Ethnoscience As A Diagnostic Tool

Handout for the session "Ethnoscience-folk taxonomy, emic-etic"

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Session Objective

At the end of the session, participants should be able to explain the use of ethnoscience to understand farmers' folk taxonomy and apply the emic-etic framework to elicit local knowledge.

Learning Content

Nature and purpose of ethnoscience; ethnoscience applications in botany and economics; folk biology; use of folk taxonomy to elicit local knowledge; emic-etic framework; eliciting frames; methods for eliciting folk knowledge; sample ethnobotany of weeds.

Key Learning Points

Ethnoscience is the study of people's perceptions, knowledge, and classification of the world as reflected in their use of language. It is also an organized examination of thought across cultures, modeled after the principles of linguistics, specifically, phonemic analysis. Most ethnoscience research has dealt with specific domains, such as folk medicine; classifications of plants, fish, and birds, and pest management (Bentley and Rodriguez 2001).

Since decision making is defined as the intentional and reflective choice in response to perceived needs, understanding farmers' perceptions and how they name and classify nature is an important first step toward improving decisions. As discussed earlier, farmers' pest management is likely to follow concepts of unbounded rationality. Thus, understanding their beliefs, knowledge, attitude, and reasoning or cognition, can uncover clues to help in designing better decision support systems. For information to be usefully applied, it will need to be presented in appropriate perspectives (or frames) and classifications. Farmers will need to remember the information and become motivated to use it to guide decisions of behavior. Often information may be delivered and received but not utilized in decisions. This is especially the case for information concerned with new opinions, attitudes, and behavior. The new information needs to be integrated into existing knowledge systems for it to be utilized. According to Anderson's (1980) information integration theory, a new opinion is adapted through formation of a general impression, which is based on many information bits. How new information is processed will also depend on how it fits into an individual farmer's existing cognitive structures.

Ethnoscience has been used by many different disciplines; thus there are studies in ethnobotany, ethnopedology, ethnoforestry, ethnoveterinary medicine, and ethnoecology.

In the field of economics, the use of local taxonomic categories has been applied to analyze the effects of different types of soil on the adoption of new maize seed varieties. Bellon and Taylor (1993) asked farmers about the various soil types on their land, what characteristics they attributed to each type, and how they ranked those soils in terms of

their suitability for maize production. Their hypothesis was that farmers' perceptions of the soil qualities on their farms significantly affect their decision on whether to adopt new technology. Their results showed that the perceptions of land qualities did indeed affect the adoption of new seed varieties. It was suggested that this type of analysis can be taken one step further by examining local classifications of such economic terms as benefits, costs, insurance, interest, security, and risk, in order to determine whether these are locally meaningful concepts.

For instance, in ethnobotany, Eyzaguirre (2003) developed the indicators that can be used to compile ethnobotanical information on diversity within crops (see box below):

Ethnobotanical indicators of diversity within crops

Species with an important role in the local food culture

- several names for varieties of the same species
- folklore associated with species
- ceremonial and ritual uses of species
- knowledge about a species is well distributed across different sectors of the community and transmitted across generations

Multiple uses of the same species

- for example, it is used as a staple, vegetable, condiment, medicine, beverage, non-food uses
- different cultivars of the species preferred for distinct uses
- different parts of the plant used for distinctive foods and non-food uses

Planting of the same species in diverse environments and micro-environments

- within an ecozone, farmers plant it under different conditions, microenvironments (e.g., field, paddy, swidden, terrace, field margins, along watercourses, home garden, inter-cropped fields, orchards)
- the species is found across a wide range of ecozones and in marginal areas, even in places where one would expect it
- the species can occupy both major and secondary roles within local farming systems

Existence of local germplasm systems and germplasm exchange within and between communities

- diverse cultural communities maintain the species within their local taxonomic and germplasm systems
- germplasm exchange across cultural communities and across growing environments
- farmers have distinct criteria for selecting planting material from their own harvest or from outside their farm or community.

Folk Biology

Bentley and Rodriguez (2001) points out the importance of the cultural importance of plants and animals and by their ease of observation, including size in folk biology. According to them, culturally important species include harmful as well as useful ones. Folk entomology covers numerous hard to see and inconsequential species, cryptic pests, visible but irrelevant insects, as well as suggestive pests and food species. Culturally important, easily observed creatures are classified in deep taxonomies and are well known by traditional peoples. Unimportant, but easily observed taxa are ordered in shallow taxonomies and are not as well known; they are often named for their physical characteristics. Culturally important, but difficult to observe organisms have more

complex taxonomies, and are frequently named for their role in human culture; traditional knowledge about them may clash with modern science. Culturally unimportant, difficult to observe species are neither known, named nor classified (Bentley and Rodriguez, 2001).

Folk Taxonomy

Folk taxonomy is considered an important indicator of diversity relating to how crop populations may be treated differently. Eyzaguirre (2003) noted that by developing many names for crop types, farmers are effectively segregating populations and often treating them differently. Local knowledge about a crop variety helps to transmit plant knowledge around the community such as knowledge of associated pests and diseases.

Folk taxonomies have hierarchical levels similar to formal biological classifications of kingdom, phylum, class, order, family, genus and species (Berlin, 1992). In folk taxonomy, the common levels are:

- **Life form** – a high level category of plants or animals that share some general shape or characteristic of their morphology. Examples: tree, vine, bush, fish, snake, bird, wug, mammal.

- **Generic** – the most common, basic level. Examples are dog, oak, grass, rice, and ant. Folk genera often do not correspond to scientific genera but may correspond to Linnaean species or family. For instance, 'dog" is a folk genus, but a Linnaean species, "grass" is a folk genus, but a Linnaean family (actually a little less, since the folk generally do not recognize maize, etc. as grasses), "rice" is a folk genus, but 2 Linnaean species and "ant" is a folk genus, but a Linnaean family, formicidae.

- **Specific –** usually separated from each other by a few characteristics. In some languages, like Spanish, Bahasa Indonesia and Malaysia, the generic name comes first, like in a Linnaean name. In others, like English, it is the other way around. The specific name tends to be a pneumonic device, e.g., color, shape, utility, etc. that makes the name easy to remember.

- **Varietal –** These are common in crops such as potato. Examples are: *papa imilla, papa imilla negra, papa imilla blanca.*

Figure 1 shows farmers' classification of leaf feeding insects in Leyte, Philippines.

Besides being hierarchical, folk taxonomy may be applied in naming parts of an object or stages of the crop (partonomy). Farmers may have names that lump groups of parts that biologists differentiate or they may have finer definitions of parts than what biologists describe. For instance, Figure 2 illustrates stages of the rice crop named by Filipino farmers.

Emic-etic framework

Ethnoscientists have made a useful distinction in describing categories of reality, namely: **etic** and **emic**. **Etic** categories involve a classification according to some external system of analysis brought in by an outsider. This is the approach of biology where the Linnaean classification system is used to define new species. It assumes that ultimately, there is an objective reality which is seen to be more important than cultural perceptions of it. In contrast, **emic** categories involve a classification according to the way in which members of a society classify their own world.

The *emic* and *etic* concepts with reference to descriptions were borrowed from the linguistic terms, phonemic and phonetic. A phonemic transcription is one that reflects the perception of the speakers of the language. A phonetic transcription may go into more detail, describing a sound in technical, linguistic terms, which the speakers of that language are not aware of. Anthropologists have adapted these linguistic concepts by deleting the first syllables to form the words *emic* and *etic*. Thus, *emic-etic* roughly means local versus scientific knowledge and this framework provides a convenient tool for researchers to obtain accurate descriptions of farmers' knowledge or concepts and compare it with scientific knowledge or concept on the same topic.

Emic knowledge can be obtained either through elicitation or through observation, because it is sometimes possible that objective observers can infer native perceptions. Etic constructs are accounts, descriptions, and analyses expressed in terms of the conceptual schemes and categories that are regarded as meaningful and appropriate by the community of scientific observers. An *etic* construct is correctly termed "etic" if it conforms to science (i.e., etic constructs must be precise, logical, comprehensive, replicable, falsifiable, and observer independent). Etic knowledge may be obtained at times through elicitation as well as observation, because it is entirely possible that native informants could possess scientifically valid knowledge.

Figure 1 illustrates the emic-etic framework as applied on stages of the rice crop.

Eliciting frames: how to ask questions

What: What is _____?

Kind: What kind of ____is it?
What are the kinds of X?
What is the difference between X and Y?
Show a person an example of an organism and ask, "What is this?" or "What is its name?"

Part: What are the parts of X?
What (separated) part of ____is it?

Use: What is ____used for?
Source: Where does _____come from?

Some methods for eliciting folk knowledge

Bentley (1999) suggests these methods for eliciting folk knowledge:

- There is knowledge associated with each concept.
- Do not ask leading questions; questions that suggest the answers.
- Do not preach. Preaching is the number one cause of silence.
- Share some information with local people, especially if they ask a direct question, of it is natural to slip in a comment.
- Use interviews, group interviews preferred.
- Listen to people without interrupting, just listen.
- Do not make fun of people.
- Hang out.
- Have rapport and patience.
- Use short questionnaires.

Preliminary Ethnobotany of Weeds in Cochabamba[1]

Table A.1 Folk Species of Weeds Recorded near the Facultad de Agronomía (Cercado)

Quechua or Spanish common name	**Translation (when possible)**	**Scientific name or description**	**Incidence, damage etc.**	**Control**	**Uses**	**Other observations**
Jat'aqu *Cojo pollo*	limping chicken?	*Amaranthus* sp.			Is cooked as food for humans. Cattle also eat it.	
Jaya qhura	Hot, spicy weed	*Skurria pinnata*?			It is made into a broom to sweep houses, to rid them of fleas.	
Chamiku		*Datura* sp.			Is poisonous for cattle.	
Ch'ulqi ch'api		*Xanthium spinosum*	It is considered to be a serious weed.			
Muni		*Bidens* sp.	The seeds stick to ones clothing.		The seeds can be made into a cough medicine.	
Tepe		*Pennisetum clandestinum*	It fills an alfalfa field, and it is hard to get rid of it.	It can be eliminated by ploughing 3 times.	Fodder for livestock.	
Botón botón	Button button	*Anoda cristata*	Is a serious weed.		Fodder.	
Nabo		*Brassica rapa*	Is a serious weed		Is good fodder, does not spoil the taste of cows' milk.	One farmer thought there were different kinds of *nabo*, some with bigger seeds. (Perhaps different spp. of *Brassica*?)
Laq'u laq'u		*Rumex lanceolata*	Is a serious densely-growing weed. It does not let other plants grow.	It can only be hoed out, otherwise, it dries and it sprouts again from the roots.	Cattle will not eat it. It is too spicy.	It has a large root. Some kinds grow their roots deep, others near the surface.
Yuyu		*Amaranthus* sp.	Is a serious weed.	Agronomists recommend herbicide.	When it is small, before growing seeds, it can be cooked and eaten.	
Khuchi watana	For tying up hogs	unidentified	It is serious. It is eliminating alfalfa fields, and is spreading.	Hoe weeding is the only way.	Cattle will not eat it.	
Verdolaga		*Portulaca oleraceae*	It has many seeds and as a weed it can fill a field. Can be a serious weed.	Hoe weeding. In maize farmers leave some, and pull up some to eat or for cattle.	It is delicious in **k'allu** (a cheese and vegetable salad). Fodder.	People can only eat it when it is tender, and a family just cannot eat it all.

[1] *Bentley, Jeffery, Perez, Salomón and Nina, Silvio. 2001. Ethnobotany of Weeds in Cochabamba; Bentley, Jeffery. 2000. Weeds and Farmer Decision-Making in Cochabamba. Report of an Anthropological Study with the PROMASSEL Project, January 10—February 4, 2000*

Emic - Etic **Framework**

Location: _____ Date:_____

Topic:

_____

Variable/Character Descriptions	*Emic* (Local Knowledge	*Etic* (Research Knowledge

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Figure 1. Stages of a rice crop

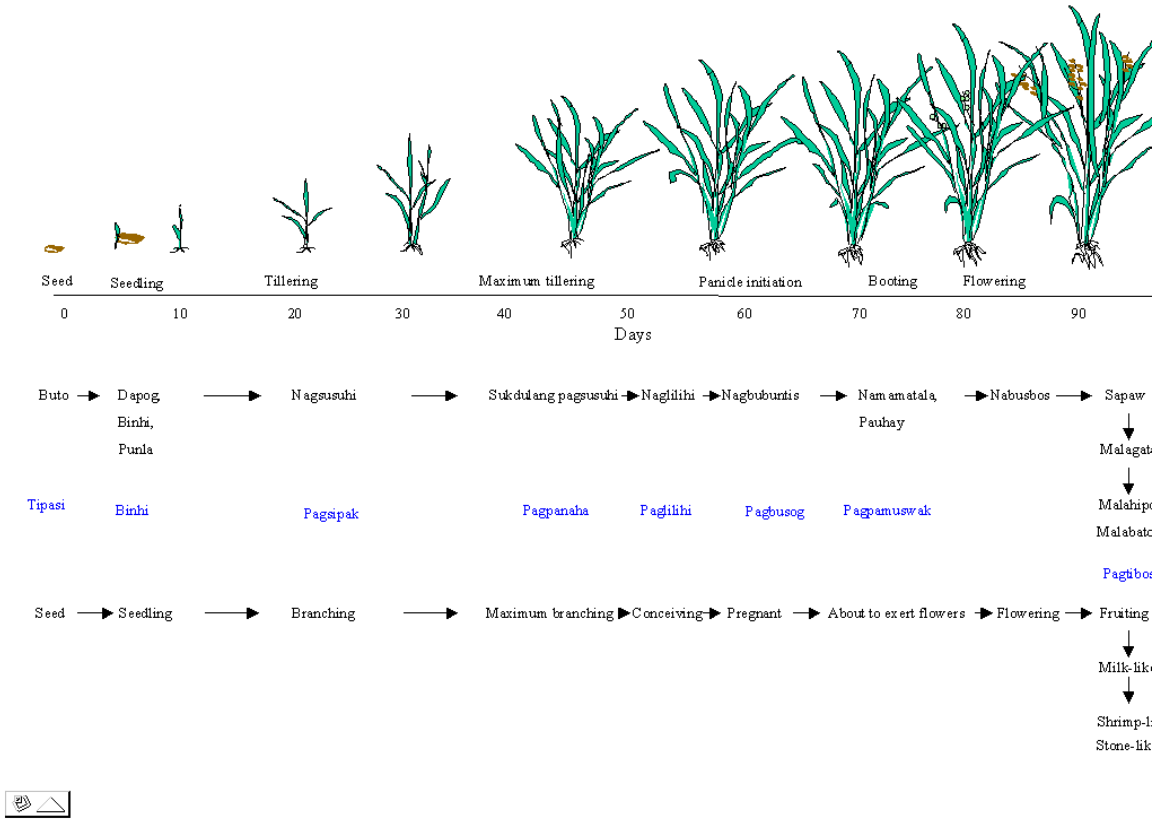

Figure 2. Farmers' classification of leaf feeding insects