

[https://doi.org/10.52326/jss.utm.2024.7\(4\).09](https://doi.org/10.52326/jss.utm.2024.7(4).09)
UDC 303.425:001.8



CONSTRAINTS IN SOCIAL SCIENCE RESEARCH: DATA COLLECTION AND SAMPLING TECHNIQUES FOR HARD-TO-REACH POPULATION

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Received: 11. 22. 2024

Accepted: 12. 18. 2024

Abstract. In recent times, various methodological approaches and techniques are used in carrying out social science research, particularly in unlikely situations and among people in hard-to-reach places. This paper intends to explore new trend in research, statistical tools, its relative importance and usefulness for carrying out survey research in hard-to-reach places. It will also contrast and compare the effectiveness of methods used, and in addition, probabilistic and non-probabilistic sampling techniques needed for hard-to-reach places will be addressed. Thus, inferences will be drawn in order to proffer probable solutions for solving future methodological issues relating to social science-based research studies in hard-to-reach-places.

Key words: *population, rare-or-hard-to-reach places, sampling technique, social research.*

Rezumat. În ultimul timp sunt utilizate diferite abordări și tehnici metodologice în cercetare pe domeniul științelor sociale, în special în situații puțin probabile și în rândul persoanelor din locuri greu accesibile. Această lucrare intenționează să exploreze noile tendințe în cercetare, instrumente statistice, să evalueze importanța și utilitatea acestora pentru efectuarea cercetărilor prin sondaj în locuri greu accesibile. De asemenea, va compara eficacitatea metodelor utilizate și, în plus, vor fi abordate tehnici de eșantionare probabilistice și non-probabilistice necesare pentru locurile greu accesibile. Astfel, vor fi trase inferențe pentru a oferi soluții probabile în rezolvarea problemelor metodologice viitoare legate de studiile de cercetare bazate pe științe sociale în locuri greu accesibile.

Cuvinte cheie: *populație, locuri rare sau greu accesibile, tehnică de eșantionare, cercetare socială.*

1. Introduction

Theories, methods and strategies in social science research have been continuously undergoing scrutiny and modifications. Lately, evident changes in outcome of empirical findings and studies from various fields of social research reveal that new ideas and methodology for social research are emerging. And notably, theorists, sociologists, anthropologists, and social scientists are affirming new trend and interestingly emerging methodologies aimed at improving the quality of social science-based research. For example,

the use of both qualitative and quantitative research methods in social sciences is becoming more strategic and essential, and employing combination of two or more methods of data collection, sampling techniques and data analysis is now believed to have a better and reliable outcome than when just one is used especially for studies in hard-to-reach places.

Research is oriented towards the discovery of relationship that exist among the phenomena of the world in which we live. It is simply a process of arriving at a dependable solution to problems through planned and systematic collection, analysis and interpretation of data [1]. Several studies revealed that scientific characteristics of social research is both empirical and logical, and that it seeks an understanding of patterns, and association between and among the things observed [2-6]. In social science, results are drawn from empirical research conducted according to the ground rules of scientific investigation, which include objectivity in the reporting of research failures, as well as its success, and acceptance in advance of the need for results to be checked and confirmed by other investigators [7]. A researcher therefore looks critically at the strength of association and seeks to understand an observed phenomenon. Hence, during the process of conducting research, it will be of immense importance to correctly elicit information in order to get a tangible result, which when obtained must also be properly reviewed and appropriately analyzed. In particular, it is advisable that research findings from hard-to-reach-places should aim at drawing inference or proffering solution. This is of immense importance because scientific method is a means of making observations more deliberate and as well reduce error [8].

Recently, participatory research strategy is a methodological approach used particularly in hard-to-reach places. As noted by Bergold and Stefan [9, pp. 30-31] and Nared and Bole [10] that there is resurgence of interest in participatory research strategies and they believed that it possessed the potential to draw attention to neglected areas. Though there are wide-range of obstacles towards ensuring that marginalized communities are meaningfully involved in research process, but adopting community engagement for research in such places will be beneficial [11]. This may as well require forming longitudinal partnership with community-based organizations. Similarly, operating through community partnership with extended time frame is acknowledged for reaching disadvantaged group in health research [12].

2. Reaching the socially marginalized

Who are the socially marginalized group? In Nigeria, for instance, the socially marginalized group constitute women in remote rural areas, fulani pastoralists, ethnic minorities, tenet farmers and so on. And a unique characteristic feature of these group of people is that they have lower status. Though there is over generalization about the marginalized groups. Yet, there is need to know who really need help among them so that they can be taken into consideration in the execution of development programmes and project targeted to bridge the gap between them and others groups of people in the nation. It will be improper to continuously claim to have development programmes when the needs of the marginalized are ignored. But in order to meet their needs and take appropriate actions regarding their issues, they must be reached and be involved in the development process intended to benefit them. Therefore, there is need to design a development strategy that will respond to the needs of all in the society.

For instance, in Nigeria, many rural women cannot maximally benefit from development efforts intended to better their lot because of remoteness which often times

makes it difficult for them to be reached. Remoteness notwithstanding, they must be reached since there is need to integrate them so as to take advantage of opportunities from development projects and programmes, because most of them are poorer than men due to socio-cultural limitations. Generally, most Nigerian rural women are impoverished and this is ingrained in the social realities of the nation's culture. Das and Singh [13, pp. 19-28] also noted that it is basically impossible to think of development while neglecting the women force, as they represent the major force for social and economic development. They are still largely the untapped resource that could boost the country's development and lead to higher growth rate and increased food production.

Similarly, accessing the fulani pastoralists in Nigeria is problematic because they are mostly found in the arid regions and semi-arid and forest zones of the country. According to Odhambo [14, pp. 20], availability of pasture and water often dictates the timing and destination of migration of these nomads, and since they do not construct any permanent structure, they live in tents and other relatively easily constructed dwellings; they can easily migrate from one area to another when condition changes. The nomadic pastoralists follow a seasonal migratory pattern that can vary from year to year. But a significant characteristic of these pastoralists is their close attachment to their livestock. Jenet et al. [15, pp. 105] as well reported that they are identified with the nature of keeping animals under conditions that are close to the wild though giving them the benefit of protection and health care.

3. Techniques for reaching the marginalized

Sampling as a basic requirement in most social science research has several techniques. In some cases, a technique may be suitable, while in others, it may not. At times combination of techniques may be required. There are instances where two major sampling procedures must be combined for a meaningful outcome. For example, when sampling is carried out in series of stages, it is possible to combine the procedures in one grand design. Besides, combination of designs often ensure reduction of standard error of statistics in social research. It is desirable therefore to ensure that the first stage(s) of the grand design is or are characterized by the probabilistic sampling design(s) which could be followed by non-probabilistic sampling design(s) if there is need to draw inferences from sample statistics to the population parameter [16]. There is need also for introduction of different designs for special needs [8]. However, in qualitative research, researchers are particularly interested in selecting individuals with unique characteristics who have experience of the phenomenon under consideration. Though several previous studies in hard-to-reach places used indirect sampling which was agreed on for rare population for whom there is generally no sampling frame [17].

The use homogeneous sampling for studies involving underrepresented socio-demographic groups such as ethnic minority was also considered relevant [17]. Many sociological research studies focus on very specific sub groups of the population for whom sampling frame are not readily available [1]. According to Mapsat and Razafindratsima [18, pp. 3-6], there are no known sampling frame for hard-to-reach-population. Thus, probability sample that allow production of unbiased estimator with a calculable variance, particularly time location sampling is used where there is no sampling frame. But the three major sampling methods used over the years in hard-to-reach places are Time Location Sampling (TLS), Respondent Driven Sampling (RDS) or Probability Snowballing and Capture-recapture. Respondent driven sampling was introduced in 1997 and it is one of the three basic means

of sampling among hard-to-reach population. Though RDS is a relative option but Probability Snowballing and Capture-recapture are ideal for hard-to-reach situations. RDS resembles snowball but under certain conditions, it allows unbiased estimators. But capture-recapture method has been used since, and it is recently applied to mobile human population such as migrant agricultural workers [18].

It was also believed that reviewed techniques allowed rare population to be sampled although it has two stages with numerous variations [18,19]. The first stage is a “filter” survey undertaken on a large sample by providing a simplified questionnaire that allowed members of the target population to be identified. Survey has been the most widely used research methods in social sciences because it make it possible to study things that are not directly observable-such as people’s attitude and beliefs and to describe a population too large to observe directly with its second stage involving selection of the actual sample. However, researchers frequently select a representative sample (a small group of respondents from a large population) to answer questions about their attitude, opinion or behaviour [20]. On the other hand, much can be learned from studies that do not use representative groups, because precision alone does not make a description distinctively representative [21]. But the ability to make inferences from a sample of a population is based on the assumption that the sample is not biased by non-response. Hence, the aim of ensuring good sample size is to maximize the response rate [1]. For instance, an integrated approach involving both qualitative and quantitative methodology was adopted in an empirical study in India where all the 137 primary health centres from two districts were listed out. In all, 400 respondents were sampled from each study district and the total population used for the study was 800 [22].

Similarly, Gosling and Edward [23, pp. 172-177] and Memon, Ting, Hwa, and Ramaya [24, pp. 1-5] highlighted steps to be taken in order to avoid sampling error and they are as follows:

1. Experience of field condition is important. It is important as well to ensure that sampling method are practical and effective enough. For instance, there are problems with identifying target clients and making initial contact [25].
2. Efficiency of the enumerators-they must be literate, numerate and accurate.
3. Need for proper training and supervision of the enumerators.
4. Preparation, planning and execution must include a pilot survey to test the questionnaire.
5. Taking appropriate decision. The decision at times may depend on the complexity of the information being collected, time burden of the interview and sensitivity of the data.

Other non-probabilistic sampling methods for reaching people in hard-to-reach places include the following:

3.1 Snow ball or random sampling technique

Snowball is an informal method used for reaching a target population. It offers practical advantage if the aim of the study is primarily exploratory, quantitative and descriptive. Snowballing still offers real benefit for studies that seek to reach difficult places or hidden population. Snowball sampling is appropriate in research where the members of a population are difficult to locate [26]. Snow ball sampling is also often used to obtain sample when there is no adequate list which could be used as a sampling frame. For instance, in India, millions of children from poor families are compelled to join the labour force as the nation is having the largest number of world’s working children. Reaching this population

may be worrisome because they are mostly unstable [27]. Hence, snow balling can only be used to collect data from this group of people.

Similarly, reaching the street children may pose a big problem because of their peculiar situation. As noted, not enough has been done to address the problem of street children and their issue remains an ignored tragedy that is set to have a devastating impact even on the development of African countries. These abandoned children have cut off all ties with family members but live on their own not only for material survival, but also psychologically. For these street children, the street is their home, the pavement is their bed, stray dogs are their friends, and the garbage heap is their granary. Oftentimes, most of these children end up in the street as a result of rural poverty [28].

Hence, targeting these marginalized groups require the use of snowballing. Another example is the study on consumption expenditure and female poverty in India which revealed that female headed household face a unique set of constraints [29]. But there is need to know if all females in poor households are at significant disadvantage in terms of non-consumption indicators of welfare, and if female headed households are over represented among the poor. However, the study revealed that they represent only a fraction of the entire female population. Using a range of welfare indicators including health, education, nutrition, labour force participation and time used, poor females were found to be worse off, though this difference is not amplified below the poverty line. In addition, snow ball sampling can be used when the target members are involved in some kind of network with others who share characteristics of interest. But a potential problem is that it will only include those within a connected network and would not recognize anyone who had no contact with it [1].

Although snowball sampling contradicts many of the assumptions underpinning conventional notions of sampling, but it has a number of advantages for reaching hard-to-reach populations such as people in remote rural communities, the deprived, marginalized, the socially stigmatized, and the elites. Though it violates the principles of sampling, notably representativeness, but it provides means of accessing vulnerable and more impenetrable social groupings. In their assertion, they believed these groups of people are often excluded from the view of social researchers and policy makers who are keen to obtain evidence of the experiences of the marginalized and excluded groups [30].

3.2 Purposive sampling

Purposive sampling is a technique used to include only elements that satisfy a particular criterion, decidedly desirable in a study and that represents the group of elements that the research specifically focuses on [31,32]. Purposive sampling requires an understanding of the population and their general characteristics as this is used in deciding sample membership. It is a good sampling technique to be used in hard-to-reach places though samples may not be the exact representation of the entire population under study, but it may be a representation of part of the population studied.

3.3 Accidental sampling

Accidental sampling is based on the availability or presence of some members of the population. It just happens that they are there at spur of the moment or can be more easily reached. Accidental sampling is used when a researcher agrees to interview anyone found in the study area. But it is not suitable for study that proposes to make a generalization for the entire population on the basis of the sample parameter. Due to an in-built bias in information obtained, the sampling procedure cannot be of much use except in pilot studies [33].

However, it is believed that though accidental sampling may not have any claim to representativeness, its major usefulness is in sounding out general opinion on popular issues. And it is more relevant in social issues than in scientific and demographic issues because the procedure encourages introduction of bias into the sample selection process [16]. But the magnitude of the bias can be manageable if the population under study is homogeneous.

3.4 Cluster sampling

Cluster sampling on the other hand involves dividing an entire population into clusters or groups and drawing sample of cluster from all the clusters. All observation in the selected clusters is included in the sample. It is also used when it is difficult or almost impossible to obtain a complete sampling frame of a given target population. Cluster sampling assumes heterogeneity within each cluster but substantial homogeneity among the cluster [32]. It is easier and quicker, but it introduces a wide margin of sampling error since sampling does not involve all elements of the target population. But the use of FGDs offers an alternative sampling techniques that could reduce opportunities for bias in household selection compared to cluster method used in hard-to-reach-places.

4. Appropriate data collection methods for remote areas

A research design is a plan of action or specification for obtaining information or data necessary for testing hypothesis under specified conditions [34, 35]. In social research, it is necessary to indicate method used for data collection. Modes refer to approaches used either to contact or obtain data from survey respondents. Mixed mode survey has been in use for a long time and it has become norm in some countries. Intercept surveys are surveys that are conducted generally in a public place or business centres.

Data collection method must produce the best result possible within the existing constraints of time and budget particularly as it regards reaching remote population. Possible technology that could be used in data collection process are mail, phone, fax, internet etc.

In addition, the major forms of data collection entail the following:

1. Attitude scales-attitude is the predisposition to respond either positively or negatively to anything concrete or abstract in the environment.
2. Rating scales-reveals the extent or frequency at which a particular behaviour or action occurred in an individual. For example, if asked about rate of visit, it may be always, occasionally, rarely, or never.
3. Activity checklist-is a list of activities supplied by an enumerator or a researcher to a respondent to indicate which one he has engaged in the past.
4. Interest inventories-is a list of activities in which a respondent indicates what things he likes or would like to do; the activities may be grouped in such a way that decision can be made on those which he likes most and which he likes least.
5. Questionnaire (Pictorial questionnaire)-questions are asked and presented to the respondents in a graphic or picture form to help respondents pick their answers. This is most helpful when collecting ideas or information from non-literate and semi-literate people.
6. Interview-this involve a face-to-face contact whereby interviewer asked the respondents questions orally. The interview could be free interview or standardized schedule.
7. Observation-anecdotal records is a form of observation technique. It is the most informal, structured observation technique. It is a written description of the behaviour

of the respondents which assists a researcher in analyzing respondent's behaviour and attitude [32]. But observations in social sciences is often less subjective because it is more frequently involves interpretation on the part of the observer [36].

5. Qualitative Data Collection Methods For Hard-To-Reach Places

With increasing emphasis on participation of local population in development programme, information based largely on qualitative insight are often very useful for policy formulation. The process of collecting qualitative data enables many of the socially marginalized or disadvantaged members of the communities to have the opportunity to express their opinion through group discussion and other participatory data exercise, and in this way, they get they get involved in the decision making policies for their own development programme [33].

Hence, qualitative data provides important insights that may not otherwise be obtainable through quantitative data and it is also relevant in cases where survey might not be possible. And in addition to the greater flexibility afforded by qualitative methods, there is also the potential for enhanced research rapports [33]. Three qualitative data collection methods which can be useful for obtaining primary data in hard-to-reach places are Focus Group Discussion (FGD), participant observation and case studies.

5.1 Focus Group Discussion (FGD)

FDG is a qualitative research technique frequently used in social science research. The participants are usually chosen from a target group whose opinion and ideas are of interest to the research. FDG can be used to gather new information to confirm findings from previous research with similar populations, or as educational tool in themselves. To assure good coverage, more than one group session is needed. Participants are recruited at random and briefly interviewed to determine if they qualify for the group [31].

5.2 Participant observation

Participant observation as the name implies, places the researcher in the dual roles of participant and observer. The researcher become a member of a group or community, thereby gaining an inside view of social and productive activities of the people. This tool enables researcher to observe the group processes from the inside. Most especially it gives a systematic observation of the patterns of interaction, way of life and social structure of the social setting under study [33]. Participant observation can a well yield much data on the nature and basis of social organization [16].

Another advantage of participant observation is that it allows misunderstanding based upon incorrect first impression to be clarified and changed because it gives an intimate view of the social organization and orientation of a specific group of people. But due the nature of the technique, an observer must dedicate a long period of time to be acceptable by the local people, but often times this may not be possible as most researches are limited to a relatively short time to complete the study and it involves small sample size, thereby limiting the type of analysis that can be conducted on the resulting data [33].

5.3 Case studies

Case studies are used to specifically target particular cases. Such case studies may be focused on livelihood activities practiced by specific groups of people or coping mechanism used by socially marginalized group of individuals. Case study methods provide important insights to specific problem faced by an identified group of individuals [33].

6. Conclusion

In carrying out social research, several non-probabilistic sampling techniques may be used for hard-to-reach people and places. However, the choice of a sampling technique still depends on the extent to which the researcher can handle it. Non-probabilistic sampling techniques are found to be most effective, reliable, usable and resourceful though their representativeness may be questioned but its uniqueness is unchallengeable in carrying research in remote places. Hence, where and when possible, use of both (probability and non-probability) sampling techniques may be employed to improve the quality of research. However, a common ground for incorporating the uniqueness of non-probabilistic sampling techniques alongside with probabilistic sampling in social science research must be devised.

Conflicts of Interest: The author declares no conflict of interest.

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Citation: Adejare, T. Constraints in social science research: data collection and sampling techniques for hard-to-reach population. *Journal of Social Sciences* 2024, 7 (4), pp. 124-132. [https://doi.org/10.52326/jss.utm.2024.7\(4\).09](https://doi.org/10.52326/jss.utm.2024.7(4).09).

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