Biodiversity and Economically Important Species in the Tropical Andes (BEISA)

A Research Collaboration between Bolivia, Ecuador and Denmark

Amendment to project document

4 Marts 2004

Henrik Balslev
Department of Systematic Botany
Institute of Biological Sciences
University of Aarhus, Build. 137, Universitetsparken
8000 Aarhus C., DENMARK
phone (45) 8942-4743, fax (45) 8613-9326, email henrik.balslev@biology.au.dk

Contents

Introduction

The present document is an **Amendment to the Project Document** entitled *Biodiversity and Economically Important Species in the Tropical Andes – A research collaboration between Bolivia, Ecuador and Denmark* submitted to the Danida Research Council for Development Research (RUF) by professor Henrik Balslev on March 28, 2003. The project period is Oct. 1, 2003 until Sept. 30, 2006. There are four partner institutions forming an ENRECA research network, established with the purpose of upgrading their capacity in biodiversity teaching and research.

The first project activity was an Inception Workshop held in La Paz, Bolivia, Dec. 8–12, 2003, organized to plan the details and coordinate the execution of the project. The Inception Workshop was attended by the key persons from the four partner institutions in La Paz, Quito, Loja and Aarhus, and representatives from potential collaborating institutions and projects in Bolivia. The present document has been elaborated based on the discussion held during the inception workshop, and subsequent correspondence between the project partners. This amendment partly includes documentation concerning those parts of the original Project Document that have been substantially changed during and after the workshop, and partly newly elaborated materials.

This **Amendment to the Project Document** will be used to coordinate and implement the project, and it will also serve as a basis for its eventual evaluation. However, the amendment is not supposed to replace the **Project Document**, which includes background information that remains valid, particularly concerning the description of the partner institutions and its key persons, and the detailed presentation and discussion of the project, its justification, objectives, and limitations.

Background

The Bolivian, Ecuadorian and Danish institutions that participate in this project have collaborated in various contexts during decades, investigating biological diversity and particularly plant resources in western tropical South America, and efforts to formalize and further this collaboration via an ENRECA-financed project began several years ago. These efforts resulted in the research proposal *Biodiversity and Economically Important Plants in the Tropical Andes, - A research collaboration between Bolivia, Ecuador and Denmark*, submitted on March 28, 2003 to the Danida Research Council for Development Research (RUF).The applicant is professor, Henrik Balslev, Biological Institute, University of Aarhus (AAU), and the local institutional partners are: **Instituto de Ecología,** Universidad Mayor de San Andrés in La Paz, Bolivia (UMSA), **Departamento de Ciencias Biológicas,** P. Universidad Católica de Ecuador in Quito, Ecuador (PUCE) and **Facultad de Ciencias Agrícolas,** Universidad Nacional de Loja in Loja, Ecuador (UNL)

RUF accepted the application in principle on June 25, 2003 (104.Dan.8-f) and granted a sum of 5.000.000 DKK, corresponding to approximately two thirds of the applied for amount of 7.425.000 DKK, but did not specify the details of which elements in the original budget should be kept. Subsequently, RUF asked professor Balslev to propose, in consultation with the project partners, a budget corresponding to the granted amount and to propose an activity plan adapted to the new budget. A first revised budget was submitted by Balslev to RUF on July 4, 2003. RUF commented on this revised budget on July 14, 2003, and Balslev integrated the RUF-comments into a second revised budget proposal submitted to RUF on Sept. 21, 2003. On the same occasion Balslev suggested that the activities that would be carried out under the revised budget should be discussed with the project partners at an **Inception Workshop** to be held in late 2003 in La Paz, Bolivia. It was envisioned that this Inception Workshop would include the project partners from La Paz, Quito and Loja, as well as representatives from future collaborating institutions and projects in Bolivia. In practice this event would facilitate a truly cooperative elaboration of an updated project proposal, integrating the visions and perspectives of the four partners, as well as the inputs from the mentioned third partners. Several additional objectives of an Inception Workshop were also mentioned by Balslev (Sept. 21): (1) To interview and select graduate students for the project; (2) To specify a strategy ensuring the sustainability of the project; (3) To develop a strategy for the south-south collaboration Bolivia-Ecuador, and; (4) To Facilitate a future collaboration with DANIDA sector programmes.

The project was officially approved by RUF at Oct. 7, 2003, with a total budget of DKK 4.999.200, for a 1st Project Phase running from Oct. 1, 2003 until Sept. 30, 2006. In the grant letter RUF also stressed a number of issues in part corresponding to the above-mentioned points mentioned by Balslev, particularly; (1) To develop a strategy for sustainability based on local ownership; (2) To define how PUCE in Quito in particular could help promote the capacity of the partner institutions in La Paz and Loja; (3) To prioritize the curriculum development both for bachelor and the master level degrees at the involved institutions; (4) To evaluate if parts of the M.Sc. programmes could be carried out at the local institutions; (5) To ensure that all initiated activities could be completed within the 1st project phase; (6) To elaborate and out-phasing plan (for the present and consecutive project phases); and, (7) To analyze the project partners national and international contacts and networks.

The issues mentioned in the correspondence between Balslev and RUF were integrated in the planning of the Inception Workshop, and the project partners themselves added additional

subjects to discuss in La Paz. Summing up the principal objectives of the Inception Workshop became the following: To

1) Revise project activities and elaborate a work plan
2) Elaborate strategy for out-phasing (after each project phase)
3) Adapt project budget to planned activities
4) Select graduate students and define their study programmes
5) Elaborate strategy for curriculum development
6) Elaborate strategy to ensure sustainability of results
7) Evaluate project partners' institutional contacts and networks
8) Elaborate strategy for south-south co-operation
9) Facilitate collaboration with Danida sector programmes.
10) Define project organization, coordination and administration

The workshop was held Monday to Friday, Dec. 8–12, 2003, at the UMSA in La Paz, and the agenda and the list of participants appear as Appendix 7. Staff and students from the partner institutions spent five days with internal planning and discussion. Representatives from the local Danida sector programmes and a number of Bolivian institutions attended the event. The project proposal was presented for them, and the possibilities for a future collaboration with these programmes and institutions were analyzed. The entire Inception Workshop was characterized by fruitful discussions in a positive spirit, resulting in the specific conclusions and strategies presented below.

Inception Workshop Results

Results concerning each of 10 Inception Workshop objectives are discussed in the order they were listed above and with the same section numbers, and throughout this document we refer to the attached documents appearing as the Appendices 1 to 12.

1) Project activities revised and work plan elaborated

As Appendix 1 appears the revised Log Frame. During the Inception Workshop the individual project activities were analyzed, discussed and adapted to the reduced budget, and as a consequence it was decided to postpone some activities proposed in the original Project Document to early in a 2nd Project phase (in year 4) rather than in the present 1st project phase. In particular, it was decided only to initiate the part of the research programme that focused on economically important plants, postponing the other research component which focused on the ecology and diversity of Bolivian forest communities to the 2nd Phase. Regarding the upgrading of the 'Colección de Fauna', La Paz, the training of staff in charge of the reference collections in the museum and the envisioned study of the economic value of native fauna in selected areas were postponed.

The remaining activities appearing in the original log frame will be carried out in this 1st project phase, in some cases with a reduced activity level, *e.g.*, fewer new courses will be developed and taught. Some IT-capacity upgrading that was envisaged to take place via formal courses will be taught in informal sessions when the relevant persons visit partner institution. Instead it is planned to upgrade the IT-capacity training of the M.Sc. students during courses in Denmark which will enable them to train relevant persons at their home institutions.

At the levels of results and objectives there are few changes compared to the original Log Frame. The most important change is that activities aimed to further the capacity of Bolivian

institutions to collaborate with third partners in projects focused at the use and value of the national biodiversity (previously 3.3 and 1.1) now have been combined into a single result (1.1) and a single activity (1.1.4).

In Appendix 2 we present the detailed work plan for activities that will be initiated during the present 1st project phase. The individual activities have, if relevant, been divided into 'tasks' facilitating the elaboration of a work plan, and for each task we have indicated the months of execution, as well as the institution(s) in charge and the principal person(s) involved. Overall the main activities during 2004 focus on the students' course work and the detailed planning of the economic botany research programme, while 2005 primarily will be spent in the field research programme, and 2006 will be used to process research results and write publications including the theses of the students.

2) Strategy for out-phasing (after each phase)

Activities which commence in the present 1st project phase are scheduled to be completed within the 3-year project period, *e.g.*, all graduate students will begin their studies in due time to complete their exams and write both international and local publications before Sept. 30, 2006. Some activities, particularly the specific research components, are envisioned to continue in a 2nd project phase, but have been designed to produce publishable results with a lasting value before the present 1st project period finishes.

Appendix 3 lists the major results and mile-stones during the anticipated four consecutive project phases. The 2nd and subsequent phases will likewise consist of activities scheduled to produce sustainable results within their individual time frames. Overall, before any activity is initiated it will be evaluated if there is staff and funding to continue that particular activity (see also Strategy to ensure Sustainability).

3) Project budget adapted to planned activities

RUF informed us on the 7. October, 2003, that the budget allocated for the project was DKK 289.200 for 2003, DKK 1.684.800 for 2004, DKK 1.597.200 for 2005 and DKK 1.428.000 for 2006, summing to the total of DKK 4.999.200 during the three years from Oct. 1, 2003 until Sept. 30, 2006. At the same time RUF approved the distribution between the four partner institutions as suggested by Henrik Balslev on Sept. 21, 2003, viz. DKK 1.756.800 to UMSA, DKK 516.000 to PUCE, DKK 238.800 to UNL and DKK 2.487.600 to AAU, as well as tentative budgets for the distribution of the individual institutions' budgets. The present revised budget appears as Appendix 4, and the budget explanation as Appendix 5.

The revised budget maintains the same amounts for each project partner as in the previous budget, but the institutions have redistributed their budgets somewhat between budget lines, and the total project distribution over years is somewhat changed compared to abovementioned amounts reserved by RUF. In particular, the proposed consumption in 2005 is higher (DKK 1.974.800) and in 2006 it is lower (DKK 1.034.200) than the amounts in the budget of 7. October, 2003. This redistribution reflects the condition placed on the project in the grant letter, *i.e.*, that all activities initialized in this 1st phase must be terminated by the end of the project phase. As a consequence, more costly field activities are concentrated in 2005, whereas the dominant activity in 2006 will be less costly and involve processing data and writing publications, ensuring that the project activities can be concluded within the three years of the present project period.

In addition to the total project budgets we have also written up annual budgets for the years 2004, 2005 and 2006 (Appendix 6).

4) Graduate students selected and their study programs defined

At the Ecuadorian partner institutions the first two graduate students were selected in August 2003, during Henrik Balslev's visit to Ecuador (paid for by other funds than this project's). These students were **Lucia de La Torre**, from PUCE in Quito, and **Orlando Sanchez** from UNL in Loja, who have started in the M.Sc. program in Aarhus and the local degree program in Loja, respectively. Both attended the Inception Workshop in La Paz, together with four potential Bolivian M.Sc. program candidates identified by the UMSA project-coordinator, viz. **Carla Maldonado**, **Narel Paniagua**, **Adriana Sanjínez** from UMSA in La Paz, and **Alain Carretero** from the Universidad de Chuquisaca in Sucre. All the mentioned candidates had in advance of the Inception Workshop elaborated fairly detailed presentations of their potential thesis research proposals. During the Inception Workshop they also documented their formal educations and other relevant experiences, and all four were found qualified to commence M.Sc. studies in this project.

In addition, a second local degree student will be selected in Loja in early 2004, to be integrated in the Loja based studies of Non Timber Forest Products (NTFP´s) in southern Ecuador. Furthermore, several not yet selected students will study for their first degree in La Paz and Quito within the research components conducted at the respective institutions regarding economically important plant species and their management.

The five M.Sc. students, four from Bolivia and one from Ecuador, begin their M.Sc. training following courses summing to 60 ECTS in Aarhus during 2004. The specific courses they will take are the following:

Feb.-June:	***Plant Biogeography and Macroecology*** (15 ECTS)
	Tropical Rainforest Ecology (10 ECTS)
	Biodiversity Informatics (5 ECTS)
July-August:	***Biology Project*** (15 ECTS)
Sept.-Oct.:	***Systematic Botany*** (15 ECTS)

In November 2004 they will return to Bolivia and Ecuador to carry out their respective thesis research projects, and in late 2005 they will return to Denmark with their data, in order to write up and defend their thesis works until April 2006.

Each of the five M.Sc. thesis students has a thesis advisor in Denmark and one at their home institution. The Danish advisor(s) will supervise the planning of their thesis before they return to their home country and later the writing of their thesis; and the local advisor(s) will supervise their field work programs from late 2004 until late 2005. It is envisioned that each thesis project will result in at least one publication in an internationally recognized scientific journal, and equally at least one nationally published contribution that may be written for a broader audience. The student becomes first author of the resulting publications, and the supervisors co-authors.

During the Inception Workshop the participants discussed whether the M.Sc. students should follow some courses at the local partner institutions, either at their own university or at PUCE in Ecuador. It was concluded that during the present 1st project phase it was preferable, to give the entire group of M.Sc. students the same formal training regarding biodiversity variation, research and management at the University in Aarhus. This procedure was seen as more efficient than designing individual study programs comprising courses offered at the different partner institutions, because a common program maximizes the

support and interaction between the students. An additional advantage is that the common program will facilitate a synchronous and coordinated planning of their M.Sc. thesis research projects, facilitating that all five thesis projects can be integrated as methodologically well-designed components of the ENRECA-research program focused on economically important species. The students will begin preparing their thesis research projects during the summer (July-August 2004), and they will finish the detailed planning of their thesis projects in November 2004, before returning to Bolivia and Ecuador. Back in their home countries each student will carry out the field research program he/she has planned until their second stay in Denmark from November 2005.

Each student is also expected to prepare information materials targeting the rural population in the region in which they conduct their research. Printed materials describing results relevant for the local populations will be distributed in the communities.

During the time spent at heir home institutions, the students will, apart from doing field work to gather data for their thesis, collaborate with staff and students at their home institutions. In particular they have to share their experiences during seminars and workshops, in this way helping to upgrade the capacity at their respective institution, *e.g.,* regarding IT.

5) Strategy for curriculum development

It is a priority of the project to enhance the curriculum development in the participating institutions, and particularly at Instituto de Ecología, UMSA. The strategy specifically involves support to a currently ongoing revision of the biology curriculum at UMSA, and based on the recommendations in this work, to support the improvement of existing courses as well as the development of new ones.

Instituto de Ecologia, UMSA has initiated an analysis of the educational needs of biology candidates in Bolivia, and based on the conclusions they will propose a new curriculum, that provides future candidates with better capabilities to solve the biological and ecological problems of Bolivia. The present project's local coordinator **Monica Moráes** has a central position in this process, and she will integrate the other project partners' experiences in the local planning process. To this end the ENRECA-project has formed an **inter-institutional working group** lead by Monica Moráes and with representatives from the four partner institutions. Drafts and proposals elaborated during the planning process will be distributed within the inter-institutional working group, and its members will continuously exchange comments, suggestions and proposals. In addition, in May 2004 the working group will gather in Trujillo, Peru (where they attend the Peruvian National Botanical Congress), to evaluate the proposal for a new curriculum at UMSA, and define and discuss the ENRECA partners' specific contributions during the forthcoming implementation process, and identify the institutions and persons in charge of each contribution. Subsequently, the working group will continue monitoring the specific actions, and the overall curriculum development at UMSA and the other partner institutions, and later, in October 2005, the working group will meet in Loja, Ecuador, to evaluate results and discuss the continued activities (including those in the stipulated 2nd project phase).

Two levels of specific actions regarding curriculum development are envisioned: Support to improve existing courses, and development of new courses. In the first case staff from institutions who teach related topics will exchange experiences. Considering that particularly the UMSA currently is updating its curriculum, it is envisioned that staff members from the Ecuadorian Universities and the University of Aarhus will network with corresponding staff members at UMSA, exchanging experiences while improving and upgrading their specific

courses, and it is anticipated that the teaching of all network-participants will benefit from this exercise. Finally, considering that courses will be taught on a permanent basis by existing staff members, the sustainability of this endeavor should be ensured.

New courses will be developed in collaboration between the partner institutions, and taught at more than one partner institution. The ongoing revision of the UMSA-curriculum will likely identify subjects for new courses, and subsequently it will be analyzed whether the same subjects may serve to upgrade the curriculum in the partner institutions. In case that new courses are co-developed by researchers from the involved institutions, and subsequently taught at the institutes the researchers come from. Essential for this strategy is the integration of permanent staff members that are willing to teach the new courses.

The subject of the first new course is **Economic Botany** because that topic, though highly important, currently is taught on a very limited scale in the involved institutions. Economic botany is the research focus area of the present ENRECA project, which will help a mutual and beneficial interaction between experiences accrued from research components in Ecuador and Bolivia, and the theoretical discussions involved in elaborating the course. In addition, it is anticipated that the research programme in economic botany will emphasize and evaluate methods suitable to investigate human interactions with plants, and it is also envisioned that the methodological aspect will become an essential component of the Economic Botany course. Other important components of the economic botany course includes medicinal plants, socio-economic valuation of plant resources, non-timber forest products (NTFP´s), commerce with plant products, intellectual rights and patents.

An additional component of the course will be **Natural Products Chemistry**, emphasizing the major categories of secondary plant substances, their effects and uses particularly for medicine, and the distribution of these substances within the botanical system, and an additional theme will be intellectual rights specifically regarding local people's knowledge of medicinal plants. This component will depend on pharmacological expertise represented by professor **Jerzy Jaruzelski**, at the Royal Pharmacological University in Copenhagen, and the subject will probably be taught as part of the abovementioned course in Economic Botany rather than as a separate course. It is envisioned that local expertise will be integrated in the elaboration and teaching of this particular component, in the case of La Paz from the 'Instituto de Química' at UMSA.

Another potential new course identified during the Inception Workshop was **Natural Resources Management**, including aspects as land-use planning, protected areas, project management, rural economy and sociology. Some aspects of such a course might be elaborated in collaboration with the FoMaBo-ENRECA project, which is a collaboration between the Section of Forestry at the Royal Veterinary and Agricultural University in Copenhagen, and the Universidad Autónoma Gabriel René Moreno (UAGRM) and Universidad Mayor de San Simón (UMSS) in Santa Cruz and Cochabamba respectively.

6) Strategy to ensure sustainability of results

The sustainability of the expected outcome of the project was evaluated during the revision of the project document. Quality, here defined as long-term sustainable investments have been prioritized over quantity, understood as ambitious activity plans, *e.g.,* in the original project document were listed up to 10 new courses to be taught particularly at UMSA. According to the present proposal fewer courses will be developed, in part due to the revised budget, but also to permit more emphasis on sustainability, viz. to ensure the presence of staff members willing to teach the new subjects, and to evaluate the funding opportunities as

an initial step in the planning process. In addition, new courses will be co-developed preferable between all four partner institutions, which may be more complicated, but result in better outcomes, and at the same time train the researchers involved in the process, and help promote the south-south dimension in the project.

A major issue relating to sustainability is the future employment of the trained M.Sc. and Ph.D. graduates. The present project has opted for training young, outstanding students, rather than persons that already have permanent positions. We believe that this procedure gives the best long term results, assuming that the younger generation is more ambitious and depend on producing excellent results. The first generation project in Ecuador has demonstrated that the trained graduates do find academically relevant positions, although not all at their home institutions. Instead candidates may enter key position in national institutions dealing with the administration and management of protected areas and biological resources, and the presence of highly qualified academic staff in such institutions may contribute significantly to promote biodiversity research and management at the national level. As such we consider the potential employment of some trained candidates in other institutions as an additional important project output rather than a failure. Highly qualified candidates in the right places contribute to the long-term sustainability of the project investment, *e.g.*, by improving the implementation of national policies regarding biodiversity issues.

Nearly all national institutions conducting biodiversity research in Latin American countries are confronted with insufficient budgets, limiting their possibilities to expand, intensify and diversify their research efforts, and to some extent also their facility to employ staff and develop their curriculum. Budgets of national research institutes depend mostly on economic policies and political priorities, beyond the control of ENRECA-projects or even the institutions themselves. However, biodiversity research institutions which attain international standards, have proven their capacity to attract external funding particularly through their participation in international projects and networks, in this way transcending the local budgetary limitations of their activity levels. An excellent example is the herbarium at PUCE in Ecuador, which currently is involved in various major international projects mostly with North American and European partners, and the activity level of the herbarium at the ULN has expanded considerably by virtue of external funding. In both PUCE and ULN the collaboration with the herbarium at AAU, partly financed through previous ENRECA-projects, was instrumental for attaining the scientific capacities necessary to attract international funding.

The experiences from Ecuador suggests that a sustainable expansion of the biodiversity research at the UMSA, will depend on a further integration of the institution in the international biodiversity research and management community; and that the integration of the UMSA should be considered as a component of a broader effort to develop Bolivian institutions to collaborate with third partners in projects focused at Bolivian biodiversity. An essential component in the strategy will be to transfer the abovementioned experiences from Ecuador to Bolivia, and a principal instrument to further this process will be the **Inter-institutional Working Group** which must facilitate a continued exchange and interaction between the project partners, gradually guiding and supporting their inception in international networks. This process is envisioned as a long-term process, and it will comprise two separate stages: In the **first stage** the principal objective will be to involve the Bolivian universities, and particularly the UMSA, in biodiversity research with foreign research institutions and networks. This will improve the capacity and the professionalism of the national institutions and researchers. In the **second stage** the focus will increasingly

change to aspects regarding the exploitation and management of the national biological resources. Such projects will often have to include additional partners, partly Bolivian institutions in charge of the control and regulation of the national biodiversity, and partly national as well as international private enterprises capable of commercializing specific products. Second stage projects may prove economically more lucrative for the national institutions than first phase projects, and may both contribute to the sustainability of the project results and facilitate that the biodiversity of Bolivia may benefit its citizens. It is envisioned that second stage collaboration projects/networks will dominate from the 3rd Project Phase (see appendix 3).

7). Project partners' institutional contacts and networks

During the Inception Workshop the main discussions were centered around the institutional working relations within the tropical Andean region, reflecting that the research component will focus on economically important plant species throughout this region. The participation of all project partners in the Peruvian and Ecuadorian botanical congresses to be held in Trujillo in May 2004 and in Loja in October 2005, respectively, will also further the collaboration between the tropical Andean countries.

A more general analysis of the institutional contacts and networks will be part of the inter-institutional working group's assignments, and the analysis will if necessary be completed during the workshop planned in Loja, Ecuador, in October 2005.

8) Strategy for south-south co-operation (particularly regarding research)

A major issue, discussed at the Inception Workshop, was to specify a strategy for the interaction between the partner institutions, and particularly between institutions in Ecuador and Bolivia (south-south). This has resulted in a strategy with two principal elements, SRP and CEE. The first is a **Shared Research Program (SRP)** focused on economically important plants in the tropical Andes, including specific coordinated research components between Bolivia and Ecuador, within the broader context of the common project. The second element of the strategy is a **Continuous Exchange of Experiences (CEE)** formalized via the Inter-institutional Working Group discussed during the previous sections. Here we will only discuss the first element of the south-south strategy, viz. the research program focused on **Economically important plant species in the Tropical Andes.**

The detailed planning of the research activities will happen throughout 2004, partly in Denmark where the students will elaborate their respective field programs, and partly via correspondence between the partner institutions. The planning starts in Ecuador because there field activities commence in early 2004, while Bolivian field work commences in December of 2004. The Danish project coordinator will visit the two Ecuadorian project partners in April 2004. At PUCE the ongoing inventory of economically important Ecuadorian plants will be evaluated, in order to plan and commence a similar inventory of Bolivian plants, and in the case of UNL the field program they will conduct focused at Non-Timber Forest Products (NTFP´s) will be discussed. This research will involve local communities throughout the Loja province, and some of them will be visited, and subsequently the experiences from Loja will support the planning of the forthcoming research in Bolivia, and particularly the study of NTFP´s to be effectuated in the department of Chuquisaca, Bolivia. Subsequently, in October 2005, the Bolivian projects partners, including the four master students, will visit Ecuador and conduct two weeks of field work particularly in southern Ecuador. The Bolivian students will collaborate with Ecuadorian botanists focusing at related subjects, and each Bolivian student have specific research interests in Ecuador, implying that they may supplement their data from Bolivia with

important data from Ecuador. This will happen immediately after they have completed their field research programmes in Bolivia, and shortly before that they will commence to process their data and write their thesis works in Denmark.

The principal components of the planned research focused on economically important plants will be the following four: **1. Inventories of economically important plants** in Ecuador and Bolivia. In Ecuador the inventory will be completed, and the results disseminated both via a book and an internet web-page. In Bolivia a similar inventory commences, taking advantage of the experiences from Ecuador, but in the present project phase will only be recorded the plants important for certain purposes, resulting in a number of specific end-products; **2. Studies of selected economically important plants,** at this point exemplified by three theses projects of the Bolivian students focused at the genus *Cinchona*, the source of quinine, which also are well represented in Ecuador, the species *Alnus acuminata* which provides wood much used for handicraft and other locally popular wood-products both in Bolivia and Ecuador, and Economically important palms along the eastern slopes of the Andes; **3. Studies of Non Timber Forest Products** particularly in Loja, Ecuador and in Chuquisaca, Bolivia, including the socio-economic value and importance of these products in the local communities; and **4. Development of methodologies to investigate human interactions with plants** as a transversal research subject, supporting the development of adequate research methodologies for the individual research subjects, and evaluating the results in order to elaborate still better methodologies.

9) Collaboration with DANIDA sector programs

It is seen in the list of participants that the three DANIDA sector programmes active in Bolivia were represented during the Inception Workshop in La Paz: viz. Environment (CTA, **Caroline van de Slyes**), Indigenous people/decentralization (CTA, **Hans Hoffmeyer**), and Agriculture (Junior Expert, **Morten Boye Hansen**) (Appendix 7). Various possibilities for potential future collaborations were identified, but here only a couple of the more promising options will be mentioned.

In the case of the indigenous people the workshop analyzed activities that would increasingly focus on alternative income-generating activities, including the extraction and marketing of non-timber forest products (NTFP´s). However, very limited information exist regarding the plant species that produce these products, and research is needed concerning both the use, extraction, and economic importance of particular NTFP´s, and the biological and ecological characteristics of the plant species providing the products, in order to evaluate the potential for at sustainable production and define an adequate management of these resources.

In the case of the environmental sector program the workshop participants analysed the need for research focused at the forests in Chuquisaca, constituting the so called *Bosque Tucumano-Boliviano* which is an endangered forest formation with a fairly limited distribution. There is very little information concerning the local peasants communities living in these forests, both concerning their use of extracted resources, the socio-economic importance of native plant resources, and the potential importance of communal norms regulating their use of forest resources, and such information is necessary in order to promote a more sustainable management of the local forests. The Danish Embassy in Bolivia has recently expressed its interest in active research focused at these issues (Appendix 8), and the faculty and local herbaria at the Universidad de Chuquisaca have also expressed their interest, as well as the mayor of Culpina near a potential research focus area in Chuquisaca (Appendix 9).

10) Projects organization, coordination and administration defined

The operational and organizational aspects of the project have been integrated in three fairly detailed bilateral 'collaboration agreements' between the Principal Project Partner (AAU) and each of the three local project partners UMSA, PUCE and ULN (appearing as the appendices 10, 11 and 12, respectively). Advanced drafts of the agreement were circulated between the project partners before the Inception Workshop, securing that only minor details had to be discussed and clarified during the session in La Paz. Overall, the project organization and administration described in the collaboration agreements, has changed little from the procedures presented in the original project document, and the key persons remain the same except for the UNL, Loja, where Ing. Felìx Hernandez Cueva, director del Area Agropecuario y de Recursos Renovables, has replaced rector Dr. Reinaldo Valaroza as the representative party.

The three bilateral collaboration agreements are similar, although the individual agreements only include the aspects relevant for the particular partner institution. At Instituto de Ecología of UMSA, La Paz, it is the standard procedure to administrate project funding through FUND-ECO, a foundation specifically established to enable a faster and more efficient administration of external funding than what is possible via the university's own administration. It was also due to this basic difference between the three agreements, that it was decided to elaborate separate agreements with each partner institution, rather than as originally envisioned a single collaboration agreement signed by all partners.

The project has a steering committee, and its main function is to approve the annual report before it is submitted to DANIDA. The steering committee has the following members (corresponding to the original project document except that the ULN representative has changed).

Dr. Finn Borchsenius, Biological Institute, University of Aarhus, AAU (secretary)
Dr. Mario Baduoin, Instituto de Ecología, UMSA
Dr. Laura Arcos Terán, Instituto de Ciencias Biológicas, PUCE
Ing. Felix Hernández C., Universidad Nacional de Loja, UNL

	Development objective	**Indicators**	**Assumptions**
0	Bolivia and Ecuador have improved research and educational capacities regarding the diversity, use and management of their native flora and fauna to international standards, and exploit national and internationally produced information to protect, use and manage their natural resources for the well-being of their citizens.	Human resources educated at project institutions contributing to natural resources management in various sectors (education /research, national/ regional/local administration, specific projects). Project results and documentation improving management of specific areas and resources (economic species, vegetation types).	Relatively stable political and economic development in Bolivia and Ecuador. Political will to improve academic education, support research, and further a sustainable management of natural resources.
	Immediate objectives	**Indicators**	**Assumptions**
1	Project partners have improved university education and developed independent capacity to research the use and management of flora and fauna, and universities and other relevant national institutions have developed capacity to elaborate, negotiate and implements projects concerning research and management of biodiversity with third partners.	Candidates educated in Denmark active in research and teaching at local institutions or elsewhere in relevant positions. Curricula permanently upgraded, research expanding, and funding of teaching and research economically sustainable and increasing. Collaboration with third partners concerning natural resource management and/or bio-diversity prospecting.	Relatively stable employment and economy at involved institutions. Will to adapt organizational structures in order to upgrade education and research, and to capture funding through new models of collaboration networking with other public as well as private institutions, organizations and specific projects.
2	Project partners record, describe and publish documentation regarding flora and fauna to local end-users as well as to researchers, and in this process take advantage of modern IT and exploit globally distributed biodiversity data accessible in international databases and informatics facilities.	Quantity, quality and impact of international publications comparable to other internationally orientated research institutions. User-friendly documentation of biodiversity disseminated via IT to a variation of users, and via locally established projects to rural communities.	Upgraded IT-facilities maintained and expanded. Researchers willing to disseminate results to a variation of end-users. Will in project institutions and others relevant national institutions to integrate countries in international biodiversity networks.
3	Project partners and other national institutions apply research conducted with local communities, and national and international biodiversity documentation, to protect, use and manage their flora and fauna.	Useful native species of project countries documented and researched with rural people. Natural resource management projects consulting/collaborating with project partners and/or integrating their staff/candidates.	Will and capacity to collaborate with rural people respecting their rights and interests, and with national/ international institutions in projects facilitating an improved management/ exploitation of biological resources.

Appendix 1. Log frame for BEISA (objectives)

Appendix 1. Log frame for BEISA (objectives)

	Results (Outputs)	**Indicators**	**Assumptions**
1.1.	Project partners and particularly UMSA, La Paz, have improved their capacity of teaching and research regarding sustainable use and management of native flora and fauna, improving and expanding courses and curricula, and actively soliciting funding from national and international institutions and organizations.	New courses elaborated and taught per academic year, and numbers of students as well as other persons attending courses. Research proposals elaborated and financed and annual funding from extern sources.	Little change of key persons in partner institutions. Will to employ candidates trained in Denmark. Will to change curricula, and actively search and expand funding.
1.2.	Bolivian and Ecuadorian undergraduate students from the participating institutions have been trained to their first degree in biodiversity management and utilization at their home-universities.	Numbers of students enrolled for program, and obtaining first local degree. First degree candidates commencing M.Sc. /Ph.D. studies, or actively involved in biodiversity research and management.	Existence of qualified candidates
1.3.	Bolivian and Ecuadorian graduate students from the participating institutions have been trained to M.Sc. and Ph.D. level in Denmark.	Number of students enrolled for program, and numbers graduating with M.Sc. / Ph.D. degrees. Graduated candidates involved in biodiversity research and management at project partner institutions or elsewhere in relevant functions.	Existence of qualified candidates
1.4.	The infrastructure and management of natural history reference collections in the collaborating institutions have improved, particularly the Colección Boliviana de Fauna, at Universidad Mayor de San Andrés, La Paz.	Numbers of extern visitors consulting museum collections, and students undertaking degree studies or other advanced studies associated with museums. Numbers of reference specimens exchanged with other museums, and numbers of new accessions entering reference collection.	Infrastructure investment maintained in adequate state.
2.1.	The IT-infrastructure of the participating institutions has been upgraded, and researchers and technicians have been trained, e.g. enabling IT-based reference collection management.	Curricula of effectuated training courses and lists of participants. Staff-publications and other documentation of upgraded IT serving to analyze and describe biodiversity and manage collections	IT-equipment maintained in adequate state, and trained staff members stay in their positions.

Appendix 1. Log frame for BEISA (results)

2.2.	Project partners have been connected to global biodiversity data facility networks, and local users have been trained, facilitating their participation and integration as equal partners in this global biodiversity database facility.	Bolivia and Ecuador active members in the global biodiversity database networks. Museum staff and associates exploiting biodiversity databases and internet in research and/or reference-collection management.	Trained staff with will to maintain and continuously upgrade their capabilities.
2.3.	Research results are published to a broad spectrum of end-users and both locally, nationally and internationally, taking advantage of modern IT for the elaboration and distribution of relevant results and information, e.g. user-friendly identification and documentation materials.	Enumeration of project partner publications, and user-friendly documentation developed and distributed via IT, e.g. CD's and home-pages maintained by staff/ institutions, and at paper to local/rural communities.	Budgets with funds for international publication. Institutions and staff with will and interest to define the implications of research, and communicate potential relevant applications to local end-users.
3.1.	Researchers have collaborated with local people/ communities, identifying economically important plants in the tropical Andes, and investigating the uses, values and management of individual species or groups of plants, as well as the combined socio-economic importance of species providing non-timber forest products (NTFP) to local people.	International publications and documentation directed to national end-users including rural communities. Lists of economically important species/ uses of plants, and detailed information concerning specific species. Criteria for a sustainable management of selected economic species and/or selected geographical areas. Socioeconomic data concerning NTFP.	Rural communities, preferably near or within protected areas, willing to collaborate, and investigators capable to involve inhabitant as partners during research, and spend time under difficult field-conditions.
3.2.	Researchers have investigated the present and potential uses and values of the native fauna, and particularly of mammals and birds.	Publications and other documentation also directed to local communities. Criteria for the use and management of specific species. Management plans for specific areas.	Rural communities exploiting fauna and researchers capable to investigate.
3.3.	The ecology, biological diversity and distribution of forest communities between 500 and 4.000 m´s elevation in Bolivia have been investigated and mapped, facilitating the general land-use planning, and an improved management of present and potentially economically important plants and animals distributed in these forests.	Permanent plots (area) and transects (length) established and maintained for long-term research. Numbers of researchers and students participating. Peer-reviewed international publications and more popular articles and reports. Maps showing distributions of species and vegetation, and present/ potential land-uses.	Selected protected areas accessible for research, including a minimal infrastructure.

Appendix 1. Log frame for BEISA (results)

	Activities in 1. project phase (year 1-3)	**Activities in 2. (year 4-6) and subsequent project phases**	**Inputs**	**Indicators**	**Assumptions**
1.1.1.	Workshops to coordinate and plan project. Initial workshop Dec. 2003 in Bolivia, meeting in Peru, May 2004, and workshop in Ecuador Oct. 2005 to discuss and evaluate research in economically important species, resume project coordination, contribute to a national Ecuadorian botanical symposium, prepare application for 2. Project phase, etc.	Additional workshops to continue evaluate the capacity of project partners, discuss research results, and to coordinate and plan project activities and results.	Institutional support.	Proceedings, revised project documents, collaboration agreements, symposium contributions, etc.	A positive collaboration between the project partners. Local partners capable to organize events.
1.1.2.	Appraise the qualifications needed by biology candidates from UMSA, and based on this evaluation evaluate the current curriculum, and contribute to an improved curriculum comprising both better existing courses and new courses.	Continuous curriculum evaluation and improvement.	Inter-institutional workgroup	Memos/ informs from workgroup. Proposals for new curriculum.	A positive attitude towards continued curriculum development at all levels in institutions, and committed participation from key persons.
1.1.3	Support aimed to improve specific existing courses, and to develop and teach (partly to be defined) new courses particularly concerning Economic Botany; Natural Products Chemistry; and, Management of Natural Resources.	Elaboration of additional courses concerning the study, description and management of biodiversity.	Researchers in relevant institutions	Materials/ curricula elaborated for specific courses. Attendance of interns as well as students from elsewhere.	Researchers/candidates within project institutions capable and willing to develop, commence, and continue teaching in new and/or updated courses.
1.1.4	Strengthen capacity of the project partners to negotiate projects with/from third parties, promoting additional research in natural resources and their management, and improving the impact and economic sustainability of the projects support to research and education.	Expanded effort to further national institutions capacity to collaborate with third partners investigating and exploiting biodiversity to the benefit of their citizens.	Inter-institutional workgroup	Strategic plan to enforce institutional capacity. Increased extern funding promoting sustainability of teaching and research.	Will particularly at QCA to share accrued experiences with the other institutions.
1.2.1.	Train pre-graduate students for their first degree (biólogo, licenciatura, ing. forestal, agrónomo) at the local institutions, integrating course work with specific thesis research focused at economically important plants.	Additional pre-graduate students selected and trained.	Local thesis Supervisors	Progress of individual students during training. Thesis work and publication of results.	Promising candidates for program present; and advisors to guide thesis research projects.

Appendix 1. Log frame for BEISA (activities)

	Activities in 1. project phase (year 1-3)	**Activities in 2. (year 4-6) and subsequent project phases**	**Inputs**	**Indicators**	**Assumptions**
1.3.1.	Select and prepare 4 Bolivian and 1 Ecuadorian graduate student for M.Sc. studies abroad.	Select and prepare students particularly for Ph.D. studies	Preparatory courses	Expatriate students with necessary capacities.	Promising candidates for program present.
1.3.2.	Train 4 Bolivian and 1 Ecuadorian graduate student in biodiversity research and management in Denmark, commencing with 10 month coursework, and finishing with up to 6 months of thesis writing and defense.	M.Sc. candidates trained to Ph.D. level, and additional pre-graduate students trained to M.Sc. level.	Courses taught in English. Thesis supervisors	Course exams of individual students Presentations of thesis works.	Qualified students present, and candidates capable to adapt to life in Denmark.
1.3.3.	Supervise individual M.Sc. candidates (after coursework in Denmark) during up to one year long local thesis research projects including field work focused on economically important species, and providing the results enabling them subsequently to write and defend their thesis reports (in Denmark).	Both M.Sc. and Ph.D. students undertaking thesis research in Bolivia and Ecuador.	Local research supervisors Field work localities with basic facilities.	Progress reports during research. Afterwards the publication of results both nationally and internationally, and if relevant to local communities.	Presence of advisors to guide thesis research projects.
1.4.1.	Identify needs and install equipment to upgrade zoological biodiversity reference collection in the ‘Colección Boliviana’ de Fauna, La Paz.	Continue to improve Colección de Fauna, La Paz	Local staff contribution	Installed equipment functional.	Specialists available to define and supervise investments
1.4.2.	All activities will be during 2. And subsequent project phases.	Train reference-collection staff in how to establish, handle, manage, and preserve particularly zoological natural history reference collections.	None in 1. Project Phase.	Materials elaborated for training program. Progress reports from lecturers.	Specialist from Danish museums available for training program.
1.4.3.	All activities will be during 2. And subsequent project phases.	Provide specialized training to selected reference-collection staff members in Denmark.	None in 1. Project Phase.	Concluding reports.	Staff members committed to be trained at the Zoological Museum, University of Copenhagen.
2.1.1.	Identify needs and install IT-infrastructure for management of biodiversity data including reference collections at participating institutions, including their connection to international biodiversity IT-facilities.	Additional analysis of IT-infrastructure, and based on this work probably more IT-investments.	IT-hardware and software	Documentation for installation of equipment and its functionality.	Capable specialists available to define and supervise investments

Appendix 1. Log frame for BEISA (activities)

	Activities in 1. project phase (year 1-3)	**Activities in 2. (year 4-6) and subsequent project phases**	**Inputs**	**Indicators**	**Assumptions**
2.1.2.	Train personal and students at participating institutions in the use of IT to process and analyze biodiversity data, including how to handle and catalogue their reference collections.	Additional training.	Courses and individual training	Materials elaborated and concluding report from lecturers.	Reference collection staff committed to improve capacities.
2.2.1.	Facilitate that relevant persons at local institutions can take advantage of international biodiversity databases, and may participate as equal partners in these global IT-facilities.	Expanded effort to integrate global IT-facilities in all relevant activities of the involved institutions.	Mostly individual support to key persons.	Materials elaborated and concluding report from lecturers. Participation in specific training.	Staff committed to apply global IT-facilities, and institutions committed to involve countries.
2.3.1.	Publish results of research and human capacity building in peer-reviewed journals, international magazines, local popular papers, at conferences and other meetings locally and internationally.	Intensify publishing both to scientific communities, and to different segments of the national publics.	Costs of publishing. Contacts to press, etc.	Specific products including proceedings and reports/informs from seminars, meetings, etc.	Researchers at partner institutions committed to publish their results at various levels.
2.3.2.	Develop user-friendly documentation of biodiversity, including its identification, use, value and management, and disseminate it through CDs and internet web-pages maintained by the participating institutions, and targeted to a variation of users ranging from scientists in related fields to students and extension workers.	Expand the elaboration and dissemination of user-friendly documentation with more biodiversity data, as well as updated/improved IT.	Guidance of involved researchers and students.	Specific products elaborated. Regular updating of web-pages.	Successful updating of staff capacity. Commitment of staff and institutions.
2.3.3.	Elaborate documentation concerning the value, use and management of natural resources particularly targeting end-users in rural communities (mainly peasants), and if possible distribute materials via locally established institutions and projects.	Develop materials targeting local end-users concerning any research involving specific communities and their experiences and knowledge.	Cost of printing, distribution, etc.	Specific products and quantities distributed. Use of materials, e.g. for training sessions in particular communities.	Commitment to disseminate results to local end-users. Potential collaborating institutions. Funding or logistic support from third partners.

Appendix 1. Log frame for BEISA (activities)

	Activities in 1. project phase (year 1-3)	**Activities in 2. (year 4-6) and subsequent project phases**	**Inputs**	**Indicators**	**Assumptions**
3.1.1.	Inventory of economically important plant species in the tropical Andes, with descriptions of individual species, data concerning the ethnic groups that use them, information concerning their present uses and values, and their management and potentials.	Continue and complete inventory of Bolivian useful plants, corresponding to the Ecuadorian inventory (to be completed during 1. Phase).	The diverse information already found in libraries, herbaria, etc.	Complete inventory in Ecuador. Database with information concerning important species in Bolivia established but not yet finished.	Capability to systemize and analyze hitherto scattered information. Collaboration with relevant institutions/ organizations investigating/ documenting uses of plants.
3.1.2.	Local, national or regional studies focused at species of plants applied for selected purposes particularly in Bolivian forest regions, including their economic and cultural values.	Supplement 1. Phase literature studies with active field programs. Investigate additional categories of plant uses particularly in Bolivia.	First mainly existing information, later field research.	Detailed information regarding specific use-categories. Recommendations to different groups of users.	Capability to define and implement field studies providing specific information to supplement surveys of existing information.
3.1.3.	Investigate the uses, economic importance, traditional management, ecology, variation and distribution of important economic plants (or groups of plants), facilitating improved valuation and management of these species.	Expanded comprehensive studies of economically important species, providing the scientific basis for sustainable management.	Diverse. Inputs from/ with various researchers/ disciplines/ methods.	Detailed information regarding economically important plants. Recommendations to local users as well as decision-makers.	Researchers capable to integrate studies of different aspects concerning the biology, ecology, and use of specific plants.
3.1.4.	Study the non-timber forest products applied in selected communities particularly in or near protected areas, and in severely disturbed as well as more intact vegetation. Evaluate their present socio-economic importance as well as their potential uses and economic value.	Socioeconomic studies evaluating the combined socioeconomic importance of native floral and faunal resources for local people in various vegetation zones.	Good field logistics. Extended periods in selected communities.	Economic analysis. Recommendations of actions to preserve or expand resources.	Local communities willing to collaborate with researchers, and the latter capable to collaborate with rural people.

Appendix 1. Log frame for BEISA (activities)

	Activities in 1. project phase (year 1-3)	**Activities in 2. (year 4-6) and subsequent project phases**	**Inputs**	**Indicators**	**Assumptions**
3.1.5	Elaborate, evaluate and improve methodologies adequate to investigate the mutual relationships and interactions between human communities and native plant resources, including both concrete uses of products from plants, and local perceptions of these resources and their values.	Integrate experiences from project and elsewhere in book with guidelines for research in human use and management of plant of native vegetation.	Experiences from this project as well as elsewhere.	Specific improvements of methodologies, and a close integration between the individual studies of economically important species.	Active collaboration in methodological development from researcher's en charge of the previous components (tasks). Capacity to integrate experiences from elsewhere.
3.2.1.	All activities will be during 2. And subsequent project phases.	Investigate the use and value of local fauna, particularly mammals and birds, considering hunting, tourism and other options.	None in 1. Project Phase.	Detailed information regarding the economic potential of local fauna. Suggestions for concrete actions.	Field logistics in areas with native fauna and local communities. Researchers capable to collaborate with local people.
3.3.1.	All activities will be during 2. And subsequent project phases.	Install permanent plots at selected forest localities in Bolivia, facilitating long-term studies of forests dynamics, dominance patterns, etc.	None in 1. Project Phase.	Progress reports describing activities/ advances/ results in specific field sites. Publications.	Access to adequate areas, and capability to set up and organize experimental field sites.
3.3.2.	All activities will be during 2. And subsequent project phases.	Study the diversity, variation and distribution patterns of selected forest species (or groups/families) along the east Andean slopes.	None in 1. Project Phase.	Progress reports, final reports and publications. Communication of recommendations to projects/ authorities.	Commitment and capability to study biological variation along Andean slopes (from Venezuela to Argentina)
3.3.3.	All activities will be during 2. And subsequent project phases.	Elaborate maps of vegetation in Bolivia, combining aerial photos/satellite images and biodiversity information.	None in 1. Project Phase.	Specific maps. Their application for land-use planning, etc.	Human resources capable to analyze vegetation images, and to combine with "ground data".

Appendix 1. Log frame for BEISA (activities)

Abbreviations (bold) for institutions and persons affiliated the individual institutions (with coordinator first).

Bo	Universidad mayor de San Andrés, La Paz, Bolivia (UMSA)	**Morae**s, M , **Carre**tero, A., **Maldo**nado, C., **Pania**gua, N., **Sanjí**nez, A.
E1	P. Universidad Católica de Ecuador, Quito, Ecuador (PUCE)	**Navar**rete, H., **Torre**s, L.
E2	Universidad Nacional de Loja, Ecuador (UNL)	**Aguir**re, Z., **Sanch**ez, O.
Da	University of Aarhus, Aarhus, Denmark (AAU)	**Kvist**, L.P., **Balsl**ev, H., **Borch**senius, F., **Oellg**aard, B.

Immediate objective / Result / Activity / Task	Year	03.	2004.				2005.				2006.			Responsible	Principal participating persons
	Trimester	4	1	2	3	4	1	2	3	4	1	2	3	Institutions	(not necessarily complete)
1 1 1 Workshops to coordinate, plan and discuss activities and results.															
1 Plan, execute and report first workshop to coordinate project		xxx	xx											Bo Da	Morae Kvist
2 Inter-institutional work group meets in Trujillo, Peru				x										Da	Kvist
3 Prepare workshop in Loja including participation in symposium							xxx	xxx						El Eq	Aguir Navar Kvist
4 Workshop in Loja to discuss results, plan 2. project phase, etc.									x					El Eq	Aguir Navar
1 1 2 Appraise existing curriculum and support curriculum development (particularly at UMSA).															
1 Interinstitutional workgroup evaluates existing curriculum				xxx										Bo E1 E2 Da	Morae Navar Borch
2 Workgroup defines contributions to new curriculum				x	xxx									Bo E1 E2 Da	Morae Navar Borch NN
3 Continued monitoring of curriculum development						xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	Bo E1 E2 Da	Morae Navar Borch NN
1 1 3 Improvement of/elaboration of specific courses															
1 Support improvement of existing courses.					xxx	xxx	xxx	xxx						Bo E1 E2 Da	NN (depending on specific subjects)
2 Elaboration of Economic Botany course					xxx	xxx	xxx	xxx						Bo E1 E2 Da	Kvist Morae Aguir Navar NN
3 Teaching of new Economic botany Course								xxx	xx		xxx			Bo E1 E2 Da	Coordinators Invited lectures
4 Natural Products chemistry (integrated with previous course)									xx		xxx			Bo Da	Lecturer from Farm. Univ, Cop. NN
5 Elaboration/teaching of Natural Resource management course											xxx	xxx		Bo E1 E2 Da	Coordinators Invited lectures
1 1 4 Strengthen capacity to negotiate projects including funding from third parties															
1 Interinstitutional workgroup evaluates existing experiences							xxx	xxx						Bo E1 E2 Da	Balsl Coordinators NN
2 Exchange of experiences and promotion of new intitiatives									xxx		xxx	xxx	xxx	Bo E1 E2 Da	Balsl Coordinators NN

Immediate objective / Result / Activity / Task	Year	03.	2004.				2005.				2006.			Responsible Institutions	Principal participating persons (not necessarily complete)
	Trimester	4	1	2	3	4	1	2	3	4	1	2	3		
1 2 1 Train pregraduate students for their first degree at local institution															
1 Two pregraduate local M.Sc. students in Loja, Ecuador			xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx		E2	Aguir Sanch NN
2 Yet to select pregraduate students in Bolivia/ Ecuador (Quito)					xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	Bo E1	Morae Navar Balsl
1 3 1 Select and prepare Bolivian and Ecuadorian students for studies abroad															
1 Selection and preparation of 5 M.Sc. students		xx	x											Bo Eq	Morae Navar Balsl
1 3 2 Train graduate students in biodiversity research and management in Denmark															
1 Coursework (60 ECTS) of 5 students at University of Aarhus			xx	xxx	xxx	x								Da Bo E1	Borch Balsl Kvist NN
2 Detail planning of individual thesis research projects					xx	x								Da Bo E1	Balsl Borch Oellg Kvist NN
3 M.Sc. thesis writing and defense at University of Aarhus									xx	xxx	xx			Da Bo E1	Balsl Borch Oellg Kvist NN
1 3 3 Supervise M.Sc. Students during thesis research in home countries															
1 Four thesis research projects at UMSA, Bolivia							xxx	xxx	xxx	x				Bo	Morae NN
2 One thesis research project at PUCE, Ecuador							xxx	xxx	xxx	xxx				E2	Navar NN
1 4 1 Upgrade zoological reference collection in Colección Boliviano de Fauna, La Paz															
1 Identify and priority infrastructure needs				xxx										Bo	NN
2 Acquire, install and maintain new as well as existing equipment					xxx			x				x		Bo	NN
2 1 1 Improvement of IT-equipment particularly in the Bolivian National Herbarium															
1 Identify, priority and install IT-equipment				xxx	xxx	xxx								Bo	NN

Appendix 2. Work plan for 1st Project Phase of BEISA

Immediate objective / Result / Activity / Task	Year	03.	2004.				2005.				2006.			Responsible Institutions	Principal participating persons (not necessarily complete)
	Trimester	4	1	2	3	4	1	2	3	4	1	2	3		
2 1 2 Train staff, students and other relevant person in using IT to investigate biodiversity															
1 Training of students integrated in their stays in Denmark			xx	xxx	xxx	xx				xx	xx			Da Bo E1	Borch NN
2 Training at local instiutitons in Bolivia and Ecuador								xxx	xxx				xxx	Bo Da	NN Students back from Denmark
2 2 1 Promote the application of and the integration with international biodiversity IT-facilties															
1 Training of relevant persons within partners institutions							xxx	xxx	xxx	xxx				Bo E1 E2 Da	Borch Navar NN
2 Promotion of biodiversity-facilities in others national institutions									xxx	xxx	xxx			Bo E1 E2 Da	Morae Balsl NN
2 3 1 Publication of scientific papers as well as popular contributions															
1 Book with ethnobotanical data from herbario QCA		xxx	xxx	xxx	xxx									E1 Da	NN Navar
2 Book describing all economically important Ecuadorian plants									xxx	xxx	xxx	xxx		E1	Torre Navar
3 Book describing extracted products and plants in Loja, Ecuador									xxx	xxx	xxx	xxx			Aguir Sanch
4 Book concerning aspects of economic botany in Bolivia							xxx	xxx	xxx	xxx	xxx	xxx		Bo Da	Morae Kvist Balsl
5 Contributions to proceedings from symposium in Peru				xxx										Da E2 E1 Bo	Participants
6 Contributions to proceedings from symposium in Ecuador						xxx	xxx	xxx	xxx	x				E2 E1 Bo Da	Aguir Navar Morae Kvist Balsl
7 Scientific publication by project researchers elsewhere				xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	Bo E1 E2 Da	Potentially all
8 Popular presentation/distribution of activities and results						xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	Bo E1 E2 Da	Students and others
2 3 2 Develop user-friendly documentation of biodiversity via internet accessible data-bases, etc.															
1 Economically important plants in Ecuador							xxx	xxx	xxx	xxx	xxx	xxx	xxx	E1	Torre Navar Borch
2 Use and management of palms in Bolivia								xxx	xxx	xxx	xxx	xxx	xxx	Bo Da	Pania Borch Morae Balsl
2 3 3 Target documentation concerning plant resources to rural end-users															
1 Particularly too communities in Loja, Ecuador									xxx	xxx	xxx			E2	Sanch NN Aguir
2 Particularly o communities in Chuquisaca, Bolivia									xxx	xxx	xxx			Bo	Carre NN Morae
3 Particularly to communities in La Paz (Yungas), Bolivia									xxx	xxx	xxx			Bo	Sanji Maldo Pania Morae NN

Appendix 2. Work plan for 1st Project Phase of BEISA

Immediate objective / Result / Activity / Task	Year	03.	2004.				2005.				2006.			Responsible Institutions	Principal participating persons (not necessarily complete)
	Trimester	4	1	2	3	4	1	2	3	4	1	2	3		
3 1 1 Inventory of economically important plant taxa															
1 Enter relevant information from Ecuador in database		xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx				E1	Torre Navar
2 Analyze information in data base concerning Ecuadorian plants							xxx	xxx	xxx	xxx	xxx	xxx		E1 Da	Torre Navar
3 Commence database with relevant information from Bolivia								xxx	xxx	xxx	xxx	xxx	xxx	Da E1	Kvist NN
3 1 2 Applications of plants for selected, specific purposes															
1 Antiparasitic plants applied in western tropical South America			xx		xx			xxx						Da	Kvist Farmaceutical University. Cop.
2 Plants used for medicine in Bolivian forests					xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx		Da Bo	Kvist NN
3 Extraction for construction and technical uses in Bolivian forests							xxx	xxx	xxx	xxx	xxx	xxx		Da Bo	Morae Pania Kvist NN
3 1 3 Studies of selected economically important plant species															
1 Selected Rubiaceae in Andean montane forests							xxx	xxx	xxx	xxx	xxx	xxx		Bo Da	Maldo Morae Kvist NN
2 Alnus acuminata (Aliso) in Bolivia and Ecuador							xxx	xxx	xxx	xxx	xxx	xxx		Bo Da	Sanda Morae Navar NN
3 Selected important/ promising palms in Bolivian montane forests							xxx	xxx	xxx	xxx	xxx	xxx		Bo Da	Pania Morae Balsl NN
3 1 4 Socioeconomic importance and management of NTFP species															
1 NTFP in southern Ecuador and particularly in Dept. Loja			xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxxxxx			Bo	Aguir Sanch NN
2 NTFP in Bolivia, and particularly in Dept. Chuquisaca.							xxx	xxx	xxx	xxx	xxx	xxx		E2	Carra Morae NN
3 1 5 Development of methodologies to investigate human interactions with plants															
1 Elaborate methodologies appropriate for research components			xxx	xxx	xxx	xxx	xxx	xxx						Da Bo E2 E1	Kvist Aguir Sanch Carre Balsl
2 Evaluate/ compare results attained using different methodologies									xxx	xxx	xxx	xxx		Da Bo E2 E1	Kvist Aguir Sanch Carre Balsl

Phase	Main activities during individual 3-year project phases	Major outputs (milestones) before next project phase
1	Training of human resources to M.Sc. Level, and to first local degree	First M.Sc. Candidates graduated in Aarhus
	Initiate curriculum development particularly at UMSA	Project partners have contributed to upgrade Biology curriculum at UMSA in Bolivia
	Establish IT-infrastructure and train use of IT to analyze biodiversity data	Modern IT including use of international databases integrated in local biodiversity research
	Initiate research in economically important plant species	Inventory of ecomomically important plant species in Ecuador completed
		Use and management of specific economically important plant species investigated
	Results from research during 1st phase dissimilated to end-users	Data regarding economically important plants published nationally and internationally
	Establish structures to continue institutional capacity building	Continuous exchange of experiences at various levels between partner institutions
2	Training of human resources to M.Sc. and Ph.D. level	First Ph.D. candidates graduated in Aarhus, and local training to Master level initiated
	Upgrading of curriculum at local institutions with M.Sc. courses	Newly developed M.Sc. courses taught at partner institutions
	Facilitate access to biodiversity data via internet connected databases	Ecuador and Bolivia take advantage of international biodiversity facilities
	Initiate research in ecology and diversity of forest communities in Bolivia	Field sites established and data gathering and analyses advancing
	Strengthen research in economically important species	Inventory of economically important plant species in Bolivia completed
		Comprehensive studies of economically important species including ecological aspects
	Results from 2nd phase disseminated in a variety of ways to end-users	Publication via reviewed journals, popular journals, internet web-pages, CD´s etc.
	Integrate partners into international biodiversity research collaborations	Research networks improve local research and contribute to partner institutions budgets
3	Integrate upgraded human resources in research, teaching and training	Trained candidates active as reseachers/teachers, and guiding local M.Sc./Ph.D. Candidates
	Streghtenening of local curricula to full M.Sc. Programmes	Two of the partner institutions offering M.Sc. programmes meeting international standards
	Develop increasingly sophisticated and independent research agendas	Major overviews of economically important species and biodiversity in the tropical Andes
	Investigate complex interactions between natural resources and man	New methods to apply biodiversity research and its results in sustainable development
	Results disseminated to end-users and stake-holders	Institutions, projects and communities involved in development prominent among end-users
	Involve partners in management and exploitation of national biodiversity	Funding accrued from international projects/networks promote activity at partner institutions
4	Support upgraded human resources in securing local leadership	Project candidates promoting active and independent leadership at local institutions
	Supplement local curricula with courses specific for Ph.D. Students	Two of the partner institutions offering Ph.D. Programmes meeting international standards
	Support locally defined and locally initiated research activities	Independent research results based on local initiatives
	Further project partners capacity to collaborate with third partners	Economic sustainability of research and teaching at partner institutions
	Integrate biodiversity research into national and regional agendas	Biodiversity information contribute to a more sustainable management of natural resources
	Support the involvement of project countries in biodiversity prospecting	Bolivia and Ecuador exploite the economic value of their biodiversity to benefit their citizens

Appendix 3. Time schedule for four 3-year BEISA project phases from 2003 to 2015

Agenda: Taller inicial del proyecto

Biodiversidad y especies económicamente importantes de los Andes tropicales – Una colaboración de investigación entre Bolivia, Ecuador y Dinamarca

Lugar: Auditorio del Instituto de Ecología, C/27 Campus Universitario, Cota Cota, La Paz (tel. 591 2 2792416, 2792582, fax 591 2 2797511)

Lunes 8 de diciembre

9 am – 9:30 am	Presentación de la logística del taller Palabras de bienvenida a cargo del Director del Instituto de Ecología, Dr. Mario Baudoin
9:30 am-12:30 pm	**Organización y coordinación del proyecto** Organigrama, cargos y funciones Coordinadores Comité de Supervisión Flujograma
14:30-18 pm	**Manual de funcionamiento interno del proyecto** Mecanismos de coordinación (Bolivia-Ecuador-Dinamarca) Cotutoría académica y de investigación Autoría de publicaciones Depósito de bienes y activos fijos

Martes 9 de diciembre

9 am-12:30 pm	**Marco de la investigación del proyecto** Visión y perfil del proyecto (M. Moraes) Presentaciones de perfiles los postulantes estudiantes del proyecto, Bolivia (N. Paniagua, C. Maldonado, A. García, R. López) Ecuador (O. Sanchez, L. de Torres) Plan de trabajo del proyecto en el componente de investigación
14:30-18 pm	**Marco del programa académico del proyecto** Trayectoria y prioridades de la Universidad de Aarhus (H. Balslev) Plan de trabajo del proyecto en el componente académico (F. Borchsenius)

Miércoles 10 de diciembre

9:15 – 11:30 am	Palabras de bienvenida a cargo del Director del Instituto de Ecología, Dr. Mario Baudoin Palabras de Viceministro de Recursos Naturales y Medio Ambiente,

	Dra. María Marconi Presentación de los antecedentes y del proyecto a cargo del Dr. Henrik Balslev
11:30 am	Refrigerio y vino de honor
14:00-18 pm	**Contexto de la colaboración Bolivia – Dinamarca** El programa del medio ambiente (CTA, C. van der Sluys) El programa de pueblos indígenas/decentralización (CTA, H. Hoffmeyer) El programa de agricultura (Experto júnior, M. Boye Hansen). Biocomercio, Foundación Bolivia Exporta (Ing. B. Zapata) Red de Intercambio de Información, CHM (Ing. V. Helguero) El proyecto FOMABO en Cochabamba/Sucre (Dr. J. Noé Hansen) Experiencias de Danida en Sucre (Dr. H. B. Pedersen) Experiencias de Danida en Loja, Ecuador (Ing. H. Zhoffre, ULN) Experiencias de Danida en Quito, Ecuador (Dr. H. Navarrete, PUCE)

Jueves 11 de diciembre

9 am-12:30 pm	**Actividades derivadas del proyecto en investigación y académico** Cursos en Dinamarca/ en Bolivia y Ecuador Temas de los cursos Publicación de resultados Participación en eventos
14:30-18 pm	**Actividades de administración y seguimiento** Administración (con FUNDECO) para detalles del manejo Procedimientos administrativos Rendición de cuentas Auditorias Contratos Informes técnicos y financieros

Viernes 12 de diciembre

9 am-12:30 pm	**Plan de trabajo 2003-2006** Presupuesto Actividades de investigación y académico Administración
14:30-18 pm	**Conclusiones** Pautas de funcionamiento interno Cronograma: presupuesto e indicadores de avance Requerimiento de continuidad y perspectivas de financiamiento Interacción con otros proyectos

Appendix 7. Participants in BEISA Inception Workshop, Dec. 8-12, 2003

Asistentes: Taller inicial del proyecto

Biodiversidad y especies económicamente importantes de los Andes tropicales – Una colaboración de investigación entre Bolivia, Ecuador y Dinamarca

Viceministro de Recursos Naturales y Medio Ambiente, Directora General de Biodiversidad: Dra. Maria Marcóni
Sistema Nacional de Areas Protegidas: Lic. Marco O. Ribero
CHM, Estrategia Nacional de Conservación y Uso de la Biodiversidad: Ing. Verónica Helguero
Departamento de Vida Silvestre, Dirección General de Biodiversidad, Ministerio de Desarrollo Sostenible: Lic. Alfonso Llobet
Fundación Bolivia Exporta: Bio-comercio, Ing. Beatriz Zapata

Director del Instituto de Ecología: Dr. Mario Baudoin
Director Ejecutivo de FUNDECO: Dr. Luis Alberto Rodrigo
Director del Herbario Nacional de Bolivia: Dr. Stephan Beck
Director de la Colección Boliviana de Fauna: Lic. María Esther Pérez
Investigadora del herbario, UMSA: Lic. Rosa Isela Meneses
Investigadora del herbario, UMSA: Lic. Esther Valenzuela
Investigador del herbario, UMSA: Lic. Alfredo Fuentes
Investigadora del herbario, UMSA: Ing. Alejandro Arauje
Investigadora del herbario, UMSA: Lic.Teresa Ortuño

Programa de Medio Ambiente, DANIDA: CTA Carolina Van der Sluys,
Programa de Pueblos Indígenas/decentralización, DANIDA: CTA Hans Hoffmeyer
Programa de agricultura, DANIDA: JPO Morten Boye Hansen
Proyecto Danida en Sucre: TA Dr. Henrik Borgtoft Pedersen
Proyecto Enreca en Cochabamba: Dr. Jens Noe Hansen

Director del proyecto, BEISA: Dr. Henrik Balslev
Director del herbario AAU, Universidad de Aarhus: Dr. Finn Borchsenius
Coordinadora del BEISA, Instituto de Ecología, UMSA: Dra. Mónica Moraes
Director del herbario, Pontificia Universidad Católica del Ecuador: M.Sc. Hugo Navarrete
Coordinador en la Facultad de Loja: Ing. Zhoffre Aguirre
Coordinador del proyecto, BEISA, Universidad de Aarhus: Dr. Lars Peter Kvist

Postulantes a programa académico de BEISA

Bolivia:	Lic. Narel Paniagua,
	Lic. Carla Maldonado
	Lic. Adriana Sanjínez
	Lic. Alain Carretero
Ecuador:	Lic. Lucía de la Torre
	Ing. Orlando Sánchez