CIAT/TSBF/UNEP/JEF/JNU Project
Conservation and Sustainable Management of Belowground Biodiversity
Phase II
Second Monitoring and Evaluation Workshop and Steering Committee Meeting
March 15-16, 2008
School of Environmental Sciences
Jawaharlal Nehru University
New Delhi 110067

The list of the participants in the meeting is given in Annexure1. At the outset, Professor M.C. Dash, Ex Vice Chancellor, Sambalpur University and Chairman, Steering Committee thanked the members of the committee for all support extended to the programme. He appreciated the huge amount of data and the uniqueness of the data sets generated in the project but also expressed a concern about a need of further improvement in presentation and publication of the project outputs. This reaction based on the review of documents prepared by the implementing scientists was endorsed by the all committee members. The committee members had marked their comments/ suggestions on the documents arising largely from Phase I work and advised the National Coordinator to compile the reactions from all members together with the comments/ suggestions offered during this meeting and forward the same to the concerned authors/ investigators for revison of the papers. With these remarks the Chairman requested the lead scientists of the three institutions involved in implementation of research and demonstration activities to present (i) the progress of work done so far (ii) future plans and requirements and asked the National Coordinator to report on the national level coordination activities and linkages of the national project with other national international projects at the end. The following comments and suggestions were offered by the Experts:

1. All presentations have highlighted numerical density as a measure of abundance of a species. One should also make efforts for measuring abundance in terms of biomass. Understandably, biomass data exist but have not been presented in the documents/power point presentations.
2. More efforts should be made to draw relationships between abundance of organisms, disturbance and management practices based on statistical analysis. Some studies done by the scientists of Sambalpur University have shown a synthetic index like ratio of earthworm biomass/termite biomass to be more responsive to disturbance/management practices than abundance of individual species or group of organisms.
3. In all the three areas, soil should be identified by major order (FAO or USDA system of classification) and apart from texture class, one should give the proportions of clay, silt and sand while describing the study area. Soil organic carbon and nutrient stocks are better understood when expressed in terms of kg/ha than in terms of %. It should be clarified whether 'Bray 1' or 'Bray 2' solution was used for estimation of available phosphorus.
4. Land use history is likely to be an important determinant of the attributes of soil biodiversity at present. More efforts should be made to reconstruct the land use

history of points sampled for inventory and to look into this attribute as an explanatory variable for variation in soil biodiversity.

5. From the point of management needs, i.e., the ways and means of improving agroecosystem/forest ecosystem functions, it may be more useful to look at the response of different earthworm species to environmental conditions/management practices, apart from looking at the pooled abundance of all earthworm species. This would also apply to other taxonomic groups. Species responses may provide insights for identification of keystone species.

6. The organisms sampled, apart from their taxonomic classification, should be characterized in terms of their functional groups/trophic groups. While such a classification may not be feasible for all groups of organisms, classification of earthworms as epigeic/endogeic/anecic should be possible based on the available literature.

7. The inventory data should be examined to ascertain the indicator value of different species or groups of organisms. For example, species common to all sites or the ones occurring only in a given land use/environmental conditions may offer a potential for use as indicator species.

8. In some places in the text provided to the members, one encountered absurd statements (e.g., use of Tullgren method for studying an organism for which it was not designed). The authors should thoroughly check the manuscripts before sending it to Journals or making it open to the wider community.

9. Data reflecting large populations of earthworms in cashew plantation in Kerala site need to be reexamined as one would normally expect low earthworm populations in quite dry sites as cashew plantations. Moreover, possible factors favouring/disfavouring a group of or individual species need to be brought out.

10. One should use standard terminology, e.g., live mulch instead of green mulch. The meanings of terms used such as land use system, land use type, land use/cover type, compost, farmyard manure should be clarified.

11. Using 'not detected' in place of '0' would be more appropriate for denoting absence of a species based on sampling of some points.

12. The logic behind the design of demonstration experiments and the objectives to be achieved through these demonstrations need to be strengthened. For example, why should one use a consortia rather than a single species? Mulching treatment aims to improve water availability or nutrient availability or both? Would increase in temperature in composting using microbes be not detrimental to earthworms as a result of warmer temperatures? Why single and double doze of farmyard manure treatments? All investigators should improve this component and present the improved versions in the next meeting.

13. Data of Karnataka site shows (i) pH of forest soil to be higher than that of grasslands, a trend opposite to what is commonly understood in the Indian conditions. (ii) higher abundance of earthworm species in paddy field than in forests – perhaps it arises from sampling of soil from field margins - the data may be reexamined and suitable explanations to the observed trends be provided in the text (iii) number of treatments in demonstration experiments seems to be too large and investigators should consult Professor Bagyaraj to finalise the experimental design (iv) investigators should give a thought to the use of low grade rock

phosphate or the high grade superphosphate as a source of phosphorus (v) compost/vermicompost used should be examined for quality (vi) the work done by Dr Chinappa Reddy on development of methods for economic valuation should be reported and discussed in the next meeting.

14. There are reports that cow dung in transported in large quantities from Karnataka to Kerala to meet the demands for coffee plantations. Kerala and Karnataka teams may pool their experiences and data to look into the possibility of the magnitude of this transfer and its impacts. Further, many a times unproductive cattle (the non-milking ones) are kept to produce manure and implications of this practice on biodiversity may also be examined.

15. The decline in traditional legume cultivation in the Nanda Devi Biosphere area should be elaborated – the decline is because of absence of effective Rhizobium population or because of higher productivity of high yielding varieties of cereals or any other reason. Efforts are also needed to identify actions and strategies for conservation of traditional legume germplasm. The area is under organic farming – is there a scope of ecolabeling favouring more profits to local farmers leading to in situ conservation of the germplasm?

16. Some traditional practices such the Baranaja system (intermixing of 12 food crops) may not be efficient as such a system is likely to involve wastage of seeds and poor grain quality and farmers may not be aware of this inefficiency.

17. In case of the work being done on assessment of functional efficiency of Rhizobia isolated from the Nanda Devi Biosphere Reserve, there is a need of reexamination of the data on growth and nitrogen concentrations and of extending the lab based work to pot/plot level experiments in field.

18. In all the study areas, (i) use of exotic earthworm species for may have negative effects on the native species and hence the unknown risks

19. The National Corodinator informed the members about (i) the highlights of deliberations in the International Steering Committee meeting held in Calicut towards the end of the last year (ii) highlights of the monitoring meeting organized by the Ministry of Environment and Forests for review of all GEF projects in India held in January, 2008 (iii) Reports submitted to the TSBF Institute informing the progress till December 2007 (iv) status of the workplan, problems faced and some possible corrective measures.

With the above points in addition to the comments/suggestions marked on the manuscripts, the expert members advised the investigators/authors to finalise the manuscripts to the benefit of wider community in the form of papers in Journals, Chapters in Books and unpublished documents on internet. At the end, the Steering Committee took following decisions.

1. The minutes of the meeting held on February 5, 2007 were approved (Annexure 7).

2. The Committee adopted and approved the six-monthly technical/financial reports submitted by the National Coordinator to the TSBF headquarter giving the progress of work done during January-June 2007 period and July-December 2007 period (Annexure 8 and 9).

3. The National Coordinator was authorized to release the project funds for execution of activities in the benchmark areas as soon as the second tranche of funds are credited to the JNU accounts. Fund flow may turn to be a serious cause of delay in some activities.
4. The lab/field consumables should be provided to Professor R.K. Singh for Rhizobia related activities in Nanda Devi Biosphere Reserve.
5. Dr U.M. Chandrashekara may organize training activities in Kerala study area for capacity building in taxonomy and biology of ants, termites and earthworms seeking support of Dr K. Karmali, Dr Swaran, Dr Ramasamy and Dr J.M. Julka.
6. Dr J.M. Julka has almost finished a document on simplified procedures for taxonomic/functional characterization of earthworms and this document would be made available for people working in the present project. Dr Julka will also work out a national level training programme for capacity builing in taxonomy and functional characterization of soil fauna as part of the present programme.
7. Dr Julka/K.G. Saxena will contact Professor B.K. Senapati and explore the scope of his participation in economic valuation of benefits from earthworms based on his work.
8. Professor M.C. Dash would initiate the process of preparation of a review paper on earthworms – their biology, mechanisms of vermicomposting etc which will form a training material in the national training course and provide insights for designing studies on biology of key species.

The meeting ended with a vote of thanks to the Chairman and members of the Steering Committee.

Annexure 1. The list of participants
Annexure 2. Presenation of the lead scientist of the Kerala Forest Research Institute: Dr U.M. Chandrashekara
Annexure 3. Presentation of the lead scintist of the University of Agricultural Sciences, Bangalore: Professor A.N. Balakrishnan
Annexure 4. Presentation of the lead scientist of the G.B. Pant Institute of Himalayan Environment and Development: Dr R.K. Maikhuri
Annexure 5. Presentation of the lead scientist of Institute of Agricultural Sciences: Professor R.K. Singh collaborating with Dr R.K. Maikhuri for Rhizobia related work in the Himalayan benchmark area
Annexure 6. Presentation of the National Coordinator: K.G. Saxena
Annexure 7. Minutes of the Phase II – First Steering Committee meeting
Annexure 8. Phase II- First 6-monthly Technical/Financial Report (January-June, 2007)
Annexure 9. Phase II- Second 6-monthly Technical/Financial Report (July-December, 2008)