CHAPTER SIX - KNOWLEDGE BASE ANALYSIS

6.1 EVALUATION OF THE REPRESENTATIVENESS OF A KNOWLEDGE BASE

The four-stage knowledge elicitation strategy outlined in Chapter 2 provides a means for eliciting knowledge, which relies initially on particularly knowledgeable, experienced and co-operative informants (or key texts). Users of the resulting knowledge bases will assume that the contents are representative of the knowledge of a defined source community or communities. Therefore any use of the knowledge base must be informed by an evaluation of the representativeness of the knowledge base. This chapter illustrates some of the approaches taken for testing representativeness.

6.1.1 DEFINITIONS OF REPRESENTATIVENESS

Definitions of, and requirements for, 'representativeness' depend on the objectives for the creation and use of a knowledge base. A knowledge base may be evaluated in terms of, for example:

- the extent to which the knowledge in the knowledge base represents a valid abstraction of the knowledge of the sources from which it was elicited; or

- the extent to which the knowledge elicited from a sample of a community and represented in a knowledge base is representative of the knowledge held by all that community.

6.1.2 VALIDITY OF ABSTRACTION

An objective measure may be required, of the extent to which the knowledge base represents a valid abstraction of the knowledge held by the sources. Such a measure may be needed if, for example, the knowledge base is to be used in planning extension activities targeted at the group of informants.

6.1.3 REPRESENTATION OF THE KNOWLEDGE HELD BY THE COMMUNITY

Knowledge bases may be required, which represent the knowledge of a defined community. Usually, these will be created through knowledge elicitation from a sample of the community's members. Consequently, further knowledge elicitation is needed to ensure that the knowledge base is also representative of the broader community. The content of the knowledge base will be compared with knowledge held by members of the community not interviewed initially.

The extent to which a knowledge base that is assumed or has been shown to be a valid abstraction of the knowledge of the original consultants is also representative of the knowledge of a wider community will depend on:

- the heterogeneity of the knowledge held by members of the community on the domain in question; and

- the impact of the sampling bias when key informants were purposively selected.

6.2 TWO METHODS OF TESTING REPRESENTATIVENESS

There are two accepted methods for testing the representativeness of a knowledge base,

For the first method a questionnaire is drawn up with a list of statements derived from the knowledge base, of which half of these are inverted statements giving the inverse of what the informants actually said, e.g. 'Goats do not eat clover'; 'Soil erosion increases soil fertility' 'Feeding orange caterpillars to cattle improves their health'. The farmers are then asked to agree or disagree with the statement. In general, if 75% or more farmers agree with a statement, then that statement can be regarded as common knowledge.

The second method is to interview a large random sample of people not included in the original knowledge base creation and to ask them open questions, of the type posed to the original informants, taking care not to ask leading questions. The information is then analysed and compared with the original response.

The disadvantage of this second method is that it is time consuming and it makes the analysis of representativeness more difficult. However, this is the more rigorous approach, and it often brings new information to the attention of the knowledge base developer.

The appropriate method to use depends on the circumstances. If the original informants come from the same community as those on whom the representativeness of the knowledge base is being tested then the first approach is sufficient. If, however, the representativeness of a knowledge base created from the information of one community is being tested in other communities, then the second approach is recommended.

Below are sample questions from the two approaches, the first taken from research into tea gardens in northern Thailand (Preechapanya, 1996, Thapa, 1994) the second from research into tree fodder resources in the mid-hills of eastern Nepal.

Method 1:

1. Cattle do not eat the young leaves of *Imperata cylindrica*

☐ Agree
☐ Agree with conditions
☐ Disagree
☐ Don't know
Conditions specified:

2. An increase in shading intensity causes a decrease in the softness of tea leaves

☐ Agree
☐ Agree with conditions
☐ Disagree
☐ Don't know
Conditions specified:

3. The rate of nutrient transfer to tea roots of *Castanopsis armata* roots is high, if *Castanopsis armata* roots entwines tea roots.

☐ Agree
☐ Agree with conditions
☐ Disagree
☐ Don't know
Conditions specified:

Method 2:

Which of the following fodder tree species causes light or heavy tapkan effects on crops?

Fodder tree species	Heavy tapkan	Light tapkan	Don't know
Nebharo (*Ficus roxburghii*)			
Badahara (*Artocarpus lakoocha*)			
Gogun (*Saurauia nepaulensis*)			
Utis (*Alnus nepalensis*)			
Amalla (*Embilica officinalis*)			
Rato siris (*Albizia julibrissin*)			

What is it about these fodder trees that causes tapkan effects on crops to be light or heavy?

Fodder tree species	Reasons for causing heavy tapkan effect	Reasons for causing light tapkan effect	Reasons for not knowing
Nebharo (*Ficus roxburghii*)			
Badahara (*Artocarpus lakoocha*)			
Gogun (*Saurauia nepaulensis*)			
Utis (*Alnus nepalensis*)			
Amalla (*Embilica officinalis*)			
Rato siris (*Albizia julibrissin*)			

Key points of Chapter 6:

- Knowledge from a purposively selected sample of informants needs to be checked to see whether this is a true representation of the knowledge of a wider community before this knowledge can be used in research and extension programmes.
- Two approaches are available for testing representativeness of knowledge in a knowledge base:
  - 1. A questionnaire listing a selection of the statements with the options 'Agree/Disagree/Don't Know';
  - 2. Open ended questions given to a selection of new informants to compare their answers with those already given and used in the knowledge base.
- Stratification of the source community for testing the representativeness of the knowledge base can reveal differences in the source community regarding knowledge held by different groups of community members.