

MANUAL FOR MAPPING AND LISTING

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This manual is an adaptation from the one published by DHS Program and used in the Demographic and Health Surveys (DHS). The scope of this manual is to guide through the process of obtaining a sampling frame that can be used to extract a random sample of households. In case that the sampling unit is an individual, a further step of listing individuals within households should be added. The guide is prepared for a cluster sampling design, for a non-cluster sampling design, we can suppose a cluster sampling design with a single cluster that includes the entire population.

The procedure described in this manual recommends that households be pre-selected in the central office prior to the start of fieldwork rather than by teams in the field who may have pressures to bias the selection. The interviewers are asked to interview only the pre-selected households. In order to prevent bias, no changes or replacements are allowed in the field. To perform pre-selection of households, a complete list of all residential households in each of the selected sample clusters is necessary..

INTRODUCTION

The households are randomly selected either from the whole population or from a set of sample points called clusters. A cluster may correspond to a locality (e.g. village), a census Enumeration Area (EA), a Refugee camp or other. Prior to interviewing, all households will need to be listed, except in the case of a clustered sampling design when only the sampling units located in the selected clusters will have to be listed.

The main objective of the households listing operation is to create a complete and updated list of households for all selected clusters, so that the sampled households can represent the total population. This list will then serve as a sampling frame for the final selection of households to be included in the survey. During the households listing operation, each selected cluster will be visited to:

- a. Update the existing map of the cluster by drawing a location map of the cluster as well as a sketch map of the structures in the cluster, and
- b. Record on listing forms a description of every structure together with the names of the heads of the households found in the structure.

The listing operation represents an appreciable field cost, but there is no reliable method by which it can be avoided. The listing exercise is one of the most important bias correction procedures in the survey, especially when the sampling frame is out-of-date. It provides complete and recent information on the number of households for each selected cluster. Selecting the sample households from the updated listing for each sample segment will ensure that the sample represents the current population under study.

It is recommended that the households listing be carried out by field staff other than interviewers, as a separate field operation conducted in all clusters before the survey starts. Listing as a separate exercise is more expensive but also more reliable. The expense is incurred because each cluster must be visited twice, once during the listing and then again during interviews. It is more reliable because listing staff, who are specifically trained and devoted to listing, are less likely to bias the sample by excluding units that are harder to reach. Also, with a separate listing the random selection of units can be done from lists in a single central location using reliable and uniform procedures.

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Households listing must be undertaken unless the sample frame or available households listing is very recent (1 year at most).

This manual provides general guidelines for carrying out the households listing operation in the field along with the responsibilities of the listing staff, and the definition of terms used. It also describes the selection of households to be included in the survey. However, this manual should be customized to adapt to specific conditions.

DEFINITION OF KEY TERMS

The definitions of key terms used in this manual are provided below.

A **cluster** is the smallest geographical area comprised of a number of adjacent households. A cluster may correspond to an Enumeration Area (EA), or a segment of a large EA with well-defined boundaries, a village or other.

A **base map** is a reference map that describes the geographical location and boundaries of a cluster.

A **location map** is a map produced during the households listing operation that shows the location of the cluster along with its boundaries. It also includes instructions on how to get to the cluster and any information that can be used to find the cluster and its boundaries.

A **sketch map** is a map produced during the household listing operation that shows all of the structures found in the cluster during the listing operation. It also contains features such as landmarks (river, roads), public buildings (e.g. park, school, or temple) and streets or roads which helps the interviewer to find the selected households.

A **dwelling** unit is a room or a group of rooms normally intended as a place of residence for one household (e.g., a single house, an apartment, or a group of rooms in a house). However, a dwelling unit can also be shared by more than one household.

A **structure** is a free-standing building that can have one or more dwellings for residential or commercial use. Residential structures can have one or more dwelling units (e.g., a single house or an apartment building).

A **household** consists of a person or a group of related or unrelated persons, who live together in the same dwelling unit, who share common living arrangements, who acknowledge the same person as the household head, who eat together and are considered as one unit.

The **head of household** is defined as a usual resident member of the household who is acknowledged by the other members of the household as the household head.

Households are found in dwellings, dwellings in structures and structures in clusters.

In some cases, one may find a group of people living together in the same dwelling, but each person has separate eating arrangements and incomes. In such cases, each person constitutes a one-person household. Collective living arrangements (sometimes also called institutional households) such as messes, hotels, residential hotels, rescue homes, homes for the elderly, orphanages, jails, army camps, workers' hostels and boarding schools are not considered as households and therefore, are excluded from the survey.

Note, however, that domestic servants and other workers living and eating in the same household should be included as household members.

For the overall majority of cases, defining or identifying a household is straightforward, but this is by no means an easy task all the time. Regardless, of precise definition and examples, there will be some difficult cases coming up and you should consult your supervisor.

It is important that this manual is customised to reflect the most precise definition possible. This is defined in the census. The census documentation will typically also have a set of appropriate examples that can be replicated here.

RESPONSIBILITIES OF THE LISTING STAFF

It is recommended that the household listing operation is carried out in each selected cluster by a listing team prior to the main survey. Ideally, each team consists of two persons: one will work as the **mapper** while the other will be the **lister**. Supervisors will be overseeing teams, while the overall household listing operation will be monitored by a listing coordinator.

Responsibilities of the supervisor

- Obtain base maps for all clusters selected for the survey;
- Assign clusters to teams;
- Ensure that all listing materials (Manual for Mapping and Household Listing, mapping and listing forms) are obtained before going to the field;
- Plan and organize fieldwork logistics (e.g. arranging for transport, identifying and contacting local officials and village elders in each cluster to inform them about the listing operation and to obtain their cooperation);
- Receive and review duly completed listing forms and maps and ensure that they are safely stored at the central office. Spot checks to be undertaken for each structure: 1) Is the cluster identification information (Province, District and cluster name) correctly entered? 2) Have all households in the structure been recorded? 3) Has the structure properly identified in the sketch map? 4) Is the structure number correct, i.e. the same as on the sketch map?
- Ensure that each cluster has been fully covered and listed;
- Monitor and verify that the quality of work is acceptable.

Responsibilities of the listing team

- Identify the boundaries of the clusters;
- Draw a detailed sketch map showing the location of the cluster and of all the structures it contains;
- List all the structures and households in the cluster in a systematic manner;

- Complete all listing forms including Segmentation Form if required;
- Transfer all completed forms to the supervisor or to the central office;
- When possible mark the structure number on the door frame of the structures within the clusters;
- Communicate to the supervisor problems encountered in the field and follow his/her instructions.

The mapper and the lister should work together at the same time in the same area. They will first identify the cluster boundaries together, and then the mapper prepares the location and sketch map while the lister does the household listing. The sketch map and the household listing form must be prepared in tandem. The following materials are needed for the household listing operation:

- Manual for Mapping and household Listing
- Felt-tipped pen (marker or chalk) to be used in numbering structures
- A note book
- Pencils and erasers
- Base maps of the selected clusters
- Cluster Information form
- Household Listing form
- Segmentation Form

STEPS IN MAPPING AND HOUSEHOLD LISTING

The household listing operation involves three main steps: locating each cluster, preparing the location and sketch maps of each cluster, and the listing of all households found in each cluster. In some cases, segmentation is required and will be described later in this manual. Individuals (household members, women,) listing involves a fourth step.

STEP 1: LOCATING THE CLUSTER

The supervisor will provide the listing team with a base map containing the cluster assigned to the team. Upon arrival in a cluster, the team should first tour the cluster to identify its boundaries and create the location map of the cluster (described below). This should be done with the assistance of the local authorities where the cluster is located. During this first tour of the cluster, the listing team should determine an efficient route of travel for listing all structures in the cluster.

In most cases, the cluster boundaries are recognizable natural features such as streams or rivers, or features such as roads or railroads. However, in some cases such as in rural areas where the cluster boundaries may not be marked with visible features, particular attention should be paid to the information provided on the base map. In such cases, assistance from local authorities will be particularly helpful.

Following the identification of the cluster boundaries, the listing team will tour the cluster a second time to create the listing and draw the sketch map of the cluster. A sketch map is a detailed map of the cluster showing all its structures and features such as roads.

STEP 2: PREPARING LOCATION AND SKETCH MAPS

The mapping of the cluster and the listing of the households should be done in a systematic manner so that there are no omissions or duplications. The cluster should be divided into parts if possible, and a part can be a block of structures. The team should finish each block before going to the adjacent one. Within each block, start at one corner of the block and move clockwise around the block. In rural areas where structures are found in small groups, the team should work in one group at a time. In each group, start from the centre and move clockwise around it.

Location map

During the first tour of the cluster, using the Cluster Information Form, the mapper will:

1. First enter the identification information of the cluster on page 1. This information is provided by the supervisor.
2. Using page 1, the mapper will then prepare a location map of the cluster. This involves drawing a map that shows the location of the cluster along with its boundaries and the boundaries of the parts that comprise the cluster. This location map should include all instructions on how to get to the cluster and any information that can be used to find the cluster and its boundaries.

Sketch map

During the second tour of the cluster, using page 2 of the Cluster Information Form, the mapper will draw a sketch map of all structures found in the cluster as follows:

1. Marking the starting point with a large 'X', identify on the map each structure by a small square at the spot where it is located in the cluster. Non-residential structures should be identified by their use (e.g. school, shop, or factory).
2. Number all structures in sequential order beginning with "1". Whenever there is a break in the numbering of structures (e.g. when moving from one block to another), use an arrow to indicate how the numbers proceed from one set of structures to another. Although it may be difficult to pinpoint the exact location of the structure on the map, even an approximate location is useful for finding the structure in the future.
3. Add to the sketch map landmarks, public buildings (e.g. park, school, or temple) and streets or roads. Sometimes it is useful to add to the sketch map landmarks that are found outside the cluster boundaries, if they are helpful in identifying other structures inside the cluster.
4. With permission, use the marker to write on the door or frame of the entrance to the structure the number that has been assigned to the structure on the sketch map. Note that this is the serial number of the structure that will be assigned on the household listing form. In order to distinguish the survey number from other numbers that may exist already on the door/frame of the structure, write HNS in front of the structure number, for example HNS/60 for structure number 60.
5. Ensure that all of the structures within the cluster boundaries are covered.

The listing team should be careful to locate hidden structures. In some areas, structures have been built so haphazardly that they can easily be missed. If there is a pathway leading from the listed structure, check to see if the pathway goes to another structure. People living in the area may help in identifying any hidden structures.

The sketch map, the cluster information and the location map should be stored together and used to find households during enumeration.

STEP 3: LISTING OF HOUSEHOLDS

Using the Household Listing Form, the Lister will record all structures and households found in the cluster as follows:

1. Begin by entering the identification information of the cluster.
2. Leave blank the first two columns which are reserved for office use.
3. **Column (1) [Serial Number of Structure]:** Record for each structure the same structure serial number that the mapper enters on the sketch map.
4. **Column (2) [Address/description of structure]:** Provide the street address of the structure or any description of the structure that helps to locate it.
5. **Column (3) [Residence (Yes/No)]:** Indicate whether the structure is used for residential purposes (eating and sleeping) by circling **Y** for “**Yes**”. In cases where a structure is used for commercial or other purposes, circle **N** for “**No**”. Structures used for both residential and commercial purposes (for example a combination of store and home), should be classified as residential (i.e. circle **Y** in column 3). Make sure to list any dwelling unit found in a non-residential structure (for example, a guard living inside a factory or in a church).
All structures must be listed, including vacant structures and structures under construction, as well as structures where the household members refuse to co-operate, or are not at home at the time of listing.
6. **Column (4) [Serial Number of Household in the structure]:** This is the serial number assigned to each household found in the structure. There can be more than one household in a structure. The first household in the structure will always have number “01”. If there is a second household in the structure, then this household should be recorded on the next line, and “02” is recorded in column 4. If the structure is an apartment building, assign one serial number to the entire structure (only one square with one number appears on the sketch map), but complete columns 4 through 7 for each apartment in the building individually.
7. **Column (5) [Name of the Head of Household]:** Write the name of the head of the household. There can only be one head per household.
8. **Column (6) [Status of dwelling]:** Circle “1” if occupied. If a dwelling is unoccupied, observations or information from neighbours will advise the appropriate code to circle. Under special circumstances where an unoccupied dwelling cannot be classified as vacant “2” or with the household temporarily absent “3”, “Other” should be circled and accompanied by the specifics of the situation in column (8).
9. **Column (7) [Observations]:** Record any special information about the household or structure (e.g. non-residential structure, under construction, or household refusal).

SEGMENTATION OF LARGE AREAS (VILLAGE, CAMP, ...) INTO SMALLER CLUSTERS

The complete listing of large area is not cost effective. For that reason, large areas should be subdivided into smaller segments of which only one will be selected and listed. Upon arrival in a large area that may need segmentation, the listing team should first tour the area and do a quick count to get the estimated number of households in the area. As a standard, each area with 300 or more households should be subdivided into an appropriate number of segments. If possible, the segments should be roughly of equal size and ideally around 100-200 households each. However, it is critical to adopt

segment boundaries that are easily identifiable. This condition must take precedence over secondary considerations of roughly same size, i.e. not all areas with 300 or more households can be segmented due to lack of clearly identifiable boundaries.

Each team should carry a number of Segmentation Forms to the field each with a random number printed in the appropriate space on the Form.

Segmentation and selection of a sample segment will be carried out as follows:

1. Draw a location map of the entire area as described above;
2. Using clear boundaries such as roads or rivers, divide the area into segments of roughly equal size in terms of the number of households;
3. Show on the location map of the area the boundaries of the newly created segments;
4. Number the segments sequentially;
5. For each segment, do a quick count of the number of dwellings;
6. Using the Segmentation Form, record the identification information of the area, the segment number, and the size of each segment in the appropriate columns (number of dwellings, percentage and cumulative percentage);
7. Compare the cumulative percentage with the random number provided on the Segmentation Form;
8. Select the first segment for which the cumulative percentage is greater than or equal to the random number;
9. Draw a sketch map of the selected segment and list all the households found in the selected segment. The selected segment corresponds to the cluster for the survey.

HOUSEHOLD SELECTION

To obtain the sample of households to be interviewed for the survey we suggest using a random number generator, for example the **Random UX** app for Android cell phones. The following steps are required.

Step 1: In column “HH number”, starting with “1”, assign sequentially a number to all households listed in the Cluster meeting one of the three following criteria:

- Occupied residential dwellings;
- Households that refused to cooperate during household listing;
- Households whose occupants were temporarily absent during household listing.

Leave the cell blank if the dwelling unit is not occupied (Column 6 = 2) or the structure is not a residential structure. For each cluster, the number assigned to the last household listed that meets one of the above 3 criteria, corresponds to the total number of households for that cluster.

Step 2: After sequentially numbering of all households listed in each cluster, record the total number of households. Using the random number generator, set the minimum and maximum values. Minimum will always be 1, Maximum will be the total number of households in the cluster. Set that the sample must not contain repeated values and the sample size (Quantity = sample size). (There are many android apps to select random samples, with similar features).

Step 3: The generator will automatically generate the household numbers for households to be interviewed in the survey. The selected households should be indicated on the Household Listing Form by circling the corresponding number in the HH Number column.

ANNEXES

MAPPING AND HOUSEHOLD LISTING FORMS

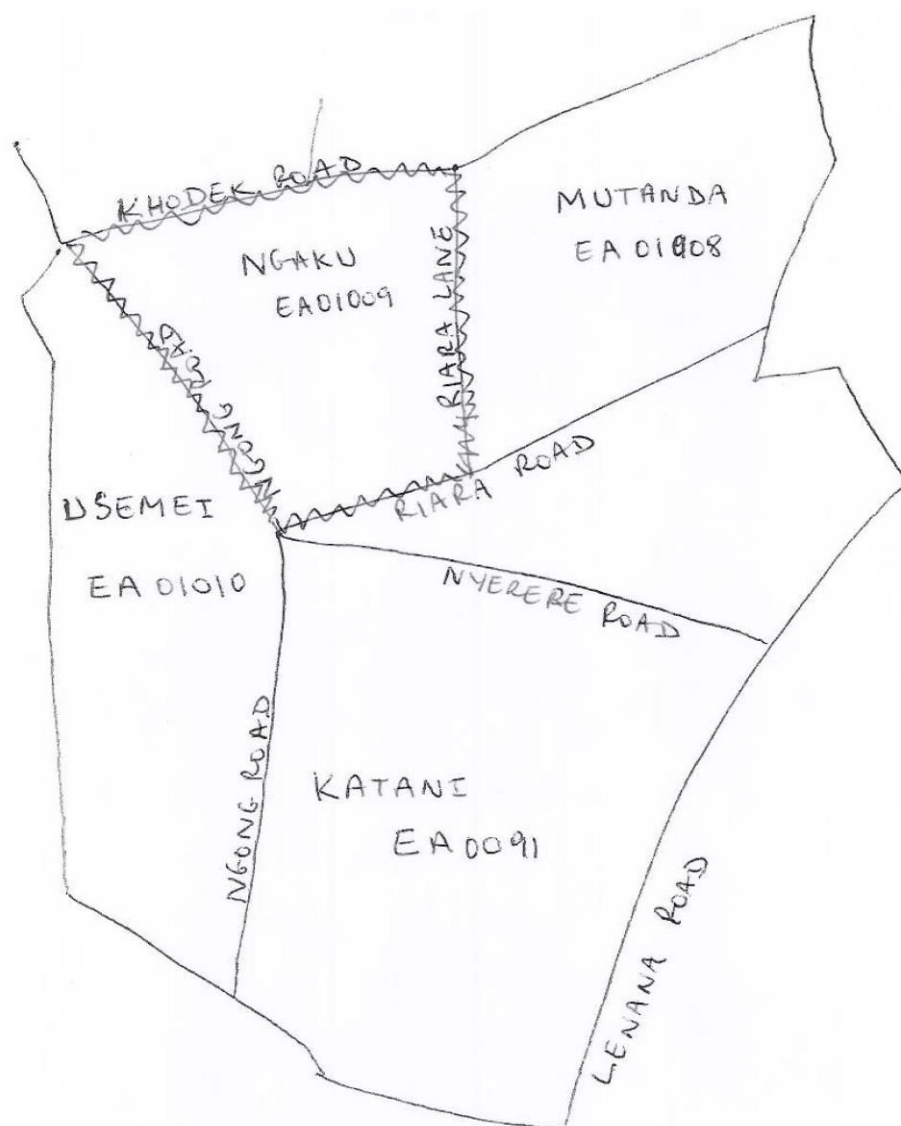
CLUSTER INFORMATION
name of survey

IDENTIFICATION	
Village (or camp, or): _____	Region: _____
Locality name and code: Name _____	Province: _____
Survey Cluster number: _____	District: _____
Mapper's name and number: Name _____	Lister's name and number: Name _____

OBSERVATIONS

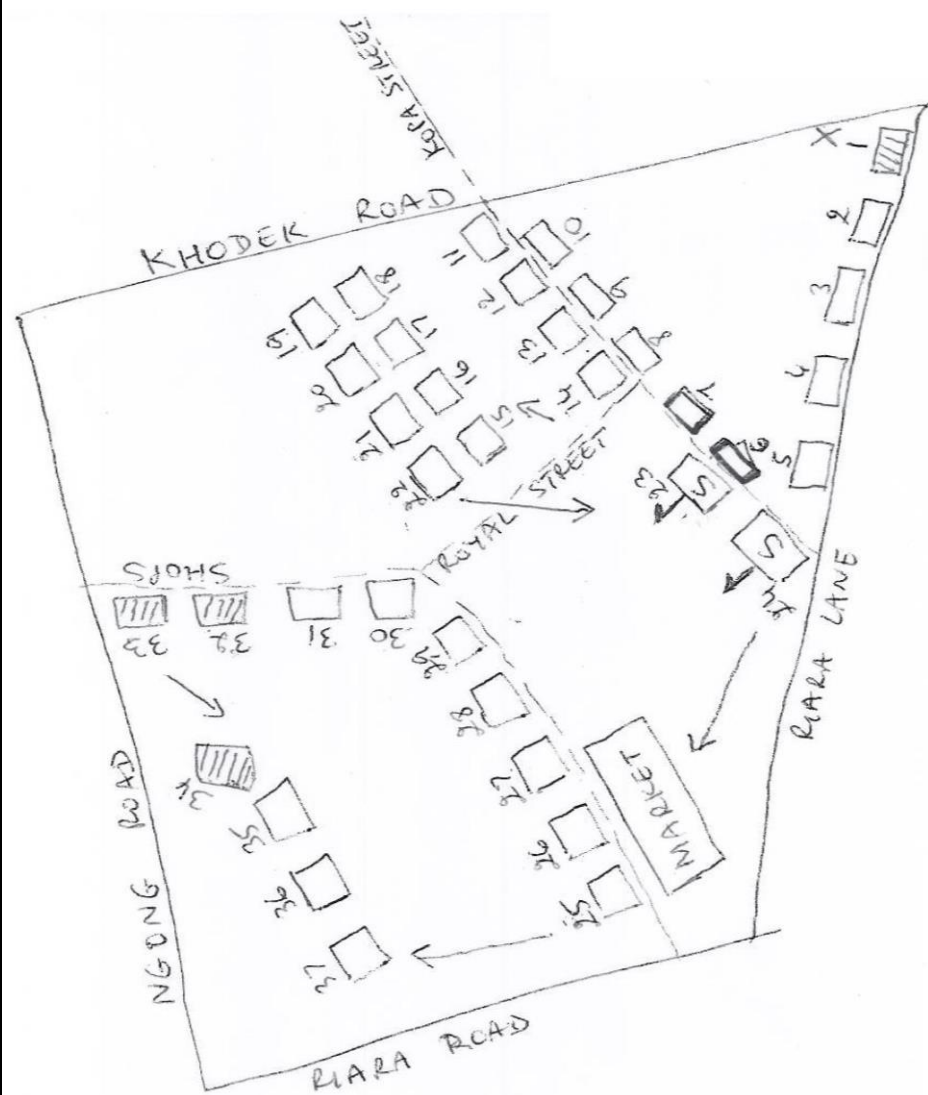
LOCATION MAP

SURVEY Cluster number: — —



SKETCH MAP

SURVEY Cluster number: _ _ _



SEGMENTATION FORM

name of survey

IDENTIFICATION	
Village (or camp, or): _____	Region: _____
Locality name and code: Name _____	Province: _____
Survey Cluster number: _____	District: _____
Mapper's name and number: Name _____	Lister's name and number: Name _____

Number of segments to be created: _____	Random number: X X X
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Segment number	Number of dwellings	Percent of total	Cumulative percent of total
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
Total	_____		1 0 0

Segment selected:	_____
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HOUSEHOLD LISTING FORM*name of survey*

IDENTIFICATION							
Village (or camp, or): _____			Region: _____		Mapper's name and number: Name _____		
Locality name and code: Name _____			Province: _____		Lister's name and number: Name _____		
Survey Cluster number: _____			District: _____		Page no.: _____		Total no. of pages: _____
Leave blank	Serial number of structure	Address/Description of Structure	Residence? Y / N <i>If no, record observations or proceed to</i>	Serial number of HH in structure	Name of head of household <i>Record the name at the time of listing</i>	Status of dwelling 1 Occupied 2 Vacant 3 Temp. absent 6 Other (Specify)	Observations
HH number	1	2	3	4	5	6	7
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	
			Y N			1 2 3 6	