DATA ANALYSIS AT THE HOUSEHOLD LEVEL: EXEMPLARY RESULTS OF HOUSEHOLD SURVEY BASED ON URBAN STRUCTURE TYPES (UST), BLOCK ZONES AND LIFE STYLE CLASSES

Household survey in Kigali

Exemplary results for household size, energy consumption and water consumption based on household surveys, conducted in Kigali between 2015 and 2016, are presented below. For a detailed analysis, the households were divided into four building types (Rudimentary, Bungalow, Villa and Apartment), four life style classes (Low, mid, mid to high and high), four USTs (Compact/mid, compact/small, open, sparsely built) and three block zone type (Commercial, urban and rural) as shown below.

Rudimentary is the dominant building type in Kigali, which is reflected through our sample size, shown above. Rudimentary takes up a share of 61%, followed by Bungalows (26%) and Villas (12%). Apartments have a negligible share in Kigali's building types. The abbreviations mentioned in the rightmost column (Acronym) are used in following figures to represent the block zone type, UST and life style class.

Classification of sample size

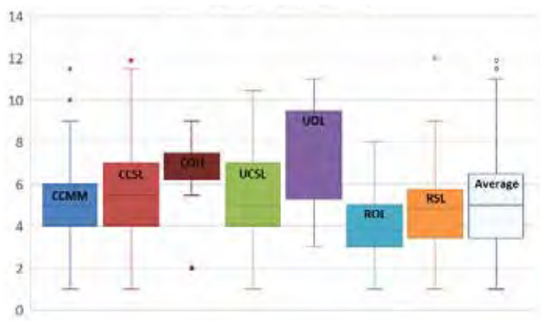
Block zone type	UST type	Life style class	Building type					Acronym
			Rudimentary	Bungalow	Villa	Apartment	Total	
Commercial	Compact/mid	mid	46	25	0	0	71	CCMM
	Compact/mid	high	0	51	13	3	67	CCMH
	Compact/small	low	171	0	0	0	171	CCSL
	Compact/small	mid	0	30	0	0	30	CCSM
	Open	high	8	9	4	0	21	COH
Urban	Compact/mid	mid	1	19	20	0	40	UCMM
	Compact/mid	mid to high	1	9	30	0	40	UCMMH
	Compact/mid	high	0	26	14	0	40	UCMH
	Compact/small	low	44	9	0	0	53	UCSL
	Open	low	8	0	2	0	10	UOL
	Open	mid	0	2	6	0	8	UOM
Rural	Open	low	88	4	0	0	92	ROL
	Sparsely built	low	78	7	0	0	85	RSL
TOTAL			445	191	89	3	728	

Data analysis at the household level

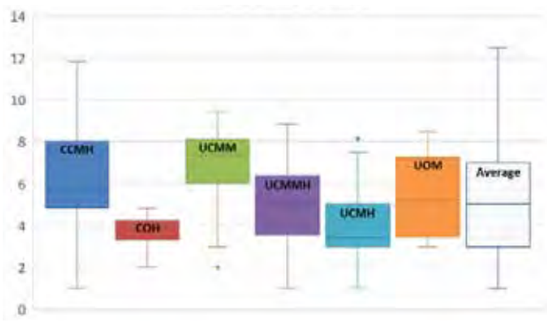
Household surveys provide important data that can be analysed according to household or an individual. Various statistical parameters, such as mean, mode, median can be calculated to compare such data. Data collected in Kigali was analysed for various parameters. Additionally, the calculated values were crosschecked using bottom-up approach. Conclusions drawn from our analysis are presented at the end of each section

Household size

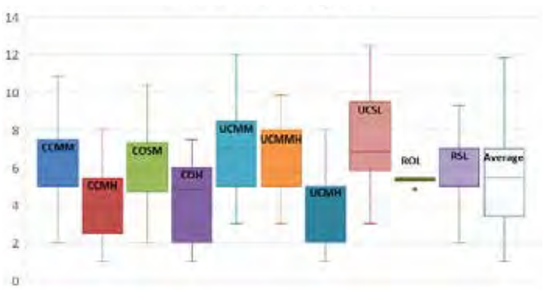
Variations in household size in Rudimentary building type



Variations in household size in Villas



Variations in household size in Bungalows

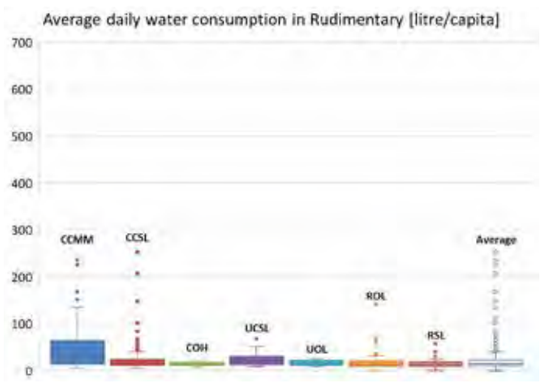


Variations in household size in Apartments

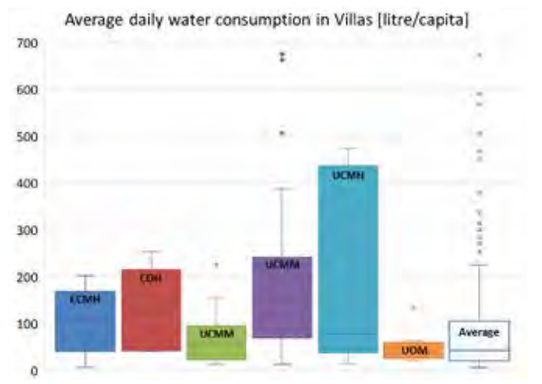
Household size in Kigali varies from one to twelve persons. Average household size across three predominant building types (rudimentary, bungalow and villa) does not vary a lot. It can be concluded that the household size is not influenced by location or building type.

Water consumption [Litre per day & capita]

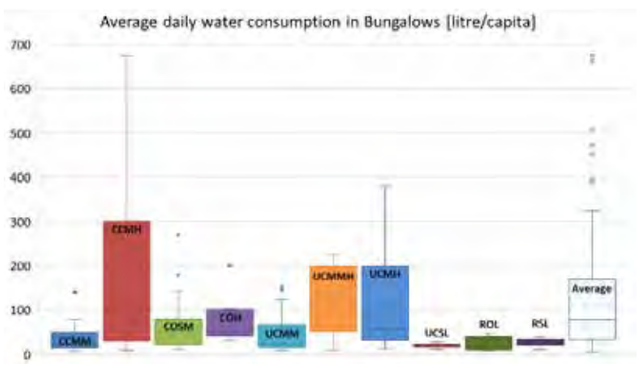
Variations in water consumption in Rudimentary building type



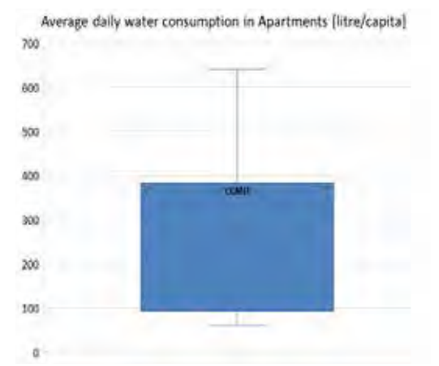
Variations in water consumption in Villas



Variations in water consumption in Bungalows



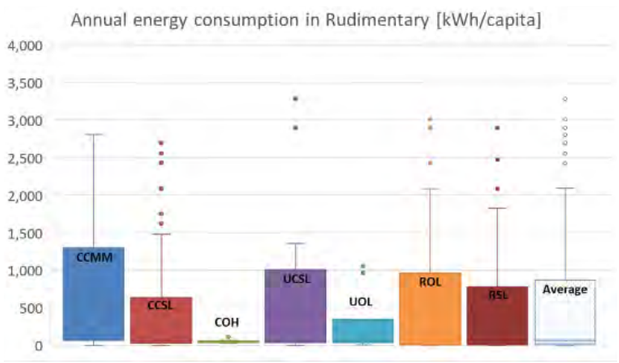
Variations in water consumption in Apartments



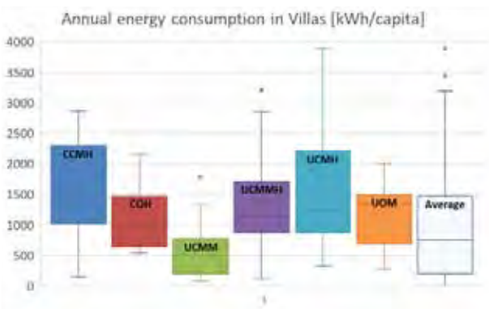
- Large variations are observed in bungalows and Villas, where are very few variations are seen in Rudimentary households
- Households living in Rudimentary buildings have the lowest water consumption per day & capita, as many informal settlements lack proper infrastructure
- Daily water consumption is heavily influenced by life style class, building types and location of the household
- Due to high variations in consumption across building types and within each building type, we propose to use Median values instead of average values for consumption patterns as they are less affected by extremes or outliers compared to mean (average)

Energy consumption [kWh per annum & capita]

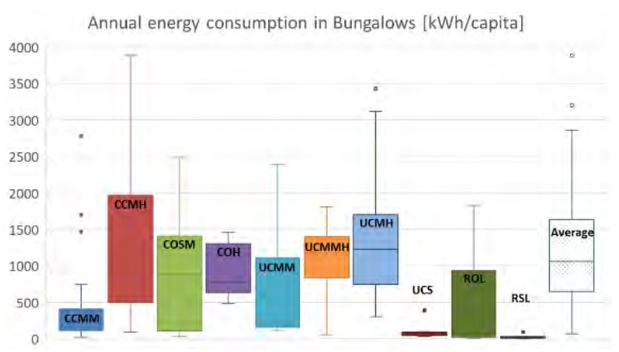
Variations in energy consumption in rudimentary building type



Variations in energy consumption in Villas



Variations in energy consumption in Bungalows



Variations in energy consumption in Apartments

- Above-mentioned energy consumption includes electricity, LPG and charcoal
- Large variations are visible in bungalows, especially between urban and rural households; the rural average in Bungalows is similar to that in the Rudimentary households.
- On an average, Households living in Rudimentary buildings have lower energy consumption (between 50 to 1300 kWh per annum & capita)
- Energy consumption is heavily influenced by building types and location of the household
- Due to high variations in consumption across building types and location, we propose to use Median values instead of average values for consumption patterns as the median is less affected by outliers and skewed data

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