

Ethnopedology Annotated Bibliography
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Barrera-Bassols, N. and J.A. Zinck. (2003). Ethnopedology: A worldwide view on the soil knowledge of local people. *Geoderma*.111(3-4), 171-195.

Ethnopedology is the study of local knowledge, beliefs, perceptions, uses, and classification, and management of soils by local people. It is considered a “hybrid” of natural and social sciences, and uses the Korpus-Cognitive-Praxis (KCP) framework of local knowledge systems. At the local level, soil knowledge is created through experience (Praxis), which is made into knowledge (Cognitive), and then rationalized symbolically (Korpus). The article defines ethnopedology and discusses current themes, methods, issues, and ideologies. It also analyzes and compiles the status of ethnopedology research around the world. Methods include a literature review and statistical analyses of the 895 references from ethnopedology research papers. From this analysis, researchers have determined four main topics in ethnopedology: understanding how local people classify and concept soil and land; documenting differences between local and scientific classification systems; analyzing how local people use agriculture in land systems; and documenting how local people manage the land. Ethnopedological studies have three approaches: linguistics, comparative and integrated. The linguistic approach, the oldest approach in the field, compares scientific and local classification terms. The comparative approach focuses on analyzing differences and similarities of scientific soil approaches and local knowledge soil systems. The integrated approach, the newest approach, focuses on integrating cultural aspects that inform local soil knowledge systems with scientific research. Statistical analysis of ethnopedological studies show that research has concentrated in areas with diverse cultural and ecological areas in Africa, Asia, and America. Also, many ethnopedological research areas on concentrated on local communities in areas with environmental issues. The authors suggest that ethnopedological studies broaden research sites, and include more research on spiritual beliefs and symbols (korpus).

Barrera-Bassols, N., J. A. Zinck, and E. Van Ranst. (2009). "Participatory soil survey: experience in working with a Mesoamerican indigenous community." *Soil Use and Management* 25(1): 43-56.

This article discusses a participatory approach to integrating scientific soil surveys and local soil surveys in designing conservation plans. The objective of this study was to collaborate with a local community to design a participatory resource soil map in the Purhepecha community of San Francisco Pichataro. The goal of the research was to understand local knowledge, beliefs, perceptions and management practices in soil, relating this knowledge to scientific soil maps. Methods used were a literature review of participatory soil survey studies. Methods for field research included ethnopedology and ethnographic research techniques, including a participatory soil survey, interviews, triad

tests, soil questionnaire, soil profile descriptions, soil correlation monoliths, soil-landscape cross-sections, and resource mapping. Twenty-seven farmers (six were women) were interviewed. Results show that Pichartaro farmers have five central soil types: hard and sticky, powdery, clayey, and gravelly. Farmers described and classified soils based on color, texture, landscape position, and stoniness, and organic matter concentration. When making soil taxonomies, farmers put all soils with other human and nonhuman beings, and then break them into the five major types and so forth. Results also show that farmers pass local soil knowledge through generations with community meetings, land management laws, and experience. It was concluded that local farmers and scientists make very similar soil maps, which are based on soil and landscape (terrain) connections. However, local farmers also conceptualize soil and land properties based on land ownership, sense of place, and identity. From this collaboration, farmers and soil scientists were able to make a community-based land-use plan.

Barrera-Bassols, N., J. A. Zinck, and E. Van Ranst. (2006). "Symbolism, knowledge and management of soil and land resources in indigenous communities: Ethnopedology at global, regional and local scales." *Catena* 65(2): 118-137.

Ethnopedology is the study of local knowledge, beliefs, perceptions, uses, and classification, and management of soils by local people. It draws from political ecology, using both natural and social sciences—a “hybrid.” The objective of this study was to use the soil Korpus-Cognitive-Praxis (KCP) model to document soil knowledge at local, global, and regional scales. Using this model, scientists wanted to document and analyze how local soil knowledge has been influenced, adapted, or changed by outside forces. Results show that local soil knowledge is based on beliefs and myths, knowledge, and management experiences that differ by agro-environment. At the global level, places with “rich” ethnopedological knowledge correlate with places of plant domestication. At the regional level, scientists found that local soil knowledge classification systems are similar, however, some regions have specialized soil knowledge based on certain crops (milpa). At the local level, soil knowledge is created through experience (Praxis), which is made into knowledge (Cognitive), and then “explained” symbolically (Korpus). Furthermore, the authors suggest that local soil knowledge be used in development practices, and that scientists focus on more of the korpus (symbols and meanings use for land management practices) side of local knowledge because it is understudied. Korpus is important to understand because it has much influence on farmers’ management decisions. This article gave informative insights into including korpus in ethnopedological studies, however does not discuss how spiritual beliefs can be different according to age, identity, gender, class, race.

Barrios, E. and M. T. Trejo (2003). "Implications of local soil knowledge for integrated soil management in Latin America." *Geoderma* 111(3-4): 217-231.

The article discusses the use of local soil knowledge with technical knowledge for development in smallholder farming communities in Latin America. The authors discuss

three case studies about local soil knowledge and management—what they call “ethnopedology”—in Mexico, Honduras, and Colombia. They explain and document the similarities and differences in the way farmers assess soil quality for agriculture. In two case studies, chosen groups of farmers were determined and asked questions about their soil knowledge and soil use. In the third case study, scientists used a “participatory approach” through participatory mapping, interviews, and focus group sessions. From their results, generally, farmers choose soils based on local vegetation, as well as, texture, moisture, location, color, and touch. The authors argue that a participatory approach is best for obtaining local soil knowledge. They explain that by knowing local soil knowledge and local plant knowledge, they can figure out “permanent and “changeable” soil characteristics used by farmers. Using this information, scientists can then integrate these characteristics with technical knowledge and fully development a community-based conservation plan based on local soil knowledge and permanent uses of soil.

Birmingham, D. M. (2003). "Local knowledge of soils: the case of contrast in Cote d'Ivoire." *Geoderma* 111(3-4): 481-502.

Studying local “knowledge and management of soils” is important for scientists and community members when designing sustainable development initiatives. The objective of this study was to analyze two communities in West Africa and their local knowledge and management of soils. The information was then applied and compared with scientific soil systems and labs. Participatory methods and use of visuals were used to interview separate groups of women, men, and young men (20-30s). These groups had second or “follow-up” interviews through out the year. Participants were asked to rank and identify soils. Overall, 250 soil samples were analyzed in a lab. Results show that people described soils based on landscapes and management systems, as well as by texture, color, gravel content, and water-holding ability. Results also show that knowledge of soils is “situated,” and people associated soil and land together. Women and men also described soils similarly, but the largest differences were in age, not gender.

Engel-Di Mauro, S. (2003). "Disaggregating local knowledge: the effects of gendered farming practices on soil fertility and soil reaction in SW Hungary." *Geoderma* 111(3-4): 503-520.

Researchers in conservation agriculture have realized that inclusion of local knowledge of natural resources is an important part of developing a community-based conservation plan. Furthermore, because men and women have different roles in farming, gendered local knowledge has also become valuable. Drawing upon these concepts, this article discusses differences and similarities in gendered soil knowledge in SW Hungary. The goal of the research was to document gendered knowledge of soil and soil use. Research was conducted in 1998-1999 in a smallholder agriculture-dominated region of Hungary, which included “25 plots in seven villages.” Research methods included soil sampling, interviews, and land analysis. It should be noted that researchers met with men and women at different times. Results indicated that men and women’s describe soils

differently, which analysis showered differences in pH, texture, or color. In addition, men described soils based on technical training and production of economic-based crops. Women, on the other hand, describe soils based on traditional knowledge, nutritional value, and for production of garden vegetables. Findings also show that men, because of their technical training in high-nutrient crops, were placing too much fertilizer on women's crops, making them invaluable. The authors conclude that their findings show women and men's "access to and control of" soils because of gender roles and economic purposes.

Fleskens, L. and F. Jorritsma (2010). "A Behavioral Change Perspective of Maroon Soil Fertility Management in Traditional Shifting Cultivation in Suriname." *Human Ecology* 38(2): 217-236.

This article is about behavioral and perception changes among Maroon farmers in Suriname. Using approaches from ethnopedology, political ecology, and behavioral theory, the goal of this research was to document how Maroon farmers' perception and cultivation practices have changed and how they have influenced soil fertility and soil fertility management throughout time. Methods include soil drillings, surveys, photography, transect-walks, key informant interviews, and field visits. Results also show that there are two types of cultivators; semi-permanent (mostly men) and shifting cultivators (mostly women). Results also show that Maroon farmers traditionally use shifting cultivation for farming. Traditionally, farmers allow extensive amount of time for cultivated land to restore soil fertility before re-cultivation. However, because of modern influences on agriculture, farmers in Suriname are shortening cultivation periods, reducing fallow episodes. As a result, soil fertility has decreased. However, because of external influences and access to economic opportunities, semi-permanent cultivators have begun to adopt more permanent plot practices and maintain soil fertility through fertilizers. Shifting cultivators do not want to adopt plot-specific soil fertility management practices because of traditional knowledge systems and no access to outside fertilizers. However, it should be noted that shifting cultivators have kept traditional knowledge on long-term plot rotation. Suggestions included that men and women collaborate and share knowledge for soil fertility management practices from both shifting and semi-permanent cultivation practices. Also, it was suggested that shifting cultivators have access to markets in order to increase soil equality, most likely influencing them to also adopt soil fertility management practices.

Sandor, J. A. and N.S. Eash. (1995). Ancient Agricultural Soils in the Andes of Southern Peru. *Soil Science Society American Journal*.59 (1), 170-179.

Agricultural terraces have played a large role in mountain farming throughout the world, and play a significant role in shaping soils and landscapes over time. Farmers in the Colca Valley in the Andes of Southern Peru have been using terrace agriculture for over 1,500 years. This article discusses long-term agriculture practices on soil fertility in the Andes of Southern Peru. Andean "soil management practices include terracing, tillage,

fertilization, and irrigation. Crop management practices include intercropping, fallowing, and use of legumes in crop rotations” (170). The objective of the study was to document and analyze long-term terrace agriculture and its effects on chemical and physical soil properties, as well as, topography. Methods include analysis of twenty-two soil profiles and transect walks of cultivated, formerly cultivated, and uncultivated areas. Other methods include a statistical analysis of cultivated and uncultivated areas, specifically focusing on the A-horizons. Results show that terrace agriculture does significantly alter the landscape and soil properties. Cultivated terraces have thicker A horizons and higher levels of natural C, N, and P. Furthermore, terrace agriculture areas return Phosphorus (manure and other fertilizers) to the soil after abandonment, suggesting that terrace agriculture practices can improve soil fertility.

Stevens, C. (2005). “Symbolic action and soil fertility: Political ecology and the transformation of space and place in Tonga.” Edited by Paulson, S. and L. L. Gezon in *Political ecology across spaces, scales, and social groups*. New Brunswick, NJ, Rutgers University Press.

This article discusses the historical and contemporary transition between traditional and industrial land management practices and agricultural markets throughout Tonga. This case study from 1991-1993, focuses on gathering quantitative and qualitative information on household economics and soil fertility in monocropped, subsistence, market, and inactive fields. Using a political ecology approach, the author studies the interconnected relationships and changes in feasting rituals, food consumption, democratic rights, religion, labor migrations, and commercial cropping to explore how changes in these social and ecological activities have degraded the land and soil fertility. Furthermore, this case study shows how regional and global marketplaces associated with commercial crop production systems influence Tongan land-management activities and social identities.

WinklerPrins, A. and N. Barrera-Bassols (2004). "Latin American ethnopedology: A vision of its past, present, and future." *Agriculture and Human Values* 21(2-3): 139-156.

Ethnopedology is a subfield of ethnoecology and studies the soil knowledge and land use of local or indigenous peoples. This also includes “management of landscape processes such as erosion and sedimentation” (140). The objective of this article was to analyze previous theoretical and empirical case studies of ethnopedology in Latin America. For methods, the authors use their own research with other case studies to conduct a “comparative analysis.” It should be noted that authors draw from the K-C-P model of korpus, cognitive, and praxis—an ethnoecology theory that links beliefs, knowledge, and practice with local land-management systems. This article also has two objectives. First, to show that ethnopedology is local knowledge of soil classification, “genesis, and formation processes,” not just local soil classification systems compared to scientific ones. Second, ethnopedology is a social theory that institutions can use to analyze complex local beliefs and ethics, historically and currently. According to authors,

research needs to “understand the link between soil knowledge and the political and socioeconomic context in which it is used” (141). And studies of soil knowledge should also include “the broader landscape process” as well as how scientific and local knowledge fit together and the symbols and beliefs (korpus) need to be studied more. The authors focus on Latin America because of its diverse agricultural history, vast cultural peoples, and many ecosystems. Results show in Latin America, local knowledge of soil and landscape processes is largely based on spiritual practices and beliefs. Thus, these “universal” local systems need to be integrated with scientific research so it is not lost and can develop sustainable farming practices. This research includes much detailed information and figures.

Zimmerer, K. S. (1993). "Soil Erosion and Social (Dis)Courses in Cochabamba, Bolivia: Perceiving the Nature of Environmental Degradation." *Economic Geography* 69(3): 312-327.

This article discusses three viewpoints concerning soil erosion among rural trade unions, peasant farmers, and development organizations in Cochabamba, Bolivia. Until the 1980s, development organizations contended that peasant farmers caused soil erosion. After the 1980s, rural trade unions challenged development organizations' perspectives, maintaining that social, political, and economic policies, not peasant farmers, have shaped Bolivian landscapes and policies, which cause soil erosion. In this article, emphasis is placed on the recognition of local farmers' perspectives on the causes of environmental degradation for a well-formed approach in conservation and local-global relationships. Methodologies of this case study focus on participatory interviews with local peasant farmers and participatory observation.