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The BIOTA para-ecologist programme— towards capacity development and knowledge exchange

UTE SCHMIEDEL*, VILHO SNAKE MTULENI, REGINALD A. CHRISTIAAN, RICHARD S. ISAACKS, DONNA KOTZE, MARIANNA JOHANNA LOT, ROBERT S. MUKUYA, WYNAND PIETERS, JEANNETE SWARTBOOI & SEBEDEUS SWARTBOOI

Summary: Within the framework of the para-ecologist programme, BIOTA employed and trained eight members of local landuser communities as para-ecologists over a period of five and a half years. The aim of this programme was to empower members of local communities to understand and support current research activities and to facilitate the communication of research results to the landuser communities to improve landuse management. Beyond that, para-ecologists developed the capacity to conduct important tasks in long-term biodiversity monitoring, and supported the regular work at the BIOTA Observatories and other research activities of the BIOTA scientists. The employment and capacity development of community members aided in the sharing of scientific findings and experiences of local landusers, and raised interest in the results of the research activities within the communities. This article provides an overview of the concept and implementation of the programme, describes the capacity development component of the programme, and shares some of the experience from both the scientists' and the para-ecologists' perspectives.

Introduction

Contemporary understanding of applied biodiversity research acknowledges the need to integrate the perspective of landusers as key custodians of biodiversity into the research process (Akhtar-Schuster et al. 2005, see also Article 8 of Convention on Biological Diversity 1992, Millennium Ecosystem Assessment 2005). Through this integration, emerging management recommendations take the experiences, availability of resources and perceptions of the environment of landusers into account and are thus more likely to be implemented successfully (Drechsel et al. 2005, Shindler et al. 2004). Furthermore, indigenous knowledge is considered to be crucial for scientific quality (Mauro & Hardison 2000, Thomas & Twyman 2004). To achieve this goal, a participatory research approach is required in which relevant stakeholder groups are involved in de-

signing the research approach itself, and contributing to the evaluation of findings and the development of management recommendations.

During the course of the project, BIOTA Southern Africa focussed increasingly on stakeholder involvement and knowledge exchange (see other contributions in this Chapter). One major undertaking was the para-ecologist programme of BIOTA Southern Africa that was launched in 2004, during the second phase of the project. Within this programme, BIOTA employed and trained eight members of rural landuser communities that were situated in the close vicinity of BIOTA Observatories on a fulltime basis. These para-ecologists were individuals without prior formal training and they benefited from an intensive capacity development programme in the fields of ecology and biodiversity monitoring during the course of their employment.

This article describes the concept of the programme, the main training components, and the work conducted by the para-ecologists. It also discusses the experiences from both researchers' and para-ecologists' perspectives.

Concept

The para-ecologist programme was initially developed following the example of the parataxonomist programme of the Parataxonomist Training Centre in Madang in New Guinea (now New Guinea Binatang Research Centre, www.entu.cas.cz/png/parataxoweb.htm). The latter was initiated in 1997 with the aim of training local people in biodiversity research, facilitating their collaboration with scientists, and fostering their involvement in conservation education efforts targeted at broader audiences.

The para-ecologist programme followed the same principles and vision but placed emphasis on ecological research, thus the adjustment of the name to para-ecologists. In the beginning, the programme was mainly aimed at training local staff to eventually take over large parts of the monitoring activities. The support of the para-ecologists with the monitoring work should not be underestimated. However, it turned out that they would not be able to take over all monitoring tasks completely. For instance, the flora was too complex for some para-ecologists to know well enough to conduct vegetation monitoring independently; there were often more than 300 species per Observatory, which is a challenging task even for professional ecologists. However, already during the implementation phase of the programme, other aspects, which were related more to the para-ecologists



Photo 1: Para-ecologists during the sixth training course in Nieuwoudtville, South Africa. Photo: Ute Schmiedel.

as local contacts and resource persons for the BIOTA project, became increasingly important—an asset that only emerged as the project progressed and the para-ecologists took on more project responsibilities that were not directly related to monitoring activities.

Implementation

Para-ecologists were selected from the communities in the vicinity of eight BIOTA Observatories between the Cape and Kavango. In most cases, the posts were advertised locally and interviews were conducted with selected applicants. In other cases, the selection of candidates was left to the leadership of the local community; or candidates were selected based on their performance as BIOTA field assistants or interpreters prior to the commencement of the para-ecologist programme. The main selection criteria were that the candidates had no tertiary education, were self-motivated, interested in nature, and willing to work in the field. An additional criterion was that the candidates had engaged in voluntary community work prior to their employment. A completed high school education (matriculation) was excluded from the list of criteria in order to offer work and

capacity development opportunities to young people who would otherwise have little alternative opportunities.

The formal employers of the para-ecologists were the chairs of the South African and Namibian BIOTA steering committees. The para-ecologists were employed fulltime for the second funding phase of the project, with the option of extending their employment into the third funding phase. Four (two Namibians, two South Africans) of the eight para-ecologists employed in October 2004 remained in this post for the entire duration of the programme (i.e. five years and six months). Three others resigned and were replaced; in only one case did BIOTA not extend the contract into the third phase of the project.

The languages spoken by the para-ecologists were Afrikaans, Nama, and Rukwangali, as their mother tongues, and English, as the only language in common. English was therefore chosen as the language for mutual communication and training.

The working time of the para-ecologists was 40 hours per week. They received a monthly salary and were beneficiaries of a medical aid plan. Their main place of work was at the Observatory/ Observatories closest to their village but they also travelled around with various scientists

according to project needs. Each para-ecologist was supervised by a BIOTA scientist working in the respective areas and to whom the para-ecologist reported to on a monthly basis.

Beyond the regular fieldwork with their supervisors, the para-ecologists also worked with many other scientists who also supported their capacity development. Each para-ecologist was equipped with a laptop, digital camera, GPS, work boots, sleeping bag, back-pack and, where required, a bicycle, tent and mattress.

The training courses

A three weeks training course was held once a year at different locations along the BIOTA Southern Africa transects, close to where one of the para-ecologist was situated (i.e. Gobabeb and Keetmanshoop in Namibia, and Kamieskroon, Vanrhynsdorp, Nieuwoudtville in South Africa). The sites were selected according to logistical considerations such as the availability of suitable, cost effective venues.

The training courses comprised practical and theoretical components and covered various aspects of the para-ecologists' work:

- theoretical background: classification of organism groups; biodiversity; drivers of biodiversity; calculation of areas, volumes, distances; various other topics as requested by participants;
- technical skills: management and use of computers, digital cameras, GPS, maps, weather stations etc.;
- methodological skills: collecting, processing and identifying plants and animals; plant photography; conducting vegetation surveys; interviews with landusers; video filming;
- communication skill: preparation and presentation of talks; providing and receiving feedback; sharing local knowledge;
- organisational skills: project planning; reporting on activities; planning of own work;
- soft skills: conflict management.

A variety of different processes were applied in the classes. The theoretical



background was often presented by the trainer, whereas for the methodological, technical, and communication skills there was a strong focus on interaction and hands-on training, role playing, peer teaching and practical exercises that were similar to the real-life tasks. Training classes were always combined with creative- and relaxation exercises to ensure that trainees remained energised and alert. For each course, a booklet with the resource- and training material was compiled and handed out to the participants. At the end of each course, the participants wrote a test on the course topics (see Electronic Appendix) and feedback was collated in preparation for the following training course. Beyond these regular training courses, the para-ecologists participated in several additional training workshops.

One highlight of the para-ecologist training courses was the participatory video workshop held by Martin Gruber in April and May 2009. During this workshop the para-ecologists conceptualised, planned, and produced a documentary video on the para-ecologist programme (Schmiedel et al. 2009, Electronic Appendix). The concept and process of this project is described in detail by Gruber (see Article III.8.4).

Further exposure and learning experiences

Skills and methods are only thoroughly mastered if they are applied repeatedly in practice, and on-the-job training was therefore even more important than the training courses for the capacity development of the para-ecologists. The para-ecologists were involved in the monitoring of biodiversity on the BIOTA Observatories and, amongst other activities, they conducted monthly phenological monitoring of plants, engaged in their own research or awareness raising projects, organised and co-facilitated workshops, took notes during meetings, documented events photographically, wrote monthly reports about their work, and planned their own work processes.

Beyond this, para-ecologists were also exposed to various special events. Every year, all para-ecologists participated in



Photo 2: Para-ecologists during computer training during the training course in 2006. Photo: Ute Schmiedel.

the annual conference of the Arid Zone Ecology Forum in South Africa where they presented posters and talks. Testament to the success of the para-ecologist programme is that individual para-ecologists were repeatedly acknowledged for best poster or oral presentations. The para-ecologists also participated in various other national and international conferences, e.g. the Namibian Rangeland Forum, and the international BIOTA conference "Biodiversity of Africa" 2008 at Spier, South Africa. They repeatedly had the opportunity to represent the BIOTA para-ecologist programme at international events, e.g. the INSITE - Science Fair in Pretoria, South Africa, the BIOTA side-event of the COP 9 in Bonn, Germany, as well as at various national meetings and events.

Due to their regular fieldwork and attendance of events, the para-ecologists travelled much more often and much further than they would have done outside of the project context. Their exposure to different places and to people with different cultural and social backgrounds broadened their horizons regarding their own and their communities' future opportunities. In rural areas of southern Africa, intercultural exchange is comparatively low, irrespective of the richness in cultures and ethnic groups of the region. The

para-ecologists perceived the travelling as a rich inter-cultural learning experience.

Work conducted by the para-ecologists

The para-ecologists supported the regular fieldwork of natural (e.g. botanists, zoologists, soil scientists) and social scientists (e.g. anthropologists and economists) at and around the BIOTA Observatories. The para-ecologists provided invaluable support during the extremely time-consuming annual botanical monitoring on the Observatories. They conducted the monitoring of the 100 m² plots, and took the standardised plot photos and other plant photos where needed. For the social scientists, the local knowledge and language-skills of the para-ecologists were key for allocating, contacting and making appointments with local informants. Para-ecologists translated or even conducted the interviews for the social scientists. They organised meetings and workshops, and co-facilitated as well as translated during these events.

During the long phases of absence of scientists, the para-ecologists continued with the regular monitoring activities (e.g. rainfall, soil properties, plant phenology, arthropods, livestock numbers)



Photo 3: Para-ecologists Marianna Lot and Theodor Cloete during fieldwork at the training course in 2005. Photo: Ute Schmiedel.

and coordinated aspects of participatory projects (restoration experiments, activities with schoolchildren) that were initiated together with the scientists. One para-ecologist was responsible for the screening of the BIOTA awareness-raising film on illegal logging in the small communities of the Kavango (see Article III.8.4). The para-ecologists also maintained the research equipment, facilitated communication between the landuser communities and researchers, and kept the scientists informed about their work progress and developments in the natural environment or within the communities.

The para-ecologists also worked with researchers from other projects or NGOs that were not part of the BIOTA project but working in related fields. This was strongly supported and even motivated for by the coordinator of the programme, as any kind of professional work experiences beyond the BIOTA context was expected to contribute to the capacity development of the para-ecologists.

The para-ecologists were also encouraged to develop their own projects within the context of BIOTA. Some of them initiated concrete project ideas, which they then managed to implement. Among these were awareness-raising projects with schoolchildren, a scorpion project, and booklets on the use of local medicinal plants.

Dealing with potential challenges

Despite the overwhelming advantages and positive impacts, the para-ecologist programme also posed challenges for the scientists and para-ecologists. These challenges and the lessons learnt by the team are shared below and may be helpful for future projects.

Long-term perspective: The employment and training of personnel is likely to create expectations among the para-ecologists with regard to employment beyond the funding phase of the project. The BIOTA project was an initiative to create Observatories and a baseline for time-series that might form the basis for long-term biodiversity monitoring activities as part of an international monitoring network (see Volume 1, Part I). Therefore, the future of the para-ecologists is closely linked to the future of the Observatories. The presence of local para-ecologists at the monitoring sites with the capacity to conduct standard biodiversity monitoring to a large extent, will be of advantage for future host institutions or projects. As long as the future of the BIOTA Observatories is unclear, employment of the para-ecologists in this context also remains uncertain. Nevertheless, the employment prospects for the para-ecologists in relat-

ed fields (nature conservation, environmental education, landuser–researcher cooperation, research assistance in future related projects) are seen as much improved compared to other community members who have not received comparable training and work experience. This has already been proven as one of the para-ecologists has been permanently employed by CapeNature, the conservation authority of the Western Cape Province of South Africa. Other para-ecologists are employed by local NGOs and research institutions and have the opportunity to gain further employment in future projects.

Cultural differences and language barriers: All parties in the project experienced strong cultural differences within the team. These were differences between members of different social and ethnic groups (among para-ecologists and scientists of different ethnic groups, landusers and scientific communities). If cultural differences are not brought to light or communicated, and remain below the surface, they may cause severe misunderstandings within the team. Para-ecologists often found themselves in the awkward position of having to defend themselves for incidents that occurred due to lingual or cultural misunderstandings or miscommunications between them and their supervisor or other scientists. For many of the scientists and all the para-ecologists, English was not their mother tongue. Due to the limited English skills, misunderstandings in communication occurred frequently and were often misinterpreted as content-related disagreements. Furthermore, most of the para-ecologists had very little exposure to other African ethnic groups before they joined the para-ecologist programme. There was thus a strong emphasis placed on soft skills, such as avoiding and solving misunderstandings through effective communication, during the para-ecologist training. Over the years, consciously dealing with cultural differences resulted in new experiences, social learning, and individual capacity development.

Discrepancies between new perspectives and old rules and constraints: The training courses and the work of the para-ecologists, which was accompanied by

travelling, visiting new places and communities, and meeting and working with members of foreign cultures brought new and unusual experiences to the para-ecologists. These experiences obviously broadened their horizons and changed their perspectives on their natural and social environments. Consequently, the para-ecologists sometimes became involved in conflicts within their home communities due to clashes between their newly gained perspectives and the established rules and constraints in the community. These new perceptions of the social and natural environment can potentially lead to conflict if they clash with existing superstitions. This may even lead to the community preventing further research on a topic, such as spiders, which is perceived as culturally inappropriate.

Envy within the community: The most serious challenge, which the para-ecologists had to face was social envy from within their own communities. Most members of the communities perceived the para-ecologist programme as a great opportunity and advantageous for the community. For others however, the obviously unusual type of work (which comprised being employed by a comparatively wealthy project, receiving training, attending conferences, travelling to other research sites, conducting odd work that was often misinterpreted by community members, etc.) raised questions and envy among younger community members. This was particularly true at the beginning of the programme, when the concept was still new to the para-ecologists and their social environment. Para-ecologists sometimes experienced difficulties with these social tensions within their own communities. Particularly for the younger and less experienced para-ecologists, problems like these seemed almost impossible to cope with and to solve due to the very close and interwoven personal relationships within the communities. Therefore, the para-ecologist training attempted to illustrate ways of coping with these difficulties by unpacking and analysing particular situations through role playing. During the course of the project, appreciation for the para-ecologists and their skills grew and they were increas-



Photo 4: Para-ecologists learning identification of plants at the Compton Herbarium in Cape Town, South Africa. Photo: Ute Schmiedel.

ingly viewed as a valuable resource by their communities.

Supervision: Some para-ecologists were affiliated with local institutions or organisations, where they worked on the daily basis. These organisations also took over their supervision. However, where such hosting organisations were not available, para-ecologists worked from home and were largely left on their own for most of the time. They were supervised via telephone, fax or email and only met their supervisors in person once a month or even once a year. The frequency of telephone contact was partly hampered by technical problems. Also, this distant supervision of para-ecologists had to compete with the many other urgent commitments of scientists and therefore tended to fall short if it was not also demanded from the para-ecologist's side. Therefore, the lack of day-to-day supervision for solving emerging problems, immediate response to questions, and monitoring of professional performance was one of the biggest challenges for both the scientists and para-ecologists. Future para-ecologist programmes should learn from this experience and arrange for the affiliation of each para-ecologist with an on-site supervising organisation. Alternatively, for more remote places where there is no supervising organisation near-

by, regular face-to-face meetings with a supervisor, who should be based within a manageable distance, is advisable.

Feedback from para-ecologists on the programme

The description of the experiences with the para-ecologist programme provided in this article is based on numerous formal and informal feedback sessions between scientists and para-ecologists. However, the overwhelmingly positive impact that this programme had on the personal and professional development of the para-ecologists can best be expressed in their own words. Some of their summarised feedback is therefore quoted below.

- “The reason why I became a para-ecologist is obvious: I don't have a tertiary education like a degree or a diploma that would have allowed me to learn things that I know now. I got the opportunity to learn this while working and during training courses. I am ready to share information that I have gained through my training that I have received through BIOTA.” (Richard Isaacks from Keetmanshoop, Namibia)
- “I love being an outreach para-ecologist [i.e. a para-ecologist that interacts



Photo 5: Para-ecologists downloading data from a weather station. Photo: Ute Schmiedel.

with community members] because I have gained skills and experiences through BIOTA and I hope that I will use it well one day after the BIOTA project ended. BIOTA has made my future bright.” (Jeannete Swartbooi from Gobabeb, Namibia)

- “I have learned a lot about biodiversity; now I see conservation of plants and animals in a new perspective and understand how important each of them is in life.” (Donna Kotze from Nieuwoudtville, South Africa)
- “I am able to do the work of a researcher due to the training that I received during the last seven years of work and the experiences I gathered in BIOTA. I also learnt a lot about how to work on my own and to conduct projects self-reliantly. If it has not been for BIOTA Southern Africa that gave me the opportunity, I would not have developed

so much knowledge.” (Reginald Christiaan from Soebatsfontein, South Africa)

- “The message that I learnt is to protect and to let live. Now I can also distribute this message among other people in the community.” (Marianna Lot from Paulshoek, South Africa)
- “Getting involved with a project like BIOTA opened my mind to learn about nature. This job also gave me the opportunity to give presentations at conferences and international congresses like COP 9 [Conference of the Parties of the Convention on Biological Diversity] in Bonn and to meet different people from different cultures.” (Robert Mukuya from Rundu, Namibia)
- “I have learnt how to do proper field work, like monitoring of plants and how to download weather stations. I have also learnt how to give presenta-

tions like at the international BIOTA congress. As a local member of a rural community it gave me hope for the future to see that I can be part of the scientific community in a special way.” (Wynand Pieters from the Knersvlakte, South Africa)

- „I want to use the training and experiences I gained through this BIOTA project to become a local tour guide within my community in order to put my community on the tourism map and to claim our fair share of the tourism cake, for the benefit of the community and Namibia as whole”. (Sebedeus Swartbooi from Gobabeb, Namibia)

Conclusions

The experiences show that the involvement of para-ecologists in the project helped to better understand the landusers’ perspective of the natural and social environment as well as the constraints, challenges and incentives for their land management decisions. Also, the para-ecologists became instrumental in knowledge exchange between scientists and landusers as well as in awareness-raising and environmental education among local communities. Thus, the para-ecologist programme contributed towards the empowerment of the local landuser communities, and to expanding their knowledge base by referring to observational data, which aided their management decisions. In this way, the programme contributed strongly to the overall success and positive perception of the BIOTA project among landuser communities.

The employment and training of para-ecologists required strong personal commitment from scientists and para-ecologists. Problems, which arise, might differ depending on the social, economic, and political environment of such a programme. Due to differences in culture and codes between scientists and para-ecologists, difficulties that are caused by miscommunication and differences in perception will almost certainly arise. These structural, intellectual or social challenges might even cause personal crises among the trainees, and they need

to be overcome with efforts from all parties, i.e. para-ecologists, supervisors, and scientists. However, if the group is willing and able to face the challenges, and if the para-ecologists are empowered to grow with their tasks and responsibilities, this close collaboration between landusers and scientists in applied, biodiversity or landuse-focussed research can be very fruitful, productive, and highly rewarding for both sides.

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