

## **CAPACITY DEVELOPMENT AND SCIENTIST–LAND USER COLLABORATION TOWARDS SUSTAINABLE MANAGEMENT OF COMMUNAL LANDS IN SOUTHERN AFRICA – CREATING INITIAL STRUCTURES**

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### **Abstract**

BIOTA AFRICA is an interdisciplinary initiative for long-term ecological monitoring and analysis of changes in biodiversity due to human land use and global climate change. The project aims to establish a research infrastructure and to empower members of local land user communities as para-ecologists to understand and support current research activities and to facilitate the communication of research results to the land-user communities for future decisions in land use management. Beyond that, para-ecologists who developed the capacity to conduct important tasks in long-term biodiversity monitoring will be crucial for the continuation of the long-term monitoring initiative beyond the current financial support by the German government. Para-ecologists could be employed for local monitoring tasks by national institutions that are interested to continue the long-term monitoring at selected sites. The employment of skilled local people will raise the acceptance of and interest in the communities in the results of the research activities and will be more economic for the institution that might host and continue the ecological monitoring initiatives in future.

### **Key words**

Integrative biodiversity research, non-academic capacity development, para-ecologists, participation

### **Introduction**

According to the Ecosystem Approach of the Convention on Biodiversity, decisions on conservation and management of natural resources should take into account requests and needs of local stakeholders. For this purpose, communication, mutual understanding and knowledge transfer among stakeholder groups (e.g. land users, scientists, and politicians) are an important prerequisite. However, the gap between these demands and the actual ‘real-world’ situation often remains irreconcilable due to big differences in perceptions, expectations and perspectives of the different stakeholder groups. Similar challenges emerge in applied land-use related research, where the acceptance of research outcomes by local land-user communities is largely depending on the extent to which research and results reflect their experiences, availability of resources and perceptions of the environment (Drechsel *et al.* 2005, Shindler *et al.* 2004). But also for the sake of scientific quality, indigenous knowledge revealed to be inevitable for biodiversity and rangeland research (Mauro & Hardison 2000, Thomas & Twyman 2004).

### **Researchers – land users collaboration**

World-wide very few projects have been made public yet, where natural science research projects employed and trained members of local land-user communities for their direct involvement in the research activities. The main aim from the researcher side is to develop the capacity of land users with a low level of formal secondary and tertiary education in order to

- a) gain local support for the often laborious work in biodiversity assessment and monitoring;
- b) benefit from local knowledge about the environmental and social constraints, challenges and incentives land users have for their management decisions or on species ecology, their potential use, possible change in population state etc.;
- c) join strengths with local stakeholders for awareness raising and environmental education among local communities;

- d) contribute to the empowerment of the local land user community to extend the knowledge base for their management decisions by adding objective observations
- e) finally increase the success of an applied, land use focussed research project.

### Case studies

The probably first programme to systematically follow this approach was the New Guinean parataxonomist programme of the *Parataxonomist Training Centre in Madang / New Guinea* (now *New Guinea Binatang Research Centre*, <http://www.entu.cas.cz/png/parataxoweb.htm>). The programme, which has been initiated in 1997, aims to train local people in biodiversity research, facilitate their collaboration with scientists and foster their involvement in conservation education efforts targeted at broader audiences. The respective researchers collaborating with parataxonomists in biodiversity research strongly benefited from the collaboration with regard to collection, taxonomic identification and care for insect collections as well as from the local peoples' detailed knowledge of plant-insect relationships (Basset et al. 2000; Basset et al. 2004). The overall aim of the *New Guinea Binatang Research Centre* is to develop the capacity of the parataxonomists to become an important link between landowners and professional biologists, groups that sometimes have difficulty understanding each other (Weiblen no year). With establishing the *Parataxonomist Training Centre in Madang / New Guinea* in 1997 (Weiblen no year), for the first time, academic researchers in the field of biodiversity and conservation initiated a formal collaboration with local people which comprised in-depth capacity development and job-creation in the field of biodiversity research.

Another project that fulltime employs and develops the capacity of members of local land-user communities in the field of biodiversity research is the international, interdisciplinary biodiversity research initiative BIOTA Southern Africa, funded by the German Federal Ministry for Education and Research (BMBF). BIOTA Southern Africa (Krug et al. in press) as part of the continent-wide initiative BIOTA AFRICA ([www.biota-africa.org](http://www.biota-africa.org)) initiated and conducts long-term in-situ biodiversity monitoring at standardised research sites (so called Biodiversity Observatories, Schmiedel & Jürgens 2005) with the aim to provide evidence on change in biodiversity that occur due to climate change or land-use management. The project has started in 2000 for the first phase of three years. In 2004, during the second phase of the project, eight members of local land-user communities in direct vicinity of core biodiversity research sites of the project (Biodiversity Observatories), have been continuously employed and trained as para-ecologists (i.e., ecologists that did not receive formal, academic training, but are trained on the job and during training courses in the field of biodiversity monitoring). The para-ecologist, in the beginning between 20 and 40 years of age, are all living in economically poor land-user (stock farmers) communities along the 2,500 km long transect where the project's research activities take place. Each para-ecologist is individually supervised and supported by one of the BIOTA Southern Africa researchers.

The training courses for para-ecologists combine technical (e.g., working with computers, digital cameras, GPS, maps), methodological (e.g., collecting and identifying plants and animals, conducting vegetation surveys and interviews with land users) and soft skills (dealing with misunderstandings and miscommunication, social envy, social and cultural differences and various conflicts that may arise from these). The para-ecologists support the field work of natural scientists (botanists, zoologists, soil scientists) and anthropologists, social and economic scientist. During the long phases of absence of academic researchers, the para-ecologists continue the regular monitoring activities (e.g. rainfall, soil properties, activities of selected animal groups, plant phenology, livestock numbers), continue the coordination of participative projects (restoration experiments, activities with schoolchildren), maintain the research equipment, facilitate the communication between the land user community and absent researchers, keep the researchers informed about the progress of their work and the developments in the natural environment or in the community.

The contribution of the para-ecologists to research activities in the field as well as their support with technical problems and in liaising with local land users turned out to be highly valuable for the researchers and important for the success and progress of the project. In particular, the permanent presence of the para-ecologists at the Biodiversity Observatories allows continuation of data

assessment, monitoring, participative projects and information flow between land-user communities and the research project even during the absence of the researchers.

With the continuous employment and training of para-ecologists from eight rural communities, BIOTA Southern Africa strives to integrate the communities into research activities in a participatory way, to empower them to take over substantial parts of the biodiversity monitoring tasks in order to facilitate their ownership of the research results. A major aim of the para-ecologist programme is to encourage members of local land-user communities to realise their own role in combating or preventing land degradation, as well as their expectations with respect to other vital groups (science, political administration, development agencies). Incentives should be created for self-administration and income diversification which are in balance with local natural resources.

### **The para-ecologists' perspectives**

Interviews with para-ecologists and questionnaires revealed the importance of the programme for the para-ecologist (Schmiedel unpublished data): The programme provides a job which is a huge asset in a social environment with an unemployment rate of about 26 % (2005) in South Africa and 35 % (1998) in Namibia (CIA World Fact Book). On the job and during the training courses, they develop their capacity in the field of biodiversity monitoring and their natural environment. Beyond this, the programme provides capacity development which goes beyond the mere learning of facts and methods. The para-ecologists gain self-confidence and confidence in working self-reliantly, in collaborating and communicating with others (e.g. other para-ecologists, researchers, community members, other stakeholders). By visiting other sites and meeting new people from various different communities (e.g. scientific community, land-user communities in different areas and other stakeholders) and thus gaining new experiences and self-confidence, the para-ecologists develop new perspectives for their own life and for their community. They feel empowered to share their understanding with other community members.

Beyond the New Guinean as well as the BIOTA Southern Africa programme, several initiatives use the term para-ecologist or para-taxonomist for initiatives where local indigenous communities are involved in ecological research or conservation projects without formal long-term commitment by the researchers in terms of employment: e.g., Arizona-Sonora Desert Museum (ASDM, [www.desertmuseum.org](http://www.desertmuseum.org)), Centre of Sustainable Environments at Northern Arizona University ([www.environment.nau.edu/international/SeriHealth](http://www.environment.nau.edu/international/SeriHealth)) (Nabhan *et al.* 1999).

### **Discussion (Challenges of the para-ecologist programme)**

Despite the strong advantages and positive assets, the para-ecologist programme also poses challenges for all parties involved (i.e. researcher communities, para-ecologists and even land-user communities) which shall also be described and discussed briefly.

#### ***a) long-term perspective***

The employment and training of personnel is likely to create expectations among the para-ecologists with regard to the time beyond the funding phase of the project. BIOTA is an initiative to create infrastructure, baseline data and first time series for biodiversity which might form the basis for long-term biodiversity monitoring activities by subsequent institutions of the host countries. Therefore, the future of the para-ecologists is seen closely linked with the future of the monitoring sites and activities. The presence of local para-ecologists at the monitoring sites that have the capacity to conduct the standard biodiversity monitoring to a large extent, will be of advantage for the future host institutions or projects with regard to economics, logistics and integration. As long as the future of the project is unclear, also the future of the para-ecologists in the project is not secure. However, even if this option would not materialise for most of the para-ecologists, their job perspectives in related fields (nature conservation, environmental education, land-user – researcher cooperation, research assistance in upcoming related projects) are much better than for other community members that do not have comparative training and working experience.

***b) cultural differences and language problems***

All parties in the project experienced the strong differences in culture between the groups. This means differences between members of different ethnic groups (among para-ecologists of different ethnic groups as well as between para-ecologists and researchers) but also between land-user communities and academic communities. If cultural differences are not reflected or communicated but remain unconscious, they may cause severe misunderstandings, fights, hurt feelings and long-lasting conflicts among groups. Para-ecologists often found themselves in the awkward need to defend themselves for things that happened due to misunderstandings or miscommunications between them and their supervisor or other researchers. The para-ecologist training thus placed a strong focus on soft skills such as avoiding misunderstandings and solving conflicts in order to prevent such problems. In return, if all parties become aware of the reason for the differences and potential misunderstandings, this may result in new experiences, social learning and personal enrichment.

***c) discrepancy between new perspectives and old rules and constraints***

The training courses and the work of the para-ecologists which goes along with travelling, visits new places, new communities, meet and work with members of foreign cultures (e.g. colleagues from various ethnic groups, members of the scientific community, tourists), bring new experience which are unusual for the communities they live in. These experiences obviously broaden the horizon and change the perspectives of the para-ecologists with regard to their natural but at the same time, and probably even more so, to their social environment. Consequently, the para-ecologists tend to become involved in conflicts between the newly gained perspectives and possibilities and the existing, established rules and constraints in their communities and families. Such discrepancies might become apparent in the social life but also in the perception of the natural environment where scientific curiosity and interest in certain organism groups or natural phenomena that have arisen from the training might conflict with existing superstition in the family which makes further investigations socially unacceptable.

***d) envy in the community***

The most serious challenge which the para-ecologists have to face is certainly social envy in their own community. Most members of the community the para-ecologist live in see the para-ecologist programme as an opportunity and advantage for the community. However, for others the obviously unusual type of job (which comprises being employed by a comparatively wealthy project, receiving training, attending conferences, travelling to other research sites, conducting uncommon tasks that often raise misinterpretation in the community, etc.) raises questions and envy. These social tensions in their own community are experienced as most difficult due to the socially and spatially close relationship and interdependence among the community members. Due to the very close, interwoven and often very emotional relationships in the community, problems like this seem to be almost impossible to cope with and to solve, particularly for young and less experienced para-ecologists. Therefore, the para-ecologist training tries to show ways of coping with respective situations by conducting role plays and trying to analyse particular situations.

**Conclusions**

The employment and training of members from local land-user communities by applied biodiversity projects, as it has been done by BIOTA Southern Africa with the para-ecologists or by the New Guinea Binatang Research Centre with the parataxonomists, requires strong personal commitment from both researchers and para-ecologists. Depending on the social, economic and political environment, the problems arising might differ. But due to the differences in cultures and codes between academic researchers and land user communities, difficulties that are caused by miscommunication and differences in perception will most certainly arise. These structural, intellectual or social challenges might even cause personal crises among the trainees which need to be overcome by efforts from both sides, para-ecologists and researchers. However, if the group is willing and able to face and overcome the challenges and if the para-ecologists are empowered to grow with their tasks and responsibilities, the close collaboration between land users and researchers in applied,

biodiversity or land-use focussed research can be very fruitful, productive and highly rewarding for either side.

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Para-ecologists having computer training at training course. Photo: Ute Schmiedel



Para-ecologists at training course. Photo: Ute Schmiedel



Para-ecologists learning identification of plants at Compton Herbarium in Cape Town, South Africa, Photo: Ute Schmiedel



Para-ecologists downloading data from a weather station. Photo: Ute Schmiedel