regions using firewood for water heating. The results suggest that in cooler regions, the reliance on firewood increases due to its significant role in fulfilling hot water needs. Similarly, space heating, though accounting for a relatively small total consumption of 1,286 TJ, shows notable use in Tanga (236 TJ), Pwani (214 TJ), and Mtwara (155 TJ).

Lighting is the least common use of firewood, totaling only 270 TJ across the Mainland Tanzania. Nonetheless, Lindi (48 TJ), Pwani (31 TJ), and Geita (27 TJ) still use firewood for lighting, which may indicate limited access to electricity.

TABLE 4.3: FIREWOOD CONSUMPTION (TJ) BY PURPOSE AND REGION IN MAINLAND TANZANIA, **2023 HECS**

| | Firewood (TJ) | | | | | |
|-------------------|---------------|---------------|---------------|----------|--|--|
| Region | Cooking | Water heating | Space heating | Lighting | | |
| Dodoma | 22,769 | 1,515 | 60 | 23 | | |
| Arusha | 15,679 | 4,754 | 62 | 20 | | |
| Kilimanjaro | 19,963 | 5,705 | 27 | - | | |
| Tanga | 25,979 | 3,631 | 236 | 3 | | |
| Morogoro | 19,926 | 3,101 | - | = | | |
| Pwani | 10,675 | 1,713 | 214 | 31 | | |
| Dar es Salaam | 3,540 | 417 | - | = | | |
| Lindi | 9,729 | 1,812 | - | 48 | | |
| Mtwara | 17,500 | 2,148 | 155 | 19 | | |
| Ruvuma | 17,758 | 3,421 | 5 | 11 | | |
| Iringa | 12,797 | 1,652 | 30 | 6 | | |
| Mbeya | 15,534 | 2,318 | 44 | - | | |
| Singida | 13,831 | 1,958 | 12 | 5 | | |
| Tabora | 17,918 | 2,572 | 63 | 10 | | |
| Rukwa | 9,051 | 1,946 | 4 | 4 | | |
| Kigoma | 11,504 | 1,151 | 10 | 17 | | |
| Shinyanga | 13,978 | 137 | 38 | 16 | | |
| Kagera | 24,784 | 2,626 | 19 | - | | |
| Mwanza | 17,808 | 979 | 10 | - | | |
| Mara | 16,283 | 518 | 49 | 8 | | |
| Manyara | 12,759 | 1,373 | 46 | 4 | | |
| Njombe | 7,954 | 2,463 | 115 | 3 | | |
| Katavi | 5,760 | 818 | 4 | - | | |
| Simiyu | 12,546 | 1,085 | 36 | 27 | | |
| Geita | 14,053 | 1,452 | 21 | 14 | | |
| Songwe | 11,201 | 2,161 | 28 | - | | |
| Mainland Tanzania | 381,282 | 53,429 | 1,286 | 270 | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

4.1.2.2 CHARCOAL CONSUMPTION

Charcoal remains a key household energy source in Mainland Tanzania, particularly in urban areas where it serves as the primary fuel for cooking.

The results in Table 4.4 show that charcoal is predominantly used for cooking with total consumption reaching 154,752 TJ per year. Dar es Salaam, the most urbanized region, leads in charcoal use for cooking (25,459 TJ), followed by Morogoro (12,109 TJ), Mwanza (11,520 TJ), and Pwani (8,966 TJ).

The total consumption used for water heating is 22,232 TJ. Morogoro had the highest consumption for water heating (2,255 TJ), followed by Mbeya (1,705 TJ) and Songwe (1,389 TJ).

Space heating accounts for the smallest portion of charcoal consumption, totaling 1,209 TJ. Among the regions, Mbeya records the highest usage for charcoal for space heating at 318 TJ, followed by Iringa with 174 TJ and Njombe with 160 TJ (Table 4.4).

TABLE 4.4: HOUSEHOLD CHARCOAL CONSUMPTION (TJ) BY PURPOSE AND REGION IN MAINLAND **TANZANIA, 2023 HECS**

| Parity | Charcoal (TJ) | | | |
|-------------------|---------------|---------------|---------------|--|
| Region | Cooking | Water heating | Space heating | |
| Dodoma | 6,367 | 785 | 10 | |
| Arusha | 3,078 | 1,101 | 9 | |
| Kilimanjaro | 2,164 | 531 | 11 | |
| Tanga | 8,072 | 1,161 | 49 | |
| Morogoro | 12,109 | 2,255 | 12 | |
| Pwani | 8,966 | 1,359 | 42 | |
| Dar es Salaam | 25,459 | 1,490 | - | |
| Lindi | 3,959 | 630 | - | |
| Mtwara | 3,641 | 707 | 4 | |
| Ruvuma | 2,564 | 664 | 73 | |
| Iringa | 3,428 | 726 | 174 | |
| Mbeya | 8,228 | 1,705 | 318 | |
| Singida | 2,675 | 379 | 20 | |
| Tabora | 8,001 | 1,414 | 28 | |
| Rukwa | 4,526 | 759 | 34 | |
| Kigoma | 3,009 | 243 | 33 | |
| Shinyanga | 3,959 | 211 | - | |
| Kagera | 5,057 | 639 | - | |
| Mwanza | 11,520 | 1,146 | 62 | |
| Mara | 3,919 | 133 | 50 | |
| Manyara | 1,202 | 301 | 31 | |
| Njombe | 2,198 | 893 | 160 | |
| Katavi | 5,972 | 819 | 3 | |
| Simiyu | 1,370 | 190 | 5 | |
| Geita | 8,046 | 602 | 18 | |
| Songwe | 5,265 | 1,389 | 63 | |
| Mainland Tanzania | 154,752 | 22,232 | 1,209 | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

4.1.2.3 LIQUEFIED PETROLEUM GAS (LPG) CONSUMPTION

Cooking accounted for the majority of LPG use at 8,235 (TJ), while water heating contributed just 86 TJ (see Table 4.5).

Dar es Salaam region leads in LPG use for cooking (3,054 TJ), followed by Mwanza (653 TJ), Arusha (484 TJ), Kilimanjaro (386 TJ), and Morogoro (402 TJ).

LPG use for water heating is very limited, reported mainly in Arusha (15 TJ), Kigoma (12 TJ), Kilimanjaro (11 TI), and Songwe (11 TI).

The category "Cooking + Water Heating", with a total of 3,888 TJ, reflects combined uses where households did not distinguish between the two functions. Arusha region leads in this category with 703 TJ, followed by Dar es Salaam (623 TJ), Mbeya (322 TJ), and Pwani (345 TJ) (Table 4.5).

TABLE 4.5: HOUSEHOLD LPG CONSUMPTION (TJ) BY PURPOSE AND REGION IN MAINLAND **TANZANIA, 2023 HECS**

| | LPG | | | |
|-------------------|---------|---------------|----------------------------|--|
| Region | Cooking | Water heating | Cooking + Water heating | |
| Dodoma | 290 | - | 183 | |
| Arusha | 484 | 15 | 703 | |
| Kilimanjaro | 386 | 11 | 252 | |
| Tanga | 291 | 3 | 140 | |
| Morogoro | 402 | - | 121 | |
| Pwani | 308 | - | 345 | |
| Dar es Salaam | 3,054 | 11 | 623 | |
| Lindi | 88 | - | 33 | |
| Mtwara | 98 | - | 56 | |
| Ruvuma | 111 | - | 102 | |
| Iringa | 109 | - | 100 | |
| Mbeya | 293 | 4 | 322 | |
| Singida | 173 | 3 | 94 | |
| Tabora | 129 | 2 | 40 | |
| Rukwa | 74 | 10 | 17 | |
| Kigoma | 160 | 12 | 51 | |
| Shinyanga | 176 | - | 32 | |
| Kagera | 75 | - | 40 | |
| Mwanza | 653 | - | 87 | |
| Mara | 210 | - | 39 | |
| Manyara | 130 | 1 | 94 | |
| Njombe | 118 | - | 103 | |
| Katavi | 66 | - | 70 | |
| Simiyu | 78 | 2 | 41 | |
| Geita | 122 | - | 35 | |
| Songwe | 156 | 11 | 167 | |
| Mainland Tanzania | 8,235 | 86 | 3,888 | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

4.2 ELECTRICITY CONSUMPTION

4.2.1 Sources of Electricity

The 2023 Household Energy Consumption Survey (HECS) for Mainland Tanzania shows that households access electricity from various sources, both on-grid and off-grid. Overall, 52.7% of households were connected to electricity through TANESCO, making it the primary provider. Coverage was notably higher in urban areas, where 72.7% of households relied on TANESCO, compared to only 30.7% in rural areas (Table 4.6 illustrates).

Solar was the second most widely used source of electricity, relied upon by 32.0% of households. Solar energy provided power in rural areas, to 52.6% of households, compared to 13.2% in urban areas. TANESCO in combination with other sources such as solar, minigrids, generators, or unspecified sources were used by a smaller share of households.

A small number of households relied on alternative or informal sources of electricity, such as communitybased systems, car batteries, or locally generated power mostly in rural areas. Only a very limited share of households reported using generators or non-TANESCO grid connections (Table 4.6).

TABLE 4.6: HOUSEHOLDS USING ELECTRICITY BY SOURCE OF POWER SUPPLY AND PLACE OF **RESIDENCE IN MAINLAND TANZANIA, 2023 HECS**

| | | | Place of R | esidence | | | |
|----------------------------|------------|----------|------------|----------|-----------|-------|--|
| Region | Mainland | Tanzania | Ru | ral | Urban | | |
| | N | % | N | % | N | % | |
| TANESCO only | 5,451,851 | 52.7 | 1,517,820 | 30.7 | 3,934,031 | 72.7 | |
| Grid only | 20,065 | 0.2 | 13,023 | 0.3 | 7,043 | 0.1 | |
| Solar only | 3,309,274 | 32.0 | 2,593,968 | 52.6 | 715,306 | 13.2 | |
| Generator only | 3,374 | 0.0 | - | = | 3,374 | 0.1 | |
| Other only | 357,666 | 3.5 | 290,603 | 5.9 | 67,063 | 1.2 | |
| TANESCO+ Mini-grid | 414,953 | 4.0 | 101,159 | 2.0 | 313,794 | 5.8 | |
| TANESCO+Solar | 420,361 | 4.1 | 182,428 | 3.7 | 237,933 | 4.4 | |
| Mini-grid+Solar | 757 | 0.01 | - | = | 757 | 0.01 | |
| TANESCO+Other | 139,320 | 1.3 | 63,970 | 1.3 | 75,350 | 1.4 | |
| TANESCO+ Mini-grid +Solar | 24,698 | 0.2 | 7,227 | 0.1 | 17,471 | 0.3 | |
| TANESCO+ Mini-grid +Other | 1,452 | 0.01 | - | - | 1,452 | 0.03 | |
| TANESCO+Solar+Generator | 1,816 | 0.02 | 1,816 | 0.04 | - | = | |
| TANESCO+Generator | 6,216 | 0.1 | 4,543 | 0.1 | 1,672 | 0.03 | |
| TANESCO+Other+Solar | 15,756 | 0.2 | 8,991 | 0.2 | 6,765 | 0.1 | |
| Other+ Solar | 177,977 | 1.7 | 149,684 | 3.0 | 28,293 | 0.5 | |
| Generator + Solar | 853 | 0.01 | 853 | 0.02 | - | - | |
| Total HH Using Electricity | 10,346,387 | 100.0 | 4,936,083 | 100.0 | 5,410,304 | 100.0 | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

In Mainland Tanzania, electricity is sourced from a variety of renewable and non-renewable energy sources, renewable sources include hydropower, solar, wind, and biomass, while non-renewable sources comprise natural gas, oil, and coal. The key sources of electricity generation reported during the survey include TANESCO, local grid, own solar, generator and other sources such as batteries (exclusively) or rechargeable lamps (not recharged from own electricity connection).

Figure 4.1 presents the sources of electricity in Mainland Tanzania, comparing rural and urban areas. Results revealed that 84.7% of households reported using TANESCO as their primary source of electricity mostly in urban areas compared to 38.3% of households in rural areas.

In rural areas, 59.7% of households report using own solar as an electricity source, compared to just 18.7% in urban areas, underscoring the importance of off-grid solutions where TANESCO's grid does not reach.

Other electricity sources are more common in rural areas (10.4%) than in urban areas (3.3%). The use of generators is very limited nationwide, showing low reliance on this energy source. Other electricity sources are more common in rural areas (10.4%) than in urban areas (3.3%).

FIGURE 4.1: DISTRIBUTION OF HOUSEHOLDS BY SOURCES OF ELECTRICITY AND PLACE OF **RESIDENCE, MAINLAND TANZANIA, 2023 HECS**

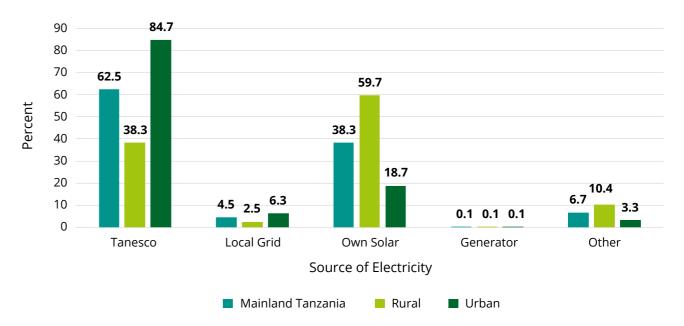


Table 4.7 presents the distribution of households using electricity by region and sources in Mainland Tanzania. The average proportion of households using electricity across Mainland Tanzania is 58.2%, though this varies significantly by region. Dar es Salaam (96.1%), Arusha (86.6%) and Kilimanjaro (85.3%) exhibit the highest reliance on TANESCO, while Geita (30.4%), Manyara (34.5%) and Singida (35.8%) showed the lowest, indicating a greater dependence on alternative electricity sources.

Overall, local grids contribute 4.5% to the total electricity supply in Mainland Tanzania. Kigoma (44.5%) and Shinyanga (20.4%) show notable reliance on local grid systems, while Many regions, such as Tanga and Singida report 0.0%, indicating limited or no access to locally supplied grid electricity.

Solar power contributes 38.3% to overall electricity use. Reliance is highest in Geita (63.6%) and Lindi (62.0%) regions, emphasizing the role of off-grid solutions, while Dar es Salaam (5.5%), Arusha (18.8%), and Kilimanjaro (18.9%) report much lower solar adoption.

Other sources account for 6.7% overall, with variations by region. Manyara (31.0%) and Kilimanjaro (22.9%) show a significant percentage of households relying on alternative methods, which may include less common electricity sources. The use of generators is minimal across all regions, averaging 0.1% (Table 4.8).

TABLE 4.7: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY REGION AND SOURCE - 2023 **HECS. MAINLAND TANZANIA**

| | Sources of Electricity (%) | | | | | | | | |
|-------------------|----------------------------|------------|-----------|-----------|-------|--|--|--|--|
| Region | TANESCO | Local Grid | Own Solar | Generator | Other | | | | |
| Dodoma | 50.2 | 2.4 | 44.1 | 0.2 | 7.2 | | | | |
| Arusha | 86.6 | 0.4 | 18.8 | - | 1.5 | | | | |
| Kilimanjaro | 85.3 | 0.5 | 18.9 | 0.3 | 22.9 | | | | |
| Tanga | 46.9 | - | 48.3 | = | 12.6 | | | | |
| Morogoro | 56.3 | 6.0 | 50.8 | 0.3 | 5.7 | | | | |
| Pwani | 60.4 | 10.4 | 43.3 | 0.2 | 7.9 | | | | |
| Dar es Salaam | 96.1 | 0.8 | 5.5 | 0.2 | - | | | | |
| Lindi | 42.8 | 6.0 | 62.0 | - | - | | | | |
| Mtwara | 42.2 | - | 59.7 | - | 0.3 | | | | |
| Ruvuma | 51.9 | 1.9 | 49.5 | - | 9.6 | | | | |
| Iringa | 71.4 | 2.7 | 29.4 | - | - | | | | |
| Mbeya | 78.6 | 14.4 | 27.0 | - | 0.7 | | | | |
| Singida | 35.8 | - | 60.3 | 0.2 | 7.5 | | | | |
| Tabora | 43.3 | 3.6 | 58.5 | - | 19.8 | | | | |
| Rukwa | 47.7 | 0.8 | 56.1 | - | 0.5 | | | | |
| Kigoma | 79.9 | 44.5 | 20.8 | - | 1.4 | | | | |
| Shinyanga | 72.1 | 20.4 | 19.9 | - | 10.6 | | | | |
| Kagera | 74.9 | - | 26.9 | - | - | | | | |
| Mwanza | 80.4 | 19.3 | 31.0 | - | - | | | | |
| Mara | 40.0 | - | 59.3 | - | 6.7 | | | | |
| Manyara | 34.5 | 0.2 | 39.6 | 0.3 | 31.0 | | | | |
| Njombe | 54.1 | 2.5 | 45.1 | - | 2.5 | | | | |
| Katavi | 39.0 | 0.5 | 57.6 | - | 13.6 | | | | |
| Simiyu | 58.1 | 1.4 | 43.7 | - | - | | | | |
| Geita | 30.4 | 5.4 | 63.6 | - | 18.6 | | | | |
| Songwe | 54.3 | 1.4 | 52.9 | 0.6 | 1.6 | | | | |
| Mainland Tanzania | 62.5 | 4.5 | 38.3 | 0.1 | 6.7 | | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

4.2.2 Types of Electricity Tariffs

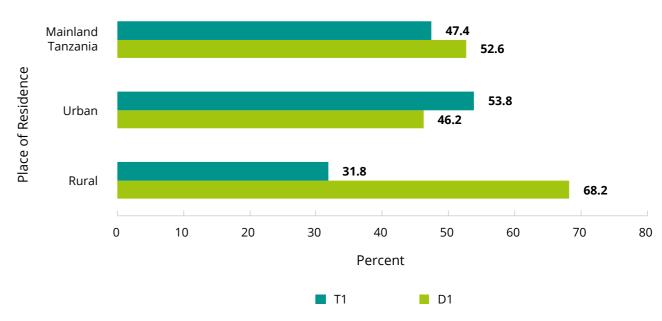
Electricity tariffs in Tanzania refer only to electricity supply by TANESCO and are regulated by the Energy and Water Utilities Regulatory Authority (EWURA). They are primarily determined based on the cost of generation, transmission, and distribution. The tariffs vary depending on the category of consumers, which include residential, commercial, industrial, and specialized users. During the survey, the following tariff types were asked - Domestic Low Usage Tariff (D1), General Usage Tariff (T1), Low Voltage Usage Tariff (T2) and Medium & High Voltage Usage Tariff (T3).

The results in Figure 4.2 show that more than half (52.6%) of households in Mainland Tanzania rely on the subsidized D1 tariff, indicating that a large proportion of the population has low electricity consumption. Rural areas rely heavily on the D1 lifeline tariff (68.2%), showing that most rural households consume minimal electricity. Overall, 31.8% of rural consumers fall under T1, meaning relatively fewer households in rural areas use electricity beyond the lifeline limit.

More urban households (53.8%) use the T1 tariff compared to rural areas. However, 46.2% of urban households still rely on the D1 lifeline tariff, showing that a significant portion of urban residents still consume low amounts of electricity (Figure 4.2).

The findings indicate that there are about two-thirds more households using D1 and T1 electricity than the number of official household contracts recorded by TANESCO. This suggests that electricity meter sharing is a widespread practice in Tanzania, with multiple households often relying on a single registered electricity connection or account to access power.

FIGURE 4.2: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND PLACE OF **RESIDENCE, MAINLAND TANZANIA, 2023 HECS**



Results in Table 4.8 reveal that the regions using mostly the D1 tariff include Morogoro (98.3%), Kilimaniaro (96.4%), Kigoma (95.5%), Manyara (93.0%), Shinyanga (87.1%), Lindi (86.1%), Kagera (82.4%), Tanga (71.1%), Mara (75.6%), Rukwa (72.9%) and Mwanza (71.0%) and are likely have lower average household electricity consumption.

The regions under T1 indicating higher electricity usage include Katavi (84.6%), Iringa (82.0%), Dodoma (81.7%), Arusha (80.3%), Dar es Salaam (75.9%), Ruvuma (71.4%), and Tabora (68.0%). Regions which show nearly equal split between D1 and T1 are Njombe (50.6% D1, 49.4% T1), Pwani (55.7% D1, 44.3% T1) and Singida (45.2% D1, 54.8% T1) (Table 4.8).

TABLE 4.8: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND REGION IN **MAINLAND TANZANIA, 2023 HECS**

| Dogion | Tarif | Tariff Type | | | |
|-------------------|-------|-------------|--|--|--|
| Region | D1 | T1 | | | |
| Dodoma | 18.3 | 81.7 | | | |
| Arusha | 19.7 | 80.3 | | | |
| Kilimanjaro | 96.4 | 3.6 | | | |
| Tanga | 71.1 | 28.9 | | | |
| Morogoro | 98.3 | 1.7 | | | |
| Pwani | 55.7 | 44.3 | | | |
| Dar es Salaam | 24.1 | 75.9 | | | |
| Lindi | 86.1 | 13.9 | | | |
| Mtwara | 40.3 | 59.7 | | | |
| Ruvuma | 28.6 | 71.4 | | | |
| Iringa | 18.0 | 82.0 | | | |
| Mbeya | 60.2 | 39.8 | | | |
| Singida | 45.2 | 54.8 | | | |
| Tabora | 32.0 | 68.0 | | | |
| Rukwa | 72.9 | 27.1 | | | |
| Kigoma | 95.6 | 4.4 | | | |
| Shinyanga | 87.1 | 12.9 | | | |
| Kagera | 82.4 | 17.6 | | | |
| Mwanza | 71.0 | 29.0 | | | |
| Mara | 75.6 | 24.4 | | | |
| Manyara | 93.0 | 7.0 | | | |
| Njombe | 50.6 | 49.4 | | | |
| Katavi | 15.2 | 84.8 | | | |
| Simiyu | 60.7 | 39.3 | | | |
| Geita | 63.7 | 36.3 | | | |
| Songwe | 64.9 | 35.1 | | | |
| Mainland Tanzania | 52.6 | 47.4 | | | |

4.2.3 Monthly Household Electricity Expenditure

Household expenditures for electricity are a key indicator for energy access, consumption behavior, and economic capacity. In Mainland Tanzania, understanding how much households spend monthly on electricity helps policymakers assess affordability, usage patterns, and the effectiveness of tariff structures. The 2023 HECS provides important insights into these spending habits, revealing that most households spend modest amounts on electricity reflecting low consumption levels and the prevalence of lifeline tariffs.

4.2.3.1 DOMESTIC LOW USAGE TARIFF (D1)

The D1 tariff is a lifeline electricity tariff structure in Tanzania, designed to support low-income households and promote electricity access by offering subsidized rates for low electricity consumption.

Figure 4.3 presents the distribution of monthly household expenditure on electricity in Tanzanian Shillings (TZS). The expenditures are grouped into four categories, and their corresponding percentages reflect the share of households falling within each spending bracket.

The results shows that over 72.5% of households spend less than 10,000 TZS per month on electricity, revealing the modest electricity consumption in Mainland Tanzania aligned with the dominance of D1 tariff users (52.6%) (see Table 4.8). Nearly half of the households (45.6%) spend between 5,000-10,000 TZS monthly on electricity.

Households spending between 10,000–15,000 TZS account for 19.5%. This group reflects a transitional category of households that may be shifting from D1 to T1, possibly due to rising income or appliance use. A smaller segment, 8.0% of households, spends over 15,000 TZS per month on electricity, indicating significantly higher energy use. These households are likely situated in urban areas and may possess energyintensive appliances such as air conditioners, electric cookers, and water heaters.

FIGURE 4.3: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE D1 BY MONTHLY **EXPENDITURE, MAINLAND TANZANIA, 2023 HECS**

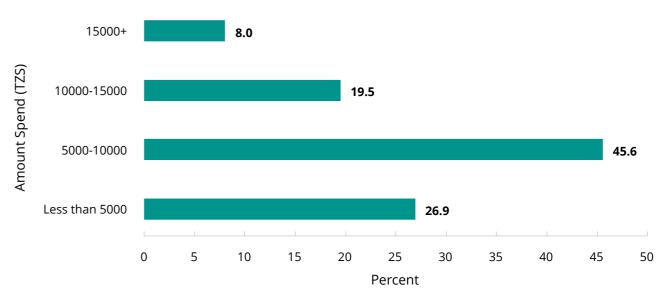


Table 4.9 shows the region's patterns on household electricity expenditure per month. The results show that the percentage of households spent less than 5,000 TZS was high in Lindi (57.6%), Rukwa (55.7%), Kagera (51.2%) and Katavi (50.8%). Dar es Salaam (5.0%) and Simiyu (4.8%) show the lowest percentage in this category. For the households that spend 5,000-10,000 TZS, Simiyu (88.4%), Geita (67.2%), and Tabora (68.0%) dominate, indicating efficient electricity usage within the D1 tariff bracket. Katavi (25.8%) and Songwe (32.7%) recorded a lower percentage in this category.

In 10,000-15,000 TZS, Dar es Salaam (41.9%), Pwani (32.9%), and Kigoma (31.5%) have the highest shares, suggesting increasing appliance use or improved income. Geita (5.8%) and Simiyu (6.9%) show the lowest spending in this tier.

Regarding the high-spending category (above 15,000 TZS), the highest percentage was observed in Dar es Salaam and Singida (18.7%) each followed Songwe (14.4%), Katavi (12.1%), and Morogoro (12.0%). Lindi, Mtwara, Tabora, Simiyu and several others have no recorded households spending in this category under D1.

TABLE 4.9: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE D1 BY MONTHLY **EXPENDITURE AND REGION, MAINLAND TANZANIA, 2023 HECS**

| | Amount Spent (TZS) | | | | | | |
|-------------------|--------------------|------------|-------------|--------|--|--|--|
| Region | Less than 5000 | 5000-10000 | 10000-15000 | 15000+ | | | |
| Dodoma | 46.2 | 36.3 | 11.1 | 6.4 | | | |
| Arusha | 33.0 | 56.0 | 9.3 | 1.7 | | | |
| Kilimanjaro | 30.8 | 47.8 | 18.1 | 3.3 | | | |
| Tanga | 21.0 | 48.0 | 21.5 | 9.5 | | | |
| Morogoro | 31.5 | 39.4 | 17.0 | 12.0 | | | |
| Pwani | 13.8 | 42.3 | 32.9 | 11.0 | | | |
| Dar es Salaam | 5.0 | 34.4 | 41.9 | 18.7 | | | |
| Lindi | 57.6 | 35.0 | 7.4 | - | | | |
| Mtwara | 34.3 | 48.6 | 17.2 | - | | | |
| Ruvuma | 33.0 | 46.1 | 12.0 | 8.9 | | | |
| Iringa | 35.6 | 47.8 | 9.6 | 6.9 | | | |
| Mbeya | 19.6 | 52.6 | 21.7 | 6.1 | | | |
| Singida | 24.8 | 37.1 | 19.4 | 18.7 | | | |
| Tabora | 15.6 | 68.0 | 16.4 | - | | | |
| Rukwa | 55.7 | 35.2 | 6.1 | 3.1 | | | |
| Kigoma | 13.6 | 43.9 | 31.5 | 11.0 | | | |
| Shinyanga | 21.9 | 51.3 | 17.0 | 9.8 | | | |
| Kagera | 51.2 | 36.3 | 9.9 | 2.7 | | | |
| Mwanza | 23.7 | 59.4 | 12.5 | 4.4 | | | |
| Mara | 34.6 | 35.2 | 21.6 | 8.6 | | | |
| Manyara | 27.1 | 59.8 | 9.7 | 3.4 | | | |
| Njombe | 14.7 | 52.0 | 26.0 | 7.2 | | | |
| Katavi | 50.8 | 25.8 | 11.4 | 12.1 | | | |
| Simiyu | 4.8 | 88.4 | 6.9 | - | | | |
| Geita | 24.1 | 67.2 | 5.8 | 3.0 | | | |
| Songwe | 40.4 | 32.7 | 12.5 | 14.4 | | | |
| Mainland Tanzania | 26.9 | 45.6 | 19.5 | 8.0 | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

4.2.3.2 GENERAL USAGE TARIFF (T1)

The T1 tariff is a standard residential electricity tariff in Tanzania, designed for general domestic consumers whose energy use exceeds the threshold defined under the lifeline D1 tariff.

majority of T1 users (33.1%) spend between TZS 5,000–10,000, suggesting that many households under this tariff are still relatively moderate users but exceed the lifeline threshold of the D1 tariff. A significant portion, 31.0%, spend between TZS 10,000–15,000, indicating growing usage, possibly linked to ownership of appliances or larger household size.

Notably, 25.8% of households spend over TZS 15,000, representing high-consumption households that are likely using energy-intensive appliances (e.g., fridges, air conditioners, water heaters). These are clearly beyond the D1 threshold and reflect upper-tier energy users under T1.

Only 10.2% of T1 households spend less than TZS 5,000, possibly due to occasional or minimal usage (Figure 4.4).

FIGURE 4.4: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE T1 BY MONTHLY **EXPENDITURE, MAINLAND TANZANIA, 2023 HECS**

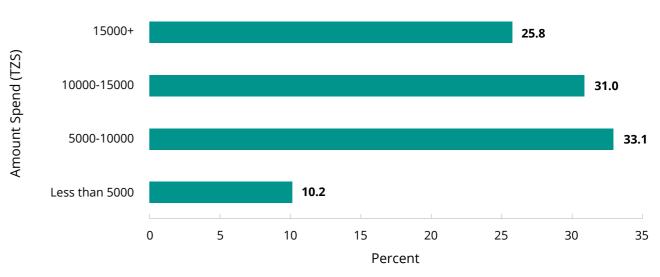


Table 4.10 provides insightful information on how households across Mainland Tanzania spend on electricity under Tariff Type T1. The majority (74.2%) of households under T1 spend between TZS 5,000 and TZS 15,000 per month.

Morogoro (78.8%) and Kigoma (76.0%) regions have the highest share of households spending more than TZS 15,000. Kilimanjaro (37.6%) and Dar es Salaam (40.6%) also show elevated spending in this category.

For moderate usage of TZS 10,000-15,000, Shinyanga region stands out with 90.6% of households falling into this category followed by Dar es Salaam (42.7%), Simiyu (39.3%) and Arusha (34.2%) regions. The lowest percentage of households was recorded in Rukwa (5.9%) and Kagera (6.8%) regions.

Rukwa (53.3%), Kagera (43.0%), and Kilimanjaro (30.1%) show a high share of households spending below TZS 5,000. The regions with the highest expenditure in the T1 category of TZS 5,000-10,000 includes Iringa (49.8%), Mbeya (49.7%), Njombe (57.9%) Manyara (57.3%) and Mtwara (51.4%).

TABLE 4.10: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE T1 BY MONTHLY **EXPENDITURE AND REGION, MAINLAND TANZANIA, 2023 HECS**

| Paris | Amount Spent (TZS) | | | | | | |
|-------------------|--------------------|------------|-------------|--------|--|--|--|
| Region | Less than 5000 | 5000-10000 | 10000-15000 | 15000+ | | | |
| Dodoma | 13.6 | 42.9 | 25.9 | 17.6 | | | |
| Arusha | 4.2 | 41.9 | 34.2 | 19.7 | | | |
| Kilimanjaro | 30.1 | 22.7 | 9.6 | 37.6 | | | |
| Tanga | 7.7 | 42.3 | 19.2 | 30.9 | | | |
| Morogoro | - | - | 21.2 | 78.8 | | | |
| Pwani | 14.2 | 39.3 | 23.7 | 22.9 | | | |
| Dar es Salaam | 1.2 | 15.4 | 42.7 | 40.6 | | | |
| Lindi | 25.0 | 50.0 | 25.0 | - | | | |
| Mtwara | 13.4 | 51.4 | 16.6 | 18.6 | | | |
| Ruvuma | 28.3 | 36.8 | 23.9 | 10.9 | | | |
| Iringa | 10.5 | 50.1 | 26.8 | 12.6 | | | |
| Mbeya | 10.3 | 49.5 | 25.9 | 14.3 | | | |
| Singida | 17.2 | 46.3 | 22.6 | 13.9 | | | |
| Tabora | 18.2 | 30.4 | 23.5 | 27.9 | | | |
| Rukwa | 53.3 | 40.8 | 5.9 | - | | | |
| Kigoma | - | 24.0 | - | 76.0 | | | |
| Shinyanga | - | = | 90.6 | 9.4 | | | |
| Kagera | 43.0 | 45.2 | 6.8 | 5.0 | | | |
| Mwanza | 26.8 | 38.1 | 19.2 | 15.9 | | | |
| Mara | 25.3 | 34.6 | 26.1 | 14.0 | | | |
| Manyara | 14.0 | 57.3 | - | 28.7 | | | |
| Njombe | 15.5 | 57.9 | 17.9 | 8.8 | | | |
| Katavi | 16.0 | 44.3 | 21.2 | 18.5 | | | |
| Simiyu | 9.8 | 35.2 | 39.3 | 15.8 | | | |
| Geita | 2.6 | 49.7 | 26.8 | 20.9 | | | |
| Songwe | 19.7 | 45.7 | 16.3 | 18.4 | | | |
| Mainland Tanzania | 10.2 | 33.1 | 31.0 | 25.8 | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

4.2.4 Monthly Electricity Consumption (kWh)

Over 69.9% of households consume 21-40 kWh monthly. This aligns with monthly spending of 10,000-15,000 TZS, matching the most common expenditure bracket in Mainland Tanzania.

In rural areas, 80.4% of households use 21–40 kWh per month and 13.2% use only 1–20 kWh. In urban areas, households are more likely to consume 41-100+ kWh, with 12.1% consuming 41-60 kWh and 5.9% consuming 81–100 kWh. Only about 1.2% of households consume more than 100 kWh/month (Figure 4.5).

FIGURE 4.5: DISTRIBUTION OF HOUSEHOLDS BY MONTHLY ELECTRICITY CONSUMPTION, **MAINLAND TANZANIA, 2023 HECS**

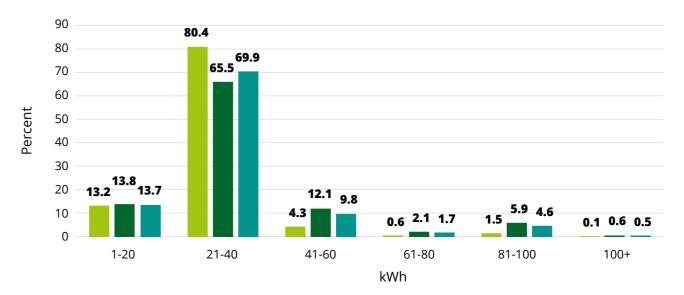


Table 4.11 indicates a dominance in low electricity consumption as most of the households fall under the 1-20 kWh and 21-40 kWh consumption categories.

Kilimanjaro (93.8%), Manyara (92.2%), and Shinyanga (90.8%) have the highest percentages of households that consume 21-40 kWh monthly. Katavi (38.2%) and Dodoma (35.4%) have the highest shares in the lowest bracket (1-20 kWh), suggesting limited access or affordability of electricity.

Households consuming above 100 kWh are very few, with Morogoro (1.7%), Tanga (1.4%), and Dar es Salaam (1.2%) having the highest (but still minimal) shares. Dar es Salaam stands out with 11.4% of households in the 81-100 kWh category, the highest among all regions, likely due to urbanization and higher appliance usage.

Dar es Salaam has a relatively higher share of mid-to-high consumption (21.3% in 41-60 kWh, 11.1% in 81-100 kWh), while Simiyu has almost no households consuming above 60 kWh per month. Regions such as Lindi, Mtwara and Rukwa have zero or negligible consumption in higher categories of monthly consumption (Table 4.11).

TABLE 4.11: DISTRIBUTION OF HOUSEHOLDS BY MONTHLY ELECTRICITY CONSUMPTION AND **REGION, MAINLAND TANZANIA, 2023 HECS**

| | kWh | | | | | | | |
|-------------------|------|-------|-------|-------|--------|------|--|--|
| Region | 1-20 | 21-40 | 41-60 | 61-80 | 81-100 | 100+ | | |
| Dodoma | 35.4 | 49.8 | 8.0 | 0.8 | 5.9 | - | | |
| Arusha | 31.5 | 53.0 | 10.4 | 0.3 | 4.7 | - | | |
| Kilimanjaro | 0.8 | 93.8 | 1.6 | 1.2 | 2.2 | 0.5 | | |
| Tanga | 12.2 | 74.2 | 9.2 | 1.5 | 1.5 | 1.4 | | |
| Morogoro | - | 87.0 | 5.8 | 0.9 | 4.6 | 1.7 | | |
| Pwani | 14.5 | 68.7 | 10.6 | 1.4 | 4.8 | - | | |
| Dar es Salaam | 10.4 | 53.4 | 21.3 | 2.5 | 11.1 | 1.2 | | |
| Lindi | 7.4 | 91.0 | - | 1.6 | - | - | | |
| Mtwara | 25.2 | 63.7 | 6.8 | - | 4.3 | - | | |
| Ruvuma | 27.6 | 62.0 | 5.5 | 3.0 | 1.9 | - | | |
| Iringa | 33.4 | 54.9 | 7.4 | 1.8 | 2.5 | - | | |
| Mbeya | 13.0 | 75.5 | 7.8 | 2.5 | 1.1 | - | | |
| Singida | 20.1 | 64.7 | 13.3 | 0.6 | 1.4 | - | | |
| Tabora | 21.8 | 62.8 | 9.7 | 0.9 | 4.8 | - | | |
| Rukwa | 9.7 | 88.2 | 1.2 | - | 0.9 | - | | |
| Kigoma | - | 87.4 | 9.3 | 3.3 | - | - | | |
| Shinyanga | - | 90.8 | 4.5 | 1.8 | 3.0 | - | | |
| Kagera | 7.2 | 89.0 | 3.1 | 0.5 | 0.2 | - | | |
| Mwanza | 7.1 | 84.5 | 3.3 | 2.9 | 2.2 | - | | |
| Mara | 4.9 | 83.0 | 8.0 | 3.0 | 1.1 | - | | |
| Manyara | 4.0 | 92.2 | 2.1 | 1.0 | 0.7 | - | | |
| Njombe | 27.4 | 63.0 | 5.2 | 1.8 | 2.0 | 0.5 | | |
| Katavi | 38.2 | 51.6 | 6.6 | - | 3.7 | - | | |
| Simiyu | 8.6 | 90.3 | 1.2 | - | - | - | | |
| Geita | 9.1 | 85.9 | 2.6 | - | 2.3 | - | | |
| Songwe | 8.5 | 70.0 | 12.7 | 4.0 | 4.8 | - | | |
| Mainland Tanzania | 13.7 | 69.9 | 9.8 | 1.7 | 4.6 | 0.5 | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

Based on the reported electricity consumption from TANESCO customers that are using electricity only for lighting and/or charging the electricity production from own solar equipment (including solar lanterns) for lighting and charging in 2023 can be roughly estimated some 406 GWh for lighting and 77 GWh for charging nationwide.

4.3 FUEL USED FOR COOKING

Cooking fuel is an essential household energy source, particularly in developing countries where it significantly impacts health, the environment, and socio-economic well-being. In many regions in Mainland Tanzania, most households rely on traditional biomass fuels such as firewood and charcoal. These fuels are often used in inefficient stoves or open fires, leading to indoor air pollution and deforestation. However, over the past decade, there have been growing efforts to promote cleaner alternatives such as liquefied petroleum gas (LPG), electricity, and biogas, driven by government policies, urbanization, and increased awareness of the health and environmental benefits of clean cooking solutions. Understanding the types of fuels used for cooking and their implications for environmental sustainability, energy policy, and public health is crucial for promoting sustainable energy transitions and improving public health outcomes.

4.3.1 Households Cooking Location

Indoor cooking is widespread in Mainland Tanzania, especially in urban areas, but it is often done without proper ventilation leading to serious health and environmental risks.

In Mainland Tanzania, 42% of households primarily cook indoors, while the majority (58%) cook outdoors or in separate structures. Indoor cooking, especially when using solid biofuels like firewood and charcoal, can expose household members to harmful smoke and pollutants, increasing the risk of respiratory disease. These statistics highlight the need to promote well-ventilated cooking environments and transitioning to cleaner cooking technologies.

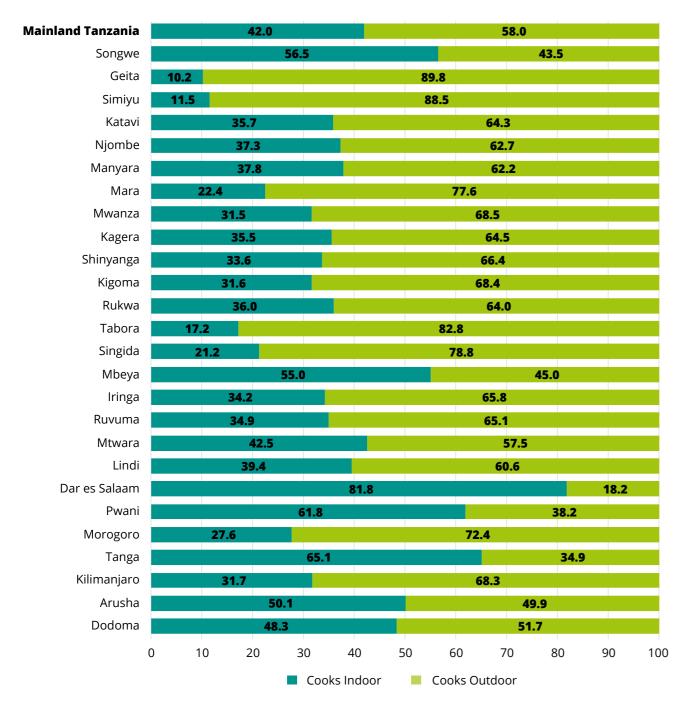
FIGURE 4.6: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS COOKING INDOOR - 2023 HECS, **MAINLAND TANZANIA**



Regions with the highest indoor cooking rates are Dar es Salaam (81.8%), Tanga (65.1%), Pwani (61.8%), Songwe (56.5%) and Mbeya (55.3%).

Regions with the lowest indoor cooking rates include Geita (10.2%), Simiyu (11.5%), Tabora (17.2%), Singida (21.2%) and Mara (22.4%). These lower rates are typically found in rural or less densely populated regions, where outdoor or detached kitchen spaces are more common and traditional solid biomass fuels are widely used (Figure 4.7).

FIGURE 4.7: DISTRIBUTION OF HOUSEHOLDS BY COOKING LOCATION AND REGION, MAINLAND **TANZANIA, 2023 HECS**



4.3.2 Primary Cooking Fuels

In Mainland Tanzania, the primary fuels reported to be used by most of the households for cooking were firewood, charcoal and LPG, while electricity, kerosene, biogas, natural gas, bioethanol and other fuels are used only to a limited extent.

Results in Figure 4.8 show that solid biofuels (firewood and charcoal) dominate cooking energy use in Mainland Tanzania, particularly in rural and peri-urban areas. Additionally, firewood (65.5%) was the most widely used fuel for cooking, reflecting its accessibility and affordability, especially in rural areas. Charcoal followed at 44.0%, particularly in urban and peri-urban areas.

When it comes to cleaner fuels for cooking, LPG was the most widely used at 24.6%, but its adoption is still low compared to traditional biomass. LPG's use is concentrated in urban areas and among middle-to highincome households due to the high upfront costs of cylinders and stoves.

Electricity was used by a small percentage of households, primarily in urban areas with reliable grid access.

Biogas (0.1%), and bioethanol (0.01%) have very low adoption rates, despite their potential to provide clean and sustainable cooking energy. Only 0.6% of households reported using other sources for cooking, including solar cookers, kerosene, briquettes, and other experimental or locally available fuels (Figure 4.8).

FIGURE 4.8: DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING. MAINLAND TANZANIA. **2023 HECS**

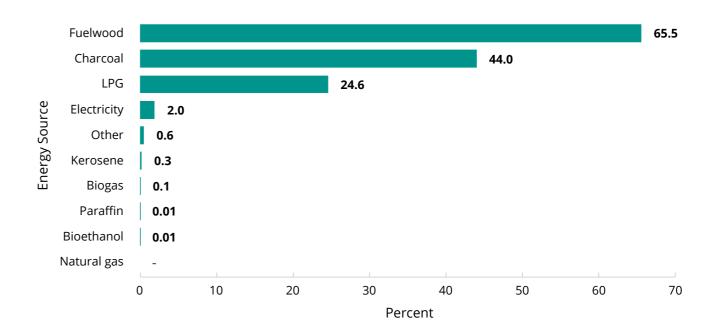


Figure 4.9 provides a detailed breakdown of the sources of energy used for cooking in Mainland Tanzania, particularly delineating rural and urban usage trends. It highlights significant disparities in energy use between rural and urban populations, reflecting differences in access to resources, infrastructure, and income levels.

The results show that most households in rural areas reported using firewood (89.6%) for cooking, while in urban areas, charcoal (68.9%) and LPG (46.2%) are more common. Cities have better access to cleaner fuels like LPG and electricity, but rural areas still depend mostly on traditional fuels like firewood.

LPG use in urban areas is 46.2% and 7.5% in rural areas. Despite electricity being used more in the urban areas (3.4%) compared to the rural areas (0.4%), it is still not widely adopted. Other fuels like biogas (0.1%), and bioethanol (0.01%) are rarely used in both rural and urban areas. Kerosene (0.3%) is hardly used anymore (see Figure 4.9).

FIGURE 4.9: DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING AND PLACE OF **RESIDENCE, MAINLAND TANZANIA, 2023 HECS**

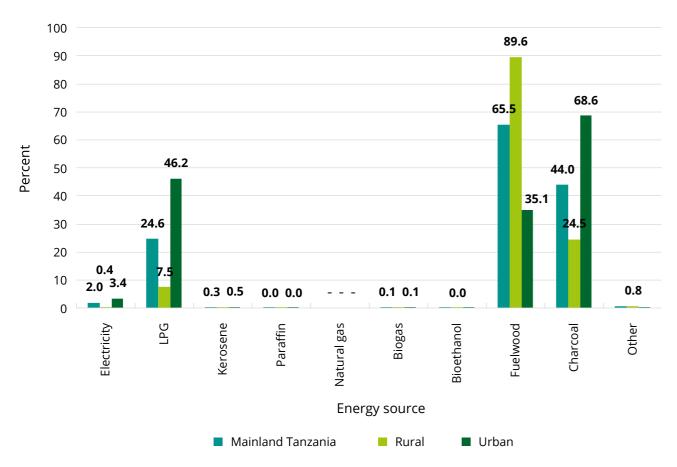


Table 4.12 provides a detailed breakdown of the primary energy sources used for cooking across different regions in Mainland Tanzania. The results show that firewood is the primary cooking energy source in most regions, with an overall national average of 65.5% followed by charcoal with a national average of 44.0%. Simiyu (91.2%), Manyara (90.0%), and Kagera (84.2%) rely heavily on firewood with percentages well above national average.

Electricity and LPG are the primary modern energy sources, but their usage is relatively low compared to solid biomass. Electricity usage is minimal, with the highest percentage in Dar es Salaam (5.1%), followed by Pwani (4.4%) and Arusha (4.2%). Most regions use electricity below 1.5%.

The use of LPG is higher than electricity but still limited, with the highest usage in Dar es Salaam (74.4%), followed by Arusha (56.3%) and Kilimanjaro (37.0%). In contrast, regions like Kigoma (5.7%) and Rukwa (6.0%) have very low LPG usage. Other modern energy sources like natural gas, biogas, paraffin, and bioethanol are almost negligible, with shares close to zero in most regions.

TABLE 4.12: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING AND **REGION - 2023 HECS, MAINLAND TANZANIA**

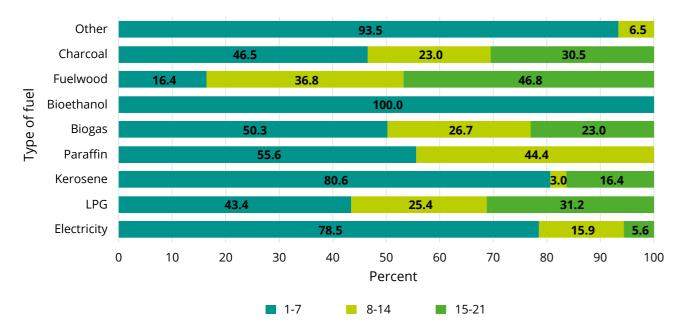
| | | | | | Energy | Source | | | | |
|----------------------|------------------|------|---------------|----------|----------------|--------|-----------------|---------------|----------|-------|
| Region | Electri- city | LPG | Kerose- ne | Paraffin | Natural gas | Biogas | Bioetha- nol | Fire- wood | Charcoal | Other |
| Dodoma | 1.7 | 22.2 | - | - | ÷ | - | = | 65.5 | 36.7 | = |
| Arusha | 4.2 | 56.3 | 0.8 | - | - | - | - | 66.4 | 32.8 | = |
| Kilimanjaro | 1.0 | 37.0 | 1.4 | 0.2 | - | 0.4 | - | 83.5 | 23.6 | 0.3 |
| Tanga | 2.3 | 15.5 | - | - | ÷ | - | = | 72.8 | 38.2 | 1.1 |
| Morogoro | 0.4 | 16.4 | 0.6 | - | - | - | - | 64.2 | 59.6 | = |
| Pwani | 4.4 | 37.2 | 0.4 | - | - | - | - | 62.7 | 75.8 | 0.7 |
| Dar es Salaam | 5.1 | 74.4 | 0.4 | - | - | - | - | 7.6 | 65.3 | - |
| Lindi | - | 6.4 | - | - | - | - | - | 82.4 | 42.3 | - |
| Mtwara | 1.0 | 11.7 | - | - | - | - | - | 77.9 | 29.4 | - |
| Ruvuma | 1.3 | 7.8 | - | - | - | - | - | 84.1 | 31.4 | 1.9 |
| Iringa | 0.7 | 25.6 | - | - | - | - | - | 72.4 | 41.3 | - |
| Mbeya | 1.7 | 22.1 | 0.3 | - | - | - | - | 61.3 | 51.0 | - |
| Singida | 1.0 | 13.5 | - | - | - | - | - | 82.0 | 30.6 | 0.2 |
| Tabora | 0.6 | 12.0 | - | - | - | - | - | 67.0 | 41.6 | - |
| Rukwa | 1.3 | 6.0 | 0.3 | - | - | - | 0.2 | 73.7 | 50.2 | = |
| Kigoma | 2.1 | 5.7 | - | - | - | 0.3 | - | 77.2 | 30.7 | - |
| Shinyanga | 2.2 | 15.6 | - | 0.2 | - | 1.4 | - | 71.4 | 36.5 | - |
| Kagera | 0.8 | 8.1 | - | - | - | - | - | 84.2 | 27.1 | - |
| Mwanza | 2.5 | 28.1 | 0.9 | - | - | - | - | 61.8 | 59.7 | - |
| Mara | 0.2 | 14.8 | - | - | - | 0.2 | - | 78.4 | 40.6 | - |
| Manyara | - | 16.0 | 0.2 | - | - | - | - | 90.0 | 21.5 | 13.1 |
| Njombe | 0.5 | 12.4 | - | - | - | 0.2 | - | 76.3 | 32.3 | 0.2 |
| Katavi | 0.8 | 9.9 | - | - | - | - | - | 53.9 | 65.6 | - |
| Simiyu | 0.8 | 6.5 | - | - | - | 0.2 | 0.1 | 91.2 | 21.8 | - |
| Geita | - | 7.7 | - | - | - | - | - | 73.6 | 48.2 | - |
| Songwe | 2.1 | 15.0 | - | - | - | - | - | 67.7 | 43.5 | 0.2 |
| Mainland Tanzania | 2.0 | 24.6 | 0.3 | 0.0 | - | 0.1 | 0.0 | 65.5 | 44.0 | 0.6 |

4.3.3 Cooking frequency by fuel type

The results in Figure 4.10 indicate that electricity is primarily used for occasional cooking, with 78.5% of households using it 1–7 times per week, but only 5.6% using it 15–21 times per week. LPG shows a different pattern, with 43.4% using it occasionally and a notable 31.2% using it frequently, indicating its growing acceptance as a reliable cooking fuel. Biogas also shows balanced use, with 50.3%, 26.7%, and 23.0% of households using it across low, medium, and high frequencies respectively.

In contrast, firewood is mainly used by high frequency cooks. 46.8% of households cook with it 15–21 times weekly, while only 16.4% use it occasionally. Charcoal follows a similar trend, with 30.5% using it frequently and 46.5% occasionally, while bioethanol is used only for occasional cooking 100% of the time. Other fuels are used mainly for occasional cooking by 93.5% of households (Figure 4.10).

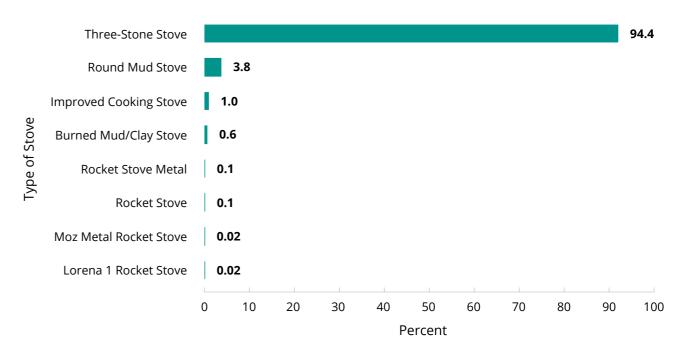
FIGURE 4.10: DISTRIBUTION OF HOUSEHOLDS BY COOKING FREQUENCY PER WEEK, FUEL TYPE IN **MAINLAND TANZANIA. 2023 HECS**



4.3.4 Types of Firewood Stoves for Cooking

In Mainland Tanzania, different types of firewood stoves are used for cooking, ranging from traditional to improved designs. The results in Figure 4.11 show that Three-Stone Stoves are the most widely used stove type, accounting for 94.4% of all households using firewood for cooking, followed by Round Mud Stoves at 3.8% and Improved Cooking Stoves at 1.0%. Other types of firewood cooking stoves accounted for a small percentage ranging from 0.02% to 0.6%. Despite the availability of more efficient firewood stoves, the threestone stove remains dominant, highlighting the need for greater awareness and accessibility of improved cookstoves to reduce firewood consumption, deforestation, and indoor air pollution (Figure 4.11).

FIGURE 4.11: DISTRIBUTION OF HOUSEHOLDS BY TYPE OF STOVE USING FIREWOOD FOR COOKING. **MAINLAND TANZANIA, 2023 HECS**



4.3.5 Types of Charcoal Stoves for Cooking

Figure 4.12 provides insights into the different types of charcoal stoves used by households in Mainland Tanzania. The traditional charcoal stove is the most used, accounting for 41.0% of households. Ceramiclined charcoal is the least used, with only 12.6% of households adopting it. Improved Cookstoves (ICS) collectively accounts for 38.5% of households, indicating some level of adoption of more efficient cooking technologies.

FIGURE 4.12: CHARCOAL STOVE TYPES USED FOR COOKING IN HOUSEHOLDS, MAINLAND **TANZANIA**

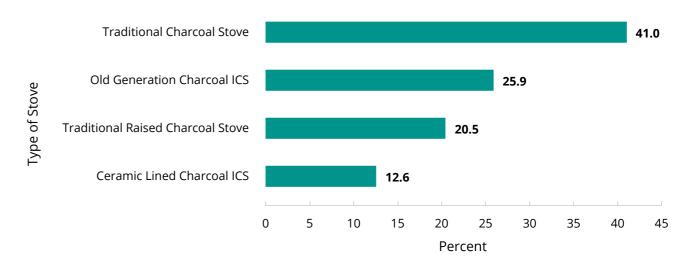


Table 4.13 provides valuable insights into the regional disparities in the use of charcoal stoves in Mainland Tanzania. While some regions have made significant progress in adopting improved cookstoves, others lag, relying heavily on traditional, less efficient stoves.

The use of charcoal stoves varies significantly across regions in Mainland Tanzania. Dodoma has the highest proportion of households reported to use ceramic-lined charcoal ICS (93.3%), while Manyara (84.9%), Mtwara (73.0%), Arusha (69.7%), Rukwa (68.8%), and Songwe (66.7%) primarily rely on traditional charcoal stoves. Kilimanjaro shows a mixed pattern, with 55.1% using old-generation charcoal ICS and 22.6% relying on traditional raised stoves. The adoption of efficient stoves remains low in many regions.

TABLE 4.13: DISTRIBUTION OF HOUSEHOLDS BY TYPE OF STOVE USING CHARCOAL FOR COOKING AND REGION, MAINLAND TANZANIA, 2023 HECS

| | Type of Stove | | | | | | |
|-------------------|-------------------------------|---|--------------------------------|-------------------------------|--|--|--|
| Region | Traditional Charcoal Stove | Traditional Raised Charcoal Stove | Old Generation Charcoal ICS | Ceramic Lined Charcoal ICS | | | |
| Dodoma | 5.7 | 0.4 | 0.7 | 93.3 | | | |
| Arusha | 69.7 | 2.0 | 23.9 | 4.4 | | | |
| Kilimanjaro | 17.6 | 22.6 | 55.1 | 4.6 | | | |
| Tanga | 60.7 | 30.0 | 5.6 | 3.6 | | | |
| Morogoro | 4.4 | 23.8 | 47.8 | 24.0 | | | |
| Pwani | 8.0 | 9.1 | 46.5 | 36.3 | | | |
| Dar es Salaam | 51.6 | 24.2 | 24.3 | - | | | |
| Lindi | 42.8 | 41.4 | 15.4 | 0.4 | | | |
| Mtwara | 73.0 | 27.0 | - | - | | | |
| Ruvuma | 26.1 | 14.2 | 36.9 | 22.8 | | | |
| Iringa | 5.4 | - | 86.2 | 8.3 | | | |
| Mbeya | 55.5 | 8.0 | 20.7 | 15.8 | | | |
| Singida | 30.6 | 27.1 | 0.7 | 41.6 | | | |
| Tabora | 66.3 | 3.2 | 30.6 | - | | | |
| Rukwa | 68.8 | 29.0 | 2.2 | - | | | |
| Kigoma | 31.9 | 24.2 | 23.2 | 20.7 | | | |
| Shinyanga | 25.4 | 73.7 | - | 1.0 | | | |
| Kagera | 62.6 | 10.1 | 19.4 | 8.0 | | | |
| Mwanza | 66.7 | 1.1 | 32.1 | 0.1 | | | |
| Mara | 30.0 | 25.3 | 37.9 | 6.8 | | | |
| Manyara | 84.9 | - | 13.9 | 1.2 | | | |
| Njombe | 40.3 | 23.7 | 35.5 | 0.6 | | | |
| Katavi | 33.3 | 54.3 | 11.9 | 0.4 | | | |
| Simiyu | 37.3 | 52.9 | 0.9 | 8.9 | | | |
| Geita | 43.5 | 23.5 | 32.5 | 0.4 | | | |
| Songwe | 28.4 | 56.6 | 4.3 | 10.7 | | | |
| Mainland Tanzania | 41.0 | 20.5 | 25.9 | 12.6 | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

A comparison of charcoal and firewood usage from the Household Budget Survey (HBS 2018), the Impact of Access to Sustainable Energy Survey (IASES 2021), and the Household Energy Consumption Survey (HECS 2023) reveals an apparent increase in reliance on traditional biomass fuels in Mainland Tanzania. Firewood consumption rose steadily from 60.9% in 2018 to 65.5% in 2023, while charcoal usage increased sharply from 28.8% to 44% over the same period. However, the higher figures reported in HECS 2023 do not necessarily reflect a true rise in usage, but rather differences in how consumption data were collected. Unlike HBS and IASES, which asked households to report only their mainly used fuel and excluding others, HECS 2023 captured information on all fuels used, regardless of purpose. This broader approach led to higher reported shares of charcoal and firewood, as many households use these fuels for different purposes such as cooking certain foods or during power interruptions, space heating and water heating. The relatively stable share of firewood suggests it remains the primary energy source for most households, while the higher charcoal share in HECS 2023 indicates its frequent use as a supplementary or secondary fuel (Table 4.14).

TABLE 4.14: SHARE OF HOUSEHOLDS USING CHARCOAL AND FIREWOOD - COMPARISON OF HECS, IASES. AND HOUSEHOLD BUDGET SURVEY

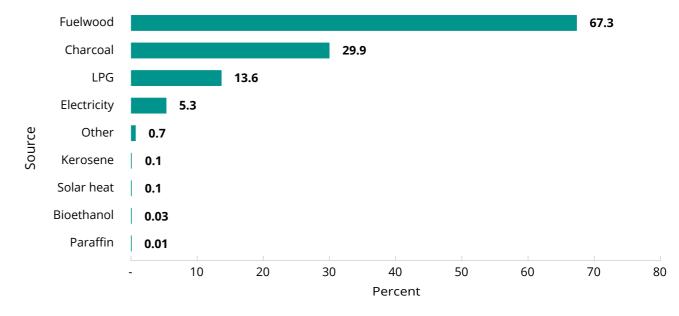
| Energy Carries | HBS 2018 | IASES 2021 | HECS 2023 | |
|----------------|----------|------------|-----------|--|
| Firewood | 60.9 | 63.3 | 65.5 | |
| Charcoal | 28.8 | 28.5 | 44.0 | |

4.4 FUEL USED FOR WATER HEATING

Water heating in Mainland Tanzania remains heavily dependent on traditional biomass (firewood and charcoal), together making up 97.2% of usage, with minimal use of modern or renewable sources. This highlights both the energy access challenges and the potential for policy interventions to promote cleaner alternatives like LPG, electricity, and solar heating.

Findings from Figure 4.13 reveals firewood was the dominant source, used by 67.3% of households followed by charcoal at 29.9%. Natural gas (0.1%) and solar heat (0.1%) have very limited use (Figure 4.13).

FIGURE 4.13: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY USED FOR WATER HEATING AND REGION, MAINLAND TANZANIA, 2023 HECS



Furthermore, high use of firewood was noted in regions such as Simiyu (90.0%), Manyara (83.0%), and Kilimanjaro (83.7%). LPG (13.7%) and electricity (5.3%) are more prevalent in urban centers, with Dar es Salaam leading at 45.5% of LPG use and 25.3% of electricity use for water heating, followed by Arusha at 36.7% of LPG use and 10.2% of electricity use (Table 4.15).

TABLE 4.15: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY USED FOR WATER HEATING AND REGION, MAINLAND TANZANIA, 2023 HECS

| | | | | | | Source | | | | | |
|----------------------|------------------|------|---------------|----------|----------------|--------|-----------------|---------------|---------------|---------------|-------|
| Region | Electri- city | LPG | Kerose- ne | Paraffin | Natural gas | Biogas | Bioe- thanol | Fuel- wood | Char- coal | Solar heat | Other |
| Dodoma | 3.5 | 16.8 | - | - | - | - | - | 56.2 | 29.9 | - | - |
| Arusha | 10.2 | 36.7 | 0.6 | - | - | - | - | 64.9 | 17.5 | - | - |
| Kilimanjaro | 2.9 | 17.1 | 0.2 | - | - | - | 0.2 | 83.7 | 9.7 | - | - |
| Tanga | 7.9 | 7.5 | - | - | - | - | 0.3 | 71.7 | 25.4 | 0.4 | 3.1 |
| Morogoro | 1.4 | 7.7 | 0.2 | - | - | - | - | 60.3 | 48.7 | 0.4 | - |
| Pwani | 4.9 | 26.6 | - | - | - | - | - | 58.9 | 61.1 | 0.3 | 1.7 |
| Dar es Salaam | 25.7 | 44.5 | - | - | - | - | - | 8.5 | 35.7 | - | - |
| Lindi | 0.7 | 2.4 | - | - | - | - | - | 81.7 | 22.2 | 0.2 | - |
| Mtwara | - | 6.2 | - | - | - | - | - | 77.5 | 21.7 | - | - |
| Ruvuma | 2.1 | 4.1 | - | - | - | - | - | 83.9 | 19.1 | - | 1.4 |
| Iringa | 5.2 | 20.1 | - | - | - | - | - | 60.8 | 33.1 | - | 0.5 |
| Mbeya | 4.9 | 19.4 | 0.6 | - | - | - | - | 57.9 | 41.5 | - | - |
| Singida | 1.7 | 8.1 | - | - | - | - | - | 82.4 | 17.8 | - | 0.7 |
| Tabora | 1.2 | 5.2 | - | - | - | - | - | 67.7 | 35.4 | - | - |
| Rukwa | 3.5 | 2.8 | 0.3 | - | - | - | - | 75.9 | 32.7 | 0.3 | - |
| Kigoma | 2.0 | 4.3 | - | - | - | - | - | 78.2 | 20.7 | - | - |
| Shinyanga | 14.3 | 20.5 | - | - | - | - | - | 39.5 | 42.3 | - | - |
| Kagera | 5.6 | 6.1 | - | - | - | - | - | 80.4 | 19.1 | - | - |
| Mwanza | 10.1 | 6.4 | - | - | - | - | - | 54.7 | 54.7 | - | - |
| Mara | 0.6 | 5.5 | - | - | - | - | - | 79.3 | 20.0 | - | - |
| Manyara | 0.9 | 16.1 | - | 0.4 | - | - | - | 82.6 | 18.5 | 0.3 | 9.3 |
| Njombe | 3.0 | 5.4 | - | - | - | - | - | 75.0 | 27.9 | 0.3 | 0.6 |
| Katavi | 2.1 | 9.4 | - | - | - | = | - | 52.2 | 62.6 | - | - |
| Simiyu | 1.5 | 5.9 | - | - | - | - | 0.3 | 90.0 | 19.5 | - | - |
| Geita | 3.1 | 3.6 | - | - | - | - | - | 69.5 | 28.4 | - | - |
| Songwe | 4.3 | 11.6 | - | - | = | - | = | 63.8 | 31.6 | - | 0.7 |
| Mainland Tanzania | 5.3 | 13.6 | 0.1 | 0.01 | - | - | 0.0 | 67.3 | 29.97 | 0.1 | 0.7 |

4.5 SPACE HEATING USING INDOOR COOKING

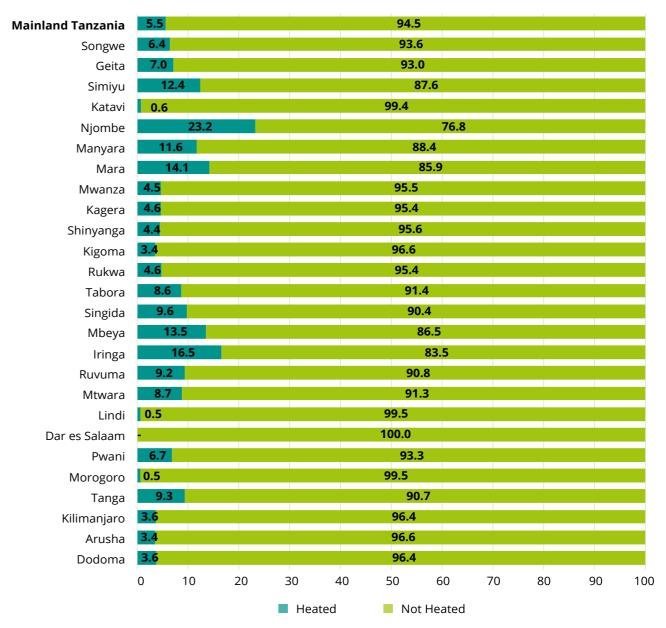
Space Heating refers to the process of maintaining indoor thermal comfort by raising the temperature within a dwelling or building. In Mainland Tanzania, the use of dedicated space heating systems is rare. Instead, space heating typically occurs indirectly as a by-product of other household activities most commonly indoor cooking particularly in cooler climatic zones such as Njombe and Iringa.

The results indicate that 5.5% of households used indoor cooking to heat their dwellings, while 94.5% stated that they do not.

Njombe tops the list on space heating using indoor cooking, with 23.2% of households reporting that indoor cooking contributes to heating their dwelling, followed by Iringa (16.5%), Mara (14.1%) and Mbeya (13.5%)

Morogoro and Lindi (both at 0.5%), and Katavi (0.6%) reported the lowest heating. Dar es Salaam shows 0% (or unreported), meaning all respondents indicated indoor cooking does not heat their household (Figure 4.14).

FIGURE 4.14: SHARE OF HOUSEHOLDS COOKING INDOORS THAT ALSO HEATED THE DWELLING, **MAINLAND TANZANIA, 2023 HECS**



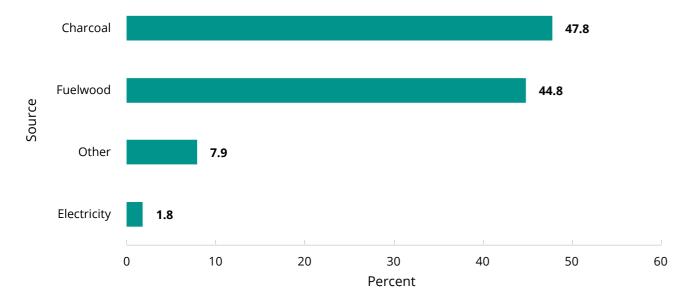
CHAPTER FOUR /// ENERGY CONSUMPTION PATTERN

4.5.1 Energy sources for space heating

In Mainland Tanzania, space heating was not commonly practiced as a dedicated activity. Instead, in cooler regions such as Njombe, Iringa, and Mbeya, households often experienced incidental space heating as a by-product of indoor cooking. The primary energy sources contributing to this incidental heating included electricity, LPG, kerosene, firewood, charcoal and other.

Traditional biomass fuels, primarily firewood (47.8%) and charcoal (41.9%), remained the dominant energy sources for space heating and electricity accounted only for 1.8% while other sources of heating recorded 7.9% (Figure 4.15).

FIGURE 4.15: DISTRIBUTION OF HOUSEHOLDS THAT HEATED DWELLING BY SOURCE OF ENERGY FOR SPACE HEATING AND REGION, MAINLAND TANZANIA, 2023 HECS



Firewood and charcoal emerged as the dominant sources of energy for space heating across most regions in Mainland Tanzania. The findings in Table 4.16 reveal that Simiyu, Geita, and Kilimanjaro (100%), Mtwara (93.1%), Kilimanjaro (74.5%) and Pwani (73.3%) had the highest reliance on firewood, indicating a strong dependence on readily available natural biomass, particularly in rural and semi-rural areas. Conversely, charcoal was the primary source in more urbanized regions such as Morogoro (100%), Mbeya (85.6%), Iringa (81.2%) and Ruvuma (81.0%), likely due to its relative convenience, higher energy density, and suitability for indoor heating compared to firewood. On the other hand, other types of sources had a significant number as shown in Table 4.16.

TABLE 4.16: DISTRIBUTION OF HOUSEHOLDS THAT HEATED DWELLING BY SOURCE OF ENERGY FOR SPACE HEATING AND REGION IN MAINLAND TANZANIA, 2023 HECS

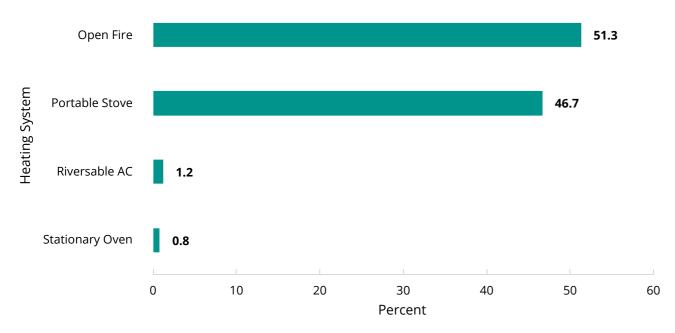
| 2.1 | | Main Source | | | | | | | |
|-------------------|-------------|-------------|----------|-------|--|--|--|--|--|
| Region | Electricity | Firewood | Charcoal | Other | | | | | |
| Dodoma | - | 63.8 | 21.5 | 14.7 | | | | | |
| Arusha | - | 64.5 | 23.6 | 11.9 | | | | | |
| Kilimanjaro | - | 74.5 | 25.5 | - | | | | | |
| Tanga | 2.9 | 66.3 | 27.2 | 3.6 | | | | | |
| Morogoro | - | - | 100.0 | - | | | | | |
| Pwani | - | 73.3 | 39.8 | - | | | | | |
| Lindi | - | - | - | 100.0 | | | | | |
| Mtwara | 4.9 | 93.1 | 6.9 | - | | | | | |
| Ruvuma | 6.9 | 12.2 | 81.0 | - | | | | | |
| Iringa | - | 16.4 | 81.2 | 2.4 | | | | | |
| Mbeya | - | 14.4 | 85.6 | - | | | | | |
| Singida | 11.8 | 12.6 | 72.1 | 15.4 | | | | | |
| Tabora | - | 51.5 | 29.5 | 19.0 | | | | | |
| Rukwa | - | 25.7 | 74.3 | - | | | | | |
| Kigoma | - | 56.7 | 43.3 | - | | | | | |
| Shinyanga | 15.9 | 89.8 | + | 10.2 | | | | | |
| Kagera | 7.9 | 31.3 | - | 60.7 | | | | | |
| Mwanza | - | 22.9 | 57.4 | 19.7 | | | | | |
| Mara | - | 47.4 | 34.9 | 17.7 | | | | | |
| Manyara | - | 44.2 | 50.2 | 9.8 | | | | | |
| Njombe | - | 32.9 | 60.9 | 6.2 | | | | | |
| Katavi | - | 56.2 | 43.8 | - | | | | | |
| Simiyu | - | 100.0 | 12.7 | - | | | | | |
| Geita | - | 58.8 | 41.2 | - | | | | | |
| Songwe | - | 29.8 | 55.9 | 14.3 | | | | | |
| Mainland Tanzania | 1.8 | 44.8 | 47.8 | 7.9 | | | | | |

4.5.2 Heating system

In Mainland Tanzania, space heating systems are largely informal and non-mechanized, reflecting both the country's generally warm climate and the socioeconomic conditions of most households. In areas where heating is necessary, particularly in the cooler highland regions or during colder seasons, households primarily depend on simple, traditional methods, rather than modern, centralized, or automated heating systems.

Results from Figure 4.16 indicate that Open fire was the most used heating method, employed by more than half of the households (51.3%) followed by portable stoves accounting for 46.7% and reversable AC (1.2%). Stationary oven was the least common heating method, used by 0.8% of households.

FIGURE 4.16: DISTRIBUTION OF HOUSEHOLDS THAT HEATED DWELLING BY MAIN HEATING SYSTEM **IN MAINLAND TANZANIA, 2023 HECS**



Open fire remains the most widely used method for space heating across many regions. Notably, regions such as Shinyanga, Simiyu, and Lindi reported full reliance (100%) on open fire. In contrast, regions with significantly lower usage include Mbeya (14.4%), Iringa (18.8%), and Ruvuma (12.2%), reflecting a shift toward alternative heating methods (Table 4.17 shows). On the other hand, the use of reversible air conditioners (ACs) was limited to a few regions, with Singida leading at 11.8%. Minimal usage was also recorded in Tanga (2.9%), Ruvuma (6.9%), and Kagera (7.9%).

Results in Table 4.17 further showed Portable Stove was also common in some regions, the highest was recorded in Morogoro (100 %) followed by Mbeya (85.6%) and Iringa (81.2%) and the lowest was recorded in Mtwara (6.9%).

TABLE 4.17: DISTRIBUTION OF HOUSEHOLDS THAT HEATED DWELLING BY MAIN HEATING SYSTEM **AND REGION IN TANZANIA, 2023 HECS**

| | | Means of Hea | ting Dwelling | |
|-------------------|-----------|----------------|--------------------|---------------|
| Region | Open Fire | Portable Stove | Stationary Oven | Reversable AC |
| Dodoma | 78.5 | 21.5 | - | - |
| Arusha | 76.4 | 23.6 | - | - |
| Kilimanjaro | 74.5 | 25.5 | - | - |
| Tanga | 69.9 | 27.2 | - | 2.9 |
| Morogoro | - | 100.0 | - | - |
| Pwani | 73.3 | 26.7 | - | - |
| Lindi | 100.0 | - | - | - |
| Mtwara | 93.1 | 6.9 | - | - |
| Ruvuma | 12.2 | 81.0 | - | 6.9 |
| Iringa | 18.8 | 81.2 | - | - |
| Mbeya | 14.4 | 85.6 | - | - |
| Singida | 27.9 | 60.2 | - | 11.8 |
| Tabora | 70.5 | 29.5 | - | - |
| Rukwa | 25.7 | 74.3 | - | - |
| Kigoma | 56.7 | 43.3 | - | - |
| Shinyanga | 100.0 | - | - | - |
| Kagera | 82.2 | 9.8 | - | 7.9 |
| Mwanza | 42.6 | 57.4 | - | - |
| Mara | 47.4 | 34.9 | 17.7 | - |
| Manyara | 49.8 | 50.2 | - | - |
| Njombe | 39.1 | 60.9 | - | - |
| Katavi | 56.2 | 43.8 | - | - |
| Simiyu | 100.0 | - | - | - |
| Geita | 58.8 | 41.2 | - | - |
| Songwe | 44.1 | 55.9 | - | - |
| Mainland Tanzania | 51.3 | 46.7 | 0.8 | 1.2 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

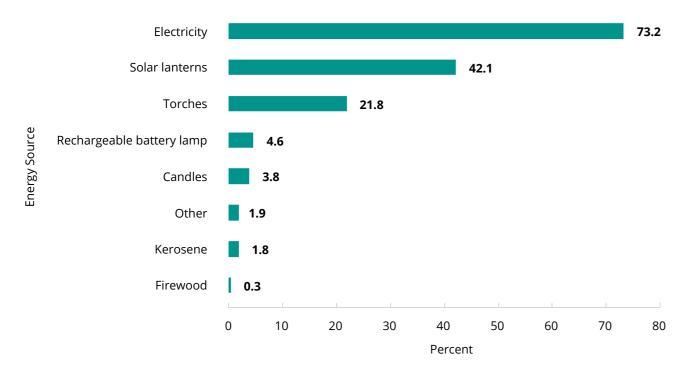
4.6 ENERGY SOURCES FOR LIGHTING

Lighting is a critical component of household energy consumption, reflecting both access to modern energy services and broader socioeconomic conditions. According to the 2023 HECS, households in Mainland Tanzania relied on a diverse mix of energy sources for lighting, ranging from grid electricity and solar lanterns to traditional fuels like kerosene and firewood.

In Mainland Tanzania, 73.2% of households reported using electricity as their primary source for lighting, showing continued progress in electrification efforts particular in rural areas (Figure 4.17 indicates).

Solar lanterns follow as the second most common source at 42.1%, highlighting the growing role of renewable energy in areas with limited or unreliable grid access and torches. Torches, used by 21.8% of households, indicate a continued reliance on portable lighting. Other sources such as rechargeable battery lamps (4.6%), candles (3.8%), other sources (1.9%), kerosene lamps (1.8%), and firewood (0.3%) were less common sources reported by the households (see Figure 4.17).

FIGURE 4.17: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY FOR LIGHTING IN **MAINLAND TANZANIA, 2023 HECS**



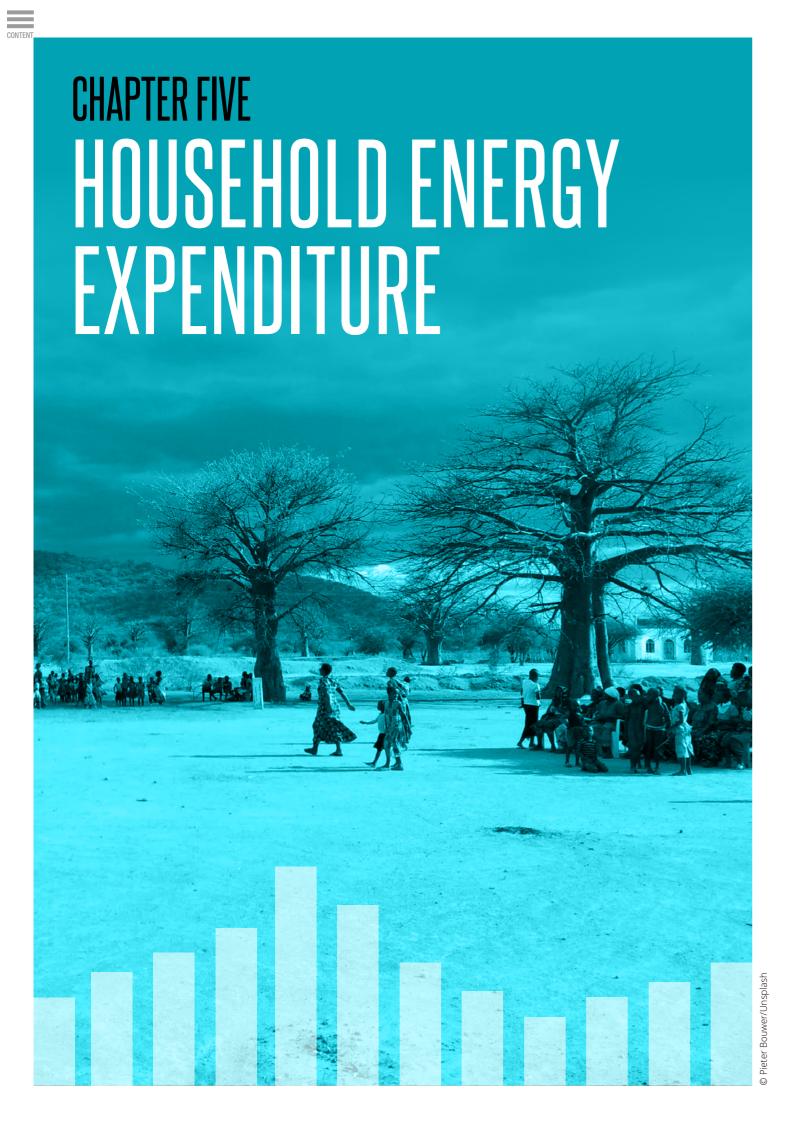
The use of kerosene, candles, and firewood remains minimal, yet they are still present in specific regions, signaling a need for further clean energy interventions. The high reliance on solar lighting in regions such as Ruvuma (61.8%) and Lindi (58.2%) indicates the success of solar distribution programs and market driven solar solutions in areas underserved by the national grid (Table 4.18).

Solar energy is an important backup source of light, especially in rural and off-grid areas. Regions such as Lindi (58.2%), Singida (57.3%), Mara (57.0%), and Ruvuma (61.4%) rely heavily on solar power, underscoring its importance in areas with limited access to the national electricity grid. Conversely, regions such as Dar es Salaam (6.1%) and Kilimanjaro (31.3%) have lower solar power usage due to their greater access to grid electricity.

TABLE 4.18: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY FOR LIGHTING AND REGION **IN MAINLAND TANZANIA, 2023 HECS**

| | Energy Source for lighting | | | | | | | | | | |
|-------------------|----------------------------|----------|---------|----------|-------------------|---------|--------------------------------------|-------|--|--|--|
| Region | Electricity | Kerosene | Candles | Firewood | Solar lanterns | Torches | Rechar- geable battery lamp | Other | | | |
| Dodoma | 81.6 | - | 1.3 | 0.6 | 39.6 | 21.8 | 1.7 | 0.3 | | | |
| Arusha | 72.1 | 3.6 | 12.5 | 0.6 | 39.1 | 5.7 | 13.1 | 4.0 | | | |
| Kilimanjaro | 84.9 | 4.3 | 12.5 | - | 31.3 | 12.1 | 22.7 | 0.7 | | | |
| Tanga | 85.5 | 9.6 | 4.8 | 0.1 | 47.9 | 13.3 | 3.4 | 1.2 | | | |
| Morogoro | 84.5 | 1.3 | 5.2 | - | 46.9 | 32.2 | 3.8 | 4.8 | | | |
| Pwani | 87.3 | 2.6 | 14.5 | 1.0 | 38.8 | 35.6 | 8.9 | 11.0 | | | |
| Dar es Salaam | 94.5 | 0.6 | 0.7 | - | 6.1 | 1.2 | 1.3 | - | | | |
| Lindi | 63.2 | 0.2 | 1.7 | 2.6 | 58.2 | 25.5 | 2.2 | = | | | |
| Mtwara | 66.4 | 0.4 | 1.0 | 0.7 | 51.7 | 23.9 | 1.4 | 4.6 | | | |
| Ruvuma | 62.0 | - | 4.7 | 0.4 | 61.8 | 23.6 | 4.5 | 2.9 | | | |
| Iringa | 80.6 | 0.4 | 2.1 | 0.3 | 37.7 | 6.3 | 2.4 | 2.9 | | | |
| Mbeya | 74.7 | 0.6 | 2.7 | - | 32.3 | 12.7 | 5.1 | 1.5 | | | |
| Singida | 93.0 | 0.2 | 0.2 | 0.2 | 57.3 | 20.5 | 0.4 | = | | | |
| Tabora | 77.4 | 1.7 | 1.0 | 0.3 | 49.2 | 31.7 | 6.3 | 2.1 | | | |
| Rukwa | 63.3 | 6.5 | 1.0 | 0.2 | 44.7 | 26.7 | 2.5 | 0.8 | | | |
| Kigoma | 35.2 | - | 0.5 | 0.6 | 47.4 | 28.6 | 3.4 | 0.6 | | | |
| Shinyanga | 43.6 | - | 0.7 | 0.7 | 49.8 | 25.7 | 2.0 | 3.7 | | | |
| Kagera | 46.4 | 7.4 | 4.6 | - | 49.6 | 23.1 | 3.0 | 0.8 | | | |
| Mwanza | 58.4 | 1.6 | 9.6 | - | 47.7 | 27.7 | 6.5 | 0.7 | | | |
| Mara | 93.0 | 0.3 | 1.9 | 0.3 | 57.0 | 17.1 | 2.6 | 0.2 | | | |
| Manyara | 66.8 | - | 0.6 | 0.2 | 50.2 | 46.3 | 6.4 | 1.1 | | | |
| Njombe | 79.7 | 0.2 | 0.9 | 0.2 | 46.7 | 6.8 | 1.8 | 0.2 | | | |
| Katavi | 91.5 | 0.4 | 2.1 | - | 40.4 | 25.2 | 3.4 | 0.1 | | | |
| Simiyu | 32.2 | - | 0.1 | 1.3 | 38.3 | 59.8 | 1.4 | 4.4 | | | |
| Geita | 65.0 | - | 0.2 | 0.5 | 57.0 | 33.0 | 2.8 | 0.8 | | | |
| Songwe | 70.9 | 0.2 | 4.2 | - | 46.7 | 29.0 | 5.0 | - | | | |
| Mainland Tanzania | 73.2 | 1.8 | 3.8 | 0.3 | 42.1 | 21.8 | 4.6 | 1.9 | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)



5.1 INTRODUCTION

Understanding the quantities of energy used by households in Mainland Tanzania is important for guiding national energy planning and improving access to affordable, reliable, and clean energy. It helps policymakers identify which fuels are most used, such as firewood, charcoal, LPG, or kerosene, and target interventions accordingly. Moreover, tracking energy consumption supports efforts to reduce deforestation and indoor air pollution, and helps monitor progress toward sustainable development goals.

5.2 AVERAGE MONTHLY HOUSEHOLD ENERGY **PURCHASES**

The findings from HECS 2023 show the typical amount of energy that households in Mainland Tanzania buy each month, based on their household size. It highlights the average use of four main energy sources commonly used for cooking and heating – LPG, kerosene, firewood, and charcoal.

Across all household sizes, firewood is the most purchased energy source, with an average of 10 bundles per month. This is followed by charcoal, averaging 9 buckets, LPG at 6 kilograms (kg), and kerosene at 5 liters. However, when converted to the same energy unit, this equates to 0.00092 TJ.

Generally, larger households (with 11 or more members) tend to purchase more energy overall, particularly LPG and firewood. However, charcoal use tends to decrease slightly as household size increases, possibly due to shifts in cooking methods or preferences (Table 5.1).

TABLE 5.1: MONTHLY AVERAGE ENERGY PURCHASES BY HOUSEHOLD SIZE AND TYPE OF ENERGY IN **MAINLAND TANZANIA, 2023 HECS**

| | Type of Energy | | | | | | | | |
|----------------|----------------|---------------------|-----------------------|-----------------------|--|--|--|--|--|
| Household Size | LPG (Kg) | Kerosine (Liter) | Firewood (Bundles) | Charcoal (Buckets) | | | | | |
| 1 | 6 | 4 | 9 | 10 | | | | | |
| 2-4 | 6 | 5 | 10 | 9 | | | | | |
| 5-7 | 7 | 5 | 10 | 8 | | | | | |
| 8-10 | 6 | 2 | 9 | 8 | | | | | |
| 11+ | 8 | 6 | 10 | 7 | | | | | |
| Total | 6 | 5 | 10 | 9 | | | | | |

Table 5.2 provides insights into how household energy purchases vary by place of residence (rural vs. urban), household size, and type of energy in Mainland Tanzania. LPG usage is consistent across rural households regardless of the household size, averaging around 6 kg per month. Even larger households (8–10 and 11+ members) do not show increased usage, staying around 5-6 kg. Urban households tend to use more LPG as household size increases – households with 5–7 members use an average of 7 kg, and those with 11+ members use an average of 8 kg.

In rural areas, firewood remains the dominant fuel, with households averaging 9 bundles per month across all household sizes. Large households (11+ members) use around 8-9 bundles, indicating continued reliance on biomass for daily cooking. On the other hand, the use of firewood in urban areas is surprisingly higher than rural areas, averaging 11 bundles per month, and peaking at 14 bundles for 11+ member households. This could reflect usage by peri-urban residents or shared households, where traditional cooking is still

The use of charcoal in rural households is lower, averaging 6 buckets monthly. Larger households (8–10 and 11+ members) use even less, possibly due to switching to firewood which is more readily available in rural areas. Charcoal consumption in urban areas is much higher, averaging 10 buckets per month consistently across all household sizes.

TABLE 5.2: MONTHLY AVERAGE HOUSEHOLD ENERGY PURCHASES BY TYPE OF RESIDENCE. HOUSEHOLD SIZE, AND ENERGY SOURCE IN MAINLAND TANZANIA, 2023 HECS

| | Place of residence | | | | | | | | | | | | |
|-----------------------|--------------------|-----|-----|------|-----|-------|----|-------|-----|------|-----|-------|--|
| Type of energy | Rural | | | | | | | Urban | | | | | |
| chergy | 1 | 2-4 | 5-7 | 8-10 | 11+ | Total | 1 | 2-4 | 5-7 | 8-10 | 11+ | Total | |
| LPG (kg) | 6 | 6 | 5 | 5 | 6 | 6 | 5 | 6 | 7 | 6 | 8 | 6 | |
| Kerosene (Liter) | 5 | 5 | 3 | 3 | 1 | 4 | 3 | 5 | 10 | 1 | 8 | 6 | |
| Firewood (Bundles) | 9 | 9 | 10 | 9 | 9 | 9 | 9 | 11 | 11 | 9 | 14 | 11 | |
| Charcoal (Buckets) | 7 | 6 | 6 | 4 | 4 | 6 | 11 | 11 | 10 | 10 | 9 | 10 | |

5.3 AVERAGE MONTHLY HOUSEHOLD ENERGY **EXPENDITURE**

Energy expenditure reflects how much households are willing and able to pay to meet their daily needs for cooking, lighting, and heating. These spending patterns vary significantly depending on household size, location (urban or rural), income levels, and access to energy infrastructure.

Table 5.3 shows the estimated monthly spending rounded to the nearest thousand Tanzanian shillings on four common household energy sources - LPG, kerosene, firewood, and charcoal - categorized by household size. On average, households spent TZS 67,000 per month on LPG, with the highest expenditure observed among households with one member, while the lowest (TZS 61,000) was recorded in households with more than 11 members.

Household spending on firewood ranges from TZS 14,000 to TZS 17, 000 with an average spending of TZS 15,000 monthly. Firewood expenditure increases with household size, indicating more usage in larger families. Households with 11+ members spend the most (TZS 17,000), reflecting higher cooking demand and dependence on biomass.

Charcoal expenditure ranged between TZS 15,000 and TZS 21,000, averaging TZS 19,000 per month. The highest spending was observed in single-person households (TZS 21,000), possibly due to frequent smallscale purchases, which often come at a higher cost (Table 5.3).

TABLE 5.3: AVERAGE MONTHLY HOUSEHOLD ENERGY EXPENDITURE (TZS), BY HOUSEHOLD SIZE AND TYPE OF ENERGY IN MAINLAND TANZANIA, 2023 HECS

| Household Size | Type of Energy | | | | | | | | |
|-----------------|----------------|----------|----------|----------|--|--|--|--|--|
| nouseriola size | LPG | Kerosene | Firewood | Charcoal | | | | | |
| 1 | 69,000 | 10,000 | 14,000 | 21,000 | | | | | |
| 2-4 | 67,000 | 14,000 | 15,000 | 19,000 | | | | | |
| 5-7 | 66,000 | 15,000 | 16,000 | 17,000 | | | | | |
| 8-10 | 68,000 | 8,000 | 14,000 | 18,000 | | | | | |
| 11+ | 61,000 | 15,000 | 17,000 | 15,000 | | | | | |
| Total | 67,000 | 14,000 | 15,000 | 19,000 | | | | | |

Furthermore, when analyzing the results in Table 5.4, based on rural and urban areas, the average expenditure on LPG tends to be lower in rural areas compared to urban areas. For example, rural households of 1 person spend about TZS 54,000, while urban households spend TZS 71,000 per month. In urban areas, LPG expenditure is higher across all household sizes. The highest expenditure is seen in households with 8-10 people (TZS 73,000).

Firewood is a commonly used energy source in rural areas, where households consistently spend between TZS 14,000 and TZS 16,000 per month, regardless of household size. In urban areas, firewood expenditure ranges from TZS 13,000 for single-person households to TZS 20,000 for those with 11+ members. While firewood is also used in urban areas, the spending patterns are more varied compared to the relatively stable expenditure observed in rural areas.

In rural areas, charcoal expenditure stays relatively consistent across all household sizes, averaging about TZS 14,000. In contrast, urban households spend more on charcoal, with monthly costs ranging between TZS 17,000 and TZS 23,000.

In rural areas, the highest energy expenditure is on LPG at TZS 56,000, followed by firewood at TZS 16,000. Similarly, in urban areas, LPG remains the most expensive energy source, with households spending around TZS 69,000, while charcoal also accounts for a notable share at TZS 20,000. Overall, energy expenditure tends to increase with household size. In rural areas, larger households (11+ members) spend less on kerosene (TZS 3,000) but more on firewood (TZS 16,000) compared to smaller households. A similar pattern is observed in urban areas, although kerosene expenditure among large households remains relatively high at TZS 17,000.

| | Place of residence | | | | | | | | | | | | |
|----------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| Type of energy | Rural | | | | | | | Urban | | | | | |
| chergy | 1 | 2-4 | 5-7 | 8-10 | 11+ | Total | 1 | 2-4 | 5-7 | 8-10 | 11+ | Total | |
| LPG | 54,000 | 57,000 | 58,000 | 50,000 | 49,000 | 56,000 | 71,000 | 69,000 | 68,000 | 73,000 | 63,000 | 69,000 | |
| Kerosene | 12,000 | 14,000 | 9,000 | 11,000 | 3,000 | 12,000 | 8,000 | 14,000 | 28,000 | 3,000 | 18,000 | 17,000 | |
| Firewood | 14,000 | 15,000 | 15,000 | 14,000 | 16,000 | 15,000 | 13,000 | 16,000 | 17,000 | 12,000 | 20,000 | 16,000 | |
| Charcoal | 16,000 | 14,000 | 14,000 | 13,000 | 12,000 | 14,000 | 23,000 | 21,000 | 19,000 | 21,000 | 17,000 | 20,000 | |

The energy pricing results from the 2023 HECS reveal significant disparities in the average unit prices of kerosene, firewood, and charcoal across different regions. These differences are influenced by factors such as regional resource endowments, transportation infrastructure, urbanization, demand patterns, environmental regulations, and market dynamics.

Based on results in Table 5.5, The price of kerosene ranges from TZS 2,300 (Rukwa, Mtwara) to TZS 4,200 (Lindi, Njombe, Manyara) with the national average of TZS 2,800 per liter. Some regions (e.g., Dodoma, Ruvuma, Iringa, Kigoma, Shinyanga) show no kerosene data, which could indicate low usage or possibly a shift in energy preference. Coastal and well-connected regions such as Dar es Salaam, Arusha, and Tanga have moderate high prices.

Lindi region recorded the lowest price of firewood (TZS 800) per bundle while the highest price was recorded in Tabora and Dar es Salaam (TZS 2,200) per bundle. The national average price was TZS 1,600.

Overall, firewood tended to be more affordable in regions such as Lindi, Rukwa, and Ruvuma, where it is commonly collected rather than bought. In contrast, urban and peri-urban areas like Dar es Salaam, Tabora, and Singida recorded higher prices, largely due to stricter forest-use regulations, deforestation pressures, climate change and increased transportation costs.

The results also indicate that the average price of charcoal was TZS 2,600 per bucket, with the highest price observed in Njombe region at TZS 6,000 and the lowest price recorded in Ruvuma, Morogoro, and Rukwa at TZS 1,700.

Generally, charcoal exhibits the widest price variation among the energy sources, highlighting significant regional disparities in production, access, and demand. Highland and southern regions such as Njombe and Mtwara report notably high prices, which may be attributed to factors like deforestation-related restrictions, long distances from major production centres, limited local availability, and stricter policy enforcement, including bans or taxation on charcoal. In contrast, regions such as Dar es Salaam maintain more moderate prices at TZS 2,600 per bucket, supported by well-established supply chains. However, these prices may still reflect the effects of increasing urban demand and a tightening supply (Table 5.5).

TABLE 5.5: AVERAGE UNIT PRICE (TZS) OF ENERGIES BY REGION IN MAINLAND TANZANIA, 2023 HECS

| | Type of Energy | | | | | | | |
|-------------------|------------------|-------------------|-------------------|--|--|--|--|--|
| Region | Kerosene (Litre) | Firewood (Bundle) | Charcoal (Bucket) | | | | | |
| Dodoma | - | 1,800 | 2,000 | | | | | |
| Arusha | 2,900 | 1,700 | 3,300 | | | | | |
| Kilimanjaro | 2,800 | 2,100 | 2,400 | | | | | |
| Tanga | 3,000 | 1,200 | 2,100 | | | | | |
| Morogoro | 2,700 | 1,600 | 1,700 | | | | | |
| Pwani | 3,400 | 1,600 | 2,000 | | | | | |
| Dar es Salaam | 3,500 | 2,200 | 2,600 | | | | | |
| Lindi | 4,200 | 800 | 2,300 | | | | | |
| Mtwara | 2,300 | 1,700 | 4,800 | | | | | |
| Ruvuma | - | 1,500 | 1,700 | | | | | |
| Iringa | - | 2,000 | 3,300 | | | | | |
| Mbeya | 2,400 | 1,700 | 3,100 | | | | | |
| Singida | 3,000 | 2,000 | 4,400 | | | | | |
| Tabora | 2,700 | 2,200 | 4,200 | | | | | |
| Rukwa | 2,300 | 1,300 | 1,700 | | | | | |
| Kigoma | - | 1,500 | 2,100 | | | | | |
| Shinyanga | - | 1,400 | 2,800 | | | | | |
| Kagera | 3,000 | 1,400 | 2,200 | | | | | |
| Mwanza | 2,800 | 1,200 | 1,800 | | | | | |
| Mara | 3,000 | 1,600 | 2,300 | | | | | |
| Manyara | 4,200 | 2,100 | 4,100 | | | | | |
| Njombe | 4,200 | 1,700 | 6,000 | | | | | |
| Katavi | 3,100 | 2,100 | 3,100 | | | | | |
| Simiyu | - | 1,600 | 3,700 | | | | | |
| Geita | - | 1,300 | 2,400 | | | | | |
| Songwe | 3,000 | 1,700 | 2,700 | | | | | |
| Mainland Tanzania | 2,800 | 1,600 | 2,600 | | | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

Compared to traditional biomass fuels, LPG tends to be more consistent in price across regions, primarily due to its centralized distribution and regulation. Where price does vary reflects the differences in distribution logistics, market competition, and access to infrastructure in different regions. In rural areas, where distribution networks are limited and initial setup costs such as purchasing cylinders and stoves are prohibitively high for many households, affordability and access remain significant barriers. Urban centers, especially Dar es Salaam and regional capitals, generally have better access to LPG due to a stronger retail presence and government incentives promoting clean energy.

The Mainland Tanzania average stands at TZS 24,000 for a 6 kg cylinder and TZS 56,000 for a 15 kg cylinder. For the 6 kg cylinder, prices range from as low as TZS 22,000 in Arusha to TZS 26,000 in Mara. For the 15 kg cylinder, the price variation is more pronounced ranging from TZS 53,000 in Rukwa to TZS 64,000 in Kagera. Dar es Salaam (TZS 24,000 for 6 kg and TZS 56,000 for 15 kg) benefit from better supply chains and competition among retailers, helping stabilize prices (Table 5.6 depicts).

Regions such as Kagera, Mwanza, Katavi and Mara show relatively high prices for the 15 kg cylinder, potentially due to higher transport costs, limited LPG suppliers, and weaker distribution infrastructure. Rukwa recorded the lowest prices for 15 kg LPG, which could suggest proximity to distribution points or subsidies/interventions in those regions (Table 5.6).

TABLE 5.6: AVERAGE PRICE OF LPG BY CYLINDER SIZE AND REGION IN MAINLAND TANZANIA, 2023 **HECS**

| Darion | Size of C | Size of Cylinder | | | |
|-------------------|-----------|------------------|--|--|--|
| Region | 6 Kg | 15 Kg | | | |
| Dodoma | 25,000 | 56,000 | | | |
| Arusha | 22,000 | 54,000 | | | |
| Kilimanjaro | 23,000 | 54,000 | | | |
| Tanga | 24,000 | 56,000 | | | |
| Morogoro | 25,000 | 54,000 | | | |
| Pwani | 24,000 | 56,000 | | | |
| Dar es Salaam | 24,000 | 56,000 | | | |
| Lindi | 25,000 | 55,000 | | | |
| Mtwara | 24,000 | 55,000 | | | |
| Ruvuma | 24,000 | 55,000 | | | |
| Iringa | 24,000 | 57,000 | | | |
| Mbeya | 25,000 | 56,000 | | | |
| Singida | 25,000 | 55,000 | | | |
| Tabora | 25,000 | 55,000 | | | |
| Rukwa | 25,000 | 53,000 | | | |
| Kigoma | 25,000 | 54,000 | | | |
| Shinyanga | 24,000 | 58,000 | | | |
| Kagera | 25,000 | 64,000 | | | |
| Mwanza | 24,000 | 58,000 | | | |
| Mara | 26,000 | 57,000 | | | |
| Manyara | 25,000 | 54,000 | | | |
| Njombe | 25,000 | 56,000 | | | |
| Katavi | 25,000 | 58,000 | | | |
| Simiyu | 25,000 | 55,000 | | | |
| Geita | 25,000 | 54,000 | | | |
| Songwe | 24,000 | 54,000 | | | |
| Mainland Tanzania | 24,000 | 56,000 | | | |

CONCLUSION

he 2023 Household Energy Consumption Survey (HECS) has provided a clear and data-driven understanding of how Tanzanian households access and use energy for cooking, lighting, heating, and other purposes. It has fulfilled its primary objective of producing reliable statistics to inform national policies and programs that promote affordable, reliable, sustainable, and modern energy access in line with SDG 7 and Tanzania's Development Vision 2025.

The findings demonstrate that electricity access has improved, reaching 71.2 % of households nationwide. However, a wide gap persists between urban (84 %) and rural (61 %) households, with rural populations depending heavily on off-grid solar systems (59.7 %) and small rechargeable devices. While this expansion reflects progress in rural electrification, it also signals the need for greater investment in grid reliability, affordability, and productive use.

In contrast, biomass continues to dominate cooking energy, with 65.5 % of households using firewood and 44 % using charcoal. Only 24.6 % of households use LPG, and 1.9 % use electricity for cooking, mostly in urban areas. This heavy reliance on biomass not only contributes to deforestation and land degradation but also exposes households—especially women and children—to indoor air pollution, leading to health complications. The persistence of traditional three-stone stoves (94.4 %) among firewood users highlights limited adoption of improved cookstoves and underscores the slow transition to clean cooking solutions.

The survey also revealed that 97.2 % of households rely on biomass for water heating, while solar water heating and biogas technologies remain almost absent. Similarly, space heating mainly a by-product of indoor cooking is prevalent in colder regions such as Njombe and Iringa, reflecting the continued dependence on traditional fuels even in non-cooking applications.

In terms of energy expenditure, most households spend less than TZS 10,000 per month on electricity and use modest quantities of biomass fuels. This low spending reflects energy poverty, where households have access to energy but cannot afford to use it effectively. Furthermore, the survey found that 72 % of households are male-headed, and most household members have attained only primary education (68.8 %). These socio-economic characteristics influence energy preferences and adoption of modern energy technologies.

Overall, the HECS 2023 results confirm that while Tanzania has made substantial strides in expanding energy access, the country still faces major challenges related to equity, clean energy transition, energy efficiency, and gender inclusion. The findings provide an evidence base for targeted interventions to accelerate progress toward sustainable, inclusive, and climate-resilient energy development.

RECOMMENDATIONS

he 2023 Household Energy Consumption Survey (HECS) results call for urgent and targeted policy actions to accelerate Tanzania's transition toward affordable, reliable, and sustainable energy access for all. To close the persistent rural–urban gap in electricity access, the government should intensify investment in decentralized renewable energy systems, particularly solar mini-grids and off-grid solutions, through the Rural Energy Agency (REA). Expanding the national grid to underserved areas should be complemented by strengthening partnerships with private investors to enhance reliability and service coverage. While the TANESCO D1 lifeline tariff has improved affordability, it should be maintained and expanded to ensure low-income households can benefit from stable access to electricity. At the same time, policies must encourage productive use of electricity, such as powering small enterprises and irrigation systems, to transform access into tangible economic gains and poverty reduction.

Transitioning from traditional biomass to clean cooking energy must become a national priority. The government should implement a comprehensive Clean Cooking Acceleration Strategy that combines fiscal incentives, behavioral change campaigns, and private-sector engagement. Reducing import duties and value-added tax on Liquefied Petroleum Gas (LPG), improved cookstoves, and accessories will make modern cooking solutions more affordable to consumers. At the same time, supporting local production and distribution of clean cooking technologies will create jobs and strengthen domestic value chains. Special attention should be given to rural households where reliance on firewood and charcoal remains high. Public education programs should emphasize the health, environmental, and time-saving benefits of clean cooking. Furthermore, empowering women as entrepreneurs, distributors, and educators in clean cooking initiatives will not only accelerate adoption but also enhance gender equity in the energy sector.

The government should also promote renewable energy solutions for heating, which remains heavily dependent on biomass. Incentivizing the adoption of solar water heaters in urban and peri-urban areas, coupled with promoting biogas digesters in livestock-keeping regions, would reduce deforestation and household energy costs. Policies that encourage integration of renewable heating technologies into new housing developments, alongside training programs for local artisans to manufacture and maintain such systems, would foster sustainable adoption and local employment.

Addressing energy poverty and improving affordability require the establishment of inclusive financing mechanisms. The government, in collaboration with financial institutions, should introduce micro-finance and green credit schemes to enable low-income households to purchase clean energy appliances and solar systems. Innovative financing models such as pay-as-you-go and revolving funds can help households transition from traditional fuels without financial strain. Progressive electricity pricing that encourages higher, productive use for small enterprises while protecting vulnerable consumers would help ensure that electricity access leads to real socio-economic benefits.

Energy programs should also integrate gender and education dimensions. Women and youth should be empowered through energy literacy programs, entrepreneurship training, and involvement in local renewable energy value chains. Expanding education and awareness at community and school levels will enhance understanding of the benefits of energy efficiency, clean technologies, and sustainable resource use. Ensuring women's participation in energy decision-making processes will make interventions more inclusive and effective.

To strengthen planning, monitoring, and accountability, Tanzania should institutionalize a national energy data system. Regular household energy surveys should be conducted and harmonized across key institutions such as NBS, REA, TANESCO, and the Ministry of Energy to provide consistent, reliable data for tracking progress toward SDG 7 and other national goals. Developing a centralized energy database will improve coordination, transparency, and the use of evidence in decision-making.

Lastly, energy sector interventions should be implemented through a multi-sectoral approach. Coordination between the energy, environment, health, and education sectors is essential to maximize impact. Clean cooking programs, for example, should be linked with environmental conservation and public health initiatives, while electrification projects should align with agricultural and industrial development plans to enhance productivity and job creation. Collaborative efforts among government, private sector, and development partners will ensure that energy access initiatives are sustainable, inclusive, and transformative for communities across Tanzania.



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TABLE 1: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SEX OF THE HOUSEHOLD **HEAD AND REGION IN MAINLAND TANZANIA, 2023 HECS**

| | | Sex | |
|-------------------|-----------|-------------|--------------|
| Region | Male % | Female % | Total N |
| Dodoma | 65.0 | 35.0 | 761,645 |
| Arusha | 76.9 | 23.1 | 614,212 |
| Kilimanjaro | 68.2 | 31.8 | 519,263 |
| Tanga | 74.8 | 25.2 | 682,898 |
| Morogoro | 69.7 | 30.3 | 853,923 |
| Pwani | 70.3 | 29.7 | 571,805 |
| Dar es Salaam | 71.6 | 28.4 | 1,635,473 |
| Lindi | 60.2 | 39.8 | 368,434 |
| Mtwara | 61.6 | 38.4 | 500,353 |
| Ruvuma | 76.0 | 24.0 | 471,368 |
| Iringa | 63.9 | 36.1 | 368,793 |
| Mbeya | 75.6 | 24.4 | 638,471 |
| Singida | 75.7 | 24.3 | 400,382 |
| Tabora | 75.8 | 24.2 | 598,909 |
| Rukwa | 76.1 | 23.9 | 367,096 |
| Kigoma | 74.6 | 25.4 | 491,515 |
| Shinyanga | 73.1 | 26.9 | 437,135 |
| Kagera | 71.6 | 28.4 | 704,890 |
| Mwanza | 71.4 | 28.6 | 817,178 |
| Mara | 67.8 | 32.2 | 474,692 |
| Manyara | 75.7 | 24.3 | 425,230 |
| Njombe | 67.3 | 32.7 | 279,608 |
| Katavi | 81.0 | 19.0 | 250,832 |
| Simiyu | 75.4 | 24.6 | 355,712 |
| Geita | 78.9 | 21.1 | 567,027 |
| Songwe | 78.1 | 21.9 | 368,456 |
| Mainland Tanzania | 72.0 | 28.0 | 14,525,300.0 |

TABLE 2: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLD MEMBERS BY SEX AND AGE **GROUP IN MAINLAND TANZANIA, 2023 HECS**

| | Sex | | | | | | | | |
|-------------------|-----------|-------------|------------|--|--|--|--|--|--|
| Age | Male % | Female % | Total N | | | | | | |
| 0 - 4 | 49 | 51 | 9,031,693 | | | | | | |
| 5-9 | 51 | 49 | 9,069,405 | | | | | | |
| 10 - 14 | 50 | 50 | 8,647,411 | | | | | | |
| 15 - 19 | 48 | 52 | 6,753,887 | | | | | | |
| 20 - 24 | 43 | 57 | 5,445,346 | | | | | | |
| 25 - 29 | 44 | 56 | 4,744,875 | | | | | | |
| 30 - 34 | 48 | 52 | 4,338,747 | | | | | | |
| 35 - 39 | 47 | 53 | 3,485,495 | | | | | | |
| 40 - 44 | 49 | 51 | 2,992,321 | | | | | | |
| 45 - 49 | 50 | 50 | 2,616,101 | | | | | | |
| 50 - 54 | 49 | 51 | 2,202,035 | | | | | | |
| 55 - 59 | 49 | 51 | 1,381,472 | | | | | | |
| 60 - 64 | 51 | 49 | 1,433,539 | | | | | | |
| 65 - 69 | 55 | 45 | 857,272 | | | | | | |
| 70 - 74 | 48 | 52 | 703,462 | | | | | | |
| 75 - 79 | 47 | 53 | 450,051 | | | | | | |
| 80 - 84 | 38 | 62 | 340,027 | | | | | | |
| 85+ | 45 | 55 | 328,064 | | | | | | |
| Mainland Tanzania | 48 | 52 | 64,821,200 | | | | | | |

TABLE 3: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY RELATIONSHIP TO THE HEAD OF HOUSEHOLDS AND REGION IN MAINLAND TANZANIA, 2023 HECS

| | | | Relations | ship with th | e Househo | ld Head | | |
|-------------------|------------|---------------------------|-----------|------------------|-------------------|---------------------------|-------------------|--------------------------|
| Region | Total | Head of House- hold | Spouse | Son/ Daughter | Father/ Mother | Grand Son/ Daughter | Other Relative | Other Not Relative |
| | N | % | % | % | % | % | % | % |
| Dodoma | 3,026,032 | 25.2 | 14.6 | 47.5 | 0.9 | 7.4 | 3.8 | 0.6 |
| Arusha | 2,680,556 | 22.9 | 15.9 | 46.8 | 0.8 | 7.2 | 4.9 | 1.4 |
| Kilimanjaro | 1,942,908 | 26.7 | 15.4 | 36.2 | 1.1 | 13.7 | 4.2 | 2.7 |
| Tanga | 3,179,579 | 21.5 | 14.0 | 45.1 | 1.0 | 11.2 | 3.8 | 3.4 |
| Morogoro | 3,637,227 | 23.5 | 15.3 | 41.7 | 0.8 | 10.8 | 5.3 | 2.6 |
| Pwani | 2,352,279 | 24.3 | 16.7 | 42.9 | 0.8 | 5.8 | 4.5 | 5.0 |
| Dar es Salaam | 5,390,074 | 30.3 | 16.0 | 37.0 | 0.5 | 4.9 | 9.1 | 2.1 |
| Lindi | 1,241,144 | 29.7 | 15.3 | 34.8 | 1.3 | 8.8 | 7.6 | 2.5 |
| Mtwara | 1,681,866 | 29.7 | 16.4 | 35.8 | 0.9 | 10.8 | 5.8 | 0.6 |
| Ruvuma | 2,039,944 | 23.1 | 17.1 | 44.9 | 0.8 | 9.7 | 4.2 | 0.2 |
| Iringa | 1,409,333 | 26.2 | 14.8 | 42.6 | 0.4 | 9.6 | 5.5 | 1.0 |
| Mbeya | 2,500,169 | 25.5 | 16.6 | 44.0 | 0.6 | 7.2 | 4.5 | 1.6 |
| Singida | 2,095,084 | 19.1 | 13.5 | 51.6 | 0.5 | 9.7 | 4.2 | 1.4 |
| Tabora | 3,407,591 | 17.6 | 12.8 | 50.7 | 0.6 | 11.4 | 5.1 | 1.8 |
| Rukwa | 1,743,575 | 21.1 | 15.7 | 53.1 | 0.6 | 5.6 | 3.4 | 0.5 |
| Kigoma | 2,649,244 | 18.6 | 13.1 | 53.3 | 0.4 | 8.5 | 5.3 | 0.9 |
| Shinyanga | 2,362,667 | 18.5 | 12.2 | 51.9 | 0.5 | 10.9 | 4.8 | 1.1 |
| Kagera | 3,045,573 | 23.1 | 14.3 | 49.8 | 0.3 | 8.5 | 3.5 | 0.4 |
| Mwanza | 4,078,427 | 20.0 | 12.5 | 49.2 | 0.8 | 12.1 | 3.7 | 1.7 |
| Mara | 2,654,595 | 17.9 | 11.1 | 52.2 | 0.8 | 12.1 | 3.8 | 2.1 |
| Manyara | 1,774,479 | 24.0 | 15.1 | 48.9 | 1.1 | 6.6 | 3.5 | 0.8 |
| Njombe | 1,016,289 | 27.5 | 17.5 | 41.9 | 0.7 | 7.7 | 3.9 | 0.9 |
| Katavi | 1,388,394 | 18.1 | 13.6 | 51.1 | 0.4 | 7.6 | 4.8 | 4.4 |
| Simiyu | 2,463,177 | 14.4 | 10.6 | 51.5 | 0.4 | 18.0 | 4.1 | 0.9 |
| Geita | 3,509,767 | 16.2 | 12.5 | 54.4 | 0.5 | 8.1 | 6.0 | 2.3 |
| Songwe | 1,551,230 | 23.8 | 17.4 | 46.3 | 0.6 | 6.5 | 4.7 | 0.8 |
| Mainland Tanzania | 64,821,200 | 22.4 | 14.4 | 46.6 | 0.7 | 9.3 | 4.9 | 1.7 |

TABLE 4: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY MARITAL STATUS AND **REGION IN MAINLAND TANZANIA, 2023 HECS**

| | | | | Marital | Status | | | |
|-------------------|------------|------------------|---------|--------------------|----------|----------------|---------|---------------|
| Region | Total | Never Married | Married | Living Together | Divorced | Sepa- rated | Widowed | Not stated |
| | N | % | % | % | % | % | % | % |
| Dodoma | 3,026,032 | 48.8 | 40.3 | 2.2 | 2.5 | 1.3 | 4.8 | - |
| Arusha | 2,680,556 | 43.8 | 47.9 | 0.5 | 1.8 | 0.8 | 5.2 | - |
| Kilimanjaro | 1,942,908 | 40.3 | 44.2 | 1.2 | 2.6 | 2.5 | 9.2 | - |
| Tanga | 3,179,579 | 46.2 | 42.4 | 1.8 | 2.4 | 2.0 | 5.1 | - |
| Morogoro | 3,637,227 | 44.0 | 35.4 | 11.2 | 4.1 | 1.0 | 4.2 | 0.1 |
| Pwani | 2,352,279 | 40.4 | 46.1 | 6.0 | 3.7 | 1.3 | 2.4 | - |
| Dar es Salaam | 5,390,074 | 48.4 | 39.9 | 4.1 | 2.3 | 1.3 | 4.1 | - |
| Lindi | 1,241,144 | 40.5 | 40.3 | 4.2 | 8.1 | 1.3 | 5.6 | - |
| Mtwara | 1,681,866 | 38.0 | 45.0 | 1.1 | 6.9 | 3.1 | 5.8 | 0.1 |
| Ruvuma | 2,039,944 | 42.5 | 44.0 | 4.3 | 2.9 | 1.8 | 4.5 | - |
| Iringa | 1,409,333 | 47.4 | 40.9 | 2.1 | 0.9 | 1.6 | 7.0 | - |
| Mbeya | 2,500,169 | 42.6 | 43.5 | 4.8 | 2.0 | 2.3 | 4.8 | - |
| Singida | 2,095,084 | 47.9 | 30.7 | 13.3 | 2.8 | 1.3 | 4.0 | - |
| Tabora | 3,407,591 | 46.6 | 38.7 | 6.6 | 2.9 | 2.1 | 2.9 | - |
| Rukwa | 1,743,575 | 45.1 | 27.5 | 19.8 | 1.8 | 1.0 | 4.7 | 0.1 |
| Kigoma | 2,649,244 | 46.7 | 42.2 | 1.0 | 2.3 | 1.6 | 6.2 | - |
| Shinyanga | 2,362,667 | 43.7 | 50.7 | - | 1.9 | 0.4 | 3.2 | 0.0 |
| Kagera | 3,045,573 | 43.9 | 44.5 | 1.0 | 2.2 | 2.5 | 6.0 | - |
| Mwanza | 4,078,427 | 48.7 | 37.1 | 4.4 | 3.3 | 1.9 | 4.4 | 0.3 |
| Mara | 2,654,595 | 48.4 | 38.9 | 2.1 | 2.4 | 1.3 | 6.8 | 0.1 |
| Manyara | 1,774,479 | 44.3 | 46.9 | 0.6 | 1.0 | 1.1 | 4.9 | 1.2 |
| Njombe | 1,016,289 | 39.7 | 43.1 | 7.0 | 1.3 | 2.3 | 6.5 | - |
| Katavi | 1,388,394 | 44.3 | 39.2 | 9.1 | 2.9 | 1.9 | 2.4 | 0.2 |
| Simiyu | 2,463,177 | 47.4 | 45.9 | 0.8 | 2.3 | 0.4 | 3.2 | - |
| Geita | 3,509,767 | 47.0 | 39.0 | 5.9 | 4.1 | 1.1 | 2.8 | = |
| Songwe | 1,551,230 | 39.2 | 52.6 | 0.2 | 1.9 | 1.1 | 4.9 | 0.0 |
| Mainland Tanzania | 64,821,200 | 45.1 | 41.5 | 4.3 | 2.8 | 1.5 | 4.7 | 0.1 |

TABLE 5: NUMBER AND PERCENTAGE OF HOUSEHOLD MEMBERS 5 YEARS AND ABOVE, WHO CAN READ AND WRITE BY ANY TYPE OF LANGUAGE AND REGION IN MAINLAND TANZANIA, 2023 HECS

| | Knows how to read and write in English or Kiswahili or both | | | | | | | | | | |
|-------------------|---|---------|---------|----------------------|-----------------------|----------------------|--|--|--|--|--|
| Region | Total | Swahili | English | Swahili & English | Any Other Language | Do not Read/Write | | | | | |
| | N | % | % | % | % | % | | | | | |
| Dodoma | 2,616,487 | 73.8 | 0.2 | 13.2 | - | 12.8 | | | | | |
| Arusha | 2,337,267 | 59.7 | 0.2 | 30.9 | - | 9.3 | | | | | |
| Kilimanjaro | 1,747,778 | 66.7 | 0.6 | 28.4 | - | 4.3 | | | | | |
| Tanga | 2,761,589 | 75.4 | 0.9 | 10.8 | 0.1 | 12.8 | | | | | |
| Morogoro | 3,140,517 | 72.0 | 0.3 | 11.1 | - | 16.6 | | | | | |
| Pwani | 2,023,561 | 71.9 | 0.1 | 18.3 | - | 9.8 | | | | | |
| Dar es Salaam | 4,774,179 | 47.5 | 0.5 | 49.7 | 0.1 | 2.3 | | | | | |
| Lindi | 1,136,610 | 73.5 | 1.3 | 6.5 | - | 18.8 | | | | | |
| Mtwara | 1,496,000 | 76.5 | 0.7 | 9.2 | 0.1 | 13.6 | | | | | |
| Ruvuma | 1,790,841 | 73.1 | 0.3 | 15.2 | - | 11.4 | | | | | |
| Iringa | 1,238,441 | 80.2 | 1.3 | 13.6 | - | 4.8 | | | | | |
| Mbeya | 2,198,675 | 60.0 | 0.4 | 26.0 | 0.1 | 13.6 | | | | | |
| Singida | 1,806,131 | 81.7 | 0.4 | 7.2 | 0.7 | 9.9 | | | | | |
| Tabora | 2,885,350 | 53.8 | 0.2 | 17.4 | - | 28.5 | | | | | |
| Rukwa | 1,499,115 | 73.2 | 0.4 | 8.3 | - | 18.1 | | | | | |
| Kigoma | 2,238,988 | 73.6 | 1.8 | 6.4 | 0.5 | 17.6 | | | | | |
| Shinyanga | 1,896,264 | 71.0 | 0.9 | 10.0 | 2.3 | 15.9 | | | | | |
| Kagera | 2,594,708 | 72.4 | 0.8 | 13.8 | - | 13.0 | | | | | |
| Mwanza | 3,476,921 | 65.0 | 0.7 | 23.2 | - | 11.1 | | | | | |
| Mara | 2,232,657 | 71.6 | 0.6 | 17.3 | 0.1 | 10.4 | | | | | |
| Manyara | 1,598,657 | 67.8 | 0.7 | 7.0 | - | 24.4 | | | | | |
| Njombe | 892,554 | 74.7 | 1.1 | 14.5 | - | 9.7 | | | | | |
| Katavi | 1,145,668 | 57.0 | 0.1 | 16.9 | 0.0 | 25.9 | | | | | |
| Simiyu | 2,038,218 | 67.9 | 1.3 | 2.3 | 0.4 | 28.1 | | | | | |
| Geita | 2,862,284 | 64.9 | 1.0 | 11.1 | F | 23.0 | | | | | |
| Songwe | 1,360,051 | 74.4 | 0.9 | 13.8 | 0.5 | 10.4 | | | | | |
| Mainland Tanzania | 55,789,508 | 67.5 | 0.6 | 17.7 | 0.2 | 14.0 | | | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 6: NUMBER AND PERCENTAGE OF HOUSEHOLD MEMBERS BY SCHOOL STATUS AND REGION **IN MAINLAND TANZANIA, 2023 HECS**

| | | | Schooling Status | | |
|-------------------|------------|---------------------|------------------|-----------|--------------------------|
| Region | Total | Attending School | Drop out | Completed | Never Attended School |
| | N | % | % | % | % |
| Dodoma | 3,026,032 | 33.3 | 8.1 | 45.9 | 12.7 |
| Arusha | 2,680,556 | 39.6 | 3.5 | 55.6 | 1.3 |
| Kilimanjaro | 1,942,908 | 31.6 | 8.3 | 58.8 | 1.2 |
| Tanga | 3,179,579 | 38.1 | 7.4 | 50.9 | 3.6 |
| Morogoro | 3,637,227 | 32.8 | 12.2 | 53.8 | 1.3 |
| Pwani | 2,352,279 | 34.5 | 6.6 | 56.4 | 2.5 |
| Dar es Salaam | 5,390,074 | 30.7 | 5.4 | 63.6 | 0.3 |
| Lindi | 1,241,144 | 34.5 | 19.3 | 42.1 | 4.2 |
| Mtwara | 1,681,866 | 30.8 | 9.2 | 54.9 | 5.1 |
| Ruvuma | 2,039,944 | 32.3 | 5.8 | 61.0 | 0.9 |
| Iringa | 1,409,333 | 37.3 | 4.0 | 56.8 | 1.9 |
| Mbeya | 2,500,169 | 37.0 | 5.3 | 57.2 | 0.5 |
| Singida | 2,095,084 | 40.5 | 4.2 | 52.1 | 3.3 |
| Tabora | 3,407,591 | 36.4 | 12.4 | 50.7 | 0.5 |
| Rukwa | 1,743,575 | 37.3 | 8.0 | 49.4 | 5.2 |
| Kigoma | 2,649,244 | 42.2 | 9.1 | 45.2 | 3.5 |
| Shinyanga | 2,362,667 | 33.4 | 6.7 | 49.2 | 10.8 |
| Kagera | 3,045,573 | 39.7 | 8.9 | 49.2 | 2.3 |
| Mwanza | 4,078,427 | 40.3 | 9.2 | 48.2 | 2.3 |
| Mara | 2,654,595 | 44.8 | 15.4 | 39.5 | 0.4 |
| Manyara | 1,774,479 | 39.0 | 7.7 | 50.9 | 2.5 |
| Njombe | 1,016,289 | 33.3 | 20.3 | 46.1 | 0.3 |
| Katavi | 1,388,394 | 38.8 | 16.9 | 43.0 | 1.4 |
| Simiyu | 2,463,177 | 39.7 | 8.4 | 48.4 | 3.5 |
| Geita | 3,509,767 | 43.2 | 12.9 | 42.6 | 1.3 |
| Songwe | 1,551,230 | 31.3 | 7.6 | 53.2 | 7.8 |
| Mainland Tanzania | 64,821,200 | 36.6 | 8.8 | 51.8 | 2.9 |

APPENDIX NUMBER 1 /// TABLES APPENDIX NUMBER 1 /// TABLES

TABLE 7: NUMBER AND PERCENTAGE OF HOUSEHOLD MEMBERS AGED 5 YEARS AND ABOVE BY HIGHEST LEVEL OF FORMAL EDUCATION REACHED AND REGION IN MAINLAND TANZANIA, 2023

| | | | | Н | ighest le | vel of So | hool rea | ched | | | | |
|----------------------|------------|-----|-------|----------------------|-----------|---------------|------------------------|-----------|-----------------------|-----------|---------|------------|
| Region | Total | ЬР | Adult | Primary Education | OSC | MS+ Course | Secondary Education | O+ Course | Advanced Secondary | A+ Course | Diploma | University |
| | N | % | % | % | % | % | % | % | % | % | % | % |
| Dodoma | 2,616,487 | 2.4 | 0.8 | 70.8 | - | - | 19.1 | 0.2 | 1.2 | - | 1.5 | 4.0 |
| Arusha | 2,337,267 | 4.2 | 0.3 | 61.9 | 0.1 | 0.5 | 22.5 | 0.7 | 1.6 | 0.8 | 2.5 | 4.9 |
| Kilimanjaro | 1,747,778 | 3.1 | 0.1 | 63.7 | - | 1.9 | 25.2 | 1.4 | 0.7 | 0.2 | 1.5 | 2.3 |
| Tanga | 2,761,589 | 3.5 | 0.2 | 72.7 | - | 0.1 | 19.6 | 0.2 | 0.9 | 0.2 | 1.0 | 1.4 |
| Morogoro | 3,140,517 | 3.1 | 0.1 | 71.1 | - | 0.2 | 20.6 | 0.8 | 0.9 | - | 1.1 | 2.0 |
| Pwani | 2,023,561 | 3.1 | - | 68.2 | - | 0.3 | 23.7 | 1.1 | 0.3 | 0.4 | 1.0 | 2.0 |
| Dar es Salaam | 4,774,179 | 2.3 | 0.1 | 46.4 | - | 0.7 | 32.1 | 1.0 | 2.2 | 0.3 | 5.5 | 9.5 |
| Lindi | 1,136,610 | 1.8 | 0.4 | 76.9 | - | 0.1 | 18.7 | 0.0 | 0.8 | 0.0 | 0.4 | 0.8 |
| Mtwara | 1,496,000 | 1.7 | 0.2 | 74.5 | - | - | 19.3 | 0.3 | 0.3 | - | 1.5 | 2.2 |
| Ruvuma | 1,790,841 | 2.1 | - | 78.8 | - | - | 14.3 | - | 0.6 | 0.2 | 0.8 | 3.2 |
| Iringa | 1,238,441 | 3.1 | 0.2 | 65.7 | 0.1 | 1.0 | 23.0 | 0.7 | 1.4 | 0.1 | 1.1 | 3.5 |
| Mbeya | 2,198,675 | 2.0 | - | 63.6 | - | 0.2 | 25.1 | 2.2 | 1.5 | - | 1.7 | 3.8 |
| Singida | 1,806,131 | 2.7 | - | 74.7 | - | 0.4 | 17.9 | 0.6 | 1.3 | = | 1.2 | 1.2 |
| Tabora | 2,885,350 | 1.1 | - | 70.5 | 0.1 | 0.1 | 21.1 | 0.9 | 1.9 | 0.3 | 2.4 | 1.6 |
| Rukwa | 1,499,115 | 3.7 | - | 74.4 | - | 0.3 | 17.7 | 0.3 | 0.9 | 0.2 | 1.0 | 1.6 |
| Kigoma | 2,238,988 | 2.9 | 0.6 | 75.5 | - | - | 16.5 | 0.8 | 1.0 | 0.1 | 0.6 | 1.9 |
| Shinyanga | 1,896,264 | 2.8 | 0.1 | 77.8 | 0.1 | 0.1 | 14.4 | 0.3 | 0.6 | 0.1 | 1.7 | 2.1 |
| Kagera | 2,594,708 | 4.7 | 0.2 | 73.0 | 0.2 | 0.7 | 18.6 | 0.7 | 0.5 | = | 1.0 | 0.4 |
| Mwanza | 3,476,921 | 3.5 | 0.1 | 62.9 | - | 0.1 | 26.8 | 0.4 | 1.0 | 0.2 | 2.2 | 2.7 |
| Mara | 2,232,657 | 4.8 | - | 72.8 | - | 0.5 | 18.2 | 0.7 | 0.8 | 0.5 | 0.8 | 0.9 |
| Manyara | 1,598,657 | 3.5 | 0.4 | 75.1 | 0.1 | 0.6 | 15.3 | 0.9 | 0.7 | 0.4 | 1.5 | 1.6 |
| Njombe | 892,554 | 2.7 | 0.1 | 70.6 | - | 0.5 | 19.8 | 1.0 | 1.1 | = | 2.0 | 2.2 |
| Katavi | 1,145,668 | 1.2 | 0.0 | 72.6 | 0.1 | 0.2 | 21.6 | 0.7 | 0.6 | 0.1 | 1.5 | 1.4 |
| Simiyu | 2,038,218 | 2.3 | 0.3 | 80.1 | - | 0.1 | 13.9 | 0.1 | 0.5 | - | 1.6 | 1.2 |
| Geita | 2,862,284 | 1.9 | 0.1 | 79.0 | - | 0.2 | 16.4 | 0.7 | 0.7 | 0.1 | 0.6 | 0.4 |
| Songwe | 1,360,051 | 3.5 | 0.2 | 73.4 | - | 0.2 | 17.8 | 0.3 | 0.8 | 0.1 | 1.3 | 2.3 |
| Mainland Tanzania | 55,789,508 | 2.9 | 0.2 | 68.8 | 0.0 | 0.3 | 21.1 | 0.7 | 1.1 | 0.2 | 1.8 | 2.9 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 8: NUMBER AND PERCENTAGE OF HOUSEHOLDS LINKED TO SMALL BUSINESSES BY TYPE OF **BUSINESS AND REGION IN MAINLAND TANZANIA, 2023 HECS**

| | | | | Type of B | usiness | | | | |
|----------------------|------------|---------------------|-----------------|--------------------|-----------------------------|------------------|-----------------|---------|-------------------|
| Region | Total HHs | HHs run business | Crop Farming | Cattle Breeding | Charcoal Produc- tion | Restau- rants | Brick- yards | Brewery | Other Business |
| | N | % | % | % | % | % | % | % | % |
| Dodoma | 761,645 | 74.7 | 37.5 | 8.8 | - | 1.8 | 1.7 | - | 4.3 |
| Arusha | 614,212 | 95.6 | 52.3 | 35.3 | - | 5.0 | - | - | 6.8 |
| Kilimanjaro | 519,263 | 84.1 | 68.2 | 54.5 | 1.5 | 19.4 | 1.8 | - | 76.1 |
| Tanga | 682,898 | 58.1 | 44.7 | 6.6 | 8.3 | 26.8 | - | - | 35.9 |
| Morogoro | 853,923 | 40.5 | 20.0 | 0.8 | 3.4 | 14.9 | - | 7.9 | 3.8 |
| Pwani | 571,805 | 82.7 | 42.5 | 9.2 | 1.1 | 3.4 | - | - | 15.0 |
| Dar es Salaam | 1,635,473 | 21.9 | 5.0 | - | = | 6.2 | - | - | 5.3 |
| Lindi | 368,434 | 66.2 | 64.5 | 0.5 | - | 25.1 | - | 2.8 | 11.0 |
| Mtwara | 500,353 | 95.6 | 88.9 | 11.9 | - | - | - | - | - |
| Ruvuma | 471,368 | 78.4 | 77.5 | 4.9 | - | 9.4 | - | - | 82.2 |
| Iringa | 368,793 | 45.1 | 18.6 | - | - | 9.7 | 2.5 | 10.6 | 27.5 |
| Mbeya | 638,471 | 62.3 | 22.8 | 5.2 | - | 6.6 | - | 3.2 | 9.6 |
| Singida | 400,382 | 93.9 | 75.2 | 31.8 | 3.3 | 5.8 | 0.9 | 4.7 | 3.8 |
| Tabora | 598,909 | 67.9 | 68.9 | 23.5 | - | 4.9 | - | - | 46.1 |
| Rukwa | 367,096 | 87.1 | 73.5 | 13.4 | - | - | - | - | 19.4 |
| Kigoma | 491,515 | 91.0 | 41.6 | 4.6 | - | 5.7 | - | - | 3.7 |
| Shinyanga | 437,135 | 55.9 | 70.8 | 19.5 | 6.2 | - | - | - | 12.2 |
| Kagera | 704,890 | 46.2 | 39.1 | 15.0 | 3.7 | 4.7 | 3.9 | 6.2 | 4.9 |
| Mwanza | 817,178 | 15.4 | 5.2 | - | - | 12.5 | - | - | 4.8 |
| Mara | 474,692 | 98.5 | 65.9 | 31.4 | - | - | - | - | 11.8 |
| Manyara | 425,230 | 52.2 | 88.8 | 58.2 | - | 18.6 | 43.0 | - | 17.3 |
| Njombe | 279,608 | 68.8 | 54.6 | 6.1 | 3.2 | 11.6 | - | 7.1 | 8.2 |
| Katavi | 250,832 | 89.0 | 74.7 | 14.2 | 2.0 | 7.2 | 10.0 | 3.0 | 8.9 |
| Simiyu | 355,712 | 95.5 | 86.6 | 23.9 | 2.5 | 8.9 | - | - | 35.2 |
| Geita | 567,027 | 58.9 | 20.0 | - | - | 19.4 | - | 7.0 | 10.4 |
| Songwe | 368,456 | 67.0 | 81.5 | 21.7 | 4.2 | 8.6 | - | 8.5 | 34.5 |
| Mainland Tanzania | 14,525,300 | 62.6 | 55.7 | 21.0 | 1.3 | 7.9 | 1.0 | 2.0 | 15.8 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)



TABLE 9: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY REGION AND PLACE OF RESIDENCE, MAINLAND TANZANIA, 2023 HECS

| Da ei au | Place of Residence | | | | | | | | | |
|-------------------|--------------------|--------------------------|-----------|--------------------------|------------|--------------------------|--|--|--|--|
| Region | Ru | ral | Url | oan | A | All . | | | | |
| | Total HHs | HHs Using Electricity | Total HHs | HHs Using Electricity | Total HHs | HHs Using Electricity | | | | |
| | N | % | N | % | N | % | | | | |
| Dodoma | 375,815 | 74.9 | 385,830 | 80.8 | 761,645 | 77.9 | | | | |
| Arusha | 306,048 | 52.3 | 308,164 | 91.4 | 614,212 | 71.9 | | | | |
| Kilimanjaro | 403,430 | 81.1 | 115,832 | 97.8 | 519,263 | 84.8 | | | | |
| Tanga | 437,188 | 81.7 | 245,710 | 91.0 | 682,898 | 85.0 | | | | |
| Morogoro | 416,065 | 78.1 | 437,858 | 87.3 | 853,923 | 82.9 | | | | |
| Pwani | 295,117 | 80.7 | 276,688 | 90.1 | 571,805 | 85.3 | | | | |
| Dar es Salaam | | | 1,635,473 | 90.5 | 1,635,473 | 90.5 | | | | |
| Lindi | 283,522 | 56.3 | 84,912 | 64.0 | 368,434 | 58.1 | | | | |
| Mtwara | 349,368 | 56.9 | 150,985 | 86.5 | 500,353 | 65.8 | | | | |
| Ruvuma | 334,016 | 59.5 | 137,352 | 65.7 | 471,368 | 61.3 | | | | |
| Iringa | 221,163 | 73.8 | 147,630 | 86.4 | 368,793 | 78.8 | | | | |
| Mbeya | 317,481 | 57.7 | 320,990 | 79.3 | 638,471 | 68.5 | | | | |
| Singida | 296,475 | 89.4 | 103,907 | 97.7 | 400,382 | 91.5 | | | | |
| Tabora | 440,312 | 72.5 | 158,597 | 88.6 | 598,909 | 76.8 | | | | |
| Rukwa | 259,058 | 59.1 | 108,038 | 71.6 | 367,096 | 62.8 | | | | |
| Kigoma | 313,083 | 16.2 | 178,433 | 68.0 | 491,515 | 35.0 | | | | |
| Shinyanga | 241,069 | 18.6 | 196,066 | 65.5 | 437,135 | 39.6 | | | | |
| Kagera | 590,419 | 38.0 | 114,471 | 88.5 | 704,890 | 46.2 | | | | |
| Mwanza | 402,856 | 35.2 | 414,323 | 75.7 | 817,178 | 55.7 | | | | |
| Mara | 271,712 | 90.1 | 202,981 | 93.3 | 474,692 | 91.5 | | | | |
| Manyara | 333,098 | 57.4 | 92,133 | 77.9 | 425,230 | 61.8 | | | | |
| Njombe | 170,304 | 70.7 | 109,304 | 87.5 | 279,608 | 77.3 | | | | |
| Katavi | 146,610 | 94.7 | 104,222 | 86.9 | 250,832 | 91.5 | | | | |
| Simiyu | 290,572 | 24.7 | 65,140 | 62.0 | 355,712 | 31.5 | | | | |
| Geita | 356,918 | 65.4 | 210,109 | 58.9 | 567,027 | 63.0 | | | | |
| Songwe | 239,708 | 60.4 | 128,748 | 87.3 | 368,456 | 69.7 | | | | |
| Mainland Tanzania | 8,091,407 | 61.0 | 6,433,894 | 84.0 | 14,525,300 | 71.2 | | | | |

TABLE 10: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES OF **ELECTRICITY AND PLACE OF RESIDENCE IN MAINLAND TANZANIA, 2023 HECS**

| Sources | Place of Residence | | | | | | | | | | |
|------------------------------------|--------------------|------|-----------|------|-----------|------|--|--|--|--|--|
| of Electricity | All % | | Ru | ral | Urban | | | | | | |
| | | | N | % | N | % | | | | | |
| TANESCO | 6,439,609 | 62.5 | 1,887,953 | 38.3 | 4,551,657 | 84.7 | | | | | |
| Local Grid | 461,926 | 4.5 | 121,408 | 2.5 | 340,518 | 6.3 | | | | | |
| Own Solar | 3,950,525 | 38.3 | 2,943,999 | 59.7 | 1,006,526 | 18.7 | | | | | |
| Generator | 12,258 | 0.1 | 7,212 | 0.1 | 5,046 | 0.1 | | | | | |
| Other | 690,007 | 6.7 | 512,327 | 10.4 | 177,680 | 3.3 | | | | | |
| Total HHs connected to electricity | 10,307,688 | | 4,934,196 | | 5,373,493 | | | | | | |

TABLE 11: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY REGION AND SOURCE OF ELECTRICITY IN MAINLAND TANZANIA, 2023 HECS

| Region | | | Sources of | Electricity | | |
|-------------------|------------------------------------|---------|------------|-------------|-----------|-------|
| | HHs Connected to Electricity | TANESCO | Local Grid | Own Solar | Generator | Other |
| | N | % | N | % | N | % |
| Dodoma | 593,141 | 50.2 | 2.4 | 44.1 | 0.2 | 7.2 |
| Arusha | 441,455 | 86.6 | 0.4 | 18.8 | - | 1.5 |
| Kilimanjaro | 440,294 | 85.3 | 0.5 | 18.9 | 0.3 | 22.9 |
| Tanga | 580,590 | 46.9 | + | 48.3 | - | 12.6 |
| Morogoro | 707,567 | 56.3 | 6.0 | 50.8 | 0.3 | 5.7 |
| Pwani | 486,695 | 60.4 | 10.4 | 43.3 | 0.2 | 7.9 |
| Dar es Salaam | 1,450,983 | 96.1 | 0.8 | 5.5 | 0.2 | - |
| Lindi | 214,095 | 42.8 | 6.0 | 62.0 | - | - |
| Mtwara | 329,370 | 42.2 | + | 59.7 | - | 0.3 |
| Ruvuma | 288,842 | 51.9 | 1.9 | 49.5 | + | 9.6 |
| Iringa | 290,242 | 71.4 | 2.7 | 29.4 | + | - |
| Mbeya | 437,554 | 78.6 | 14.4 | 27.0 | + | 0.7 |
| Singida | 366,410 | 35.8 | + | 60.3 | 0.2 | 7.5 |
| Tabora | 456,060 | 43.3 | 3.6 | 58.5 | + | 19.8 |
| Rukwa | 230,422 | 47.7 | 0.8 | 56.1 | + | 0.5 |
| Kigoma | 172,076 | 79.9 | 44.5 | 20.8 | - | 1.4 |
| Shinyanga | 173,245 | 72.1 | 20.4 | 19.9 | + | 10.6 |
| Kagera | 325,770 | 74.9 | + | 26.9 | + | - |
| Mwanza | 455,428 | 80.4 | 19.3 | 31.0 | - | - |
| Mara | 434,272 | 40.0 | + | 59.3 | + | 6.7 |
| Manyara | 262,285 | 34.5 | 0.2 | 39.6 | 0.3 | 31.0 |
| Njombe | 216,043 | 54.1 | 2.5 | 45.1 | + | 2.5 |
| Katavi | 229,479 | 39.0 | 0.5 | 57.6 | - | 13.6 |
| Simiyu | 112,060 | 58.1 | 1.4 | 43.7 | - | - |
| Geita | 357,209 | 30.4 | 5.4 | 63.6 | - | 18.6 |
| Songwe | 256,099 | 54.3 | 1.4 | 52.9 | 0.6 | 1.6 |
| Mainland Tanzania | 10,307,688 | 62.5 | 4.5 | 38.3 | 0.1 | 6.7 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 12: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND PLACE OF RESIDENCE IN MAINLAND TANZANIA, 2023 HECS

| Diago Of Docidones | Tarif | Tariff Type | | | | |
|--------------------|---------|-------------|--|--|--|--|
| Place Of Residence | D1 % | T1 % | | | | |
| Rural | 68.2 | 31.8 | | | | |
| Urban | 46.2 | 53.8 | | | | |
| Mainland Tanzania | 52.6 | 47.4 | | | | |

TABLE 13: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND **REGION IN MAINLAND TANZANIA, 2023 HECS**

| | Tariff Type | | | | |
|-------------------|-------------|---------|--|--|--|
| Region | D1 % | T1 % | | | |
| Dodoma | 18.3 | 81.7 | | | |
| Arusha | 19.7 | 80.3 | | | |
| Kilimanjaro | 96.4 | 3.6 | | | |
| Tanga | 71.1 | 28.9 | | | |
| Morogoro | 98.3 | 1.7 | | | |
| Pwani | 55.7 | 44.3 | | | |
| Dar es Salaam | 24.1 | 75.9 | | | |
| Lindi | 86.1 | 13.9 | | | |
| Mtwara | 40.3 | 59.7 | | | |
| Ruvuma | 28.6 | 71.4 | | | |
| Iringa | 18.0 | 82.0 | | | |
| Mbeya | 60.2 | 39.8 | | | |
| Singida | 45.2 | 54.8 | | | |
| Tabora | 32.0 | 68.0 | | | |
| Rukwa | 72.9 | 27.1 | | | |
| Kigoma | 95.6 | 4.4 | | | |
| Shinyanga | 87.1 | 12.9 | | | |
| Kagera | 82.4 | 17.6 | | | |
| Mwanza | 71.0 | 29.0 | | | |
| Mara | 75.6 | 24.4 | | | |
| Manyara | 93.0 | 7.0 | | | |
| Njombe | 50.6 | 49.4 | | | |
| Katavi | 15.2 | 84.8 | | | |
| Simiyu | 60.7 | 39.3 | | | |
| Geita | 63.7 | 36.3 | | | |
| Songwe | 64.9 | 35.1 | | | |
| Mainland Tanzania | 52.6 | 47.4 | | | |

TABLE 14: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE D1 BY MONTHLY EXPENDITURE AND REGION IN MAINLAND TANZANIA, 2023 HECS

| | | Amoun | t Spent | |
|-------------------|----------------|------------|-------------|--------|
| Region | Less than 5000 | 5000-10000 | 10000-15000 | 15000+ |
| | % | % | % | % |
| Dodoma | 46.2 | 36.3 | 11.1 | 6.4 |
| Arusha | 33.0 | 56.0 | 9.3 | 1.7 |
| Kilimanjaro | 30.8 | 47.8 | 18.1 | 3.3 |
| Tanga | 21.0 | 48.0 | 21.5 | 9.5 |
| Morogoro | 31.5 | 39.4 | 17.0 | 12.0 |
| Pwani | 13.8 | 42.3 | 32.9 | 11.0 |
| Dar es Salaam | 5.0 | 34.4 | 41.9 | 18.7 |
| Lindi | 57.6 | 35.0 | 7.4 | - |
| Mtwara | 34.3 | 48.6 | 17.2 | = |
| Ruvuma | 33.0 | 46.1 | 12.0 | 8.9 |
| Iringa | 35.6 | 47.8 | 9.6 | 6.9 |
| Mbeya | 19.6 | 52.6 | 21.7 | 6.1 |
| Singida | 24.8 | 37.1 | 19.4 | 18.7 |
| Tabora | 15.6 | 68.0 | 16.4 | - |
| Rukwa | 55.7 | 35.2 | 6.1 | 3.1 |
| Kigoma | 13.6 | 43.9 | 31.5 | 11.0 |
| Shinyanga | 21.9 | 51.3 | 17.0 | 9.8 |
| Kagera | 51.2 | 36.3 | 9.9 | 2.7 |
| Mwanza | 23.7 | 59.4 | 12.5 | 4.4 |
| Mara | 34.6 | 35.2 | 21.6 | 8.6 |
| Manyara | 27.1 | 59.8 | 9.7 | 3.4 |
| Njombe | 14.7 | 52.0 | 26.0 | 7.2 |
| Katavi | 50.8 | 25.8 | 11.4 | 12.1 |
| Simiyu | 4.8 | 88.4 | 6.9 | = |
| Geita | 24.1 | 67.2 | 5.8 | 3.0 |
| Songwe | 40.4 | 32.7 | 12.5 | 14.4 |
| Mainland Tanzania | 26.9 | 45.6 | 19.5 | 8.0 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 15: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE T1 BY MONTHLY EXPENDITURE AND REGION IN MAINLAND TANZANIA, 2023 HECS

| Dogion | | Amount S | Spent (TZS) | |
|-------------------|----------------|------------|-------------|--------|
| Region | Less than 5000 | 5000-10000 | 10000-15000 | 15000+ |
| | % | % | % | % |
| Dodoma | 13.6 | 42.9 | 25.9 | 17.6 |
| Arusha | 4.2 | 41.9 | 34.2 | 19.7 |
| Kilimanjaro | 30.1 | 22.7 | 9.6 | 37.6 |
| Tanga | 7.7 | 42.3 | 19.2 | 30.9 |
| Morogoro | - | - | 21.2 | 78.8 |
| Pwani | 14.2 | 39.3 | 23.7 | 22.9 |
| Dar es Salaam | 1.2 | 15.4 | 42.7 | 40.6 |
| Lindi | 25.0 | 50.0 | 25.0 | - |
| Mtwara | 13.4 | 51.4 | 16.6 | 18.6 |
| Ruvuma | 28.3 | 36.8 | 23.9 | 10.9 |
| Iringa | 10.5 | 50.1 | 26.8 | 12.6 |
| Mbeya | 10.3 | 49.5 | 25.9 | 14.3 |
| Singida | 17.2 | 46.3 | 22.6 | 13.9 |
| Tabora | 18.2 | 30.4 | 23.5 | 27.9 |
| Rukwa | 53.3 | 40.8 | 5.9 | - |
| Kigoma | - | 24.0 | - | 76.0 |
| Shinyanga | - | - | 90.6 | 9.4 |
| Kagera | 43.0 | 45.2 | 6.8 | 5.0 |
| Mwanza | 26.8 | 38.1 | 19.2 | 15.9 |
| Mara | 25.3 | 34.6 | 26.1 | 14.0 |
| Manyara | 14.0 | 57.3 | - | 28.7 |
| Njombe | 15.5 | 57.9 | 17.9 | 8.8 |
| Katavi | 16.0 | 44.3 | 21.2 | 18.5 |
| Simiyu | 9.8 | 35.2 | 39.3 | 15.8 |
| Geita | 2.6 | 49.7 | 26.8 | 20.9 |
| Songwe | 19.7 | 45.7 | 16.3 | 18.4 |
| Mainland Tanzania | 10.2 | 33.1 | 31.0 | 25.8 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 16: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY ELECTRICITY CONSUMPTION PER MONTH AND REGION IN MAINLAND TANZANIA, 2023 HECS

| | | | | | | | | Plac | e of R | eside | nce | | | | | | | |
|----------------------|----------|-----------|-----------|-----------|------------|----------|----------|-----------|-----------|-----------|------------|----------|----------|-----------|-----------|-----------|------------|----------|
| | | | Ru | ral | | | | | Urb | an | | | | | Α | II , | | |
| Region | 1-20 kWh | 21-40 kWh | 41-60 kWh | 61-80 kWh | 81-100 kWh | 100+ kWh | 1-20 kWh | 21-40 kWh | 41-60 kWh | 61-80 kWh | 81-100 kWh | 100+ kWh | 1-20 kWh | 21-40 kWh | 41-60 kWh | 61-80 kWh | 81-100 kWh | 100+ kWh |
| Dodoma | 37.4 | 55.5 | 4.3 | - | 2.9 | - | 34.8 | 48.1 | 9.2 | 1.1 | 6.8 | - | 35.4 | 49.8 | 8.0 | 0.8 | 5.9 | - |
| Arusha | 22.4 | 63.9 | 8.6 | - | 5.1 | - | 35.1 | 48.8 | 11.1 | 0.4 | 4.6 | - | 31.5 | 53.0 | 10.4 | 0.3 | 4.7 | - |
| Kilimanjaro | 0.8 | 94.4 | 1.2 | 0.8 | 2.1 | 0.7 | 0.8 | 92.3 | 2.5 | 2.0 | 2.3 | - | 0.8 | 93.8 | 1.6 | 1.2 | 2.2 | 0.5 |
| Tanga | 8.2 | 87.6 | 4.2 | - | - | - | 15.5 | 63.0 | 13.4 | 2.7 | 2.8 | 2.6 | 12.2 | 74.2 | 9.2 | 1.5 | 1.5 | 1.4 |
| Morogoro | - | 95.7 | 4.3 | - | - | - | - | 83.6 | 6.4 | 1.2 | 6.4 | 2.4 | - | 87.0 | 5.8 | 0.9 | 4.6 | 1.7 |
| Pwani | 12.5 | 72.7 | 10.1 | 2.3 | 2.5 | - | 15.4 | 66.9 | 10.9 | 1.0 | 5.8 | - | 14.5 | 68.7 | 10.6 | 1.4 | 4.8 | |
| Dar es Salaam | | | | | | | 10.4 | 53.4 | 21.3 | 2.5 | 11.1 | 1.2 | 10.4 | 53.4 | 21.3 | 2.5 | 11.1 | 1.2 |
| Lindi | - | | - | - | - | - | 16.3 | 80.3 | - | 3.4 | - | - | 7.4 | 91.0 | - | 1.6 | - | |
| Mtwara | 25.6 | 71.2 | 3.2 | - | - | = | 25.1 | 62.0 | 7.6 | - | 5.2 | - | 25.2 | 63.7 | 6.8 | - | 4.3 | - |
| Ruvuma | 23.8 | 67.8 | 3.6 | 2.8 | 1.9 | - | 32.6 | 54.3 | 8.1 | 3.3 | 1.8 | - | 27.6 | 62.0 | 5.5 | 3.0 | 1.9 | - |
| Iringa | 34.0 | 57.7 | 5.8 | - | 2.5 | - | 32.9 | 52.5 | 8.9 | 3.3 | 2.5 | - | 33.4 | 54.9 | 7.4 | 1.8 | 2.5 | - |
| Mbeya | 19.0 | 75.4 | 5.7 | - | - | - | 10.2 | 75.6 | 8.8 | 3.7 | 1.6 | - | 13.0 | 75.5 | 7.8 | 2.5 | 1.1 | - |
| Singida | 23.4 | 67.1 | 8.4 | 1.1 | - | - | 15.8 | 61.5 | 19.6 | - | 3.1 | - | 20.1 | 64.7 | 13.3 | 0.6 | 1.4 | - |
| Tabora | 28.5 | 62.7 | 8.8 | - | - | = | 18.8 | 62.9 | 10.1 | 1.3 | 7.0 | - | 21.8 | 62.8 | 9.7 | 0.9 | 4.8 | - |
| Rukwa | 10.6 | 89.4 | - | - | - | = | 8.6 | 86.7 | 2.7 | - | 2.0 | - | 9.7 | 88.2 | 1.2 | - | 0.9 | - |
| Kigoma | - | 83.0 | 17.0 | - | - | - | - | 88.3 | 7.7 | 4.0 | - | - | - | 87.4 | 9.3 | 3.3 | - | - |
| Shinyanga | - | | - | - | - | - | - | 89.6 | 5.1 | 2.0 | 3.4 | - | - | 90.8 | 4.5 | 1.8 | 3.0 | - |
| Kagera | 9.3 | 86.6 | 3.7 | - | 0.4 | - | 4.2 | 92.4 | 2.2 | 1.2 | - | - | 7.2 | 89.0 | 3.1 | 0.5 | 0.2 | |
| Mwanza | 1.2 | 94.6 | - | - | 4.2 | = | 8.8 | 81.7 | 4.2 | 3.7 | 1.6 | - | 7.1 | 84.5 | 3.3 | 2.9 | 2.2 | - |
| Mara | 3.8 | 92.3 | 1.9 | 1.9 | - | - | 5.4 | 78.7 | 10.8 | 3.5 | 1.6 | - | 4.9 | 83.0 | 8.0 | 3.0 | 1.1 | - |
| Manyara | 2.0 | 92.6 | 4.1 | - | 1.3 | - | 6.1 | 91.9 | - | 2.0 | - | - | 4.0 | 92.2 | 2.1 | 1.0 | 0.7 | - |
| Njombe | 28.2 | 63.5 | 4.8 | 1.5 | 2.0 | - | 27.0 | 62.8 | 5.4 | 2.0 | 2.0 | 8.0 | 27.4 | 63.0 | 5.2 | 1.8 | 2.0 | 0.5 |
| Katavi | 43.0 | 54.4 | 1.3 | - | 1.3 | - | 36.0 | 50.4 | 8.9 | - | 4.7 | - | 38.2 | 51.6 | 6.6 | - | 3.7 | - |
| Simiyu | 9.4 | 90.6 | - | - | - | - | 7.8 | 90.0 | 2.2 | - | - | - | 8.6 | 90.3 | 1.2 | - | - | - |
| Geita | 7.3 | 90.2 | - | - | 2.5 | - | 12.0 | 79.2 | 6.7 | - | 2.0 | - | 9.1 | 85.9 | 2.6 | - | 2.3 | _ |
| Songwe | 14.5 | 67.8 | 10.9 | 4.0 | 2.8 | - | 6.0 | 70.9 | 13.5 | 3.9 | 5.7 | - | 8.5 | 70.0 | 12.7 | 4.0 | 4.8 | - |
| Mainland Tanzania | 13.2 | 80.4 | 4.3 | 0.6 | 1.5 | 0.1 | 13.8 | 65.5 | 12.1 | 2.1 | 5.9 | 0.6 | 13.7 | 69.9 | 9.8 | 1.7 | 4.6 | 0.5 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 17: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS COOKING MAINLY INDOOR BY REGION IN MAINLAND TANZANIA, 2023 HECS

| Parity | | Cooks Indoor | |
|-------------------|------------|--------------|------------|
| Region | N | Cooks Indoor | Not Indoor |
| | % | % | % |
| Dodoma | 761,645 | 48.3 | 51.7 |
| Arusha | 614,212 | 50.1 | 49.9 |
| Kilimanjaro | 519,263 | 31.7 | 68.3 |
| Tanga | 682,898 | 65.1 | 34.9 |
| Morogoro | 853,923 | 27.6 | 72.4 |
| Pwani | 571,805 | 61.8 | 38.2 |
| Dar es Salaam | 1,635,473 | 81.8 | 18.2 |
| Lindi | 368,434 | 39.4 | 60.6 |
| Mtwara | 500,353 | 42.5 | 57.5 |
| Ruvuma | 471,368 | 34.9 | 65.1 |
| Iringa | 368,793 | 34.2 | 65.8 |
| Mbeya | 638,471 | 55.0 | 45.0 |
| Singida | 400,382 | 21.2 | 78.8 |
| Tabora | 598,909 | 17.2 | 82.8 |
| Rukwa | 367,096 | 36.0 | 64.0 |
| Kigoma | 491,515 | 31.6 | 68.4 |
| Shinyanga | 437,135 | 33.6 | 66.4 |
| Kagera | 704,890 | 35.5 | 64.5 |
| Mwanza | 817,178 | 31.5 | 68.5 |
| Mara | 474,692 | 22.4 | 77.6 |
| Manyara | 425,230 | 37.8 | 62.2 |
| Njombe | 279,608 | 37.3 | 62.7 |
| Katavi | 250,832 | 35.7 | 64.3 |
| Simiyu | 355,712 | 11.5 | 88.5 |
| Geita | 567,027 | 10.2 | 89.8 |
| Songwe | 368,456 | 56.5 | 43.5 |
| Mainland Tanzania | 14,525,300 | 42.0 | 58.0 |

TABLE 18: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING AND PLACE OF RESIDENCE, 2023 HECS

| Source of Cooking | Source of Cooking | | | | | | | |
|----------------------|-------------------|-----------|-----------|--|--|--|--|--|
| Source of Cooking | N | Rural | Urban | | | | | |
| Number of households | 14,525,300 | 8,091,407 | 6,433,894 | | | | | |
| Electricity | 2.0 | 0.4 | 3.4 | | | | | |
| LPG | 24.6 | 7.5 | 46.2 | | | | | |
| Kerosene | 0.3 | 0.1 | 0.5 | | | | | |
| Paraffin | 0.0 | 0.0 | 0.0 | | | | | |
| Natural gas | - | - | - | | | | | |
| Biogas | 0.1 | 0.1 | 0.1 | | | | | |
| Bioethanol | 0.0 | 0.0 | 0.0 | | | | | |
| Firewood | 65.5 | 89.6 | 35.1 | | | | | |
| Charcoal | 44.0 | 24.5 | 68.6 | | | | | |
| Other | 0.6 | 0.8 | 0.3 | | | | | |
| Other | 0.6 | 0.8 | 0.3 | | | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 19: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR **COOKING AND REGION IN MAINLAND TANZANIA, 2023 HECS**

| | | | | | Energ | gy Source | | | | | |
|----------------------|------------|---------------|-------|------------|------------|------------------|----------|--------------|------------|------------|---------|
| Region | N | % Electricity | % LPG | % Kerosene | % Paraffin | % Natural gas | % Biogas | % Bioethanol | % Firewood | % Charcoal | % Other |
| Dodoma | 761,645 | 1.7 | 22.2 | - | - | - | - | - | 65.5 | 36.7 | - |
| Arusha | 614,212 | 4.2 | 56.3 | 0.8 | - | - | - | _ | 66.4 | 32.8 | _ |
| Kilimanjaro | 519,263 | 1.0 | 37.0 | 1.4 | 0.2 | - | 0.4 | - | 83.5 | 23.6 | 0.3 |
| Tanga | 682,898 | 2.3 | 15.5 | - | - | - | - | - | 72.8 | 38.2 | 1.1 |
| Morogoro | 853,923 | 0.4 | 16.4 | 0.6 | - | - | - | - | 64.2 | 59.6 | - |
| Pwani | 571,805 | 4.4 | 37.2 | 0.4 | - | - | - | - | 62.7 | 75.8 | 0.7 |
| Dar es Salaam | 1,635,473 | 5.1 | 74.4 | 0.4 | - | - | - | - | 7.6 | 65.3 | - |
| Lindi | 368,434 | - | 6.4 | - | - | - | - | - | 82.4 | 42.3 | - |
| Mtwara | 500,353 | 1.0 | 11.7 | - | - | - | - | - | 77.9 | 29.4 | - |
| Ruvuma | 471,368 | 1.3 | 7.8 | - | - | - | - | - | 84.1 | 31.4 | 1.9 |
| Iringa | 368,793 | 0.7 | 25.6 | - | - | - | - | = | 72.4 | 41.3 | - |
| Mbeya | 638,471 | 1.7 | 22.1 | 0.3 | - | = | - | - | 61.3 | 51.0 | - |
| Singida | 400,382 | 1.0 | 13.5 | - | - | - | - | - | 82.0 | 30.6 | 0.2 |
| Tabora | 598,909 | 0.6 | 12.0 | - | - | - | - | - | 67.0 | 41.6 | - |
| Rukwa | 367,096 | 1.3 | 6.0 | 0.3 | - | - | - | 0.2 | 73.7 | 50.2 | - |
| Kigoma | 491,515 | 2.1 | 5.7 | - | - | - | 0.3 | - | 77.2 | 30.7 | - |
| Shinyanga | 437,135 | 2.2 | 15.6 | - | 0.2 | - | 1.4 | - | 71.4 | 36.5 | - |
| Kagera | 704,890 | 0.8 | 8.1 | - | - | - | - | - | 84.2 | 27.1 | - |
| Mwanza | 817,178 | 2.5 | 28.1 | 0.9 | - | - | - | - | 61.8 | 59.7 | - |
| Mara | 474,692 | 0.2 | 14.8 | - | - | - | 0.2 | - | 78.4 | 40.6 | - |
| Manyara | 425,230 | - | 16.0 | 0.2 | - | - | - | - | 90.0 | 21.5 | 13.1 |
| Njombe | 279,608 | 0.5 | 12.4 | - | - | - | 0.2 | - | 76.3 | 32.3 | 0.2 |
| Katavi | 250,832 | 0.8 | 9.9 | - | - | - | - | - | 53.9 | 65.6 | - |
| Simiyu | 355,712 | 0.8 | 6.5 | - | - | - | 0.2 | 0.1 | 91.2 | 21.8 | - |
| Geita | 567,027 | - | 7.7 | - | - | - | - | - | 73.6 | 48.2 | - |
| Songwe | 368,456 | 2.1 | 15.0 | - | - | - | - | - | 67.7 | 43.5 | 0.2 |
| Mainland Tanzania | 14,525,300 | 2.0 | 24.6 | 0.3 | 0.0 | - | 0.1 | 0.0 | 65.5 | 44.0 | 0.6 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 20: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF STOVE USING FIREWOOD FOR COOKING AND REGION, MAINLAND TANZANIA, HECS 2023

| | Type of Stove | | | | | | | | | | |
|----------------------|---------------|--------------------------|-----------------------|------------------------------|-----------------|-----------------------------|-----------------------------|--------------------------|---------------------------------|--|--|
| Region | | Three- Stone Stove | Round Mud Stove | Improved Cooking Stove | Rocket Stove | Burned Mud/Clay Stove | Lorena 1 Rocket Stove | Rocket Stove Metal | Moz Metal Rocket Stove | | |
| | N | % | % | % | % | % | % | % | % | | |
| Dodoma | 497,699 | 99.4 | 0.6 | - | - | - | - | - | - | | |
| Arusha | 407,842 | 98.4 | 0.6 | 0.3 | 0.3 | - | 0.5 | - | - | | |
| Kilimanjaro | 433,516 | 88.5 | 6.2 | 3.8 | - | 1.3 | - | 0.2 | - | | |
| Tanga | 497,099 | 87.7 | 11.4 | 0.2 | - | 0.6 | - | = | - | | |
| Morogoro | 548,289 | 98.2 | 1.2 | 0.6 | - | - | - | - | - | | |
| Pwani | 357,974 | 97.9 | 1.1 | - | - | 0.5 | - | 0.5 | - | | |
| Dar es Salaam | 121,840 | 100.0 | - | - | - | - | - | = | - | | |
| Lindi | 303,625 | 98.8 | 1.0 | 0.1 | - | - | - | = | - | | |
| Mtwara | 389,895 | 99.4 | 0.4 | - | 0.3 | - | - | - | - | | |
| Ruvuma | 396,457 | 85.7 | 3.1 | 5.6 | - | 5.7 | - | - | - | | |
| Iringa | 266,578 | 94.9 | 2.3 | 1.5 | 0.3 | 1.0 | - | - | - | | |
| Mbeya | 391,591 | 97.0 | 1.5 | 1.1 | - | 0.4 | - | - | - | | |
| Singida | 328,223 | 98.7 | 1.1 | 0.3 | - | - | - | - | - | | |
| Tabora | 398,232 | 93.2 | 3.0 | 0.2 | - | 2.4 | - | 1.2 | - | | |
| Rukwa | 270,447 | 82.9 | 17.1 | - | - | - | - | = | - | | |
| Kigoma | 379,311 | 91.5 | 5.0 | 1.9 | 0.4 | 1.1 | - | = | 0.2 | | |
| Shinyanga | 311,704 | 99.4 | 0.6 | - | - | - | - | - | - | | |
| Kagera | 593,577 | 89.1 | 9.1 | 1.8 | - | - | - | - | - | | |
| Mwanza | 504,920 | 99.7 | 0.3 | - | - | - | - | - | - | | |
| Mara | 372,201 | 96.2 | 3.8 | - | _ | - | - | - | - | | |
| Manyara | 381,944 | 98.6 | 0.4 | 0.6 | - | 0.3 | - | - | - | | |
| Njombe | 213,389 | 76.0 | 20.1 | 2.6 | 0.2 | - | - | 0.4 | 0.6 | | |
| Katavi | 135,300 | 96.3 | 2.3 | 1.1 | - | 0.4 | - | - | - | | |
| Simiyu | 324,372 | 100.0 | - | - | - | - | - | - | - | | |
| Geita | 417,229 | 98.9 | 0.5 | - | - | 0.5 | - | - | - | | |
| Songwe | 248,529 | 82.5 | 12.5 | 3.9 | - | 1.0 | - | - | - | | |
| Mainland Tanzania | 9,491,782 | 94.4 | 3.8 | 1.0 | 0.1 | 0.6 | 0.0 | 0.1 | 0.0 | | |

TABLE 21: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF STOVE USING CHARCOAL FOR COOKING AND REGION, MAINLAND TANZANIA, 2023 HECS

| | | Type of Stove | | | | | | | | | | |
|-------------------|-----------|-------------------------------|---|--------------------------------|-------------------------------|--|--|--|--|--|--|--|
| Region | | Traditional Charcoal Stove | Traditional Raised Charcoal Stove | Old Generation Charcoal ICS | Ceramic Lined Charcoal ICS | | | | | | | |
| | N | % | % | % | % | | | | | | | |
| Dodoma | 278,765 | 5.7 | 0.4 | 0.7 | 93.3 | | | | | | | |
| Arusha | 201,507 | 69.7 | 2.0 | 23.9 | 4.4 | | | | | | | |
| Kilimanjaro | 122,437 | 17.6 | 22.6 | 55.1 | 4.6 | | | | | | | |
| Tanga | 260,991 | 60.7 | 30.0 | 5.6 | 3.6 | | | | | | | |
| Morogoro | 508,774 | 4.4 | 23.8 | 47.8 | 24.0 | | | | | | | |
| Pwani | 432,644 | 8.0 | 9.1 | 46.5 | 36.3 | | | | | | | |
| Dar es Salaam | 1,046,787 | 51.6 | 24.2 | 24.3 | - | | | | | | | |
| Lindi | 155,950 | 42.8 | 41.4 | 15.4 | 0.4 | | | | | | | |
| Mtwara | 147,152 | 73.0 | 27.0 | - | - | | | | | | | |
| Ruvuma | 148,218 | 26.1 | 14.2 | 36.9 | 22.8 | | | | | | | |
| Iringa | 152,071 | 5.4 | - | 86.2 | 8.3 | | | | | | | |
| Mbeya | 325,891 | 55.5 | 8.0 | 20.7 | 15.8 | | | | | | | |
| Singida | 122,463 | 30.6 | 27.1 | 0.7 | 41.6 | | | | | | | |
| Tabora | 246,909 | 66.3 | 3.2 | 30.6 | - | | | | | | | |
| Rukwa | 184,411 | 68.8 | 29.0 | 2.2 | - | | | | | | | |
| Kigoma | 150,769 | 31.9 | 24.2 | 23.2 | 20.7 | | | | | | | |
| Shinyanga | 159,435 | 25.4 | 73.7 | - | 1.0 | | | | | | | |
| Kagera | 190,777 | 62.6 | 10.1 | 19.4 | 8.0 | | | | | | | |
| Mwanza | 487,904 | 66.7 | 1.1 | 32.1 | 0.1 | | | | | | | |
| Mara | 192,901 | 30.0 | 25.3 | 37.9 | 6.8 | | | | | | | |
| Manyara | 91,112 | 84.9 | - | 13.9 | 1.2 | | | | | | | |
| Njombe | 90,346 | 40.3 | 23.7 | 35.5 | 0.6 | | | | | | | |
| Katavi | 164,536 | 33.3 | 54.3 | 11.9 | 0.4 | | | | | | | |
| Simiyu | 77,369 | 37.3 | 52.9 | 0.9 | 8.9 | | | | | | | |
| Geita | 273,176 | 43.5 | 23.5 | 32.5 | 0.4 | | | | | | | |
| Songwe | 159,556 | 28.4 | 56.6 | 4.3 | 10.7 | | | | | | | |
| Mainland Tanzania | 6,372,853 | 41.0 | 20.5 | 25.9 | 12.6 | | | | | | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

APPENDIX NUMBER 1 /// TABLES

APPENDIX NUMBER 1 /// TABLES

TABLE 22: OVERALL ENERGY CONSUMPTION (KG) PER YEAR BY HOUSEHOLDS BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND FUEL TYPE, MAINLAND TANZANIA, 2023 HECS

| Place of Residence | Household Size | Firewood (Kg) | Charcoal (Kg) | LPG (Kg) |
|--------------------|----------------|----------------|---------------|-------------|
| Rural | 1 | 1,141,815,424 | 105,259,944 | 5,219,996 |
| | 2-4 | 8,785,191,936 | 972,354,880 | 23,760,106 |
| | 5-7 | 8,548,449,280 | 557,631,808 | 11,890,802 |
| | 8-10 | 2,869,271,040 | 126,404,936 | 1,569,825 |
| | 11+ | 1,014,417,152 | 27,708,346 | 320,075 |
| | Total | 22,359,144,448 | 1,789,360,000 | 42,760,804 |
| Urban | 1 | 340,025,632 | 308,472,672 | 27,708,318 |
| | 2-4 | 2,123,460,352 | 2,129,953,152 | 108,476,896 |
| | 5-7 | 2,230,567,936 | 1,482,835,584 | 64,081,312 |
| | 8-10 | 695,385,024 | 296,799,872 | 14,296,810 |
| | 11+ | 217,188,288 | 33,025,876 | 906,720 |
| | Total | 5,606,627,328 | 4,251,087,104 | 215,470,064 |
| Mainland Tanzania | 1 | 1,481,841,024 | 413,732,608 | 32,928,312 |
| | 2-4 | 10,908,652,544 | 3,102,308,096 | 132,237,008 |
| | 5-7 | 10,779,017,216 | 2,040,467,456 | 75,972,112 |
| | 8-10 | 3,564,656,128 | 423,204,800 | 15,866,635 |
| | 11+ | 1,231,605,504 | 60,734,220 | 1,226,795 |
| | Total | 27,965,771,776 | 6,040,446,976 | 258,230,864 |

TABLE 23: OVERALL HOUSEHOLD FIREWOOD CONSUMPTION BY PURPOSE (KG) AND REGION, **MAINLAND TANZANIA, 2023 HECS**

| Design | | Firev | wood | |
|-------------------|----------------|---------------|---------------|------------|
| Region | Cooking | Water heating | Space heating | Lighting |
| Dodoma | 1,459,524,224 | 97,136,592 | 3,821,780 | 1,471,625 |
| Arusha | 1,005,076,864 | 304,759,488 | 3,948,174 | 1,275,005 |
| Kilimanjaro | 1,279,690,880 | 365,698,016 | 1,713,165 | - |
| Tanga | 1,665,339,648 | 232,769,760 | 15,157,972 | 184,591 |
| Morogoro | 1,277,282,944 | 198,793,888 | - | = |
| Pwani | 684,275,072 | 109,838,984 | 13,717,459 | 2,015,220 |
| Dar es Salaam | 226,928,704 | 26,725,520 | - | = |
| Lindi | 623,677,632 | 116,144,280 | - | 3,066,984 |
| Mtwara | 1,121,795,712 | 137,682,640 | 9,944,832 | 1,188,302 |
| Ruvuma | 1,138,310,144 | 219,290,848 | 289,450 | 688,498 |
| Iringa | 820,341,888 | 105,926,040 | 1,930,410 | 411,818 |
| Mbeya | 995,789,184 | 148,616,096 | 2,833,198 | = |
| Singida | 886,581,760 | 125,533,984 | 749,943 | 326,810 |
| Tabora | 1,148,605,440 | 164,877,328 | 4,060,944 | 649,620 |
| Rukwa | 580,220,672 | 124,765,456 | 262,423 | 268,988 |
| Kigoma | 737,437,824 | 73,773,056 | 632,405 | 1,104,916 |
| Shinyanga | 896,056,320 | 8,784,053 | 2,442,786 | 1,035,594 |
| Kagera | 1,588,709,248 | 168,302,976 | 1,204,647 | = |
| Mwanza | 1,141,567,104 | 62,727,828 | 620,307 | = |
| Mara | 1,043,783,040 | 33,235,196 | 3,151,894 | 542,945 |
| Manyara | 817,894,592 | 88,022,896 | 2,934,016 | 245,173 |
| Njombe | 509,847,392 | 157,899,984 | 7,372,994 | 199,426 |
| Katavi | 369,248,640 | 52,439,328 | 225,255 | - |
| Simiyu | 804,262,720 | 69,566,528 | 2,289,666 | 1,721,622 |
| Geita | 900,844,224 | 93,104,152 | 1,347,613 | 911,781 |
| Songwe | 718,032,064 | 138,501,264 | 1,771,360 | - |
| Mainland Tanzania | 24,441,124,864 | 3,424,916,224 | 82,422,688 | 17,308,916 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 24: OVERALL HOUSEHOLD CHARCOAL CONSUMPTION BY PURPOSE (KG) AND REGION, **MAINLAND TANZANIA, 2023 HECS**

| | | Charcoal | |
|-------------------|---------------|---------------|---------------|
| Region | Cooking | Water heating | Space heating |
| Dodoma | 215,828,224 | 26,624,304 | 350,324 |
| Arusha | 104,353,600 | 37,327,304 | 318,068 |
| Kilimanjaro | 73,340,704 | 17,996,282 | 388,456 |
| Tanga | 273,619,456 | 39,345,612 | 1,668,554 |
| Morogoro | 410,470,176 | 76,434,432 | 391,963 |
| Pwani | 303,917,984 | 46,064,044 | 1,430,593 |
| Dar es Salaam | 863,003,200 | 50,507,808 | - |
| Lindi | 134,218,032 | 21,359,878 | - |
| Mtwara | 123,417,752 | 23,950,008 | 133,913 |
| Ruvuma | 86,922,624 | 22,498,602 | 2,460,522 |
| Iringa | 116,189,880 | 24,594,782 | 5,913,466 |
| Mbeya | 278,902,400 | 57,806,256 | 10,784,990 |
| Singida | 90,676,840 | 12,837,514 | 694,163 |
| Tabora | 271,220,288 | 47,922,420 | 943,931 |
| Rukwa | 153,419,952 | 25,738,492 | 1,150,618 |
| Kigoma | 102,015,136 | 8,247,236 | 1,104,944 |
| Shinyanga | 134,218,736 | 7,163,630 | - |
| Kagera | 171,407,040 | 21,649,266 | - |
| Mwanza | 390,497,664 | 38,836,424 | 2,087,632 |
| Mara | 132,835,920 | 4,517,899 | 1,688,117 |
| Manyara | 40,729,188 | 10,218,673 | 1,054,701 |
| Njombe | 74,520,432 | 30,267,776 | 5,439,429 |
| Katavi | 202,428,416 | 27,764,340 | 87,762 |
| Simiyu | 46,453,288 | 6,446,410 | 167,608 |
| Geita | 272,755,872 | 20,421,524 | 608,600 |
| Songwe | 178,481,504 | 47,074,272 | 2,119,157 |
| Mainland Tanzania | 5,245,844,480 | 753,615,168 | 40,987,508 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 25: OVERALL HOUSEHOLD LPG CONSUMPTION BY PURPOSE (KG) AND REGION, MAINLAND **TANZANIA, 2023 HECS**

| | | LPG | |
|-------------------|-------------|---------------|----------------------------|
| Region | Cooking | Water heating | Cooking + Water heating |
| Dodoma | 6,124,114 | - | 3,861,992 |
| Arusha | 10,241,734 | 320,106 | 14,852,781 |
| Kilimanjaro | 8,169,924 | 228,215 | 5,321,973 |
| Tanga | 6,159,029 | 71,037 | 2,951,407 |
| Morogoro | 8,504,526 | - | 2,558,895 |
| Pwani | 6,504,459 | - | 7,290,665 |
| Dar es Salaam | 64,568,472 | 242,894 | 13,166,248 |
| Lindi | 1,869,993 | - | 694,039 |
| Mtwara | 2,080,884 | - | 1,193,948 |
| Ruvuma | 2,344,465 | - | 2,150,214 |
| Iringa | 2,295,104 | - | 2,109,634 |
| Mbeya | 6,186,087 | 88,786 | 6,801,409 |
| Singida | 3,663,225 | 66,729 | 1,990,373 |
| Tabora | 2,737,835 | 33,786 | 840,900 |
| Rukwa | 1,564,408 | 211,442 | 363,285 |
| Kigoma | 3,384,988 | 261,299 | 1,081,592 |
| Shinyanga | 3,714,071 | - | 669,127 |
| Kagera | 1,583,185 | - | 847,501 |
| Mwanza | 13,812,429 | - | 1,831,341 |
| Mara | 4,436,793 | - | 822,660 |
| Manyara | 2,748,809 | 18,778 | 1,982,011 |
| Njombe | 2,485,505 | - | 2,185,677 |
| Katavi | 1,396,449 | - | 1,478,318 |
| Simiyu | 1,654,783 | 39,441 | 873,557 |
| Geita | 2,588,481 | - | 744,841 |
| Songwe | 3,291,896 | 227,741 | 3,536,689 |
| Mainland Tanzania | 174,111,648 | 1,810,254 | 82,201,080 |

TABLE 26: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY MAIN SOURCE OF ENERGY USED FOR WATER HEATING AND REGION, MAINLAND TANZANIA, 2023 HECS

| | | | | | | Source | 9 | | | | | | |
|----------------------|-------------|---|---------------|-------|------------|------------|---------------|----------|--------------|------------|------------|--------------|---------|
| Region | Z Total HHs | HHs heat up water % regularly for other purposes than cooking | % Electricity | % LPG | % Kerosene | % Paraffin | % Natural gas | % Biogas | % Bioethanol | % Firewood | % Charcoal | % Solar heat | % Other |
| Dodoma | 761,645 | 37.1 | 3.5 | 16.8 | 70 | 70 | 70 | 70 | 70 | 56.2 | 29.9 | 70 - | 70 |
| Arusha | 614,212 | 91.4 | 10.2 | 36.7 | 0.6 | | | | | 64.9 | 17.5 | | |
| Kilimanjaro | 519,263 | 82.4 | 2.9 | 17.1 | 0.0 | - | - | _ | 0.2 | 83.7 | 9.7 | - | |
| Tanga | 682,898 | 55.4 | 7.9 | 7.5 | - | _ | - | | 0.2 | 71.7 | 25.4 | 0.4 | 3.1 |
| Morogoro | 853,923 | 53.3 | 1.4 | 7.7 | 0.2 | - | - | | - | 60.3 | 48.7 | 0.4 | - |
| Pwani | 571,805 | 62.7 | 4.9 | 26.7 | - | - | - | | - | 58.7 | 61.3 | 0.3 | 1.7 |
| Dar es Salaam | 1,635,473 | 24.0 | 25.3 | 45.5 | - | - | - | | - | 7.8 | 36.0 | - | - |
| Lindi | 368,434 | 69.4 | 0.7 | 2.4 | - | - | - | | - | 81.7 | 22.2 | 0.2 | - |
| Mtwara | 500,353 | 64.9 | - | 6.2 | - | - | - | | - | 77.5 | 21.7 | - | - |
| Ruvuma | 471,368 | 88.7 | 2.1 | 4.1 | - | - | - | | - | 83.9 | 19.1 | - | 1.4 |
| Iringa | 368,793 | 51.2 | 5.2 | 20.1 | - | - | - | | - | 60.8 | 33.1 | - | 0.5 |
| Mbeya | 638,471 | 56.3 | 4.9 | 19.4 | 0.6 | - | - | | - | 57.9 | 41.5 | - | - |
| Singida | 400,382 | 60.2 | 1.7 | 8.1 | - | - | - | | - | 82.4 | 17.8 | - | 0.7 |
| Tabora | 598,909 | 71.0 | 1.2 | 5.3 | - | - | - | | - | 67.3 | 35.2 | - | - |
| Rukwa | 367,096 | 63.9 | 3.5 | 2.8 | 0.3 | - | - | | - | 75.9 | 32.7 | 0.3 | - |
| Kigoma | 491,515 | 32.9 | 2.0 | 4.3 | - | - | 0.9 | - | - | 78.2 | 20.7 | - | - |
| Shinyanga | 437,135 | 11.0 | 14.3 | 20.5 | - | - | 7.5 | - | - | 39.5 | 42.3 | - | - |
| Kagera | 704,890 | 48.0 | 5.6 | 6.1 | - | - | - | | - | 80.4 | 19.1 | - | - |
| Mwanza | 817,178 | 33.5 | 10.1 | 6.4 | - | - | - | | - | 54.7 | 54.7 | - | - |
| Mara | 474,692 | 38.5 | 0.6 | 5.5 | - | - | - | | - | 79.3 | 20.0 | - | - |
| Manyara | 425,230 | 50.9 | 0.9 | 16.2 | - | 0.4 | - | | - | 83.0 | 18.2 | 0.3 | 9.3 |
| Njombe | 279,608 | 98.2 | 3.0 | 5.4 | - | - | - | = | - | 75.0 | 27.9 | 0.3 | 0.6 |
| Katavi | 250,832 | 48.8 | 2.1 | 9.4 | - | - | - | | - | 52.2 | 62.6 | - | - |
| Simiyu | 355,712 | 39.1 | 1.5 | 5.9 | - | - | - | - | 0.3 | 90.0 | 19.5 | - | - |
| Geita | 567,027 | 44.3 | 3.1 | 3.6 | = | - | - | | - | 69.5 | 28.4 | - | - |
| Songwe | 368,456 | 68.2 | 4.3 | 11.1 | - | - | - | | - | 64.2 | 31.3 | - | 0.7 |
| Mainland Tanzania | 14,525,300 | 52.1 | 5.3 | 13.7 | 0.1 | 0.0 | 0.1 | - | 0.0 | 67.3 | 29.9 | 0.1 | 0.7 |

TABLE 27: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS COOKING MAINLY INDOORS THAT HEAT THEIR DWELLING BY REGION, MAINLAND TANZANIA, 2023 HECS

| | | Heating Dwelling | |
|-------------------|----------------------------|------------------|------------|
| Region | HHs cooking mainly indoors | Heated | Not Heated |
| | N | % | % |
| Dodoma | 367,102 | 3.6 | 96.4 |
| Arusha | 307,814 | 3.4 | 96.6 |
| Kilimanjaro | 164,444 | 3.6 | 96.4 |
| Tanga | 444,607 | 9.3 | 90.7 |
| Morogoro | 235,995 | 0.5 | 99.5 |
| Pwani | 352,827 | 6.7 | 93.3 |
| Dar es Salaam | 1,311,197 | - | 100.0 |
| Lindi | 145,040 | 0.5 | 99.5 |
| Mtwara | 212,581 | 8.7 | 91.3 |
| Ruvuma | 164,651 | 9.2 | 90.8 |
| Iringa | 125,909 | 16.5 | 83.5 |
| Mbeya | 351,081 | 13.5 | 86.5 |
| Singida | 84,857 | 9.6 | 90.4 |
| Tabora | 102,110 | 8.6 | 91.4 |
| Rukwa | 132,016 | 4.6 | 95.4 |
| Kigoma | 155,154 | 3.4 | 96.6 |
| Shinyanga | 146,904 | 4.4 | 95.6 |
| Kagera | 250,006 | 4.6 | 95.4 |
| Mwanza | 257,529 | 4.5 | 95.5 |
| Mara | 106,163 | 14.1 | 85.9 |
| Manyara | 160,315 | 11.6 | 88.4 |
| Njombe | 104,239 | 23.2 | 76.8 |
| Katavi | 89,620 | 0.6 | 99.4 |
| Simiyu | 40,998 | 12.4 | 87.6 |
| Geita | 57,650 | 7.0 | 93.0 |
| Songwe | 207,569 | 6.4 | 93.6 |
| Mainland Tanzania | 6,078,378 | 5.5 | 94.5 |

TABLE 28: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS HEATED DWELLING BY SOURCE OF ENERGY FOR SPACE HEATING AND REGION, MAINLAND TANZANIA, 2023 HECS

| | | | | M | ain Source | | | | |
|----------------------|------------------------|------------------|----------------|-----|------------|----------|----------|---------------|-------|
| Region | HHs Heated Dwelling | Electri- city | Natural gas | LPG | Kerosene | Firewood | Charcoal | Solar heat | Other |
| | N | % | % | % | % | % | % | % | % |
| Dodoma | 13,331 | - | - | - | - | 63.8 | 21.5 | - | 14.7 |
| Arusha | 10,343 | = | - | = | - | 64.5 | 23.6 | = | 11.9 |
| Kilimanjaro | 5,846 | = | - | = | - | 74.5 | 25.5 | = | = |
| Tanga | 41,135 | 2.9 | - | - | - | 66.3 | 27.2 | - | 3.6 |
| Morogoro | 1,074 | - | - | - | - | - | 100.0 | - | - |
| Pwani | 23,589 | - | - | - | - | 73.3 | 39.8 | - | - |
| Lindi | 672 | - | - | - | - | - | - | - | 100.0 |
| Mtwara | 18,592 | 4.9 | - | - | - | 93.1 | 6.9 | - | - |
| Ruvuma | 15,159 | 6.9 | - | - | - | 12.2 | 81.0 | - | - |
| Iringa | 20,743 | - | - | - | - | 16.4 | 81.2 | - | 2.4 |
| Mbeya | 47,285 | - | - | - | - | 14.4 | 85.6 | - | - |
| Singida | 8,164 | 11.8 | - | - | - | 12.6 | 72.1 | - | 15.4 |
| Tabora | 8,768 | - | - | - | - | 51.5 | 29.5 | - | 19.0 |
| Rukwa | 6,097 | - | - | - | - | 25.7 | 74.3 | - | - |
| Kigoma | 5,349 | = | - | = | = | 56.7 | 43.3 | = | - |
| Shinyanga | 6,447 | 15.9 | - | = | = | 89.8 | - | = | 10.2 |
| Kagera | 11,378 | 7.9 | - | = | = | 31.3 | - | = | 60.7 |
| Mwanza | 11,518 | - | - | - | - | 22.9 | 57.4 | - | 19.7 |
| Mara | 14,963 | - | - | - | - | 47.4 | 34.9 | - | 17.7 |
| Manyara | 18,580 | = | - | = | = | 44.2 | 50.2 | = | 9.8 |
| Njombe | 24,187 | = | - | = | = | 32.9 | 60.9 | = | 6.2 |
| Katavi | 549 | = | - | = | - | 56.2 | 43.8 | = | - |
| Simiyu | 5,066 | = | - | - | - | 100.0 | 12.7 | - | - |
| Geita | 4,049 | = | - | = | = | 58.8 | 41.2 | = | - |
| Songwe | 13,250 | - | - | - | - | 29.8 | 55.9 | - | 14.3 |
| Mainland Tanzania | 336,134 | 1.8 | - | - | - | 44.8 | 47.8 | - | 7.9 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 29: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS HEATED DWELLING BY MEANS OF HEATING DWELLING AND REGION, MAINLAND TANZANIA, 2023 HECS

| | | Mea | ns of Heating Dwe | elling | |
|-------------------|------------------------|-----------|-------------------|-----------------|---------------|
| Region | HHs Heated Dwelling | Open Fire | Portable Stove | Stationary Oven | Reversable AC |
| | N | % | % | % | % |
| Dodoma | 13,331 | 78.5 | 21.5 | - | - |
| Arusha | 10,343 | 76.4 | 23.6 | - | - |
| Kilimanjaro | 5,846 | 74.5 | 25.5 | - | - |
| Tanga | 41,135 | 69.9 | 27.2 | - | 2.9 |
| Morogoro | 1,074 | - | 100.0 | - | - |
| Pwani | 23,589 | 73.3 | 26.7 | - | - |
| Lindi | 672 | 100.0 | - | - | - |
| Mtwara | 18,592 | 93.1 | 6.9 | - | - |
| Ruvuma | 15,159 | 12.2 | 81.0 | - | 6.9 |
| Iringa | 20,743 | 18.8 | 81.2 | - | - |
| Mbeya | 47,285 | 14.4 | 85.6 | - | - |
| Singida | 8,164 | 27.9 | 60.2 | - | 11.8 |
| Tabora | 8,768 | 70.5 | 29.5 | - | - |
| Rukwa | 6,097 | 25.7 | 74.3 | - | - |
| Kigoma | 5,349 | 56.7 | 43.3 | - | - |
| Shinyanga | 6,447 | 100.0 | - | - | - |
| Kagera | 11,378 | 82.2 | 9.8 | - | 7.9 |
| Mwanza | 11,518 | 42.6 | 57.4 | - | - |
| Mara | 14,963 | 47.4 | 34.9 | 17.7 | - |
| Manyara | 18,580 | 49.8 | 50.2 | - | - |
| Njombe | 24,187 | 39.1 | 60.9 | - | - |
| Katavi | 549 | 56.2 | 43.8 | - | - |
| Simiyu | 5,066 | 100.0 | - | - | - |
| Geita | 4,049 | 58.8 | 41.2 | - | - |
| Songwe | 13,250 | 44.1 | 55.9 | - | = |
| Mainland Tanzania | 336,134 | 51.3 | 46.7 | 0.8 | 1.2 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 30: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY FOR LIGHTING AND REGION, 2023 HECSS

| | | | | Energy Sou | rce for Ligl | nting | | | |
|----------------------|--------------|------------------|----------|------------|---------------|-------------------|---------|--------------------------------------|-------|
| Region | | Electri- city | Kerosene | Candles | Fire- wood | Solar lanterns | Torches | Rechar- geable battery lamp | Other |
| | N | % | % | % | % | % | % | % | % |
| Dodoma | 721,347.8 | 81.6 | - | 1.3 | 0.6 | 39.6 | 21.8 | 1.7 | 0.3 |
| Arusha | 612,446.9 | 72.1 | 3.6 | 12.5 | 0.6 | 39.1 | 5.7 | 13.1 | 4.0 |
| Kilimanjaro | 517,374.1 | 84.9 | 4.3 | 12.5 | - | 31.3 | 12.1 | 22.7 | 0.7 |
| Tanga | 678,918.5 | 85.5 | 9.6 | 4.8 | 0.1 | 47.9 | 13.3 | 3.4 | 1.2 |
| Morogoro | 837,160.3 | 84.5 | 1.3 | 5.2 | - | 46.9 | 32.2 | 3.8 | 4.8 |
| Pwani | 561,492.8 | 87.3 | 2.6 | 14.5 | 1.0 | 38.8 | 35.6 | 8.9 | 11.0 |
| Dar es Salaam | 1,521,146.3 | 94.5 | 0.6 | 0.7 | - | 6.1 | 1.2 | 1.3 | - |
| Lindi | 326,799.2 | 63.2 | 0.2 | 1.7 | 2.6 | 58.2 | 25.5 | 2.2 | - |
| Mtwara | 491,362.4 | 66.4 | 0.4 | 1.0 | 0.7 | 51.7 | 23.9 | 1.4 | 4.6 |
| Ruvuma | 467,479.6 | 62.0 | - | 4.7 | 0.4 | 61.8 | 23.6 | 4.5 | 2.9 |
| Iringa | 359,806.7 | 80.6 | 0.4 | 2.1 | 0.3 | 37.7 | 6.3 | 2.4 | 2.9 |
| Mbeya | 566,741.7 | 74.7 | 0.6 | 2.7 | - | 32.3 | 12.7 | 5.1 | 1.5 |
| Singida | 393,941.9 | 93.0 | 0.2 | 0.2 | 0.2 | 57.3 | 20.5 | 0.4 | - |
| Tabora | 584,151.8 | 77.4 | 1.7 | 1.0 | 0.3 | 49.2 | 31.7 | 6.3 | 2.1 |
| Rukwa | 364,274.2 | 63.3 | 6.5 | 1.0 | 0.2 | 44.7 | 26.7 | 2.5 | 0.8 |
| Kigoma | 488,432.6 | 35.2 | - | 0.5 | 0.6 | 47.4 | 28.6 | 3.4 | 0.6 |
| Shinyanga | 396,103.8 | 43.6 | - | 0.7 | 0.7 | 49.8 | 25.7 | 2.0 | 3.7 |
| Kagera | 703,544.6 | 46.4 | 7.4 | 4.6 | - | 49.6 | 23.1 | 3.0 | 0.8 |
| Mwanza | 786,820.8 | 58.4 | 1.6 | 9.6 | - | 47.7 | 27.7 | 6.5 | 0.7 |
| Mara | 473,002.5 | 93.0 | 0.3 | 1.9 | 0.3 | 57.0 | 17.1 | 2.6 | 0.2 |
| Manyara | 388,828.5 | 66.8 | - | 0.6 | 0.2 | 50.2 | 46.3 | 6.4 | 1.1 |
| Njombe | 271,944.9 | 79.7 | 0.2 | 0.9 | 0.2 | 46.7 | 6.8 | 1.8 | 0.2 |
| Katavi | 250,831.9 | 91.5 | 0.4 | 2.1 | - | 40.4 | 25.2 | 3.4 | 0.1 |
| Simiyu | 352,931.1 | 32.2 | - | 0.1 | 1.3 | 38.3 | 59.8 | 1.4 | 4.4 |
| Geita | 548,503.2 | 65.0 | - | 0.2 | 0.5 | 57.0 | 33.0 | 2.8 | 0.8 |
| Songwe | 360,033.8 | 70.9 | 0.2 | 4.2 | - | 46.7 | 29.0 | 5.0 | - |
| Mainland Tanzania | 14,025,422.0 | 73.2 | 1.8 | 3.8 | 0.3 | 42.1 | 21.8 | 4.6 | 1.9 |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 31: AVERAGE ENERGY PURCHASED PER MONTH BY HOUSEHOLDS BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND ENERGY TYPE, MAINLAND TANZANIA, 2023 HECS

| | Place of residence | | | | | | | | | | | | |
|-----------------------|--------------------|-----|-----|------|-----|-------|----|-----|-----|------|-----|-------|--|
| Type of energy | | | Ru | ral | | | | | Url | oan | | | |
| circisy | 1 | 2-4 | 5-7 | 8-10 | 11+ | Total | | 2-4 | 5-7 | 8-10 | 11+ | Total | |
| LPG (kg) | 6 | 6 | 5 | 5 | 6 | 6 | 5 | 6 | 7 | 6 | 8 | 6 | |
| Kerosene (Liter) | 5 | 5 | 3 | 3 | 1 | 4 | 3 | 5 | 10 | 1 | 8 | 6 | |
| Firewood (Bundles) | 9 | 9 | 10 | 9 | 9 | 9 | 9 | 11 | 11 | 9 | 14 | 11 | |
| Charcoal (Buckets) | 7 | 6 | 6 | 4 | 4 | 6 | 11 | 11 | 10 | 10 | 9 | 10 | |

TABLE 32: AVERAGE HOUSEHOLD EXPENDITURE (TZS) ON ENERGY PER MONTH BY HOUSEHOLD SIZE AND ENERGY TYPE, MAINLAND TANZANIA, 2023 HECS

| Household Size | Type of Energy | | | | | | | | | |
|-----------------|----------------|----------|----------|----------|--|--|--|--|--|--|
| Houseriola size | LPG | Kerosene | Firewood | Charcoal | | | | | | |
| 1 | 69,000 | 10,000 | 14,000 | 21,000 | | | | | | |
| 2-4 | 67,000 | 14,000 | 15,000 | 19,000 | | | | | | |
| 5-7 | 66,000 | 15,000 | 16,000 | 17,000 | | | | | | |
| 8-10 | 68,000 | 8,000 | 14,000 | 18,000 | | | | | | |
| 11+ | 61,000 | 15,000 | 17,000 | 15,000 | | | | | | |
| Total | 67,000 | 14,000 | 15,000 | 19,000 | | | | | | |

TABLE 33: AVERAGE HOUSEHOLD EXPENDITURE (TZS) ON ENERGY PER MONTH BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND ENERGY TYPE, MAINLAND TANZANIA, 2023 HECS

| | | | | | F | Place of r | esidence | | | | | |
|----------------|--------|--------|--------|--------|--------|------------|----------|--------|--------|--------|--------|--------|
| Type of energy | | | Ru | ral | | | | | Urk | an | | |
| chergy | 1 | 2-4 | 5-7 | 8-10 | 11+ | Total | 1 | 2-4 | 5-7 | 8-10 | 11+ | Total |
| LPG | 54,000 | 57,000 | 58,000 | 50,000 | 49,000 | 56,000 | 71,000 | 69,000 | 68,000 | 73,000 | 63,000 | 69,000 |
| Kerosene | 12,000 | 14,000 | 9,000 | 11,000 | 3,000 | 12,000 | 8,000 | 14,000 | 28,000 | 3,000 | 18,000 | 17,000 |
| Firewood | 14,000 | 15,000 | 15,000 | 14,000 | 16,000 | 15,000 | 13,000 | 16,000 | 17,000 | 12,000 | 20,000 | 16,000 |
| Charcoal | 16,000 | 14,000 | 14,000 | 13,000 | 12,000 | 14,000 | 23,000 | 21,000 | 19,000 | 21,000 | 17,000 | 20,000 |

APPENDIX NUMBER 1 /// TABLES APPENDIX NUMBER 1 /// TABLES

TABLE 34: UNIT PRICE (TZS) OF ENERGIES BY PLACE OF RESIDENCE, MAINLAND TANZANIA, 2023 **HECS**

| Time of Fuerra | Place of Residence | | | | | | | |
|-------------------|--------------------|-------|-------|--|--|--|--|--|
| Type of Energy | Rural | Urban | Total | | | | | |
| Kerosene (Liter) | 2,800 | 2,900 | 2,800 | | | | | |
| Firewood (Bundle) | 1,600 | 1,500 | 1,600 | | | | | |
| Charcoal (Bucket) | 3,000 | 2,400 | 2,600 | | | | | |

TABLE 35: UNIT PRICE (TZS) OF ENERGIES BY REGION, MAINLAND TANZANIA, 2023 HECS

| Parison | Type of Energy | | | | |
|-------------------|------------------|-------------------|-------------------|--|--|
| Region | Kerosene (Litre) | Firewood (Bundle) | Charcoal (Bucket) | | |
| Dodoma | - | 1,800 | 2,000 | | |
| Arusha | 2,900 | 1,700 | 3,300 | | |
| Kilimanjaro | 2,800 | 2,100 | 2,400 | | |
| Tanga | 3,000 | 1,200 | 2,100 | | |
| Morogoro | 2,700 | 1,600 | 1,700 | | |
| Pwani | 3,400 | 1,600 | 2,000 | | |
| Dar es Salaam | 3,500 | 2,200 | 2,600 | | |
| Lindi | 4,200 | 800 | 2,300 | | |
| Mtwara | 2,300 | 1,700 | 4,800 | | |
| Ruvuma | - | 1,500 | 1,700 | | |
| Iringa | - | 2,000 | 3,300 | | |
| Mbeya | 2,400 | 1,700 | 3,100 | | |
| Singida | 3,000 | 2,000 | 4,400 | | |
| Tabora | 2,700 | 2,200 | 4,200 | | |
| Rukwa | 2,300 | 1,300 | 1,700 | | |
| Kigoma | - | 1,500 | 2,100 | | |
| Shinyanga | - | 1,400 | 2,800 | | |
| Kagera | 3,000 | 1,400 | 2,200 | | |
| Mwanza | 2,800 | 1,200 | 1,800 | | |
| Mara | 3,000 | 1,600 | 2,300 | | |
| Manyara | 4,200 | 2,100 | 4,100 | | |
| Njombe | 4,200 | 1,700 | 6,000 | | |
| Katavi | 3,100 | 2,100 | 3,100 | | |
| Simiyu | - | 1,600 | 3,700 | | |
| Geita | - | 1,300 | 2,400 | | |
| Songwe | 3,000 | 1,700 | 2,700 | | |
| Mainland Tanzania | 2,800 | 1,600 | 2,600 | | |

[&]quot;-" Withheld to avoid disclosing data for individual households or insufficient data available from survey (Total includes withheld data)

TABLE 36: THE PRICE OF LPG BY CYLINDER SIZE AND REGION, 2023 HECS

| | Size of | Cylinder |
|-------------------|---------|----------|
| Region | 6 Kg | 15 Kg |
| Dodoma | 25,000 | 56,000 |
| Arusha | 22,000 | 54,000 |
| Kilimanjaro | 23,000 | 54,000 |
| Tanga | 24,000 | 56,000 |
| Morogoro | 25,000 | 54,000 |
| Pwani | 24,000 | 56,000 |
| Dar es Salaam | 24,000 | 56,000 |
| Lindi | 25,000 | 55,000 |
| Mtwara | 24,000 | 55,000 |
| Ruvuma | 24,000 | 55,000 |
| Iringa | 24,000 | 57,000 |
| Mbeya | 25,000 | 56,000 |
| Singida | 25,000 | 55,000 |
| Tabora | 25,000 | 55,000 |
| Rukwa | 25,000 | 53,000 |
| Kigoma | 25,000 | 54,000 |
| Shinyanga | 24,000 | 58,000 |
| Kagera | 25,000 | 64,000 |
| Mwanza | 24,000 | 58,000 |
| Mara | 26,000 | 57,000 |
| Manyara | 25,000 | 54,000 |
| Njombe | 25,000 | 56,000 |
| Katavi | 25,000 | 58,000 |
| Simiyu | 25,000 | 55,000 |
| Geita | 25,000 | 54,000 |
| Songwe | 24,000 | 54,000 |
| Mainland Tanzania | 24,000 | 56,000 |

TABLE 37: THE PRICE OF LPG BY CYLINDER SIZE AND PLACE OF RESIDENCE IN MAINLAND **TANZANIA, 2023 HECS**

| Place of Residence | Size of | Cylinder |
|---------------------|---------|----------|
| Place of Residerice | 6 Kg | 15 Kg |
| Rural | 24,000 | 55,000 |
| Urban | 24,000 | 56,000 |
| Total | 24,000 | 56,000 |

APPENDIX TWO QUESTIONNAIRE

| United Repulic of Ta HOUSEHOLD ENERGY (This information is collected under the S THIS INFORMATION IS STRICTLY CONFIDENTIAL AND I Executed by the Ministry of Energy a | CONSUMPTION SURVEY 2023/24 tatistics Act, [Cap 351 R.E 2019]) S TO BE USED FOR STATISTICAL PURPOSES ONLY | CONFIDENTIAL |
|---|--|--------------|
| EXPE FRAN STRESS (CF FOR COUNTRY OF THE PROPERTY OF THE PROPER | ERTISE **** NCE **** | * * |
| IDENTIFICATION DETAILS 0. | | |
| HH GPS Coordinates | | |
| Y(S) X(E) | | |
| CODE | NAME | |
| 1. REGION | | |
| 2. DISTRICT | *************************************** | |
| 3. COUNCIL | | |
| 4. ELECTION STATE | *************************************** | |
| 5. DIVISION | | |
| 6. WARD/SHEHIA | | |
| 7. VILLAGE/MTAA | | |
| 8. ENUMERATION AREA (EA) | | |
| 9. HOUSEHOLD NUMBER & NAME OF HOUSEHOLD HEAD | | |
| 10. NAME OF LOCAL LEADER/SHEHA | | |
| 11. PHONE NUMBER OF LOCAL LEADER/SHEHA | | |
| 12. NAME OF ENUMERATOR & ID | | |
| 13. PHONE NUMBER OF ENUMERATOR | | |
| 14. DATE OF INTERVIEW | | |
| 15. DID THE HOUSEHOLD AGREE TO BE INTERVIEWED? | | |
| YES1 NO2 | | |

| SECTION I: HOUSEHOLD MEMBERS | | | | | | | |
|--|----------|--|----------------------------|---|--|---|---|
| IN ORDER TO MAKE A COMPREHENSIVE LIST OF | 1 | | | .3. | 4. | 5. | 9 |
| THENTUGATES CORRECTED TO THE MOSEBOLD, USE THE FOLLOWING PROBE OUSSIGNS: First, give me the names of all the members of your immediate chanly who numenally live and west that meats together here. WHITE DOWN MARES, SEX, AND RELATIONSHIP TO TH HEAD. LIST HOUSEHOLD HEAD ON DIME. Then, give me the names of any other persons who are not persons the name of any other household members who normally live and ear their meals means of coher persons who are not person now but normally live and ear their meals here. For example, household members have normally experience of travelling. Simally give me the names of studying alsewhere or travelling. Simally give me the names of any other persons who are not persons not related to you or other persons not related to you or other persons not eclased to you or other wall wet that meals together here, such nor telatives. | - a 00au | A COMPLETE LIST OF ALL DUALS WHO NORMALLY MAD ATE THER MEALS. HER IN THIS THOUSE IN THE PAST 6. HIGH STARTING WITH THE OF HOUSEHOLD. OF HOUSEHOLD. HERE IS SAME AS. EHOLD HEAD LISTED ON R.) | What is the sex of [NAME]? | What is [NAME]'s relationship to the head? **MEAD OF HOUSEHOLD | How old is [Name]? IF LESS THAN 1 YEAR OF AGE, TYPE ZERO | What is [NAWE]'s current marital status? Name of Married Listing Together | What is the main economic activity of (NAME)? |
| 4 TITH OHM STUATIONS TOTAL FON OU | | LIST | CODE | CODE | YEAR | CODE | CODE |
| HOUSEHOLD ELSEWHERE, AND GUESTS WHO ARE VISITING TEMPOPARILY AND HAVE A | 1 | | | | | | |
| HOUSZHOLD ELSEWHERE. | 2 | | | | | | |
| | m | | | | | | |
| | 4 | | | | | | |
| | 2 | | | | | | |
| | 9 | | | | | | |
| | 7 | | | | | | |
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| | 12 | | | | | | |
| | 13 | | | | | | |
| | 14 | | | | | | |
| | 15 | | | | | | |

| SECTION | N II: EDUCATION | | |
|--|---|--|--|
| | For all household member 5 ve | ars and older we would like to kno | ow about their aducation |
| | 1.Can [Name] read and write? | 2. What is the schooling status of (NAME)? | 3. What is the highest grade of education [Name] completed? |
| I N D I V I D U A L | Kiswahili 1 English 2 Kiswahili & English 3 Any other language 4 Don't Read/Write 5 | Attending School1 Dropped Out2 Completed3 Never Attended School4 | PP1 ADULT1 PRIMARY D111 D212 D313 D414 D515 D616 D717 D818 OSC19 MS+COURSE20 SECONDARY FI21 F222 F323 F425 O+COURSE25 F531 F632 A+COURSE33 DPLOMA34 UNIVERS ITY & EQUIVALENT U141 U242 U343 U444 U5.&+45 |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |

| Questions asked/Variables requested | Yes=1/no=2 | Share | Specification |
|---|------------|-------|---------------|
| Did you run one or more business linked to your household in 2023? | | | |
| 1.1. Was this the only income? | | | |
| 1.2. Is it possible to separate the energy consumption of business activities from private consumption? | | | |
| Type of business | | | |
| Crop Farming | | | |
| Livestock breeding | | | |
| Charcoal production | | | |
| Restaurant | | | |
| Brickyard | | | |
| Brewery | | | |
| Other | | | |

| | | Frequency | | | |
|---|-----------|-----------|----------------------|---------------|--------------|
| Questions asked/Variables requested | Yes=1/no= | | Quantity in I/kwh | Specification | Expenditures |
| Did your household use Electricity during the period of January to December 2023? | | | | | |
| 2.1. What were the sources of your electricity? | | | | | |
| Tanesco | | | | | |
| Minigrid | | | | | |
| Own solar | | | | | |
| Own generator | | | | | |
| Diesel | | | | | |
| Petrol | | | | | |
| Kerosene | | | | | |
| Other | | | | | |
| Other | | | | | |
| 2.Is electricity used for | | | | | |
| Business | | | | | |
| Lighting | | | | | |
| Consumer/office electronics | | | | | |
| Kitchen appliances | | | | | |
| Charger | | | | | |
| Air condition | | | | | |
| Other | | | | | |
| What were the quantities purchased in the last month? | | | | | |
| D1 Contract | | | | | |
| T1 Contract | | | | | |
| T2 Contract | | | | | |
| T3 Contract | | | | | |
| .4.1 How much did you pay for electricity in the last month? | | | | | |

| Questions asked/Variables requested | Yes=1/no=2 | Frequency | Quantity in kg | Specification |
|--|------------|-----------|----------------|---------------|
| 3. Do you cook mainly indoors | | | | |
| 3.1. Do you use cooking activity during cool season also for space heating? | | | | |
| 3.2 Do you use cooking also for water heating for other purposes than cooking, e.g. dish washing or body care? | | | | |
| 3.3. Do you use electricity for cooking? | | | | |
| 3.4 Do you use LPG for cooking? | | | | |
| 3.5. Do you use kerosene for cooking? | | | | |
| 3.6. Do you use paraffin for cooking? | | | | |
| 3.7. Do you use natural gas for cooking? | | | | |
| 3.8. Do you use biogas for cooking? | | | | |
| 3.9. Do you use bioethanol for cooking? | | | | |
| 3.10. Do you use fire wood for cooking? | | | | |
| Three-stone stove | | | | |
| Round mud stove | | | | |
| Improved cooking stove | | | | |
| Rocket stove | | | | |
| Burned mud/clay stove | | | | |
| Lorena 1 Rocket stove | | | | |
| Rocket stove metal | | | | |
| Lorena 2 Rocket stove | | | | |
| Moz Metal rocket stove | | | | |
| 3.10.3 Do you heat up water for other purposes than cooking (e.g. dish washing) directly after cooking? | | | | |
| 3.11.Do you use charcoal for cooking? | | | | |
| Traditional charcoal stove | | | | |
| Traditional raised charcoal stove | | | | |
| Old generation charcoal ICS | | | | |
| Ceramic lined charcoal ICS | | | | |
| 3.11.3 Do you heat up water for other purposes like cooking directly after cooking? | | | | |
| 3.12.Do you use other? | | | | |
| 3.13.Do you use other? | | | | |
| 3.14.Do you use other? | | | | |

| Questions asked/Variables requested | Yes=1/no=2 | Frequency | Quantity in kg | Specification | m²/kWh |
|--|------------|-----------|----------------|---------------|--------|
| 4.1. Do you heat up water regularly for other purposes than cooking and independently from cooking ? | | | | | |
| 4.2 Do you use electricity for water heating? | | | | | |
| 4.3 Do you use LPG for heating? | | | | | |
| 4.4.Do you use kerosene for water heating? | | | | | |
| 4.5.Do you use paraffin for water heating? | | | | | |
| 4.6.Do you use natural gas for water heating ? | | | | | |
| 4.7.Do you use biogas for water heating ? | | | | | |
| 4.8.Do you use bioethanol for water heating? | | | | | |
| 4.9 Do you use fire wood for water heating? | | | | | |
| 4.10 Do you use charcoal for water heating? | | | | | |
| 4.11 Do you use solar heat for water heating? | | | | | |
| 4.12.Do you use other? | | | | | |
| 4.13.Do you use other? | | | | | |
| | | | | | |
| Section 5: Space heating | | | | | |
| Questions asked/Variables requested | Yes=1/no=2 | Period | Quantity in kg | Specification | m²/kWh |
| 5.0 Do you use additional energy commodities for space heating? | | | | | |
| 5.1 Do you heat your dwellings during the cool season? | | | | | |
| 5.2.Did you use electricity for space heating? | | | | | |
| 5.3.Did you use natural gas for space heating ? | | | | | |
| 5.4.Did you use biogas for space heating? | | | | | |
| 5.5.Did you use LPG for space heating? | | | | | |
| 5.6.Did you use kerosene for space heating? | | | | | |
| 5.7.Did you use fire wood for space heating? | | | | | |
| 5.8.Did you use charcoal for space heating? | | | | | |
| 5.9.Did you use Solar heat for space heating? | | | | | |
| 5.10.Did you use other? | | | | | |
| 5.12. What is your main heating system? | | | | | |
| Open fire | | | | | |
| | | | | | |
| Portable stove | | | | | |
| Portable stove Stationary oven | | | | | |
| | | | | | |
| Stationary oven | | | | | |

| ¥ / | | | | | |
|--|------------|---------|------|---------------|--------------------|
| Section 6: Lighting | | | | | |
| Questions asked/Variables requested | Yes=1/no=2 | Room nr | Time | Specification | Quantity/Frequency |
| 6.0 Did you light your dwelling in 2023 regularly? | | | | | |
| 6.1. Did you use electricity for lighting (excluding torches and solar lantern)? | | | | | |
| 6.2.Did you use LPG for lighting? | | | | | |
| 6.3.Did you use kerosene lighting? | | | | | |
| 6.4.Did you use candles for lighting (paraffin wax)? | | | | | |
| 6.5.Did you use acetylene for lighting ? | | | | | |
| 6.6.Did you use biogas for lighting? | | | | | |
| 6.7.Did you use fire wood for lighting? | | | | | |
| 6.8.Did you use solar lanterns for lighting ? | | | | | |
| 6.9.Did you use torches (using dry cells) for lighting? | | | | | |
| 6.10. Did you use rechargeable battery lamp for lighting? | | | | | |
| 6.11.Did you use other? | | | | | |

Section 7: Quantities used/related expenditures

| Questions asked/Variables requested | Purchased Yes=1/no=2 | Consumption annually=1 monthly=2 | Unit/Size kg/l/m³/basket | Quantity | Expenditures | Storage period |
|-------------------------------------|-------------------------|--|-----------------------------|----------|--------------|-------------------|
| LPG | | | | | | |
| Kerosene | | | | | | |
| Paraffin | | | | | | |
| Acethylene | | | | | | |
| Candles | | | | | | |
| Natural gas | | | | | | |
| Biogas | | | | | | |
| Fire wood | | | | | | |
| Charcoal | | | | | | |
| Specified 1 in Section 2-Section 6 | | | | | | |
| Specified 2 in Section 2-Section 6 | | | | | | |
| Specified 3 in Section 2-Section 6 | | | | | | |
| Specified 4 in Section 2-Section 6 | | | | | | |
| Specified 5 in Section 2-Section 6 | | | | | | |

| Section 8: Privately owned vehicles | | | | | | | |
|---|------------|--------------|--------|----------|---------------|-------------|---------------|
| Questions asked/Variables requested | Ownership | Business use | Number | Quantity | Expenditures | I/100 km | Annual km |
| | Yes=1/no=2 | Yes=1/no=2 | Number | Quantity | Expellultures | 1/ 100 KIII | Allilual Kill |
| 8.1.1.Do you own personal cars ? | | | | | | | |
| Diesel | | | | | | | |
| Gasoline | | | | | | | |
| LPG | | | | | | | |
| Kerosine | | | | | | | |
| Electricity | | | | | | | |
| 8. 1.2 Do you own light duty vehicles ? | | | | | | | |
| Diesel | | | | | | | |
| Gasoline | | | | | | | |
| LPG | | | | | | | |
| Kerosine | | | | | | | |
| Electricity | | | | | | | |
| 8.1.3.Do you own heavy duty vehicles? | | | | | | | |
| Diesel | | | | | | | |
| Gasoline | | | | | | | |
| LPG | | | | | | | |
| Kerosine | | | | | | | |
| Electricity | | | | | | | |
| 8.1.4.Do you own 3-wheelers? | | | | | | | |
| Diesel | | | | | | | |
| Gasoline | | | | | | | |
| LPG | | | | | | | |
| Kerosine | | | | | | | |
| Electricity | | | | | | | |
| 8.1.5.Do you own 2-wheelers? | | | | | | | |
| Diesel | | | | | | | |
| Gasoline | | | | | | | |
| LPG | | | | | | | |
| Kerosine | | | | | | | |
| Electricity | | | | | | | |

| Section 9: Business related consumption for Businesses reporte | d in Section 1 (except charcoal production | n) | | | | |
|--|--|--|-----------------------------|----------|--------------|------|
| Questions asked/Variables requested | Yes=1/no=2 | Consumption annually=1 monthly=2 | Unit/Size kg/I/m³/basket | Quantity | Expenditures | Stor |
| Electricity consumption | | | | | | |
| D1 Contract | | | | | | |
| T1 Contract | | | | | | |
| T2 Contract | | | | | | |
| T3 Contract | | | | | | |
| LPG consumption | | | | | | |
| Kerosene consumption | | | | | | |
| Paraffin consumption | | | | | | |
| Acethylene consumption | | | | | | |
| Candles consumption | | | | | | |
| Natural gas consumption | | | | | | |
| Biogas consumption | | | | | | |
| Fire wood consumption | | | | | | |
| Charcoal consumption | | | | | | |
| Other 1 consumption | | | | | | |
| Other 2 consumption | | | | | | |
| Other 3 consumption | | | | | | |
| Other 4 consumption | | | | | | |
| Other 5 consumption | | | | I | | |



HOUSEHOLD ENERGY CONSUMPTION SURVEY REPORT 2023: MAINLAND TANZANIA SEPTEMBER 2025