Sample Design

This part elaborates in issues related to universe of the study, sampling size, sampling frame, and sampling method.

The population of the survey:

The survey will target residents of Libya 18 years old and above.

Sampling frame and sample size:

The most recent population census of 2006 will be used as a sampling frame. In this census Libya is divided into 22 Shabiyah (province) and these Shabiyahs are further divided into 667 Mahallahs (Locality). As will be explained blow, the survey will cover all the 22 Shabiyah with no area excluded. The sample size is agreed to be 2100 which will allow for a confidence level of 95% and a margin of error of 2.14%.

Sampling method

A stratified multi-stage random sampling technique will be used. This method will ensure a complete demographical and geographical representation of the population of Libya.

First, the number of the interviews is allocated in proportion to population size of each of the 22 Shabiyahs. Please see the attached excel file sheet one. The first column shows the name of the 22 Shabiyahs; the second column shows the population size of each Shabiyah according to 2006 census. In the third column

the relative size of the population of each Shabiyah is calculated; the number of interviews allocated to each Shabiyah is shown in the fourth column.

In the second stage, a number of Mahallahs, the primary sampling units, will be randomly selected in each Shabiyah, using Probability Proportional to Size (**PPS**) sampling technique. In this technique, the probability of selecting a sampling unit (i.e. Mahallah) is proportional to the size of its population. It gives a probability (i.e., random, representative) sample and ensures that individuals in larger Mahallahs have the same probability of getting into the sample as those in smaller Mahallahs, and vice verse.

The number of Mahallahs to be selected in each Shabiyah is determined so that 25 interviews, on average, will be conducted in each Mahallah. In total, 85 Mahallahs will be randomly selected across Libya.

Sheet 2 in the attached excel file shows an example of choosing Mahallahs in Benghazi Shabiyah. First, all Mahallahs in Benghazi are listed (column A and B) and the population sizes for each one of them are shown in column C. In column D, the running cumulative population is calculated.

The number of Mahallahs to be selected in each Shabiyah is determined so that 25 interviews, on average, will be conducted in each Mahallah. Thus the total number of Mahallahs to be visited in each Shabiyah is calculated by dividing the number of interviews by 25. In Benghazi, for example the number of Mahallah to be visited is (251/25=10).

The Sampling Interval (SI) is calculated by dividing the total population size of Benghazi by the targeted number of Mahallahs (670797/10= 67080). The random start (RS) is a number chosen randomly between 1 and 67080 (SI). The

number 23992 is randomly chosen in Benghazi by the excel formula (Random between (1, 67080). The following series is calculated: RS; RS + SI; RS + 2SI; RS + 3SI; RS + 4SI; RS + 5SI; RS + 6SI; RS + 7SI; RS + 8SI; RS + 9SI. The Mahallahs selected are those for which the cumulative population contains the numbers in the series calculated above. These Mahallahs are listed with number of interviews.

In the third stage, a number of households are selected in each Mahallah. A Sketch map for each Mahallah will be drawn and each Mahallah will be divided into approximately equal-sized segments. One or more segments will be randomly selected and the number of households in each segment will be estimated. A skip figure will be calculated by dividing the estimated number of households in each segment by the number of the interviews. This skip figure will be used to select households by **Systematic Sampling Method**. In each household, an individual will be randomly selected by using **Kish Grid**. The survey operates a **call-back** system which revisits temporarily unavailable targets for up to **three times**. If the targeted individual is not available after three time call-back, there would be no replacement from the same household, but a new household will be selected instead.