

The origin, method and purpose of PLEC

Harold Brookfield

Principal Scientific Coordinator

UNU Project on People, Land Management and Environmental Change (PLEC)

PLEC is about small farmers and biodiversity. Until a few years ago, all agriculture was believed to be the enemy of biodiversity. Nowadays it is realized that some areas managed by small farmers contain almost as much biodiversity as the wild. This diversity, which consists largely of species useful to people, is now often seen as the most valuable part of all biodiversity (Wood and Lenné 2000). Even in regard to the wild itself, ecological thinking has swung away from the old view that the richest biodiversity occurs in ecosystems that have had a long period of undisturbed evolution leading toward a 'climax' state. Since the late 1970s it has been forcefully argued that disturbances may be essential to the creation and maintenance of plant and animal diversity.

PLEC has evolved during these years of change in ecological thinking, and of a growing recognition of the role of careful and industrious small farmers in cultivating and sustaining the diversity of the biosphere. This new approach has emerged with the modern movement for *in situ* conservation of agricultural biodiversity. It recognizes farmers' contribution in nurturing a wide range of species useful to people, and varieties or 'landraces' of these species. The modern valuation of diversity has grown also from realization that diversity can reduce pest impact without heavy use of chemicals. It also helps maintain the soil. Moreover, while modern high-yielding crops cultivated by industrial methods have produced great benefits for human-kind, there are large areas in which these high-yielding varieties do not perform particularly well. More importantly, if the practices of industrial agriculture were applied to many of the areas used by small farmers, they would lead quickly to severe land degradation.

Millions of small farmers are 'resource-poor' in the sense that they lack both the means to adopt industrial agriculture, and also the land on which it could profitably be applied. Yet they manage a full and wide range of crops. They do so by technologically simple means, calling on considerable knowledge and skills, and being ready to adapt to changing conditions. Solutions developed on experimental stations often have not worked out for them, because of their conditions of production. A classic example is alley-cropping agroforestry with exotic species, developed in West Africa in the 1970s and widely promoted since that time. It has never been universally popular with farmers and is now abandoned by its principal sponsor, ICRAF, in favour of more robust traditional relay and sequential systems using mainly indigenous trees.

For all of the last century, and even now in some quarters, the production and management systems practised by many small farmers have been derided, and fiercely criticized, by most agricultural scientists and almost all governments. Yet the systems survive, and some of them survive quite well. Despite all the gloom and doom about the consequences of small farmers' 'backward' practices, some of their land, too, survives quite well. How do the farmers manage this?

The role of PLEC

This was the question that the project on People, Land Management and Environmental Change (PLEC) set out initially to answer when it was formed by the United Nations University in 1992. A small core group, myself and my two principal colleagues, had been asking this same question for years in three different parts of the world. PLEC set out to develop multi-disciplinary research groups of developing country scientists, across the tropics and sub-tropics, to explore how farmers in diverse, but mostly economically-marginal, environments were actually managing their resources for production. We sought to establish whether they were conserving or degrading their natural resources and especially their biodiversity. Mainly using our professional contacts, we found lead scientists of the inquiring type we were seeking in twelve countries; we failed in two or three others. Each of the lead scientists recruited a small working team and by 1994, when we attracted the attention of the United Nations Environment Programme, some had already achieved useful results. The teams included a number of agricultural and soil scientists, but also many members of other disciplines, principally ecology, botany, geography, anthropology, and rural sociology. Almost all were based in national developing-country institutions.

Research has remained a principal objective of PLEC, but it soon ceased to be the only objective. In some of our national Clusters, scientific input quite quickly also embraced the more practical objectives of encouraging conservationist methods and aiding farmers in concrete ways. Some of these ways were not unlike the standard procedures of agricultural extension, but they also included development of systems in which the farmers' ways were supplemented by scientific understanding. There followed the further objective of assisting the best farmers in promoting their methods among their neighbours and other farmers so as to improve the sustainability of production for a larger population. PLEC's farmer-to-farmer alternative to the more familiar 'transfer of technology' proved popular.

In parallel with what was simultaneously taking place in the area of soil and water conservation in Africa (Reij et al. 1996), the aim has been to add the fields and fallows of the best or most 'expert' farmers to the experimental farms as recognized foci of innovation. This followed from our statement, as early as 1994, that 'effective [resource] management systems do not have to be invented only by modern science. They exist, and have been continuously developed by the world's farmers' (Brookfield and Padoch 1994: 43). Progress was quick in some countries. By the time our international project began to get funding from the Global Environmental Facility, in 1998, the research areas became what we called our 'demonstration sites', where the demonstrators of best practice were the farmers themselves.

The changing role of PLEC scientists

It is important to explain what some of the stages were in this transition from a simple research project to a wider research and demonstration project, because this was not easy. It helped that almost all of our collaborators came from research backgrounds, rather than from experience in project management. PLEC retained an important research objective in inventorying biodiversity and the diversity of farming systems, areas in which many farmers have great knowledge. We had a specific purpose in doing this, which was to test the association between diverse farm management and

biodiversity. Doing this work helped the scientists to become attuned to listening to farmers rather than just talking to them.

Many were already familiar with the so-called participatory methods of achieving consensus among farmers derived from farming-systems research, including focus-group discussions, participatory rural appraisal and the like. It took time to go on from this and become accustomed to dealing with collaborating farmers as individuals, rather than simply as members of a community. In the process, the more alert scientists began to recognize the very considerable differences in methods, skills and knowledge between individual farmers. While not everyone succeeded in making this transition, most did.

A major shift in scale was necessary. As field research scientists, many of our people began with surveys over quite large areas, and along transects some of which were of considerable length. While these are good ways of gaining a regional overview, they are not good ways of identifying the differences between individual farmers, and getting to know the farmers personally. Over the period between 1995 and 1999, a big task in project coordination was to persuade scientists to select small areas and small groups of farmers on which to focus their attention. Only after rigorous guidelines had been set out early in 1999 for the collection of data on biodiversity, and on diversity of farm management – what we call agrodiversity – was this sort of concentrated effort achieved in all areas (Zarin et al. 1999; Brookfield et al. 1999).

The fact that we have been an international project has been of major importance. Networking, through meetings and the twice-yearly project publication, *PLEC News and Views*, and correspondence, kept members in each country in touch with advances elsewhere in the project. Visits by the scientific coordinators, and later the members of the project's internal Scientific and Technical Advisory Team, have assisted greatly in harmonizing progress.

The most important change that had to take place, and among certain of our groups it took place spontaneously, was to change the habits of professional lifetimes and to regard farmers as knowing what they were doing and why they did it. This was fundamental to identification of the 'expert farmers', who innovated, quickly adapted their practices, and could be encouraged to instruct others. It required close observation of farmers' practices, and especially of spontaneous changes in those practices. The farmers who were initially pointed out to our scientists, by officials and other recognized key informants, were often the ones who did what they had been told to do by the extension services. They were seldom the ones who made up their own minds and experimented in their own ways. Yet it was among the latter that the real experts were to be found. Recognition of the true experts came quickly in some areas, more slowly in others, and was itself a major development of skills among our scientists.

Assisting the farmers

The work of PLEC scientists in helping farmers to improve both conservation and their own livelihoods has differed quite widely from country to country. Sometimes it has involved setting up nurseries to assist the expansion of forms of agroforestry suitable for local conditions. It has involved assistance in the exchange and importation of germplasm, and the encouragement of conservation through fairs and open days. Very specifically, it has involved the encouragement of biodiverse

farming, the introduction of fruiting trees to diversify income sources, and support for a range of activities that create value out of biodiversity. In one striking case in the Republic of Guinée, scientists gave practical support to a group of women who were spontaneously seeking to revive an ancient practice of dyeing cloth for sale in the local area. This has been so highly successful an enterprise that support is now being given to the wider marketing of the product.

In this case as in most others, the first step was discovery of what the farmers were doing themselves. Innovators occur in small numbers in most rural societies. Some of the innovations are potentially viable and widely useable; others are not. Some farmers also learn quickly and get ideas from other areas, and nowadays even from the media. Important occasions were visits between the farmers from different demonstration sites, facilitating interchange of ideas as well as germplasm and experience. For the PLEC scientists, the skill has been to find out what will work. Many farmers are keen experimenters who will try out any new germplasm, or seemingly good idea, that comes their way. Although from very different intellectual backgrounds, farmers and scientists have in common that they learn from observation and experiment. The key to success in PLEC demonstration work has been to develop this mutual bond.

The wider purpose of PLEC

All this has been done over several years in some 25 demonstration sites in twelve countries (see attached map "The Clusters of PLEC"). In the more successful instances there is a strong regional impact. But if this were all, it would be a limited return from a large investment in the time of PLEC's scientists. There is a wider purpose of PLEC, and it is to give support to new approaches to research, conservation and development in the marginal lands and resource-poor communities of rural areas in the developing countries. This purpose begins with capacity building at the local level, extends to the national level, and has outreach to a wider audience in the international environment and development field. Capacity building starts with the farmers, then extends to local and regional officials. It includes both graduate and undergraduate students in national universities; a significant number are being trained in the PLEC approach, and in its scientific methods of monitoring change in farm practices and biodiversity. Policy and technical recommendations have been made by PLEC scientists in each country to the national and regional authorities, presented in workshops that have been well attended. The recommendations are being brought together for wider dissemination.

The first stage in reaching a wider international audience has been through our progress reports to the United Nations Environment Programme and the Global Environmental Facility, and especially through wide distribution of the project periodical, *PLEC News and Views*, of which 18 issues have now appeared since 1993. All but the earliest issues are now available through the PLEC web site. There has also been a small flow of articles in learned journals. Two PLEC-related books have been written and published, one about agricultural diversity (agrodiversity) as a whole and one about a farmer-centred approach to work on land degradation (Brookfield 2001; Stocking and Murnaghan 2001). In the last year we have prepared a book setting out PLEC methodology, and including more than a dozen case studies of work done using this methodology. This book is now in press, in London, England (Brookfield et al. 2002). A further book, for publication by the United

Nations University Press, will be generated from the final reports of the first phase of the project, which comes to an end in 2002.

Regional publication has taken place mainly in West Africa and China. A book has appeared about the former region and another is being prepared (Gyasi and Uitto 1997; Gyasi in preparation). In China, use has been made of the journal *Acta Botanica Yunnanica* (2000) for one special issue, and another is planned. The details of the next stage of PLEC, which will be far more decentralized than the first phase, are still being worked out, but extension and formalization of capacity building will certainly be important elements.

There are two central aspects of PLEC that distinguish it from most other projects. Conservation and development are not seen as trade-offs, but as twin aims that can be combined into a single set of activities among the farmers. This is made possible by the fact that cultivating biodiversity can, in many areas, be a profitable activity for farmers, as PLEC has shown. The second aspect is that while farmers' practices may well be capable of improvement, we see the improvement as something that can be built on what the best of them do, not as something that should be promoted only from outside.

Both these are bold statements, but we are publishing evidence in support of them. We join with some leaders in the Integrated Pest Management movement in seeing the road to a more sustainable agriculture as leading from respect for farmers' capacities, through capacity building which provides scientific support, to improved, hybridized, farming systems which are developed by the farmers themselves. PLEC is a way to approach sustainable development, not a formula. It gets behind farmers as experimenters; it seeks to understand their systems, and to link scientific knowledge to their own.

References

- Acta Botanica Yunnanica*, Suppl. XII, 2000. Agrobiodiversity Assessment and Conservation.
- Brookfield, H. 2001. *Exploring Agrodiversity*. New York, Columbia University Press.
- Brookfield, H. and C. Padoch 1994. Appreciating agrodiversity: a look at the dynamism and diversity of indigenous farming practices. *Environment* 36(5): 6-11, 37-45.
- Brookfield, H., M. Stocking and M. Brookfield 1999. Guidelines on agrodiversity assessment in the demonstration site areas (revised to form a companion paper to the BAG guidelines). *PLEC News and Views* 13: 17-31.
- Brookfield, H., C. Padoch, H. Parsons and M. Stocking (eds) 2002 (in press). *Cultivating Biodiversity: the Understanding, Analysis and Use of Agrodiversity*. London, ITDG Publications [formerly Intermediate Technology Press].
- Gyasi, E.A. and J.I. Uitto (eds) 1997. *Environment, Biodiversity and Agricultural Change in West Africa*. Tokyo, United Nations University Press.
- Gyasi, E.A. ed. In preparation. *Managing Biodiversity: the Traditional Way in Ghana and Guinea*. Tokyo, United Nations University Press.
- Reij, C., L. Scoones and C. Toulmin (eds) 1996. *Sustaining the Soil: Indigenous Soil and Water Conservation in Africa*. London: Earthscan.
- Stocking, M.A. and N. Murnaghan 2001. *Handbook for the Field Assessment of Land Degradation*. London, Earthscan.
- Wood, D. and J.M.Lenné (eds) 1999. *Agrobiodiversity: Characterization, Utilization and Management*. New York, CABI.
- Zarin, D.J., Guo Huijun and L. Enu-Kwesi 1999. Methods for the assessment of plant species diversity in complex agricultural landscapes: guidelines for data collection and analysis from the PLEC Biodiversity Advisory Group (BAG). *PLEC News and Views* 13: 3-16