

Article

Collecting data for poverty and vulnerability assessment in remote areas in Sub-Saharan Africa

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Abstract

Data collection for poverty assessments in Africa is time consuming, expensive and can be subject to numerous constraints. In this paper we present a procedure to collect data from poor households involved in small-scale inland fisheries as well as agricultural activities. A sampling scheme has been developed that captures the heterogeneity in ecological conditions and the seasonality of livelihood options. Sampling includes a three point panel survey of 300 households. The respondents belong to four different ethnic groups randomly chosen from three strata, each representing a different ecological zone. In the first part of the paper some background information is given on the objectives of the research, the study site and survey design, which were guiding the data collection process. The second part of the paper discusses the typical constraints that are hampering empirical work in Sub-Saharan Africa, and shows how different challenges have been resolved. These lessons could guide researchers in designing appropriate socio-economic surveys in comparable settings.

Key Words: Socio-economic household surveys; Survey design; Data collection challenges; Sub-Saharan Africa.

1. Introduction

To collect economic data in small-scale fisheries in Sub-Saharan Africa (SSA) is challenging, as patterns and constraints of resource use vary considerably, *i.e.*, spatially, seasonally and over time. This requires careful planning of the collection of data that is needed for meaningful poverty and vulnerability assessment. Although small-scale fisheries (SSF) can generate significant profits and make considerable contributions to poverty alleviation and food security, little information exists about their actual contribution to livelihoods and household economics in Sub-Saharan Africa (FAO 2005, 2006). The key constraints for empirical studies in this field are difficulties associated with data collection, such as remoteness and inaccessibility especially during the rainy season. High variability of natural resource conditions, and thus production, cause additional requirements for survey design. For preparation and implementation of a survey in SSA, researchers can draw upon similar studies in other parts of the world concerning survey methodology, questionnaire design, and interview procedure, *e.g.*, the World Bank's Living Standard Measurement Survey (LSMS) questionnaire. However, many peculiarities of rural communities in SSA require an adapted and elaborated approach.

Some of these peculiarities are of an ecological nature, such as seasonal changes in access to resources and markets, which are directly affecting patterns and constraints of resource use. Others pertain to the economic side of household behavior, since income-generating activities of rural households in SSA compose complex portfolios.

Particularly households in fishery-dependent communities have adopted a flexible and strongly seasonal matrix of diversified activities (Béné, Neiland, Jolley, Ovie, Sule, Ladu, Mindjimba, Belal, Tiotsop, Baba, Dara, Zakara and Quensiere 2003a; Béné, Neiland, Jolley, Ladu, Ovie, Sule, Baba, Belal, Mindjimba, Tiotsop, Dara, Zakara and Quensiere 2003b; Béné, Mindjimba, Belal, Jolley and Neiland 2003c; Neiland, Jaffry and Kudasi 2000, Neiland, Madaka and Béné 2005; Sarch 1997). The local populations are alternatively or simultaneously fishers, herders, and farmers, and each piece of land is potentially a fishing ground, a grazing area and a cultivated field, depending on the flood cycle (Béné *et al.* 2003a, page 20). Due to high vulnerability of the ecological and economic system to shocks, such as flood, drought and pest outbreaks which result in year to year variation in fish stocks and in high crop losses, households have diversified their activities portfolio, thus spreading the risk of income losses. Capturing the dynamic interplay of the different livelihood elements is a special challenge in conducting socio-economic household surveys. Other constraints for data collection are culturally determined, for example tensions between different ethnic groups, the existence of a multitude of languages and patois spoken in the study region, or some peculiarities of the Muslim-African culture.

The data required for poverty and vulnerability assessment demand an appropriate survey methodology, for data quality to meet the requirements of a robust econometric analysis. Data needs for economic poverty assessment and the evaluation of SSF's contribution to poverty and vulnerability alleviation are substantial. Detailed information on

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household income, including different income sources such as agricultural production, fishing, livestock rearing, off-farm work *etc.*, is necessary. Also, data on the stock and value of productive and convertible assets, as well as on the distribution of consumption expenditures need to be elicited. In addition, information on control variables, such as ecological, economic or social shocks that have occurred in the past, subjective risk assessments, debts and liabilities, household composition, and others, is required.

This paper presents the collection procedure of quantitative household data from poor households in the Logone floodplain, a major inland fisheries region in Northern Cameroon. The objective of collecting household level panel data in 2007-2008 was to assess the role of small-scale fisheries (SSF) in mitigating risk through portfolio diversification, thus contributing to reducing vulnerability to poverty. In this paper, we emphasize the requirements of the general methodological approach for sampling and survey design. Due to the complex nature of the SSF sector outlined above, a procedure for sampling and data collection is required that allows the assessment of poverty and vulnerability of SSF households. Particularly, the survey design needs to account for the high variation in income generating activities over time as a result of the high variability of access to natural resources and resulting adjustments in a household's food security situation, consumption, income and assets.

2. Study site and sampling procedure

The study site is the Logone floodplain in the Far-North province of Cameroon. The floodplain covers about 8,000 km² and is part of the bigger Logone-Chari subsystem in the Lake Chad Basin, which supplies 95% of Lake Chad's total riverine inputs and has a basin area of approximately 650,000 km² (UNEP 2004). Within this vast area a representative region was defined in collaboration with national experts and other key informants, while considering the accessibility and logistic feasibility of the study. The study area covers about 2,400 km², spreading from the Maga Lake in the south to Ivyé village in the north, where the Logomatya joins the Logone River. This area is relatively densely populated and is characterized by rich fish stocks and intensive fishing, fish processing and fish trading.

The livelihoods of the rural population in this area are particularly exposed to harsh climatic conditions, such as limited and erratic rainfall, which result in a large variation of production outcomes from year to year (In this respect, the study area is representative for many similar rural settings, particularly in the Sudano-Sahelian zone of Sub-Saharan Africa.) and thus considerable income risk. However, the impact is different between the sub-regions of

the study area. Based on Neyman (1938), as cited in Rao (2005), a stratified random sampling procedure was therefore considered most effective. To draw a representative sample of households in the study area while accounting for different production conditions (such as access to fish resources), a stratification of the study site into different agroecological zones was undertaken. It was assumed that under different ecological and production conditions the role of fisheries in terms of income generation would differ. This procedure allowed capturing the whole continuum of fishing intensity (from specialized/full-time fishermen to purely agriculture/livestock rearing oriented households).

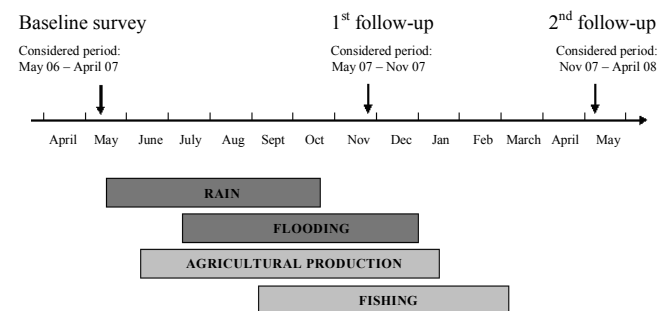
In a second step, a complete list of villages in the study area ($N = 88$) was compiled. These villages served as the primary sampling unit. Following the recommendations of local fisheries experts, 14 villages were selected proportional to the total number of villages per zone. The average village size in the floodplain (study area) is about 45 households, with a range of 15 to 100 households. Within villages every second household was chosen randomly from household lists established by the village headman. Hence, a sample size of 300 households was chosen proportional to the size of the village populations, which equates to a sampling ratio of 7% of the total population (estimated at 20,000 by the Ministry of Livestock, Fisheries and Animal Industries, MINEPIA).

All selected villages were visited before commencing the household level survey with the aim to establish contacts between the researcher and the village headmen and conduct focus group discussions (FGDs) with the village leaders. The objective of the FGDs was twofold. First, some general information was collected such as the village size, infrastructure, and access to fish resources and markets. Second, complete household lists for every selected village were compiled, since no official statistical information existed. For this study, a household was defined as an economically independent unit consisting of the household head, one or more spouse(s), children and other directly dependent members, living in the household or having migrated to other locations. Household size varies from two (*i.e.*, normally husband and spouse) to more than 15. Large households are common for Northern Cameroon, since due to widespread polygamy household heads often live together with up to four wives. Mostly, households do not live separately from other kin households, but usually form a clan, living together in a larger compound. However, within the compound, households are independent from each other. During the visits, special attention was paid to list the names of individual household heads and not only those of the compound/clan leaders. The additional information collected during the FGDs was necessary to get a first understanding of the livelihood options and constraints in

the study area, which proved to be helpful for the development of the household questionnaire. In the last step, the compiled household lists were used for a weighted random sampling of the 300 sample households.

3. Survey design

Seasonality is an important characteristic of the livelihood conditions in the Logone floodplain. Therefore, in order to capture seasonal variation, the survey was designed to yield a two-period panel data set (2006 – 2007), with an additional third survey six months after conducting the baseline survey (see Figure 1). The baseline survey was accomplished right at the end of the dry season, when income-generating activities are extremely limited, and the financial resources, generated during the rainy season in 2006, are being used up. The period covered in the baseline survey was May 2006 to April 2007, constituting a stock check of average income flows, consumption expenditures, and an asset inventory. The first follow-up survey captured the busy time of the year, where expenditures rise due to investments (e.g., purchase of new fishing nets and other productive assets), and variable production costs in agriculture and fishing. Finally, the second follow-up survey covered the second half of the year, giving account of the economic household activities in this period. This approach was chosen to improve the accuracy of data on livelihood activities by reducing the recall period, and to make sure to capture seasonal variation in income and consumption.



Source: own illustration

Figure 1 Livelihood options in the study area and design of the survey

Before the start of each survey, enumerator training workshops of 3 to 4 days were conducted, including pre-testing of the questionnaire in order to detect weaknesses and the necessity to eliminate, rephrase or add additional questions. The baseline pre-test was carried out in two villages of zone 1 and 2, in order to test the suitability of the questionnaire for different livelihood conditions. The baseline study was completed within 3 weeks in May 2007 by four enumerators, working in a team, and accompanied

and directly supervised by the first author. This procedure gave the opportunity for immediate cross-checking for missing information, and also enabled the researcher to observe and reinforce interview techniques and immediately discuss problems or questions.

Due to the relative remoteness of the villages and difficulties of access, careful logistical planning was necessary. The field trips often covered several days, and it was inevitable to spend the nights in the villages. Hence, the survey procedure adopted was as follows: the whole team arrived in a village, presenting itself to the village chief, who had been previously informed about the arrival date of the team during the FGD visit. The chief then called the heads of the selected households to a central meeting place, usually under a tree in front of the chief's house. After the interview, which normally took about one hour, the respondent was given a small present as a compensation for his time (a package of sugar and a bag of tea), and the next household head was called to sit down. Working in a group enabled the team to finish a village in about one or two days and proceed to the next one. That course of action strongly motivated and encouraged the enumerators for security and psychological reasons. The interview time, and hence the time planned to be spent per village, was held flexible, so that careful cross-checking for consistency and plausibility of responses was ensured. Hence, during the enumerator training workshops and throughout the data collection process, special emphasis was placed on the ultimate primacy of data quality.

4. Data collection challenges and lessons learnt

This section describes some challenges and constraints in data collection, which have been encountered during this study, but which are not limited to the study region. Similar settings are found in many wetlands and floodplains in SSA, and the lessons learnt in this study may prove helpful for comparable data collection endeavors.

Seasonality

When collecting data in rural fisheries-dependent communities in SSA, the seasonal nature of the livelihood systems and the ecological constraints need to be taken into consideration. Very often, villages are spatially marginalized and access is extremely difficult during certain periods of the year. For example, in the Logone floodplain in North Cameroon, access to the villages is very restricted during several weeks twice a year due to the annual flood cycle. At the beginning of the flooding season, and during the deflooding period, access is not possible, neither by vehicle, nor by boat. Hence, the placing of the survey periods need to be adapted to these conditions. For example,

although it would have been more reasonable to place a follow-up survey at the end of the production cycle in January, thus better capturing agricultural production and fishing harvests, this procedure proved to be unfeasible. From mid December to end of February access to the sampled villages was not possible at all. The research team decided for a compromise, collecting data in December, even if this falls in the midst of the harvesting season. The missed data on yields and income was then recollected during the second follow-up. Similar problems arise in other major inland fisheries such as the Hadejia-Nguru Wetlands in Nigeria or the Lower Shire river basin in Malawi.

Defining time periods

For recall surveys and particularly for panel surveys (*i.e.*, the research team is repeatedly revisiting the same households) it is important to assure a common understanding of the time period that is considered in the questionnaire. Different notions of the time span may result in biased information concerning income or consumption flows and can flaw the results and conclusions drawn from the study. In order to assure a common understanding of the requested time period, the respective cultural understanding of time needs to be taken into account. We found that in the Logone floodplain, people do not think in time units such as weeks or months. Hence, questions, such as: “How much did you spend on food items in the last 6 months?” were not appropriate. In this case, it proved instrumental to refer to certain region-wide acknowledged social events or celebrations. For example, the survey in November coincided with the Tabaski festivities, so that it was easy for the respondents to delimit the time period considered in the second follow-up survey.

Selection of enumerators and their cultural competence

Perhaps the most important factor in empirical work is the choice of the enumerators. To achieve good data quality, enumerators must not only provide the needed skills and knowledge, but also dispose over additional soft skills, such as mastering of languages, social competence, and the will to work under severe conditions.

The lack of sufficiently educated interviewer personnel in the Far-North Province in Cameroon presented a serious constraint. For this study, a team of five MINEPIA staff, who work as government officials in the survey area, was recruited as enumerators. While respondents can have reservations to provide information to government officers, the more important factor was that the survey team represented the two ethnic groups of the study area. Also, enumerators spoke the languages of the region, they were familiar with the local peculiarities, and used to the conditions in the field. In addition, respondents' willingness

to provide information was actually encouraged in expectations of a follow-up governmental support.

Another advantage of the selected enumerators was awareness and sensitivity towards ethnic tensions. Enumerators were careful not to take sides with either one of the involved parties, and avoided offensive statements. This was especially important with regard to multiple visits of villages and respondents during the follow-up surveys. Any disaccord between respondents and enumerators would have resulted in significant attrition and the need to drop entire villages from the sample.

Certain cultural or religious norms also demanded tactfulness and respect. For example, in a number of villages only men could be interviewed, since women in that African-Muslim culture are not allowed to meet or talk to men other than direct family members. In cases where the household head was not present at the time of the visit, it was not possible to interview the spouse (or any other woman in the household) instead. An adult male household member had to be chosen to provide the required information. For the same reason, interviews could not take place in the house of the respondents. For the sake of compliance to these cultural norms, the interview procedure had to be adapted. Instead of visiting the chosen households one by one, all sampled household representatives in each village were called to a central meeting place by the village chief (usually in front of the chief's house). If the household head was not present, another adult member of the household (usually male) was interviewed. The enumerators then seated themselves at a distance of about three to five meters from each other, calling the respective respondent to be interviewed in private, while the others were waiting for their turn.

Sample attrition

A particular challenge of panel surveys in general is to maintain the size of the sample over time (Jäckle and Lynn 2008, Laaksonen 2007). Attrition can be high due to several reasons. For example, in some cases the household head has died, the whole household has moved away, or the respondents lose interest to participate especially if no or not enough incentives are provided. The loss of willingness to participate in a follow-up survey caused a problem during the second visit. Due to budget constraints the survey team decided not to compensate the participants for their time at the second visit. For the baseline survey, each respondent had received a box of sugar and a package of tea which turned out to be a strong extrinsic incentive. When households learned that no remuneration had been foreseen at the second visit, 69 households (23% of the total sample) announced that they were “too busy” to participate. Considering this reaction, compensation was again offered at the

third survey, so that most of the lost households could be regained. They were even willing to respond to both questionnaires (1st and 2nd follow-up). Thus the missing data could be completed during the last survey round albeit at the cost of lower reliability due to memory bias. Such respondent behavior is consistent with findings by Jäckle and Lynn (2008), who report significant positive effects of continued incentive payments on attrition, bias and item non-response. At the end of the survey period, 14 households (4.7%) have been lost due to permanent migration or other reasons, and hence were removed from the sample.

5. Summary and conclusions

Data collection for poverty analysis in SSA is a challenging endeavor. Often, cultural, ecological and economic constraints push researchers to put up with a compromise between data quality and feasibility of the study. On the other hand, collection of such data is important because little is known about poverty and vulnerability of marginalized groups such as fisheries communities in remote areas of SSA. In this paper, we present the approach that has been taken in the course of a study on poverty and vulnerability in the Logone floodplain, which is a major fishing area in Northern Cameroon. We identify typical constraints that are often hampering empirical work in SSA, and show how different challenges can be overcome by an adequate survey design, sampling and careful application of the survey instrument. Major constraints encountered were the difficulties to access the target population, limitations in finding qualified enumerators and high demand for cultural sensitivity of the research team.

Of eminent importance is a close collaboration with local authorities and experts in the respective field of research, as well as a good understanding of and compliance with local cultural norms and values. Learning from the local population and empathizing with its peculiar ways of living before starting the survey per se has been found to be a key success factor for working in that region. Summing up, it can be concluded that despite a number of difficulties, quantitative data collection in rural Sub-Saharan Africa is a task that can be completed with satisfying results. An appropriate survey design and interview procedure developed in collaboration with local staff and experts can assure adequate data quality for economic poverty and vulnerability analysis.

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