Ethics in research: still a long way to go

I read with interest the Guest Editorial by Mukhi[1] that highlighted the significance of ethics in Indian scientific research. Ethics in both science and social science research is an important concern these days owing to the increased number of predatory journals, open access publishing, the API requirement for teaching positions in universities and colleges, and the large number of publishers coming into the research arena. In this background, it is crucial to teach research ethics to students and research scholars from the very beginning of their careers. At what stage should they be taught about ethics is a critical question to be answered. Teaching departments, especially in social science disciplines teach papers in research methodology to their undergraduate students, but ethics is rarely part of the curriculum. Then who will ensure that ethics is being followed – researchers, supervisors, institutions where the research is being carried out, or publishers? To deal with this situation, it is important to prepare future researchers much in advance through refresher courses and seminars so that they can understand the importance of ethics in conducting and publishing research. Introduction of research ethics into the mandatory coursework curriculum for doctoral students is also important.

Moreover, our university websites do not provide detailed information on ethical policies and committees while many universities in other parts of the world have this information prominently visible in their websites[2], and respond to queries of prospective students as well. It is important for university websites in India to carry information about ethical issues in research, guidelines to be followed, ethical committees and their constitution, and so on. The role of journals and publishers with regard to academic practice also needs to be recognized. Unlike journals of international repute, many Indian journals do not ask for prior ethical approval for research papers to be published. Policies on ethics, malpractice, misuse of data, authorship, plagiarism, duplicate publication and self-citation must be clearly stated by all journals, including this one. Similarly, funding agencies can implement the following steps to encourage researchers to adhere to the highest ethical standards: prior ethical approval for all the submitted research projects and establishment of clear guidelines on ethics, especially in social science research and publication. We still have a long way to go as far as ethics in research is concerned, but the above few steps suggested would provide researchers with the necessary information on the issue.

1. Mukhi, S., *Curr. Sci.*, 2016, **110**(6), 955–956.
2. http://research-compliance.umich.edu/

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Ethnopedology: an ancient way to better comprehend modern soil science

Historically soils have been classified according to their appearance and characteristics. The Chinese textbook, *Yugond* (2500 BC) is probably the first ever on soil classification; indeed, it provided an effective and interpretative classification. Dokuchaev and others used vernacular soils like *chernozem*, *solonetz* and *gley* as central concepts for scientific classification. Vernacular soil names have been used throughout history and helped provide the basis of scientific classification[1]. Folk soil taxonomies were characterized, developed, refined and used generation after generation through time-tested trials and errors. Basically, indigenous wisdom which farmers have acquired and preserved over time has repeatedly been ignored rather than streamlined. Scientific systems and detailed soil mapping have already replaced folk taxonomies, especially in the more developed countries[1,2].

Developing countries follow the same path as scientific practices are gradually dominating over farmers' indigenous practices and eventually farmers are forced to adopt modern scientific practices. Consequently, environmental deterioration is taking place as maximum modern practices emphsize more on productivity than sustainability. Moreover, ignoring 'time-tested age-old knowledge' of farmers leads to inappropriate harness of the hidden treasures. Hence, ethnopedology is re-examined for understanding sustenance of soil fertility by making research findings more comprehensible to local farmers, especially in relation to changing cultural landscape, particularly in developmental contexts.

Ethnopedology implies a systematic classification and management of soils by indigenous folks. It focuses on cultural definition of soils from an anthropological perspective, besides the perspective of soil science. It tends to rely upon value and management of soil; local adaptation, renewal and transformation strategies of soil properties and land qualities; co-validation of ethnopedological knowledges, abilities and skills with modern soil science, geopedological survey, agroecological strategies, etc. Thus, ethnopedology simply focuses on how people understand, view and manage land. So ethnopedological studies mostly concentrate on three main domains regarding the social theories of soil and land resources, namely the symbolic (Kosmos), the cognitive (Corpus) and the management (Praxis) dimensions, which form the K–C–P complex or the ethnoecological model[3]. This notion of classifying soil according to social criteria rather than physical and chemical criteria is favoured by national and international soil surveys such as USDA[4] and World Reference Base[5,6].

Ethnopedological research has several advantages. The five major benefits of such research on local soil knowledge are: (i) it is much more rapid and economical than conventional soil survey techniques[7]; (ii) offers important insights into the land-use considerations of farmers and soil–plant interactions, which farmers deal with and correlate to[8]; (iii) facilitates communication (through common language) among farmers, extension workers and researchers[9], and establishes values and assures quality of soil investigations; (iv) considers locally relevant important variables for land classification, and (v) assesses and refines land management policies for including local contexts and perspectives[10]. Policy planners can understand soil diversity which is an integrative perspective of soil quality management.

Use of folk taxonomies in scientific soil classification, mapping and environmental impact assessment is still not being explored. The last two centuries have witnessed a rapid loss of such potentially useful information. Termination of link between folk and scientific soil classification promoted such land management decisions, which stimulated resources degradation and caused severe economic hardship on communities. There are several examples from Africa, Asia, Europe and Americas, especially the Senegal River Valley, United States and Saudi Arabia[1].

To understand local soil knowledge, it is necessary to keep in mind that it does not exist in a social vacuum; rather it exists in a random fashion, which is largely affected by individual beliefs and value systems. So, socio-economic, historical and cultural contexts need to be considered. To capture all these, the aim of ethnopedological research needs to go beyond classificatory approach. Management of soil and land resources is more important than merely classification. There is a need to amalgamate natural and social sciences which can surpass the cognitive studies of soil and land as 'perceived natural objects' with focus on the different ways social subjects engage symbolically, cognitively and practically with soil and land resources[11]. Promising bottom-up approach with synergistic effect of more functional ethnopedological studies is the need of the hour. Furthermore, there is a need to fully understand the local context as a complex, dynamic and open system, where soil and land knowledge is applied in diverse ways according to the ever-changing individual and social realities. Synergism can be strengthened by integrating modern scientific and technical advances with historical wisdom and local needs on a worldwide scale.

1. Krasilnikov, P. V. and Tabor, J. A., *Geoderma,* 2003. **111**, 197–215.
2. Tabor, J. A. and Krasilnikov, P. V., In *Soil Terminology and Correlation* (ed. Krasilnikov, P. V.), Karelian Research Centre/Russian Academy of Sciences/ Institute of Biology, Petrozavodsk, 2002, pp. 208–214.
3. Barrera-Bassols, N. and Toledo, V. M., *J. Latin Am. Geogr*., 2005, **4**(1), 9–41.
4. Soil Survey Staff, *Soil Taxonomy*, Agriculture Handbook, USDA/NRCS Washington, DC, 1999, vol. 436, 2nd edn.
5. FAO/ISRIC/ISSS, World Soil Resources Reports, FAO, Rome, 1998, vol. 84.
6. ISSS Working Group RB, In *World Reference Base for Soil Resources: Introduction* (eds Deckers, J. A., Nachtergaele, F. O. and Spargaren, O.), ISSS, ISRIC, FAO, Acco, Leuven. 1998, 1st edn.
7. Schutjes, A. H. M. and Van Driel, W. F., In Paper Presented at the Premier Colloque International de I'AOCASS: gestation durable de sole et de l'environment en Afi-ique, University of Arizona, 1994.
8. Dialla, B. E., *Indig. Knowl. Dev. Monit.*, 1993, **1**(3), 17.
9. Sikana, P., *ILEIA Newsl.*, 1993, 15.
10. Winklerprins, A. and Sandor, J. A., *Geoderma*, 2003, **111**, 165–170.
11. Barrera-Bassols, N. and Zinck, J. A., *Geoderma*, 2003. **111**, 171–195.

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