Towards multidisciplinary household questionnaires

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Abstract

During the ESIA process, social practitioners collect socio-economic data to develop social baselines by various means including household (HH) surveys. In order to conduct them, detailed questionnaires are developed, but often without the input of other specialists and often without careful consideration of the potential diversity of analysis required. Data on biodiversity, natural resource use, cultural heritage and hydrology are often collected separately whilst they could be integrated in one household surveys, potentially creating a more holistic description of the study area.

The aim of this paper is to promote an approach for the development of HH survey questionnaires which are integrated as well as the use of relational databases (Microsoft Access). Indeed, relational databases can provide great flexibility in terms of outputs (and integration with GIS) but only under the condition that the relationship between all the data (data model) has been adequately defined with all specialists' inputs. To achieve this, it is important for each specialist to assess what information they specifically need and at what level (household, household member). Using examples, the paper will illustrate this approach.

Introduction

During the Environmental and Social Impact Assessment (ESIA) process, various specialist studies are conducted which aim at describing the biophysical (water, soil, ecology, air, noise, etc...) and social environment of a particular area in order to assess the potential negative and positive impacts associated with the implementation of a project in that area. Throughout this process, regular interaction and communication between the engineering and environmental/social teams take place to ensure optimal project design, prevent environmental or social negative impacts by applying mitigation hierarchy and obtain a 'social licence' to operate. Yet, there is sometimes a lack of dialogue between the environmental and social teams causing the impact assessment to lack integration. Without dialogue between social and environmental specialists throughout the ESIA process, especially during the scoping and impact assessment stages, impacts cannot always be adequately defined. This is especially true for impacts relating to natural resource uses which require input from both biodiversity and social specialists. International Good Practice standards emphasise the importance of integration. IFC's most recent Performance Standard 6 (2012) calls for more integration of the biophysical and social studies in order to identify, prioritize and assess ecosystem services (IFC, 2012).

In order to address this lack of communication between the biophysical and social specialists and to ensure a more thorough and complete impact identification process, this paper proposes an approach which relies on the use of household questionnaires as common ground for all specialists. The paper argues that these questionnaires should be regarded as one of the tools that can bring all specialists together during the ESIA process and enable the collection of data which are useful for a

wider range of ESIA disciplines. Because relational databases (such as Microsoft Access) play a key role in the design of questionnaires and in terms of data entry, management and analysis, the use of relational databases is promoted in this approach.

Using a concrete example and a process chart flow, this paper explains how the tools are used to promote a more integrated impact assessment process.

The ESIA Process

The ESIA process, typically carried out to obtain an environmental authorisation, aims to identify and assess environmental and social impacts associated with a project in order to determine how negative impacts can be avoided, minimised, mitigated or compensated, and positive impacts optimised. Throughout the process, stakeholders must be engaged in a two-way communication in order to ensure that they have input into the project design.

The ESIA process is often divided into four different stages as follows:

- **Screening or scan:** The objective of the screening phase is to determine if an ESIA is required. It generally involves reviewing available documentation and one or two ESIA team members (project manager and the social lead) conducting a site visit including key informant interviews and a preliminary identification of potential issues and impacts.
- **Scoping and detailed plan of study:** This stage is characterised by more in-depth issue identification, the definition of the study area/zone of influence and a formal engagement of the stakeholders through consultations. These scoping activities lead to the establishment of the scope for the specialist studies (terms of reference or ToR).
- **Baseline studies:** In this phase specialist surveys (including household surveys) are conducted to compile a physical, biological, social and economic baseline of the study area.
- **Impact assessment:** In this phase potential impacts are identified, defined and rated in terms of their significance on sensitive receptors (e.g. local communities, water, etc...). Measures are identified to optimise or mitigate impacts and form the basis for the development of the management and monitoring plans.

Integration tools

It is argued here that in order to support the assessment of biophysical and socio-economic elements in a holistic manner, household survey questionnaires and relational databases (such as Microsoft Access) should be used.

Typically, a household questionnaire consists of a set of questions which relate to subjects such as demographics, education, health, water and livelihood strategies. Each question (e.g. what is your age?) relates to a variable (e.g. age).

These variables, depending on the type of questions (e.g. opened, closed) can be categorised into four levels of measurements (nominal or categorical, ordinal, interval, and ratio) (Grotenhuis, 2009). A nominal variable can take various values, but as opposed to an ordinal variable, there is no intrinsic ordering in the values. For example, the marital status variable (single, married, divorced or widowed) is nominal whereas the educational level is variable (nil, primary school, secondary school,

university) is ordinal. Both variables are widely used in household surveys, because they involve a restricted number of response categories which facilitates the quantitative analysis process.

Each variable is assessed at a particular level and can refer to the household itself (access to water) or the individual/household member (gender, age and occupation) (See Table 1),

Table 1: Example of aspects of a household questionnaire

Category	Variables	Questions	Level
Demographics	Gender	Is this person female or male?	Individual
	Age	What is your age?	
	Types of primary occupation	What do you for living?	
Water	Types of water sources	Where do you get your water from?	Household
	Types of water uses	What purposes do you use the water for?	

In order to properly analyse the household data (variables), the questionnaires need to be designed in conjunction with the design of the database structure or data model (as shown in Figure 1). Such design includes the definition of each variable and the relationship between each variable (data model).

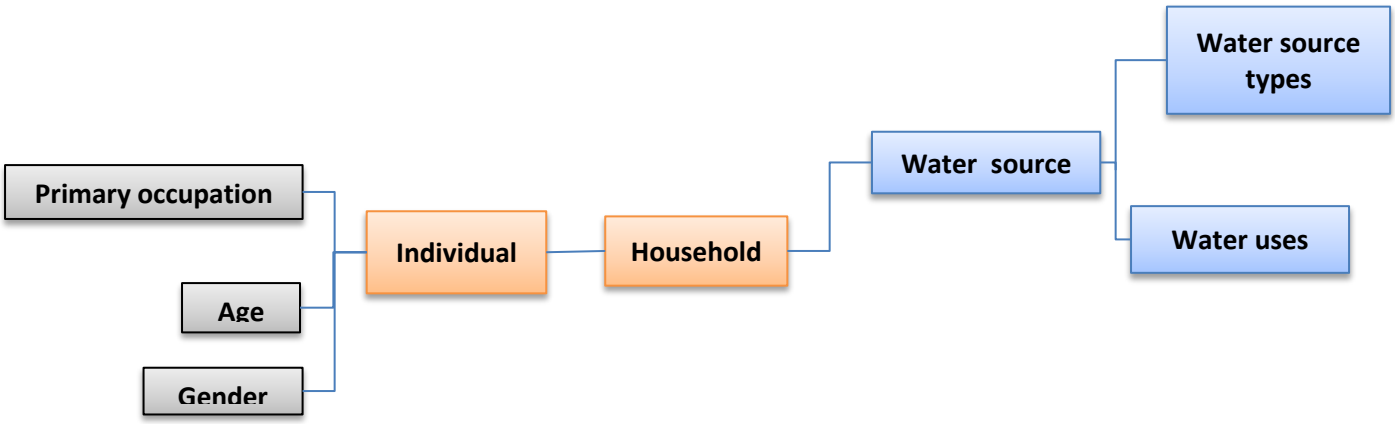

Figure 1: Example of simplified data model

The Integration Process

The process of integrating the different specialist inputs follows the ESIA process as shown in Figure 2. The flow chart shows how the integration activities (workshop and feedback to specialists) and integration tools support impact assessment process. Using one example relative to natural resource use, the integration process is described at the different ESIA phases.

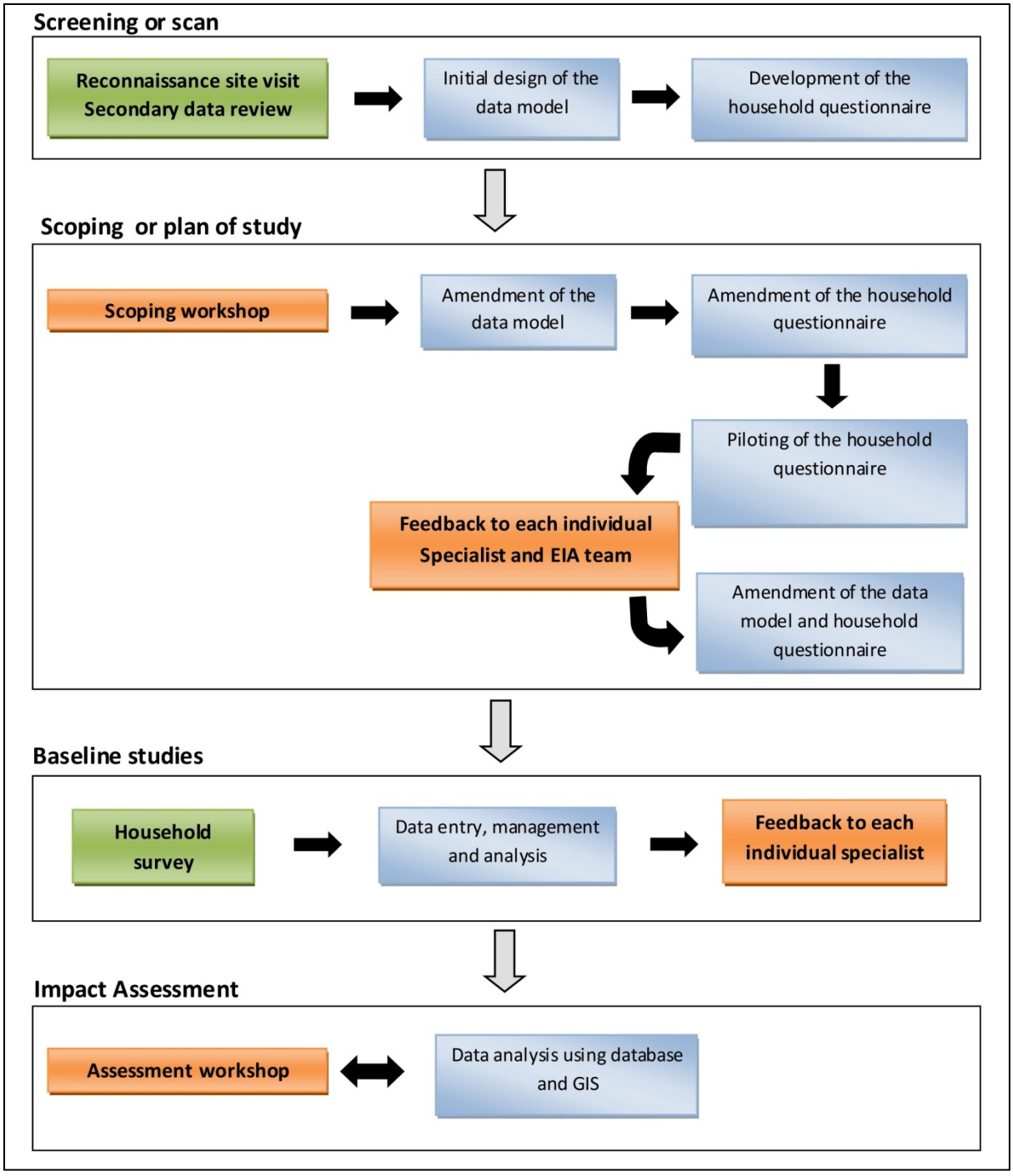

Figure 2: Integration process

Screening phase

The reconnaissance site visit and secondary data review enable social specialists to start the construction of the data model which constitutes the basic building stone of the HH survey questionnaire.

Scoping phase

During this phase, the scope of the specialist studies is defined, and the dialogue between the biophysical and social teams is initiated.

1. Scoping workshop

To facilitate the integration of the studies, a workshop is organised consisting of the following sessions:

- **Session 1:** A potential list of impacts (with no input from the stakeholders yet) is compiled based on the preliminary specialists' findings as well as a list of data required to assess such impacts. For example, the biodiversity specialist might explain that the project infrastructure's footprint might lead to the cutting down of trees. Therefore, information on threatened tree species (based on the IUCN red list) in the study area needs to be collected through ecological surveys.
- **Session 2:** The content of the initial HH survey questionnaire is presented using tables (see Table 1) and simplified data models (see Figure 1) to facilitate the understanding of the biophysical specialists.
- **Session 3**: Potential linkages between social and biophysical data are discussed with a focus on natural resource uses. Additional variables required to better assess/identify new or existing impacts are compiled into a list. For example, a linkage might be made between the biodiversity and social studies. The name and number of tree species (variables) used by the communities might need to be identified in order to assess the magnitude to which certain tree species (and potentially threatened species) are being used in the study area. This might subsequently help in the understanding of how the project activities might affect people's livelihoods.

The list of additional variables (e.g. the name and number of tree species) is input into the data model and subsequently into the questionnaire (e.g. w*hich tree species do you use?* and *how often do you use the following tree species?*).

2. Piloting of the questionnaire

Scoping consultation meetings are a key aspect of the scoping phase and these are usually run by the social specialist. This means that HH survey questionnaires can be pre-tested or piloted using randomly sampled households just after these meetings. The purpose of the pilot is to check that the design of the questionnaire works in practice, and to identify, delete and/or amend problematic questions and refine the questionnaire. Piloting is particularly useful for nominal and ordinal variables which call for pre-defined answers that need to be contextualised.

3. Individual discussion with biophysical specialists

Following the pilot exercise, individual discussions are organised by the social specialist in order to inform biophysical specialists of any relevant findings and any subsequent changes that might need to be made to the data model and questionnaire. This discussion also provides the opportunity for the biophysical specialist to provide more inputs into the data model.

For example, following discussion with the biodiversity specialist and using photographic evidence, the pilot exercise might reveal that two of the species used by communities are threatened and that these species are also used for various purposes. Therefore, the original questions might need to be amended as follows: *How often do you use tree species X and Y and for which purposes (cooking, building, medicine)?*

Baseline studies

Sampled project affected households are interviewed using the questionnaires. Collected data is input into the database before being analysed using pre-defined queries. Findings are individually shared with the biophysical specialists.

For example, data analysis might reveal that only one of the threatened tree species is predominantly used and mostly for building whereas the other species is used only on rare occasions by a selected number of (non-native) households for medicine. This information is passed on to the biodiversity specialist.

Impact assessment phase

The objective of the assessment workshop is to allow for the contextualisation and interpretation of each specialist's findings, which is essential in order to assess impacts holistically. Given that household data is stored in the relational database, data can be queried instantly during the course of the workshop in various ways and linked and/or overlaid with other data sources (e.g. GIS data).

Conclusion

To enable EIA specialists to assess impacts in a more holistic manner, this paper promotes an approach which facilitates the integration of the various studies during the ESIA process using HH survey questionnaires and relational databases. Using this approach, field studies can also become more cost effective with less data duplication and data gaps and a wider range of quantitative indicators can also be used for the development of subsequent management and monitoring plans. Finally, this approach can be adapted and used with different data collection methods and tools such as focus group discussions and specific specialist guides. The hydro census guide is an example of one of those guides which are sometimes used by water specialists to collect data on water uses.

Reference

IFC (2012) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living, January 2012.

Grotenhuis Manfred, Weegen Th.M.C.M (2009). Statistical tools: an overview of common applications in social sciences. Chapter 1: 11-22.