

SAMPLING FOR THE YEAR 2012

During the 2009 Population and housing census, the country was delineated into 95,800 Enumeration areas (EAs).

What is an enumeration area?

An enumeration area is the smallest unit of counting. This has on average of 50 to 100 households for the rural areas and a maximum of 150 households for EAs found in the urban areas. Thus, an EA can be a whole or part of a village. The determination of an EA depends on many factors which include:

- The population distribution
- The locality of the EA
- The Natural and physical man-made features that can be used for boundaries

The sampling process

The EAs in each district were included in the sample with the exception of special EAs. The sampling process put in consideration the size of the EA in terms of Number of households per EA. Total number of households was calculated for each district excluding special EAs.

Steps taken

1. Identify what type of EA, Rural or Urban
2. Calculate the total households in the Rural or Urban EAs in the district
3. Proportion the 30 EAs into urban and rural.
4. If the district has urban EAs, then , identify the planned and unplanned (Slums) EAs
5. Calculate the total households in planned and unplanned EAs and determine the proportion of households that fall in the two areas
6. Out of the Urban proportion of the 30 EAs, then determine the proportion that should be assigned to the Planned and Unplanned areas
7. Calculated the probability of each EA being selected based in which area it falls.
8. The EAs are then sampled based on PPS (proportion to size) bearing in mind the Primary sampling Unit being the 30 EAs per district. The District with Rural and urban component will be divided into two sets of PSUs derived from 3 above.

For 2012 Sample, a total 4,740 EAs have been sampled which fall within the 158 districts to be covered which is the whole country based 2009 Population and housing census.

Sample distribution of EAs as per Province

PROVINCE	RURAL EAS	URBAN EAS	Total	SLUM EAS
CENTRAL	395	115	510	0
NAIROBI	0	120	120	51
COAST	253	137	390	16
EASTERN	740	100	840	0
NORTH EASTERN	294	36	330	0
NYANZA	554	76	630	0
RIFT VALLEY	1125	195	1320	19
WESTERN	546	54	600	86
TOTAL	3907	833	4740	172
PERCENT (%)	82.4	17.6	100	20.6

It will be noted that 82.4% (3,907) EAs are to be found in the rural and 833 EAs fall within the Towns which is 17.6 % of all the EA. Out of the Urban EAs, 20.6 % fall within the slums(unplanned) Areas.

It will be noted that the sample is 4.95 % of all the EAs in the country and they are evenly distributed. This sample is huge and is anticipated that this sample will big enough to give inference to the whole population at 5% of degrees of freedom.

To get the total number of households I the district

$$DH_T = \sum_{i=1}^n E_i H$$

Where

DH_T= This is total number of households in the in the district

E_iH = Number of households in the Enumeration area

Total Number of Households that fall in the Urban

$$Dh_u = \sum_{i=1}^n REiH$$

Dh_u= Total Urban Households

REiH = Number of households in the Urban EA

Total number of Households that are in the Slums

$$\sum_{i=1}^n SEiH$$

DH_s= Total households in the slums

SEiH = The number of Households in the slums

PROVINCE	DISTRICT	RURAL EAS	URBAN EAS	Total	SLUM EAS
CENTRAL	GATANGA	30	0	30	
	GATUNDU	29	1	30	
	GITHUNGURI	25	5	30	
	KIKUYU	24	6	30	
	KIKUYU	24	6	30	
	KIRINYAGA	26	4	30	
	LARI	30	0	30	
	LIMURU	15	15	30	
	MURANGA NORTH	27	3	30	
	MURANGA SOUTH	28	2	30	
	NYANDARUA NORTH	26	4	30	
	NYANDARUA SOUTH	28	2	30	
	NYERI NORTH	26	4	30	
	NYERI SOUTH	23	7	30	
	RUIRU	0	30	30	
	THIKA WEST	6	24	30	
	THIKA EAST	28	2	30	
	TOTAL		395	115	510

NAIROBI	NAIROBI EAST	0	30	30	12
	NAIROBI NORTH	0	30	30	8
	NAIROBI WEST	0	30	30	19
	WESTLANDS	0	30	30	12
	TOTAL	0	120	120	51
COAST	KALOENI	23	7	30	
	KILIFI	20	10	30	
	KILINDINI	0	30	30	7
	KINANGO	23	7	30	
	KWALE	28	2	30	
	LAMU	25	5	30	
	MALINDI	17	13	30	
	MOMBASA	0	30	30	9
	MSAMBWENI	19	11	30	
	TAITA	25	5	30	
	TANA DELTA	29	1	30	
	TANA RIVER	24	6	30	
	TAVETA	20	10	30	
	TOTAL	253	137	390	16
EASTERN	CHALBI	30	0	30	
	EMBU	25	5	30	
	GARBATULLA	24	6	30	
	IGEMBE	28	2	30	
	IMENTI NORTH	23	7	30	
	IMENTI SOUTH	27	3	30	
	ISIOLO	13	17	30	
	KANGUNDO	28	2	30	
	KIBWEZI	26	4	30	
	KITUI	28	2	30	
	KYUSO	30	0	30	
	LAISAMIS	27	3	30	
	MAARA	28	2	30	
	MACHAKOS	17	13	30	
	MAKUENI	28	2	30	
	MARSABIT	20	10	30	
	MBEERE	30	0	30	
	MBOONI	30	0	30	
	MERU CENTRAL	30	0	30	
	MERU SOUTH	27	3	30	
MOYALE	20	10	30		
MUTOMO	30	0	30		

	MWALA	28	2	30
	MWINGI	27	3	30
	NZAU	28	2	30
	THARAKA	30	0	30
	TIGANIA	30	0	30
	YATTA	28	2	30
	TOTAL	740	100	840
NORTH EASTERN	FAFI	27	3	30
	GARISSA	19	11	30
	IJARA	24	6	30
	LAGDERA	29	1	30
	MANDERA CENTRAL	28	2	30
	MANDERA EAST	24	6	30
	MANDERA WEST	28	2	30
	WAJIR NORTH	30	0	30
	WAJIR SOUTH	28	2	30
	WAJIR WEST	30	0	30
	WAJIR EAST	27	3	30
		TOTAL	294	36
NYANZA	BONDO	24	6	30
	BORABU	30	0	30
	GUCHA SOUTH	27	3	30
	SUBA	27	3	30
	SIAYA	28	2	30
	RONGO	27	3	30
	RARIEDA	29	1	30
	RACHUONYO	28	2	30
	NYANDO	27	3	30
	NYAMIRA	29	1	30
	MIGORI	23	7	30
	MASABA	29	1	30
	MANGA	30	0	30
	KURIA WEST	24	6	30
	KURIA EAST	30	0	30
	KISUMU WEST	29	1	30
	KISUMU EAST	5	25	30
	KISII SOUTH	28	2	30
	KISII CENTRAL	24	6	30
	HOMA BAY	27	3	30
GUCHA	29	1	30	
	TOTAL	554	76	630

RIFT
VALLEY

BARINGO CENTRAL	24	6	30	
BARINGO NORTH	30	0	30	
BOMET	30	0	30	
BURET	29	1	30	
EAST POKOT	30	0	30	
ELDORET EAST	22	8	30	2
ELDORET WEST	17	13	30	2
KAJIADO CENTRAL	22	8	30	
KAJIADO NORTH	10	20	30	1
KEYO	28	2	30	
KERICHO	25	5	30	1
KIPKELION	30	0	30	
KOIBATEK	23	7	30	
KWANZA	30	0	30	
LAIKIPIA EAST	22	8	30	
LAIKIPIA NORTH	30	0	30	
LAIKIPIA WEST	30	0	30	
LOTOKITOK	27	3	30	
MARAKWET	30	0	30	
MOLO	24	6	30	
NAIVASHA	17	13	30	
NAKURU	9	21	30	1
NAKURU NORTH	19	11	30	
NANDI CENTRAL	26	4	30	
NANDI EAST	28	2	30	
NANDI NORTH	29	1	30	
NANDI SOUTH	30	0	30	
NAROK NORTH	23	7	30	
NAROK SOUTH	30	0	30	
POKOT CENTRAL	30	0	30	
POKOT NORTH	30	0	30	
SAMBURU CENTRAL	24	6	30	
SAMBURU EAST	27	3	30	
SAMBUR NORTH	28	2	30	
SOTIK	29	1	30	
TINDERET	30	0	30	
TRANS MARA	30	0	30	
TRANS NZOIA EAST	30	0	30	
TRANS NZPIA WEST	20	10	30	
TURKANA CENTRAL	30	0	30	
TURKAN NORTH	25	5	30	

	TURKANA SOUTH	30	0	30	
	WARENG	17	13	30	7
	WEST POKOT	21	9	30	6
	TOTAL	1125	195	1320	19
WESTERN	BUNGOMA EAST	26	4	30	
	BUNGOMA NORTH	25	5	30	
	BUNGOMA SOUTH	25	5	30	
	TESO SOUTH	26	4	30	
	TESO NORTH	23	7	30	
	SAMIA	30	0	30	
	MUMIAS	26	4	30	
	MT. ELGON	28	2	30	
	LUGARI	29	1	30	
	KAKAMEGA SOUTH	30	0	30	
	KAKAMEGA NORTH	29	1	30	
	KAKAMEGA EAST	29	1	30	
	KAKAMEGA CENTRAL	21	9	30	
	HAMISI	30	0	30	
	EMUHAYA	29	1	30	
	BUTERE	29	1	30	
	BUSIA	30	0	30	
	BUNYALA	26	4	30	
	BUNGOMA WEST	30	0	30	
	VIHIGA	25	5	30	
	TOTAL	546	54	600	

The above selection is arrived at by the following formula

$$P_{di} = d \frac{MoS_i}{\sum_{i=1}^N MoS_i}$$

where

“ p_{di} ” is the clusters/EA inclusion probability,

“ d ” is the overall EAs sample size for the district“

MoS – Number of households within EA

Sum (MoS) – Number of households within a district

The above formula has been applied to generate the EAs selected in all the districts and also applied to the proportions of the EAs that fall in the Rural and urban and where the district has both urban and rural areas and where the urban is composed of slums after determining the numbers of EAs that fall in any of the areas.

For the selection of the household within the EA the following formula applies

$$P_{hi} = \frac{h}{H_i}$$

Where:

P_{hi} is the household inclusion probability

H_i total households within the cluster/EA