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Combining household qualitative data and quantitative data in food security research

Trial lecture for the PhD-degree, Trondheim, 10.06.2005

Working papers on Population and land use in central Ethiopia, no. 5

Acta Geographica - Trondheim

Series B, No. 4

Foredrag/Lectures Trondheim 2006
Combining household qualitative data and quantitative data in food security research

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1. Introduction

In this lecture, I will argue that combining qualitative and quantitative household data in a single research project allows a comprehensive and holistic understanding of food security situations. This has been the standpoint underpinning my doctoral thesis research in Oromiya Zone, North-Eastern Ethiopia (Degefa Tolossa 2005) which has been carried out using a mixed research design approach.

While quantitative data refers to measurable and countable demographic and economic characteristics of, for example, a household, qualitative data consists of a range of behavioural traits such as beliefs, customs, values, knowledge, and experiences, as well as various events, processes and resulting structures, which cannot be accounted for in numerical terms. Specific quantitative household-level, food-security indicator data include household composition, possession of production assets, and size of income and food intake. These data can be generated through methods such as structured questionnaire surveys, observations and by drawing upon information from secondary documents. In contrast, qualitative food security related data involves peoples’ tastes and preferences, local knowledge, social relations and networks, vulnerability to hazards, power relations, and political participation. The diverse participatory approaches which broadly fall under interview, observation and examination of archives are the methods used for gathering qualitative data. By carefully looking at a household’s qualitative and quantitative information, it is possible to understand situations of livelihood, well-being and food security. Thus, if gathered and documented on the basis of appropriate and relevant

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1 This article is my PhD trail lecture held on 10 June 2005 in the Faculty of Social Sciences and Technology Management (SVT), Norwegian University of Science and Technology (NTNU), Trondheim. I wish to express my deepest gratitude to my supervisor Associate Professor Axel Baudouin for his unreserved follow-up of my studies, and the Department of Geography at NTNU for offering me a delightful academic environment.
methods, these data will complement each other in an endeavour to analyse household food security.

Against this background, in this trial lecture I will reflect on how household food security can be better understood by combining data from qualitative and quantitative indicators.

In the methodology literature, there are two competing perspectives regarding the importance and the possibility of combining qualitative and quantitative methods in a single research study designed to understand social phenomena (Brannen 1992, Bryman 1992, Tashakkori & Teddlie 1998 & 2003, Creswell et al. 2003, Snape & Spencer 2003, Knox 2004, Aziz 2005).

On the one hand, there is a ‘paradigm purity’ argument which puts forward the idea that qualitative and quantitative research methods are linked to a distinct philosophy of ‘positivism’ and ‘constructivism’ respectively, for which it is impossible to combine methods from two approaches in a single research project to uncover social phenomena. The key assumption for the advocates of this argument is that methods need to be derived from the philosophical stance of the research, since positivists exclusively rely on quantitative methods, while constructionists prefer qualitative research. As stressed by Knox (2004), the advocates of the ‘paradigm purism’ believe in an exclusive alignment between philosophical stances and methods.

The second line of thinking posits the idea of ‘compatibility thesis’, which argues that it is possible to address a research problem that philosophically falls under positivism and constructivism by choosing the most appropriate method from either the qualitative or quantitative approach, or a combination of the two. The crux of the argument here is that there should not necessarily be an alignment between philosophy and method; instead, there can be ‘elective affinity’. Julia Brannen (1992), one of the earliest advocators of mixing methods, states: ‘One should be able to select what is best from the variety of tools available for a particular piece of research’.
This line of thinking would be consistent with the idea of a ‘pragmatism paradigm’ which argues for ‘mixed research design’ whereby methods from qualitative and quantitative approach can complement each other within a single research project. Mixed research design relies on plural methods and philosophies. As Hammersley (1992) noted, there is no hard or fast rule for exclusive and one-to-one correspondence between method and philosophy.

Outline of the presentation
With this conceptual background to the two opposite perspectives in research methodology, the remaining part of my lecture is structured into five sub-sections. First, I will describe some pertinent views of ‘paradigm purists’, i.e. positivism and constructivism, along with their respective methods. Second, I will reflect on some characteristics of the ‘mixed research approach’ which draws on pragmatism, the philosophy that advances the view that ‘what works’ is a good research method. Third, I will give an overview of the main theoretical shifts in studies of food security since the 1970s and their implications for methods used to investigate household food security. Fourth, I will briefly highlight my fieldwork practice, that was based on ‘mixed research design’ in the Oromiya Zone, North-Eastern Ethiopia. Lastly, I will summarize the main points.

2. Philosophical stance as a basis for research design and method selection: The divide between positivists and constructionists

It has been argued that it is important to be aware of the philosophical debates and methodological developments arising from them in order to secure the quality of research and therefore the extent to which findings are accepted (Snape & Spencer 2003). As I have indicated, there exist divergent opinions on how to ensure research quality. Some writers argue that different methodological approaches are underpinned by particular philosophical assumptions, and that researchers should maintain consistency between the philosophical starting point and the method they adopt. By contrast, others believe that the methods associated with a range of philosophical positions each have something to offer.
The first argument formed one of the backgrounds for the divide between the ‘positivist paradigm’ and ‘constructionist paradigm’ and also for the persistence of heated debates between the two over decades. For positivists, the world is measurable, controllable and explainable (Knox 2004). They believe that the world exists ‘externally’, and that its properties should be measured using objective methods.

This means that only knowledge that is observable is, in fact, valid. It then brings together the epistemology of positivism – the knower and the known are independent – with quantitative methods, i.e. methods which result in essentially numerical evidence. Positivists thus argue that the methods of the ‘natural sciences’ are appropriate for the study of social phenomena (Bryman 1992). Knox (2004) asserted that the relationship between positivism and quantitative methods has almost become a ‘law’ or ‘truth’. This clearly tells us that an epistemology determines the type of method to be adopted in social research. Non-measurable world data are invalid according to positivism, and as a result research underpinned on the philosophy of positivism does not give room to accommodate methods from the qualitative approach.

On the other hand, ‘constructionists’ or ‘naturalists’ hold the view that observations cannot be pure in the sense of altogether excluding the interests and values of individuals. Investigations must employ empathic understanding of those being studied, and the paradigm supports qualitative methods (Howe 1998 cited in Tashakkori & Teddlie 2003).

Constructionists believe that it is impossible to objectively measure and classify the world (Aziz 2005). They stress the importance of interpretation as well as observation in understanding the social world. In this regard, the job of a researcher becomes simply to understand the meaning from which social reality is constructed. There is a general recognition that qualitative research methods which fall under observation, interviewing and documentary analysis are appropriate to provide a holistic understanding of research participants’ views and actions in the context of their lives as a whole (Snape & Spencer 2003: 7).
Therefore, the advocates of each paradigm have their own distinct ontological and epistemological stances. The ideas of ‘philosophical purity’ and ‘incompatibility thesis’ are apparently reflected in the selection of tools to investigate a research problem. Positivists think that true knowledge can be generated through tools that facilitate the measuring of social phenomena. Hence, the special attachment to quantitative methods emanates from their philosophical belief. In a similar way, qualitative method is linked to constructionists. With respect to the logic of inference, positivists focus on deduction (proof or disproof of a predetermined hypothesis), while naturalists are interested in induction (constructing theory from observations – grounded theory).

Because of these polarized positions, research methods to investigate societal problems have been subordinated to the philosophical stance upon which research is underpinned. This, by and large, limits social researchers to formulating and investigating research problems that fall in line with their own philosophical stand.

The wish to insist on ‘paradigm purity’ confines a researcher to a specific method. There is an apparent fear that any attempt to include methods attached to other philosophical stances puts an investigation at risk of generating invalid and unacceptable research output. Hence, the concern for mixing methods and the quest for methodological pluralism within a single social research study has partly emanated from this reality. The move towards mixed method, however, does not necessarily mean the tension between constructionists and positivists is over.

3. Mixed research design, and the pragmatist idea of ‘what works’

Mixed research method refers to ‘collection and analysis of both qualitative and quantitative data in a single study in which the data are collected concurrently or sequentially, are given priority, and involve integrations of the data at one or more stages in the processes of research (Creswell et al. 2003).

Mixing methods for investigating social phenomena is associated with a pragmatist paradigm, which for some authors is a ‘multi-paradigm’, while others consider it as
‘paradigm-free’. It is a ‘deconstructive paradigm that debunks concepts such as “truth” and “reality” and focuses instead on “what works” as the truth regarding the research question under investigation (Tashakkori & Teddlie 2003). Pragmatism rejects the either/or choices associated with the paradigm tension, and instead advocates the application of mixed methods in research.

The move towards a mixed approach is partly aimed at offsetting the limitation of one method by another. Quantitative methods basically enable the generation of ‘categorical data’ with either enumeration or measurements with categories, yet nonetheless with limited potential to uncover processes involved in societal changes. Conversely, qualitative methods explore ‘events and processes’ in a society, but hardly allow measuring of the different attributes that account for the structural differences between different groups in a society. This clearly suggests that mixing methods allows a comprehensive understanding of the rather complex social world.

Tashakkori & Teddlie (1998) claim that: ‘with the growing of the uses of mixed research method in social and behavioural sciences, the researchers are free to use the methods most appropriate to their research questions’. It seems that the barriers set by philosophical boundaries have been removed, and researchers can now investigate problems by applying any method(s) they consider to be the most appropriate.

According to Snape & Spencer (2003), the main purpose of bringing qualitative and quantitative methods together is to yield different types of intelligence about a study subject rather than simply to fuse the output from two approaches of enquiry.

Further, Creswell and his associates (2003) have identified three profound advantages of mixing methods:

- First, ‘the use of multiple methods can cancel out some of the limitations of certain methods’ – since both qualitative and quantitative methods have their own inherent weaknesses.
Second, ‘mixing different types of methods can strengthen a study’ – it will be a great advantage when the findings of one are corroborated by the other.

Third, ‘the complex social phenomena are best understood through different methods’ – some phenomena have multi-dimensions and have linkages with a range of variables, the understanding of which should be based on a mix of diverse methods.

Depending on the sequential relations and degree of dominance of either of the methods, it is possible to mix qualitative and quantitative data in four different ways (Figure 1).

In my view, however, a mixed method research design is still not free from some practical shortcomings, particularly when it comes to cases of time-bound, degree-fulfilment student research. This can be explained by different problems:

- Fieldwork, and also data processing, comparing and integrating at analysis level are time consuming (and have time limitations).
- Research costs are excessively high (i.e. in terms of funding).
- Contradictory findings arising from the use of different methods might lead to frustration on the part of the researcher the first time they are encountered.
- The approach demands sufficient research skills in both quantitative and qualitative methods. This is considered to be one of the barriers for some researchers considering adopting this approach. According to Heller (2001), sticking to a single method and attacking others in counterpart camps emanates from either the proper understanding of the weakness of the method or the lack of knowledge (ignorance) about the method in question.
- Effective and balanced utilization of mixed research data may require an interdisciplinary understanding.
Figure 1. Types of mixed methods research design.

1. Qualitative methods are used to help develop quantitative measures and instruments.

   Qualitative ➔ Quantitative ➔ Results

2. Quantitative methods are used to elaborate a primarily qualitative study.

   Qualitative ➔ Results
   ➔ Quantitative

3. Qualitative methods are used to help explain quantitative findings.

   Quantitative ➔ Results
   ➔ Qualitative

4. Qualitative and quantitative methods are used equally and in parallel

   Qualitative ➔ Results ➔ Quantitative

Source: Adapted from Creswell et al. (2003)
4. Mixing methods in food security research

Famine and malnutrition as a human scourge has had a long history. However, the concept of food security was first coined following the First World Food Conference in 1974 in Rome. Since then, its definition has changed considerably, and recently it has been cited that the number of definitions has exceeded 250. Recent definitions have focused on issues of availability, access, vulnerability, utilization, livelihood, sensitivity, cultural values, and human rights (Figure 2).

Figure 2. Household food security: research design, data type and explanations.

Experts in the field (Maxwell & Frankenberger 1992, Maxwell 1996) broadly group the main concern and subsequent theoretical shifts relating to the subject into three.
One is the shift from ‘global and national’ concern to that of ‘household and individual’, which informs about the changes in the scale of data aggregation and approaches to assessing the level of food security. Emphasis on food availability, which relates population size to the amount of food available from production, was highly criticized when the idea of food entitlement was advanced by Amartya Sen (1981). Sen proposed that food security is a matter of who has access to food, means who can acquire food through their own production efforts or by purchase from markets rather than the availability of sufficient food in a given region or a country. He substantiated his arguments on the basis of evidence from many famine catastrophes in Africa and Asia, e.g. the famines of Bengal in 1943; Ethiopia in 1972–1974; Bangladesh in 1974; and the Sahel in the early 1970s.

The second shift has been from a ‘food first’ to a ‘livelihood approach’ which entails the changes in scope and priority at household level, and whether to emphasize meeting immediate and current food consumption needs or sustaining household livelihoods. The implication for method in this regard is clear, since looking at the situation of household in a wider and holistic perspective has become so important. Hence, there is a need to look at household asset situations, local contexts, vulnerability and institutional set-ups (Figure 2), as well as how these diverse issues are interlinked. Understanding the complex situation of livelihood calls for food security research to be underpinned on ‘mixed research method’ design.

The third shift is from objective measurements to peoples’ perceptions, suggesting a clear shift in the types of data necessary to address the complex linkages between diverse factors affecting food and livelihood security. In this regard, in addition to quantitative data, there are other issues that need special attention such as local culture (as every society has culturally accepted food – in terms of both staples and meals), food preferences (the issue of rights and freedom of choice), and food safety. Insights into these characteristics can be found through qualitative investigations.

Therefore, underpinning food security research on mixed research design gives the chance to look at food security in its multiple dimensions: the food availability aspect, access to food, the factors related to state-society relations (political economy issues), and the utilization dimension.
Selected cases

Some recent livelihood and poverty-related research observations have indicated that mixed research is the most appropriate way to uncover livelihood, and poverty and subsequent food-insecurity problems (Figure 3).

Figure 3: Some examples from recent cases of mixed research on livelihood and poverty.

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Main focus of research and study area/site</th>
<th>Methods combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank Ellis (2000)</td>
<td>Livelihood and poverty in rural Tanzania</td>
<td>• Focus group discussion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Participatory wealth ranking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sample survey</td>
</tr>
<tr>
<td>Howard White (2002)</td>
<td>Poverty analysis in rural Africa</td>
<td>• Secondary demographic statistics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ethnography</td>
</tr>
<tr>
<td>Svein Ege &amp; Harald Aspen (2002)</td>
<td>Poverty and famine in Wello, North-Eastern Ethiopia</td>
<td>• Ethnography</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Indicators household survey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mapping land-use patterns</td>
</tr>
<tr>
<td>Christopher Barrett (2004)</td>
<td>Livelihood and poverty in Rural Kenya</td>
<td>• Household survey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Focus group interview</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Key informant interview</td>
</tr>
<tr>
<td>Gerard Howe &amp; Andy McKay (2004)</td>
<td>Chronic poverty in Rwanda</td>
<td>• Participatory poverty assessment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Single-round household survey</td>
</tr>
</tbody>
</table>

The important point to note here is the fact that the experts from the two extremes of the disciplines, i.e. economics and anthropology in the debate between positivists and constructionists, have accepted the importance of mixing methods.
5. The practice of mixed research in Oromiya Zone

The initial design of my thesis research (Degefa Tolossa 2005) was a mixed approach on equal basis, and the data-generation activities were undertaken concurrently during the first session of the fieldwork. Thus, a structured household survey and sets of qualitative methods that broadly fall under the categories of observation and interview were used during the first phase of my fieldwork (Figure 4).

Figure 4: Fieldwork practice in Oromiya Zone.

<table>
<thead>
<tr>
<th>Phase I – 2002</th>
<th>Phase II – 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>QUALITATIVE</strong></td>
<td><strong>QUALITATIVE</strong></td>
</tr>
<tr>
<td>• Key informant interview</td>
<td>• Key informant interview</td>
</tr>
<tr>
<td>• Case study in-depth interview</td>
<td>• Case study in-depth interview</td>
</tr>
<tr>
<td>• Observations</td>
<td>• Observations</td>
</tr>
<tr>
<td>• Group discussion (focus/panel)</td>
<td>• Group discussion (focus/panel)</td>
</tr>
<tr>
<td>• Participatory wealth ranking</td>
<td>• Participatory wealth ranking</td>
</tr>
<tr>
<td>• Life history narratives</td>
<td>• Life history narratives</td>
</tr>
<tr>
<td>• Artefacts</td>
<td>• Artefacts</td>
</tr>
<tr>
<td>• Secondary sources</td>
<td>• Secondary sources</td>
</tr>
<tr>
<td><strong>QUANTITATIVE</strong></td>
<td><strong>QUANTITATIVE</strong></td>
</tr>
<tr>
<td>• Structured household survey for 140 households (70 in each community)</td>
<td>• Secondary statistical data</td>
</tr>
<tr>
<td>• Secondary statistical data</td>
<td></td>
</tr>
<tr>
<td><strong>Concurrent/simultaneous</strong> = QUAL + QUAN</td>
<td><strong>QUAL</strong></td>
</tr>
</tbody>
</table>

**Overall research design:** Mixed approach ‘QUAL dominant’ and ‘less QUAN dominant’

Source: Summarized from Degefa Tolossa (2005). Note: *QUAN stands for Quantitative, and QUAL for Qualitative*

During the second fieldwork session, I concentrated on a variety of qualitative methods which were used for generating additional data, as well as some follow-up data.
6. Summary of the main points

Depending on the purpose and focus of a given research project, food security at household level can be examined through mixed method. The sequence of practices and the level of dominancy of either method may vary according to different factors, such as type of data sought, time, funding, etc.

The ‘research question’ that an investigator intends to address will predominantly determine the type of data to be generated along with appropriate tools, rather than a philosophical background of the problem under investigation. This is because certain research problems such as food security and poverty have multiple dimensions to be handled by integrating methods from qualitative and quantitative methods.

I am not, however, arguing that research relying exclusively on either quantitative or qualitative methods is incomplete and invalid. Depending on the issue to be addressed in the research it is possible to opt to carry out surveys, experiments or certain participatory approaches. There has been and continues to be an enormous amount of research in various social sciences and the humanities that depends purely on either a qualitative or quantitative approach.

I have the feeling that the recipes in many research methodology text books are somewhat conventional formulas. Actual research practice, however, needs to be flexible and there is a need to make adjustments in the course of the research process.

What seems to be very important is to look creatively and open-mindedly for a method that allows for uncovering the issue under research by using different approaches, rather than simply adopting approaches that are conventionally known and already in place. It is in this way that research may contribute to new knowledge, and researchers will also gain exposure to new skills.
References


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