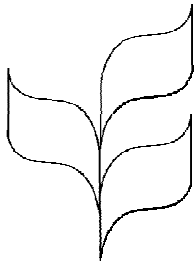




**CBD**



**CONVENTION ON  
BIOLOGICAL DIVERSITY**

Distr.  
GENERAL

UNEP/CBD/COP/4/Inf.7  
4 May 1998

ENGLISH ONLY

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CONFERENCE OF THE PARTIES TO THE  
CONVENTION ON BIOLOGICAL DIVERSITY  
Fourth meeting  
Bratislava, 4-15 May 1998

SYNTHESIS OF CASE-STUDIES ON BENEFIT SHARING

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## Introduction

1. Under various decisions of the third meeting of the Conference of the Parties, Governments, international agencies, research institutions, representatives of indigenous and local communities and non-governmental organizations were invited to submit case-studies to the Executive Secretary on different thematic areas and cross-cutting issues. These include case-studies related to agricultural biological diversity (decision III/11 paragraphs 10, 11 and annex 3); local and indigenous communities (decision III/14 paragraph 3); access to and sharing of benefits arising out of the use of genetic resources (decision III/15 paragraph 2 (a)); incentive measures leading to benefit-sharing (decision III/18 paragraph 7).

2. On the basis of those decisions, the Secretariat has developed an indicative outline for case-studies on benefit-sharing arrangements. The call for case-studies and the outline have been made available on the Internet (<<http://www.biodiv.org/bs/callbfl.html>>) and were distributed at the third meeting of the Subsidiary Body of Scientific, Technological and Technical Advice, held in Montreal from 1 to 5 September 1997. A reminder was sent out in October 1997. The call for case-studies is attached as Annex IV to the present document.

3. By 22 April 1998, the Secretariat has received 15 case-studies, one of which compares two cases linked to one user institution, and one comparison between two of the case-studies. Two case-studies were submitted by Governments: India and the Republic of Mali. Two case-studies and their comparison were submitted by the United Nations Environment Programme, the other 11 by non-governmental organizations and individuals. In order to facilitate the reading of the synthesis, a key word has been attributed to every case-study. A list of the keywords and the corresponding case-studies is attached as Annex I below.

4. The present synthesis assumes familiarity on the part of the reader with the concept of the sharing of benefits arising out of the use of genetic resources and related issues such as access, biotechnology, technology transfer, and the knowledge, innovations and practices of local and indigenous communities. Documents UNEP/CBD/COP/4/21 and UNEP/CBD/COP/4/23 provide an overview of the current debate and an indication of the implementation regarding access to genetic resources.

### I. OVERVIEW OF THE CASE-STUDIES SUBMITTED

5. The call for case-studies covers a broad range of benefit-sharing arrangements. Three studies consider benefit-sharing through sustainable use (Mali on fishery, Prunus on phytomedicine, Zimbabwe on wildlife). The other 12 case-studies focus on bioprospecting, i.e. the search of genetic material for pharmaceutical, industrial, biotechnological, agricultural and other applications. UCDavis covers agricultural use and Yellowstone deals with biotechnological applications. The other 10 case-studies focus on drug development (India/Kani, Fiji, Suriname, AfricanICBG, ICBD, Nigeria, NCI, Ancistrocladus, Cartel). However, some of the studies on bioprospecting include sustainable use whereby the supply of raw material by the community or country of origin being one aspect of benefit-sharing. Those case-studies give a broader perspective by including sustainable use of biological

diversity (India/Kani, Suriname, NCI, partly ICBG). Mali is the only case-study that focuses on benefit-sharing amongst one group of stakeholders in one area, namely, the fishermen in Inner Niger Delta. This study is about the fair management of a resource and the benefits derived from harvesting that resource.

6. Micro-organisms are the object of only one case-study (Yellowstone). Animal biological resources are the object of two case-studies (Mali, Zimbabwe). The other 12 focus on plant genetic and biological resources.

7. Two case-studies cover the same case: India and Kani both analyse the arrangement of the Tropical Botanic Garden and Research Institute with the Kani tribe in Kerala, India, but draw different conclusions. One case-study describes a programme for bioprospecting of the International Cooperative Biodiversity Group (ICBG). The study is a mixture between a report of the work and the policy concept of ICBG. Two case-studies AfricanICBG and Suriname, look into two different projects of the ICBG, which means that in fact three out of 15 case-studies cover the same programme. Another case-study involving a government agency of the United States analyses two different cases of drug discovery and development spanning 40 years within the same institution, the United States National Cancer Institute (NCI). The case on Topotecan in NCI does not describe a benefit-sharing arrangement but is rather used as an example against which the development of the benefit-sharing arrangement of Calandolide is described. The synthesis will therefore not look at the case of Topotecan of NCI but refer the reader to the case-study itself.

8. For a better understanding of the synthesis, there follows a brief overview of the case-studies.

9. AfricanICBG (no. 6). African ICBG, one of five programmes currently supported by the International Cooperative Biodiversity Group programme (see ICBG), is a collaboration of over 16 institutions in Africa and the United States, including the Bioresources Development and Conservation Programme (BDCP) (NGO in Africa), the Walter Reed Army Institute of Research (Washington, D.C.), the Smithsonian Tropical Research Institute, the University of Dschang (Cameroon) and the International Centre for Ethnomedicine and Drug Development (Nigeria). The main focus of the African ICBG project is the establishment of an integrated programme for the discovery of biologically active plants for drug development, especially for tropical diseases, biodiversity conservation, and at the same time ensuring that local communities and source countries derive maximum benefits for their biological resources and their intellectual contribution. This is sought by active involvement of universities, traditional healers and NGOs from Africa. The programme has established trust funds for long-term management of financial benefits.

10. Ancistrocladus (no.7). The United States National Cancer Institute (NCI) developed the anti-HIV compound michellamine B which is derived from Ancistrocladus korupensis. Original collections of that rainforest liana were conducted within the Korup National Park in Cameroon. Process benefits derived from joint research and investment in a domestication and cultivation programme. Negotiations between NCI, the Government of Cameroon, and other

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domestic stakeholders grinded to a halt due to the high toxicity of the compound.

11. Cartel (no. 14). The pilot phase of a project entitled "The Transformation of Traditional Knowledge into trade Secrets" is underway in Ecuador. The project starts out from the premise that biological diversity shares a similar cost structure to that of an information good: extremely high opportunity costs in the maintenance of habitats but extremely low costs of accessing components of those habitats. It is argued that as a parallel to patents, copyrights and trademarks, which are accepted as instruments to enable the emergence of a market for information goods, oligopoly rights over genetic resources should be allowed to enable the emergence of a market for habitats. Thus, the project attempts to achieve a cartelization of traditional knowledge within Ecuador. It is a collaborative efforts by Inter-American Development Bank and several NGOs. The project sets out to catalogue traditional knowledge and maintains the database at regional centres, which is safeguarded through a hierarchy of access restrictions. After filtering the knowledge, what is not yet public will be negotiated as a trade secret in a Material Transfer Agreement (MTA). The benefits from the MTA are to be split between the Government and all communities that deposited the same knowledge in the database.

12. Fiji (no. 3). The University of the South Pacific (USP) received a grant from the Biodiversity Conservation Network (BCN) to fund research and bioprospecting activities in conjunction with community development and conservation efforts. USP works with the community of Verata and Strathclyde Institute of Drug Research, Glasgow, Scotland, which acts as a broker. The project focus on community development and conservations and ethnobotanical collections.

13. ICBG (no.11). The International Cooperative Biodiversity Groups (ICBG) are a programme jointly sponsored by the United States National Institutes of Health (NIH), the National Science Foundation (NSF) and the United States Agency for International Development (USAID) to address the related issues of biodiversity conservation and the promotion of sustained economic development through drug discovery from natural products. The programme currently funds five groups working in eight countries in Latin America and Africa. Every group has one academic principal investigator as the programme leader. The projects have a duration of five years with the possibility of extension (see AfricanICBG, Suriname).

14. India (no.1). The wild plant Trichopus zeylanicus has anti-fatigue and energetic properties. The lead was provided by a tribal community, the Kani, inhabiting the south-western Ghat region of Kerala State in India. Their use of the plant has led to bioprospecting and development of a scientifically validated drug "Jeevni" by the Tropical Botanic Garden and Research Institute (TBGRI). The drug was licensed to a phytomedical company for 2 per cent licence fee. The TBGRI shares those benefits with the Kani on equal terms.

15. Kani (no.4). This study considers the same case as India.

16. Mali (no. 2). Partners in this project are governmental research and development agencies, a technical regional committee and decentralized bodies of management of fisheries which represent local communities. The project

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considers the Inner Delta of the Niger in Mali and strives for a sustainable management of fish resources with a fair and equal distribution of the benefits amongst the communities.

17. NCI (no.13). United States statutory authority permits the National Cancer Institute to enter into certain collaborative partnerships with academia, the private sector, and other public research organizations for the development and licensing of drug candidates. The case-study explores the evolution of the NCI approach to access and benefit sharing (ABS). This evolving policy framework is illustrated through two case-studies. After contributions by NCI and several other actors, the pharmaceutical company Smith-Kline Beecham developed the anti-cancer drug Topotecan from a derivative of the plant C. acuminata. The samples were obtained from China in the 1930s and there were negligible ABS arrangements outside the United States of America. After initial work by the NCI, the development of the anti-HIV compound calanolide from two tree species indigenous to Sarawak, Malaysia, involves a joint venture between the State Government of Sarawak and Medichem Research, a United States pharmaceutical company.

18. Nigeria (no. 10). This case-study presents an experience on trust funds, focusing on a constitution, which serves as the general operative document establishing the goals, objectives, rights and duties of the fund. With a well formulated constitution, trust funds can be considered as an instrument that may generate long-term benefits at the community level under the Convention on Biological Diversity. The pilot project is held in Nigeria, where the Healing Forest Conservancy (NGO in USA) donated \$40,000 to a recently established trust fund. The Bioresources Development and Conservation Programme (a Nigerian NGO) launched the Fund for Integrated Rural Development and Traditional Medicine (FIRD-TM). The FIRD-TM has an independent board composed of leaders of traditional healers' associations, senior government officials, representatives of village councils and technical experts from scientific institutions. Its objective is to receive funds that can be used to build technical skills in Nigeria so that bioresources are a viable vehicle for sustainable development and improved health care. The model Constitution provides for the distribution of benefits to all stakeholders, and the Board of Directors will distribute the funds according to the guidelines.

19. Prunus (no. 8). Prunus africana (Pygeum) occurs in Africa with a range extending from Cameroon across mainland Africa to Kenya and Madagascar, and as far south as the Cape. Over the past 20 years, the bark has been sold on the phytomedical market in Europe as a treatment for benign prostatic hyperplasia, and the bark of this species continues to be over-harvested for export markets. The case-study focuses on sustainable management agreements signed in 1997 between the main purchasing company, Plantecam Medicam, and the villages of Mapanja and Bokwongo, Cameroon. The agreements are an effort to correct the process of so far illegal and over-harvesting, and generate greater benefits for local communities from the commercial use of Pygeum bark. This agreement outlines general benefits for the village, such as increased and stable revenues from higher payments per ton collected and training in sustainable management techniques, and serves the wider conservation objective of sustainably managing this species.

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20. UCDavis (no. 12). Indian researchers identified resistance to rice blight in the Malian wild rice species Oryza longistaminata. They supplied a sample to the International Rice Research Institute (IRRI), which, between 1978 and 1990, bred its resistance into rice variety IR24, to form the breeding line IRBB21. Professor Pamela Ronald and her colleagues obtained a sample of IRBB21 from IRRI, and identified and cloned the gene Xa21. The University of California, Davis filed a patent on the Xa21 in 1995 and has entered into agreements to license the gene to two agricultural biotechnology companies. UC Davis has established the Genetic Resources Recognition Fund as a mechanism to sponsor fellowships for scholars from source countries such as Mali.

21. Suriname (no. 5). The programme is part of ICBG (see ICBG). It is led by a researcher of the Virginia Polytechnic Institute and State University in the United States. Other participants include Conservation International (CI), Bedrijf Geneesmiddelen Voorziening Suriname (BGVS), a pharmaceutical company owned by the Surinamese Government, the Missouri Botanical Gardens, and an American pharmaceutical company, Bristol-Myers Squibb. Each institution carries out a specific role in the Suriname programme, including botanical and ethnobotanical collections and inventory, extraction, screening, chemistry, and drug development. CI works with local tribal people, the Maroons, to carry out the ethnobotanical part of the research. The benefit-sharing arrangement assigns benefits to the participants, Surinamese institutions and a newly established fund according to a complicated key.

22. Yellowstone (no.12). Under a Cooperative Research and Development Agreement (CRADA) between Yellowstone National Park (YNP) and the biotechnology company Diversa, based in California, the company provided the Park with an up-front payment of \$100,000, payable in five yearly instalments of \$20,000, to be offset against any future royalty payments received by the Park under the agreement. The company will also transfer equipment and train Park staff in recent molecular biology techniques, to a value of \$75,000 per year. In return, the company gains access to extremophilic microorganisms and other genetic resources in the Park, and is permitted to use specimens collected earlier under Research Specimen Collection Permits for product development.

23. Zimbabwe (no. 9). This case-study analyses distribution of wildlife revenues in the Bulilimangwe and Tsholotsho districts' CAMPFIRE (Communal Area Management Programme for Indigenous Resources) programmes in south western Zimbabwe. CAMPFIRE is a community-based natural resource management programme. It seeks to demonstrate that, with appropriate incentives, wildlife is a viable land-use option in ecologically marginal areas. In communal areas, those living with or close to the wildlife, and thus paying the costs of doing so, will benefit from wildlife use. The study focuses on two difference wildlife benefits distribution systems adopted by the Bulilimangwe and Tsholotsho districts. In the former, each ward receives an equal amount of money that are allocated to the wards, which use the amount for community projects. In the latter, the ward where an animal is shot is regarded as the ward which produced the animal, and it therefore gets the larger share of the wildlife revenue. It is pointed out, however, that in both cases, the benefits are distributed according to administrative

boundaries, which do not necessarily reflect the costs incurred and contributions made by communities.

#### A. Main actors involved

24. The actors can be distinguished between those from the country of origin and those from the country in which the use of the genetic resource will take place (i.e., research and development (R&D) of the drug, commercialization of the product etc.). In four case-studies, all actors are from the country of origin (India/Kani, Yellowstone, Mali, Zimbabwe), and bioprospecting and research and development take place in the same country.

25. In the three cases of sustainable use, the actors are from the country of origin. Funding, however, comes from an overseas development agency or a non-governmental organization (Mali, Zimbabwe, Prunus (only with regard to the conservation project)).

26. All other case-studies have a variety of actors who interact in different ways. In every case-study apart from Suriname and UCDavis, one or several governmental agencies are involved in the benefit-sharing arrangement. In Suriname, the Suriname company participating in ICBG is government-owned. Apart from the case of NCI, UCDavis and Yellowstone, communities are always part of the benefit-sharing arrangement. NGOs play a considerable catalytic role (Suriname, Fiji, AfricanICBG, Ancistrocladus, Zimbabwe, Nigeria, Cartel). Research institutions, including botanical gardens, and universities both from the provider and user country have an important role in bioprospecting. They provide human resources for collection, taxonomy, extraction of material and carry out basic research. They are very often key partners in the arrangement (India/Kani, Suriname, Fiji, AfricanICBG, Nigeria, ICBG, NCI, Cartel, Yellowstone). A special case is AfricanICBG, where 45 active investigators from the 16 different institutions involved in the project contribute to its various aspects.

27. In summary, it can be said that the kind and number of actors involved depend upon the purpose of the arrangement set up by its initiator and the services and know-how those actors can provide. A detailed table of the actors involved in each of the case-studies is attached as annex III below.

#### B. The ecosystems, species and genetic resources concerned

28. All the genetic resources considered in these case-studies are derived from biodiversity-rich ecosystems such as tropical forests or fumerals. Apart from Yellowstone, the countries are centres of megadiversity.

#### C. The type of benefit-sharing arrangements and the expected results

29. All arrangements are geared towards long-term partnerships and longer-term benefits. This is by definition the case in the studies on sustainable use as those activities are meant to continue without a time-limit beyond the period of funding. The project in Mali aims at a fair distribution of benefits out of the use of fish resources; Zimbabwe at benefits which directly go to the communities. Regarding bioprospecting, most of the partnership continue and built on experiences gained, as long as research and development in the genetic resource continues (NCI;

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Ancistrocladus as an example where it came to a halt). There is the prospect of benefits in case of a marketable product and the long term benefits through awareness and transfer of knowledge (for example Fiji). The bioprospecting arrangement is especially beneficial in the longterm if the source country can provide sustainably harvested raw material or an intermediate supply for the product (NCI; India/Kani; Ancistrocladus, Nigeria).

30. All cases aim at both the equitable sharing of benefits and conservation, including sustainable use. If the prospecting includes the participation of local and indigenous communities, the programmes are also designed to conserve ethnobotanical knowledge (Suriname; India/Kani; Fiji; AfricanICBG; Cartel; Nigeria). The objectives of the different cases are analysed in depth in section III below, and the types of arrangements are considered in section V.

#### D. Time-frame addressed

31. Time-frames for the arrangements vary considerably, from two years to an unlimited long-term perspective. Different aspects of one arrangement might have different time spans, for example a bioprospecting activity and the longer-term benefits derived. The shortest time frame is found in the case Mali with two years for setting in place a new management of the fisheries in the area. The project in Fiji was designed for three years, but the partnerships will remain, and in all likelihood, expand. ICBG projects are funded for five years but ICBG can apply for another five year grant. So did Suriname. AfricanICBG is limited in time only with regard of funding by ICBG. The components of the project are long-term, for example the Integrated Rural Development and Traditional Medicine project established by the Biodiversity Development and Conservation Program. Cartel began in late 1995 and entered into a pilot phase in early 1997.

32. India/Kani licensed the product to private company for seven years. Yellowstone National Park entered into a five-year partnership with Diversa, terminable upon 30-days written notice by either party, but benefit-sharing obligations which were due during the partnership remain after the end of the agreement.

33. Nigeria has two time frames that respond to the needs of two different stakeholders:

(a) The Fund for Integrated Rural Development and Traditional Medicine project is designed as a long-term fund that will last until its dissolution, as described in the Fund's constitution;

(b) The duration of the Conservancy pilot project is approximately one year. The time estimated to be needed to test the efficacy and efficiency of the trust fund process and to develop a model constitution that can be replicated for future use by other Shaman collaborators.

34. The arrangement in NCI (Calandolide) - a joint venture between the Sarawak government and the United States based drug company Medichem - is not limited in time but depends on the success of the drug candidate and the

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funding situation. In the case of Ancistrocladus, no clear time frame exists as the research came to a halt and an agreement was never signed.

#### E. Relevance to the Convention

35. The case-studies cover a broad range of articles of the Convention on Biological Diversity. All those on bioprospecting are in some way or another implementing the third objective of the Convention, the fair and equitable sharing of benefits arising out of the use of genetic resources. Most of them and, in particular, those covering the sustainable use of biological resources are contributing as well to the second objective of the Convention, the sustainable use of the components of biological diversity. This also contributes, at least in some aspect, to the first objective, the conservation of biological diversity. The case-studies illustrate the interlinkage of all three objectives of the Convention and their mutual support and reinforcement.

36. Case-studies involving ethno-pharmaceutical or other indigenous or local knowledge, innovations or practices are contributing to the implementation of Article 8(j) and also 10(c) if they are protecting traditional cultural practices, such as traditional healing (AfricanICBG, Suriname, Nigeria, India/Kani). In supporting sustainable use and in situ as well as ex situ conservation (deposit of samples in the national herbarium), the studies address Articles 8, 9, and 10. In creating alternative sources of income, the cases provide incentives for conservation (Suriname, Prunus).

37. Education and public awareness through benefit-sharing are addressed in arrangements involving communities in bioprospecting with prior informed consent. This is also the case when companies for the first time develop a corporation policy on genetic resources and benefit sharing (Article 13). Sustainable harvesting requires monitoring and environmental impact assessment (Article 14) and encourages research, which contributes to the conservation and sustainable use of biological diversity (Article 12(b)).

38. Benefit-sharing arrangements regarding bioprospecting are mostly negotiated on the basis of prior informed consent (NCI, Suriname, Fiji, Nigeria, AfricanICBG, Yellowstone) and are mutually agreed. Provisions on joint research, in-kind and monetary benefits including shares in the royalties are relevant to the requirements of Article 15, 19.1, 19.2 and 16.3 and Article 17 and 18 (exchange of information and technical and scientific cooperation). The case of Cartel, however, intentionally tries to limit the dissemination of information to capture the more appropriate value of the knowledge.

39. The case-studies cover most of the provisions of the Convention and, properly implemented, fulfil its obligations, apart from one criteria: Whether the sharing of benefits is "fair and equitable" is a question that can only be answered after an in-depth analysis. It depends on the value system upon which the judgment is based and therefore, can not be answered in this synthesis.

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## II. DESCRIPTION OF THE CONTEXT

40. There are two kind of scenarios the case-studies are dealing with: one is "species-focused" and the other one is "broad-based". Whereas in Ancistrocladus, Prunus, NCI, India/Kani, and UCDavis the relevant resource has already been identified at the time when benefits were negotiated, the remaining case-studies consider an earlier stage in the bioprospecting cycle, which is the identification of useful compounds of biological resources.

41. In most of the cases bioprospecting takes place in tropical countries (see section I B above). Most of the forests in which the activities take place are threatened through logging and land conversion (for example Suriname, Nigeria, AfricanICBG, Prunus, Ancistrocladus, NCI, Cartel). There is pressure on the land with growing population for subsistence as well as the need for economic development. This is often adressed by increased industrial activities such as logging, mining and coral harvesting. Environmental stresses such as waste disposal and health issues such as water treatment are major problems (Fiji).

42. Regarding the sustainable supply of biological resources, stresses on the ecosystem and the biological resource stem from overharvesting, illegal trade, and mismanagement due to centralization (Mali, Prunus, Zimbabwe).

43. There is in most of the countries of origin a lack of systematic evaluation of the flora and fauna of the region both for taxonomic purposes, as well as for biologically active compounds (Suriname, AfricanICBG, Nigeria, Yellowstone for micro-organisms).

## III. PURPOSE/OBJECTIVES OF THE BENEFIT-SHARING ARRANGEMENTS

44. The cases regarding sustainable use aim at a fair and equitable sustainable use of the resource (Mali, Zimbabwe, Prunus). Mali's strategy aims at a decentralized management of the resource. All bioprospecting arrangements aim at an integration of economic benefits through bioprospecting and sustainable use and conservation of both biological diversity and, in the case of indigenous and local communities, their knowledge. In Fiji, the objective was to increases conservation through another possibility of income, bioprospecting. Ancistrocladus aimed at sustainable use through the cultivation of the plant and further research to optimize its yield in Cameroon. India/Kani aims at conserving the local knowledge and providing an additional source of income to the Kani tribe through harvesting of the plant.

45. Projects funded by the ICBG aim to integrate improvement of human health through drug discovery, incentives for conservation of biodiversity, and new models of sustainable economic activity that focus on the environment, health, population and democracy. The programme is based "on the belief that the discovery and development of pharmaceutical and other useful agents from natural products can, under appropriate circumstances, promote sustained economic growth in developing countries while conserving the biological resources from which these products are derived." Suriname's objective is, apart from the promotion of drug discovery and the conservation of biological diversity the conservation of ethnobotanical knowledge.

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46. AfricanICBG's has as its primary aim the development and implementation of an effective and constructive resource management and conservation plan based on an intimate understanding of the key factors driving medicinal plant use and the loss of biodiversity. The overriding concept is to increase the net worth of the tropical forest as a living resource base and to demonstrate the feasibility of an ecological management strategy which uses drug development as a catalyst for the conservation of biological diversity. Its main target therapeutic categories are tropical diseases such as malaria, leishmaniasis and trypanosomiasis. In this way, the scientific expertise can be applied to the under-researched diseases afflicting the poor in developing countries.

47. Prunus Africana is faced with over-harvesting. Therefore, two contractual agreements between the main purchasing company, Plantecam Medicam, and the villages of Mapanja and Bokwongo were signed for harvesting and supply of Pygeum bark. It aims at reducing illegal harvesting and smuggling and at managing the species sustainably.

48. The project Cartel aims to achieve sharing of benefits by cartelization of traditional knowledge within Ecuador. It is considered to be a more effective way to protect the knowledge and capture rightful benefits, as traditional knowledge shares the same characteristics as the information good, which possesses high fixed costs but extremely low marginal costs.

49. Yellowstone National Park wishes to promote scientific research, to raise revenue for its conservation activities and to obtain benefits from the research. It also wants to minimize the tax burden for United States citizens. Diversa Inc. believes it can identify over the next five years micro-organisms that may yield the enzymes and bioactive molecules that will prove extremely useful for applications in medicine, biotechnology, food production and industrial chemistry (Yellowstone).

50. The United States National Cancer Institute's approach to benefit-sharing with source countries is guided by its collaborative approach to drug development. NCI and Sarawak concluded a memorandum of understanding for that purpose, followed by an agreement of NCI with Medichem, and a joint venture of Medichem and the Government of Sarawak. The agreement aims at the development and production of a marketable drug based on a natural resource compound from Sarawak. Although the objective of NCI is drug development, it takes into consideration the ethic of the Convention in now negotiating a memorandum of understanding with the country of origin (NCI, in comparison with earlier practices, reflected in the example of Topotecan in the same case-study).

#### IV. PROCESS FOR ESTABLISHING THE ARRANGEMENTS

51. The negotiations for the contracts in the different case-studies often take years. Negotiations between the Government of Cameroon and the National Cancer Institute (Ancistrocladus) even grinded to a halt when it became clear that for the time being there were no prospects in the further development of the drug. Problems arise when the competence in a country to deal with bioprospecting and sustainable use of biological resources has not been clarified amongst the stakeholders either through legal or administrative measures or through consent amongst the stakeholders concerned. If the

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relationship amongst the stakeholders is not clear, the country and its communities risk to lose out during the negotiations. The efficiency and effectiveness of the implementation of the arrangement later on might be put in danger (Ancistrocladus, India/Kani).

52. As the ethics of the Convention - sharing of benefits arising out of the use of genetic resources - are a rather recent development, some agreements are changing and evolving over time. For example, in the case of NCI (Calandolide) the University of Illinois at Chicago (UIC) collected plants in Sarawak, under the auspices of the Southeast Asian Plant Collection Contract between the NCI and UIC. The UIC obtained a collection and export permit from the relevant Malaysian and Sarawak agencies, but there was no formal agreement between the NCI and the Sarawak government regulating specificities of benefit-sharing. NCI developed a letter of intent only in 1988 which contained provisions on intellectual property rights, benefit-sharing, technology transfer etc. In response to the desire from source countries to be more closely involved in research and the commercialization process, NCI developed a second model agreement, the Letter of Collection which reflected a significant evolution compared to the Letter of Intent. Since 1995, NCI uses a third standard agreement, its Memorandum of Understanding. It is directly negotiated between NCI and an organization in the source country. It has been developed "in response to the increase in the capacities of source countries to engage in drug discovery and development, which has given rise to better opportunities for joint collaboration between the NCI and source country partners" (NCI). As this example shows, institutions learn through experience and over time to mould their agreements according to the capacities and interests of their source country counterparts.

53. Not only the arrangements, but also the partners during the negotiations might change. The University of South Pacific (USP) had to change the partner of its negotiations, SKB, as it closed down its natural resource discovery division in April 1996. USP then successfully concluded negotiations with Strathclyde Institute of Drug Research at Strathclyde University in Glasgow, Scotland (SIDR). The advantages and disadvantages of a broker as the direct partner in the benefit-sharing arrangement are discussed in the case-study (Fiji, pp. 6).

54. Negotiations with indigenous and local communities are most successful if they are conducted through meetings with the community and its leaders leaving enough time for discussion (Fiji; Nigeria) and building of confidence. For example, a letter of intent between Conservation International and the Granman of the Saramaka tribe first embodied the fiduciary relationship of both partners before entering a longer-term agreement of ten years (Suriname). Legal advice by experts with international experience in the field of bioprospecting arrangements, or professionals from the village, living in town but keeping close ties with the village, proved to be helpful during the negotiations (Fiji, Prunus).

55. The arrangement regarding Prunus was carried out on a step-by-step basis: it started with a study to identify the most suitable villages for sustainable harvesting. The initiation of this system began with a sequence of steps such as perception gathering; conflict mapping; identification of

common ground; building on that group to set up a harvesting system; and putting in place a participatory monitoring and evaluation system.

56. "The determination of the main partners to work patiently through each step of the process and retain a vision of an equitable bioprospecting agreement with long-term benefits for all partners" is considered to be one key feature of a successful partnership on benefit-sharing (Fiji).

57. There is a need to pay attention to the process. Although community members are involved in the negotiation and implementation of an arrangement, this might not necessarily be participatory in the sense that all relevant stakeholders or the whole community are sufficiently involved. It is important to ensure for successful establishment and implementation of an arrangement that the participation is broad-based and takes into account the traditional structure of the communities (Zimbabwe, India/Kani, Prunus).

58. While access was in 1990, prior to the Convention, and not subject to any agreement, the arrangement setting up the benefit-sharing mechanism was unilaterally set up by UC Davis in consultation with some experts in the field. In the case of Yellowstone, the public was not involved during the negotiations. This and other reasons led to claims against the Department of the Interior by some NGOs.

## V. CONTENT AND IMPLEMENTATION OF THE ARRANGEMENTS

### A. Structure of the benefit-sharing arrangements

59. The contractual arrangements regarding genetic resources can take many forms, depending on the number and kind of partners in the arrangement. The structure of contracts governing actual bioprospecting activities can range from one contract that includes every stakeholder to a wheel of contracts between various partners. In every case-study examined, formal written contracts have been established amongst the partners, apart from the case of Ancistrocladus, where a framework for collaboration and a benefit-sharing plan was never articulated.

60. The projects of ICBG subscribe to a variety of solutions among the partners, apart from a cooperative agreement between the United States Government and the United States University leading the project. In Suriname, all stakeholders of the project apart from the Maroon tribe - Conservation International, Bedrijf Geneesmiddelen Voorziening Suriname (BGVS), Virginia Polytechnic Institute and State University (VPISU), Missouri Botanical Garden, Bristol-Myers-Squibb - signed a long-term research agreement. The "Granman" (chief) of the tribe signed a separate letter of intent with Conservation International and a statement of understanding with BGVS. These arrangements may be illustrated as follows:

	Letter of intent			
Maroon tribe	=====	CI	=====	BMS ===== MBG
Granman Saramaka)	Statement of Under-	\\	ICBG long-term	//
standing		\\	Research Agreement	//
	=====	BGVS	=====	VPISU

[== signifies contractual arrangements)

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61. In Fiji, the arrangements are established "in-line", i.e.:

Verata community = University of South Pacific = Strathclyde = companies

62. Initially a direct contract with the company, Smith Kline Beecham (SKB), and the community was envisaged. It was felt that contracts that involve the communities as equal partners are preferable as they recognize the role of communities in the conservation of resources, knowledge and national development. The drug companies, however, have legal constraints to pay benefits only to legally constituted bodies. This issue was not fully resolved before SKB closed down their natural products discovery division. The absence of any firm policy by SKB and the University of the South Pacific (USP) was another source of difficulties as, on some issues, no final stance could be given by the representatives at the meetings. As USP chose the Strathclyde Institute of Drug Research (SIDR) as its partner, the relation to the companies was through SIDR as the broker.

63. It is noted that arrangements with communities might need the revision of the agreement on an continuous or regular basis. For example the renewal of consent by the Saramaka people is done periodically through formal discussions with representatives of the tribe (Suriname).

64. Legal constraints for the user in the home country, or other legal concerns, might hinder certain regulations regarding benefit-sharing arrangements. The United States legal framework under which NCI operates prohibits it from commercializing its innovations. NCI has the right to patent innovations, but is required to grant licences to companies that seek to commercialize. United States law contains provisions which require United States federal agencies to give "preference" to United States-based institutions and small businesses. The source-country organizations would need to compete with other potential licensees, although they might have cooperated in the research (NCI).

65. In Nigeria it is planned to distribute benefits among all the stakeholders, no matter whether the knowledge is successfully used. In Cartel, in turn, only those who provide relevant information get benefits.

#### B. Mechanisms of benefit-sharing

66. Benefits include a wide range of options. Together, the 15 case-studies reflect all aspects of benefits described below; nearly all beneficiaries receive more than one kind of benefit. Benefits can be clustered according to the moment in time during the arrangement they accrue the following:

(a) Start-up benefits. Benefits at the beginning such as an up-front lump sum or hardware equipment like extraction or screening facilities.

(b) Process benefits. Benefits arising out of the process of research and development, such as capacity building and technology transfer through infrastructure, technology transfer, expertise and know-how building, and training through joint research. The duplication of samples in the national herbarium is another process benefit in kind (Suriname). Fees per sample are monetary process benefits. Regarding sustainable use, process

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benefits can be the solution or detention of conflicts (Mali). "Perhaps, however, the greatest benefit for participating African countries will not be in the form of tangible and measurable things such as equipment and supplies, but in the catalysing role of ICBG in providing an enabling environment for to develop a suitable model for the integration of the material needs of their communities with the equally urgent demand for conservation. As has been noted by several authors, sustainable development and conservation of resources as developed countries have done in the past. This new goal calls for fundamental changes in development objectives, values, planning, strategies, institutions, technology characteristics, and production systems" (AfricanICBG).

(c) Product benefits. Benefits after the commercialization of the final product, including royalties.

67. Benefits can be clustered according to their kind, including monetary, software or hardware benefits, moral benefits such as recognition in publications or "relation" benefits such as establishing or entering networks, access to publishers or the establishment of a union of sustainable harvesters to defend common interests (Prunus).

68. Moral and relation benefits are not transferred according to a formalized mechanism put in place but happen through the interaction of the participants. "It is important to note, however, that many of the most significant benefits provided by this type of multi-disciplinary and multi-institutional program are the least obvious, the most mundane-seeming, and certainly those that have attracted the least attention. . . . difficult to quantify the role of human and institutional relationships in developing capacity and expertise through informal exchanges. This might be manifested through access to funders, publications and literature, potential corporate collaborators, and the ideas of an expanded network of colleagues". (AfricanICBG)

69. With regard to financial benefits, the main questions to solve are: what is the share of the royalty attributed to the country of origin and how is it distributed within the country? In most of the cases, the royalty share attributed to the country of origin and/or its stakeholders is not indicated (ICBG; NCI). Royalties negotiated with companies receiving NCI licences vary according to the contribution of the genetic resource or knowledge to the final product. However, the share in profits of the joint venture set up by Medichem and the Sarawak government is indicated: it is 50:50 (NCI).

70. The financial benefits in Yellowstone for the provider of the genetic resources is a mixture of start up financial benefits and a share in the royalty: Yellowstone National Park receives \$100,000 payable in five yearly instalments of \$20,000, to be offset against undisclosed royalties of up to 10 per cent upon commercialization of a product derived from genetic resources from the Park. Royalty rates are based on a sliding scale, depending on the end-use of the research results and the magnitude of sales (Yellowstone). The Park pays \$28,000 to an NGO for assistance in negotiating the arrangement with Diversa. Concerning non-monetary benefits, Yellowstone National Park receives equipment valued at \$75,000 for each of the five

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years, including the transfer of DNA extraction kits, training in sampling techniques and in DNA fingerprinting techniques.

71. The share in the royalties to the country of origin is normally broken down into different parts for different stakeholders. For example, in Suriname the - confidential - royalty rate is broken into seven different portions which vary according to whether the sample is derived from ethnobotanical collections or derived from random collections. With this division of benefits of an unknown percentage of the royalty, it would be interesting to know what amount of money will finally end up in the trust fund, apart from the \$60,000 start-up payment. The Kani tribe receives 50 per cent of a 2 per cent royalty share at ex-factory sales price of the phytomedical product, which goes into the trust fund (India/Kani).

72. Formalized mechanism of benefit-sharing are, in particular, trust funds. They receive either some start-up money or a lump-sum, and often the royalties negotiated for the communities participating in the bioprospecting activity. Such funds have been set up in Suriname (Forest People's Fund, \$60,000 and share in those royalties attributed to Suriname partners in the ICBG), Prunus (Village Development Fund; Union Fund), AfricanICBG, Nigeria (trust fund pilot project for the time being, \$50,000), Kani (Kerala Kani Samudaya Kshema Trust, to manage the royalties), UCDavis (Genetic Resources Recognition Fund, payments by two licensee companies (\$52,000 and \$30,000) and a single, matching payment of \$52,000 by UC Davis in one lump-sum one year after commercialization). The trust funds normally support development projects and training.

73. Regarding the Zimbabwe case, the revenue from wildlife, mainly from safari hunting, is distributed as follows: In Bulilimangwe, 15 per cent the revenue goes to the council for levy, 35 per cent to the council for project management and 50 per cent to CAMPFIRE wards. Each ward receives an equal amount of money from the 50 per cent of the revenues allocated to the beneficiary wards. Ward committees decide on how the revenues are going to be used. The revenues from wildlife are not large enough to be shared as household dividends. In Tsholotsho, revenues are not distributed uniformly. The ward where an animal is shot is regarded as the ward which produced the animal and gets a larger share of the wildlife revenue (Zimbabwe).

74. The fair and equitable allocation of fish resources in the Mali case-study are decided upon by the community of fishermen. The process is not yet finalized.

75. The benefits at Cartel are only in-kind in the short term. They consist in a catalogue of traditional knowledge in customized databases. Each participating community will have its own file in the database and will not be able to access files of any other community. The database is maintained at regional centres and is safeguarded through a hierarchy of access restrictions. Because traditional knowledge is usually not unique to any one community, the manager of the database filters the deposited knowledge across communities to determine which communities are commoners to the same knowledge. The user then filters this knowledge against what is already in the public domain through the on-line botanical database known as NAPRALERT from the University of Illinois-Chicago. Monetary benefits may be realized if that knowledge which is not yet public can be negotiated as a trade secret

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in a material transfer agreement (MTA) with either industrial end-users or intermediaries. The benefits from the MTAs are monetary and split between the Government and all communities that deposited the same knowledge in the database. The share of the communities is then used to finance public projects previously identified by each community.

### C. Benefits realized

76. Although the recipient user of the genetic or biological resource obtains benefits through access to the resource or knowledge and the sample collected under the agreement, those benefits will be disregarded in the following as the main focus of benefit-sharing is the aspect of benefits accrued at the provider side which have been ignored before the Convention.

77. The development of a marketable drug is a long process and most of the benefit-sharing arrangements only started recently (the oldest being NCI-Calanolide with a first letter of intent dating from 1988). There are no benefits yet derived from royalties of the commercialization of a product. Trust funds only recently started working and the money put into them has not yet been processed for respective projects. Most of the benefits already realized are those gained from the process of research and development: training, equipment, transfer of know-how, capacity building and "relation" benefits (AfricanICBG, Suriname, Fiji, Yellowstone, NCI, ICBG, Nigeria, Ancistrocladus, India/Kani).

78. For example, the community of Verata benefited from the planning phase: three participatory workshops were organized with the community that focused on natural resource management, including an environmental awareness workshop and a participatory rural appraisal workshop. The main objectives of the workshops were to identify the ten most important problems of the village. The community thereby prepared a community action plan and an integrated resource-management plan. Community members were trained in monitoring, local concepts of resource use, ecological principles, and in the development of a monitoring programme (Fiji).

## VI. POLICY, LEGISLATIVE AND ADMINISTRATIVE CONTEXT

79. None of the countries in the case-studies has enacted stand-alone access-and-benefit-sharing laws or regulations implementing Article 15 and related articles. (Sarawak, Malaysia, however, enacted an ordinance which came into effect on 1 January 1998, which installs a Sarawak Biodiversity Centre. The Centre will regulate, inter alia, access to genetic resources (NCI).

80. Countries in which the activities take place usually have regulations about research permits and export of biological resources. However, these permits are general in nature and do not specifically regulate access and benefit-sharing. Most of the case-studies started in a legal and policy vacuum with unclear administrative competencies on the various governmental levels: national/federal level, provincial/state level, local level. There was, and mostly still is, no specific legislation and clear general policy regulating access to genetic resources for bioprospecting or sustainable use (India/Kani, Prunus, Ancistrocladus, Fiji, Yellowstone, NCI).

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81. "A significant institutional obstacle to addressing issues raised by the case of Ancistrocladus korupensis has been the lack of a clearly defined national authority to oversee access and benefit-sharing issues. As a result, rather than a strategic approach to negotiations with the NCI, and access and benefit-sharing issues in general, the Government of Cameroon has demonstrated a more reactive response to events" (Ancistrocladus).

82. It was not, however, only Governments, also other main actors of the benefit-sharing arrangement such as companies, universities and research institutions that lacked clear policy on bioprospecting before they entered into the benefit-sharing arrangements (UCDavis, India/Kani, Fiji, Yellowstone, Cartel). Research institutions develop their policies on bioprospecting as they go along (NCI, UCDavis), relying on colleagues with expertise in the field and on their intuition "to do the right thing" (UCDavis).

83. Although there is no specific law and policy on benefit-sharing, there are laws and regulations in most of the countries which regulate or impact on aspects of a benefit-sharing arrangement the partner want to set up. Sometimes the legal provisions are not clear with regard to their consequences for benefit-sharing arrangements as they do not specifically regulate genetic resources but impact on their legal status. Some provisions which might be considered as "ideal" provisions can not be stipulated in the arrangement due to legal constraints. The question is then whether there is a need for a new law on access and benefit-sharing or whether the existing law allows for solutions which nevertheless satisfy the interests and needs of the partners to the arrangement (for example NCI, Yellowstone).

84. In the case of India/Kani, the royalty of 2 per cent has been criticized as being too small with regard to the contribution of the Kani. However, this is the amount that is prescribed in the standard format for transfer of technology agreements prescribed by the Center for Scientific and Industrial Research, an autonomous institution set up by the Government.

85. The database in Cartel is safeguarded through a hierarchy of access restrictions, so administration control is executed through functional control. Cartelization of traditional knowledge should be allowed; it is argued that if one accepts monopoly patents, copyrights, trademarks as legitimate instruments to enable the emergence of a market for information goods, then one should accept oligopoly rights as an argumentum a majore ad minus over genetic resources to enable the emergence of a market for habitats, and similarly for traditional knowledge.

86. One can summarize that in most of the cases the legal, policy and administrative context is not propitious to fair and equal arrangements, neither to their negotiation nor to their implementation.

## VII. IMPACT ON CONSERVATION

87. A sound assessment of the impact of the case-studies on the conservation of biological resources has not been done so far. Also, it is too early to assess most of the cases as they just started to be implemented.

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At least one can say that so far no case-study has negative impacts on conservation, but several have positive ones.

88. The sustainable-use aspects of each study have positive impacts on the conservation of the species harvested as well as on support species. This goes without saying for those projects aiming at sustainable use (Mali, Zimbabwe, Prunus), provided that they are implemented in a continuous and proper fashion. However, bioprospecting-oriented projects might also contribute to sustainable use. For example, the cultivation of Arogyapacha provides protection to the associated tree species as they provide the necessary shade for this plant (India/Kani). If Ancistrocladus will prove of economic value, the supply of sustainable raw material might act as an alternative economic activity to more destructive practices, such as clearing for agriculture or hunting (Ancistrocladus).

89. Some of the bioprospecting arrangements have as one of their aims the conservation of biological diversity or of traditional knowledge. Conservation is one of the reasons why they have been set up (AfricanICBG; Nigeria; Suriname; Cartel)

#### VIII. Policy relevant conclusion: lessons learned and replicability

90. Most of the case-studies are still in its infancy; in none of them marketable drug or product has yet developed. Some and partly even considerable benefits of the process of research and development have already been allocated to the provider of the resource. All the case-studies are a step in the right direction as they all aim, directly or indirectly, at benefit-sharing, sustainable use and through those or directly, at conservation. However, all of them still have shortcomings which can, if properly addressed, be eliminated.

91. One message common to all case-studies is the need to establish a clear institutional setting with clear competencies and a legal and policy framework which is favourable for multidisciplinary arrangements.

92. As the actual chances of a drug being developed is relatively low, benefit-sharing mechanisms other than royalties with immediate incentives are more important. There is a desire for more guidance and a more structured process for how to submit proposals to the Fund (Suriname). In order to promote biodiversity conservation, the source-country must be given the opportunity to participate in bioprospecting, including access to the means by which they can add values to these resources. The basic needs of the inhabitants are crucial to create incentives for protecting the natural resources. Due to the time-frame for drug production, long-term relationships are important.

93. In determining compensation packages for access to genetic resources, emphasis should be placed on research and development process benefits and capacity-building rather than short-term cash payments. However, an up-front payment into a trust for projects provides directly available funding and an incentive for conservation and sustainable development (Suriname, Nigeria, Yellowstone for conservation, UCDavis) Source countries should endeavour to

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add value to their resources before trading the samples. Involving a range of stakeholders in benefit-sharing arrangements consultations will help to ensure the development of a workable benefit-sharing measure. Biodiversity prospecting is a multidisciplinary and complex field, and the cooperation of a range of sectors in society is required in order to develop effective regulations.

94. The incentive to over-harvest the species in the wild is created by social, economic, and political factors which are often complex to address, as persistent sustainability problems associated with *Pygeum* across Africa attest. This includes the land-tenure system, which impacts on incentives and possibilities of sustainable harvesting. In order for two-party agreements tackling such issues to be effective over time, they must be part of a wider national and international policy framework (Prunus).

95. As a tool for conservation and sustainable use, benefit-sharing plans should integrate mechanisms to achieve those aims. These include the participation of local communities in the establishment of the arrangement and the consideration of their interests in the arrangement. Benefit-sharing arrangements should strive to include the use of their knowledge, innovations and practices upon their approval.

96. The benefit-sharing should be carefully planned. For example, there is a need to differentiate between producing and non-producing communities and carefully allocate the revenues according to the contributions made to the project as well as the costs incurred. Those who live with the wildlife might readily understand the concept of CAMPFIRE and wish to protect their natural resources. Such an effort will be successful in establishing a clear link between producer (defined by cost) and benefit (Zimbabwe).

97. In order to negotiate properly and to be on an equal footing with international companies, a register of experts upon which the communities can draw was proposed. Generally neither scientists nor conservation-and-development practitioners, government natural resource representatives or the local community representatives have sufficient commercial and legal experience to negotiate agreements without competent legal counsel. Each party to an agreement should have independent legal advice during the negotiation process (ICBG). Because of the structural disadvantage of communities and scientists willing to establish a fair arrangement, contracts should not be confidential (Fiji). Extensive communication in the host country language is necessary to satisfy informed consent requirements during the negotiations. It is also important during the collections process as a tool for local capacity-building, adequate project design, and for developing broad public support (ICBG).

98. Regarding the structure of the arrangement on benefit-sharing one can conclude that the arrangements can take many forms. National legislation in one partner's country can hinder certain regulations and one has to think about solutions which respect the law but nevertheless satisfy the interests of the partner which are affected by the legal constraints. Participants should think carefully how to design the arrangements. They should strive for an arrangement which allows, if necessary, changes in the project partners and, if possible, for the inclusion of the communities concerned in the main framework and at all stages of design and implementation.

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99. Most of the subjects of the case-studies are designed for the specific situation and are not replicable as such (Mali, Fiji, Suriname, Prunus; an exemption is Nigeria, where the constitution for the trust fund has been designed to be replicable in any country and ICBG which is an "adaptable" programme. However, experiences gained can be transferred with necessary adaptations to other situations. A further deep analysis of specific case-studies against the situation for which an arrangement shall be designed may assist in extracting elements of that arrangement that can be used for new ones.

100. Every assessment of a benefit-sharing arrangement has one last question, the answer to which is crucial for the overall evaluation of the case: is the arrangement a fair and equitable sharing of benefits. Looking at the case-studies submitted, one might be tempted to conclude: before the Convention and its ethic came into existence, there was nothing; now, there is something. Whether it is fair and equitable remains to be seen.

Annex I

KEY WORDS AND LIST OF CASE-STUDIES

<u>Keyword</u>	<u>Case-study no.</u>	<u>Authors</u>
<u>Ancistrocladus</u>	7	Laird/Lisinge
<u>Cartel</u>	15	Vogel, H.
<u>Fiji</u>	3	Aalbersberg et al.
<u>ICBG</u>	11	Rosenthal, J.
<u>AfricanICBG</u>	6	Iwu/Laird
<u>India</u>	1	Government of India
<u>Kani</u>	4	Anuradha, A.
<u>Mali</u>	2	République du Mali
<u>NCI</u>	14	ten Kate et al.
<u>Nigeria</u>	10	Moran, K.
<u>Prunus</u>	8	Laird/Lisinge
<u>Suriname</u>	5	Guerin-McManus et.al
<u>UCDavis</u>	12	ten Kate et al.
<u>Yellowstone</u>	13	ten Kate et al.
<u>Zimbabwe</u>	9	Madzudzo, E.

Annex II

A. CASE-STUDIES SUBMITTED BY GOVERNMENTS

1	Government of India, Ministry of Environment and Forests	Benefit sharing model experimented by Tropical Botanic Garden and Research Institute (TBGRI), a national centre of excellence on tropical plant diversity
2	République du Mali, Ministre du développement rural et de l'eau	Programme test de gestion décentralisée de la pêche dans le Delta Central du Niger au Mali

B. CASE-STUDIES SUBMITTED BY INTERNATIONAL AND  
NON-GOVERNMENTAL ORGANIZATIONS

3	Aalbersberg, William G.; Korovulavula, Iso; Parks, John E.; Russell, Diane	The Role of a Fijian Community in a Bioprospecting Project
4	Anuradha, R.V.	Sharing with the Kanis. A case-study from Kerala, India
5	Guerin-McManus, Marianne; Famolare, Lisa M.; Bowles, Ian A., Malone, Stanley A.J.; Mittermeier, Russel A.; and Rosenfeld, Amy B.	Bioprospecting in Practice: A Case-Study of the Suriname ICBG Project and Benefits Sharing under the Convention on Biological Diversity
6	Iwu, M and Sarah A. Laird	The International Cooperative Biodiversity Group: <u>Drug Development and Biodiversity Conservation in Africa: Case-Study of A Benefit-Sharing Plan</u>
7	Laird, Sarah; Lisinge, Esterine	<u>Ancistrocladus korupensis</u> : A Species with Pharmaceutical Potential from Cameroon
8	Laird, Sarah; Lisinge, Esterine	Sustainable Harvesting of <u>Prunus africana</u> on Mount Cameroon: Benefit-Sharing between Plantecam Company and the Village of Mapanja
8a	Laird, Sarah; Lisinge, Esterine	Conclusion: The <u>Ancistrocladus korupensis</u> and <u>Prunus africana</u> Case-Studies from Cameroon: Contrasting Benefit-Sharing in the Pharmaceutical and Phytomedical Industries
9	Madzudzo, Elias	Communal Tenure, Motivational Dynamics and Sustainable Wildlife Management in Zimbabwe
10	Moran, Katy	Mechanisms for benefit sharing: Nigerian Case-study for the Convention on Biological Diversity
11	Rosenthal, Joshua P.	The International Cooperative Biodiversity Groups ICBG Program

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12	ten Kate, Kerry and Amanda Collis	The Genetic Resources Recognition Fund of the University of California, Davis
13	ten Kate, Kerry, Laura Touche and Amanda Collis	Yellowstone National Park and the Diversa Corporation Inc.
14	ten Kate, Kerry and Adrian Wells	The access and benefit-sharing policies of the United States National Cancer Institute: a comparative account of the discovery and development of the drugs Calanolide and Topotecan
15	Vogel, Joseph Henry	Case-study no. 6: Bioprospecting: The Impossibility of a Successful Case Without a Cartel



Annex III

LIST OF MAIN ACTORS

Actors										
No.	Case-study	source country government	NGO	community	research institution/ botanical garden	company	user country government	NGO	research institution/ botanical garden	company
1 + 4	India/Kani	Forest Department of Kerala		Kani tribe in Kerala	Tropical Botanical Garden and Research Centre (TBGRI)	Aryavaidaya Pharmacy, Colombatore Ltd				
2	Mali	- Institut d'Economie Rurale, - Direction des Ressources Forestières Fauniques et Halieutiques, - Comité Technique Régionale de Suivi		communautés locales, représentées par organes de gestion décentralisée de peche)			ORSTROM			
3	Fiji	- Environment Department, - Provincial governments for native affairs	- Biodiversity Conservation Network (BCN)(Biodiv. Support Program of WWF, NC, WRI funed by USAID) - South Pacific Action Committee for Human Ecology and Environment, SPACHEE	Verata, coastal community	University of the South Pacific					Initially Smith Kline Beecham (SB), then Strathclyde Institute of Drug Research in Glasgow
5	Suriname		Conservation International	Saramaka Maroons		Bedrijf Geneesmiddelen Voorziening Suriname (govm'l)	ICBG Programme (NIH/NSF/USAID)	--	-Virginia Polytechnic Inst.and State Univ. -Missouri Botanical Garden	Bristol Myers Squibb Pharmac.Research Inst.

Actors										
No.	Case-study	source country government	NGO	community	research institution/ botanical garden	company	user country government	NGO	research institution/ botanical garden	company
6	African ICBG	- Enugu State Forestry Department (Nigeria); - Ministry of Environment and Forest (Cameroon)	Bioresources Development and Conservation Program (BDPC); Nigerian Union of Medical Herbal Practitioners, Enugu State Branch (NUMHP) (Nigeria)	Umukabia, (Nigeria); Owai Community (Nigeria)	International Centre of Ethno-medicine and Drug Development (InterCEDD) (Nigeria); University of Ibadan (Nigeria); University of Dschang (Cameroon)		ICBG Programme (NIH/NSF/USAID); Walter Reed Army Institute of Research	Healing Forest Conservancy	the Smithsonian Tropical Research Institute	Shaman pharmaceuticals Inc.; Pharmaceutical Research institute, Bristol-Myers Squibb
7	<u>Aristocladus korup ensis</u>	-Commission for the Exploitation and Conservation of A. korupensis - Min. of Environment and Forestry - others Ministries - Korup National Park	Korup Project (WWF Cameroon with Korup National Park)	people in the Korum area (indigenous villagers, settlers, migrant laborers)	- University of Yaounde; - Purdue University		National Cancer Institute, US		Missouri Botanical Garden	
8	<u>Prunus Africanus</u>	Ministry of Forests and Environment, Cameroon Mount Cameroon Project		Bakweri villages of Mapanja and Bokwongo, Cameroon		Plantcam-Medicam (French-owned)				
9	Zimbabwe	Rural District Councils of the communities concerned	Redd Barna; Zimbabwe Trust	Bulilimangwe;Ts holotsho			US Agency for International Development, funding	World Wide Fund for Nature, funding		
10	Nigeria	Government of Nigeria	Bioresources Development and Conservation Programme	Culture groups; traditional healers; village councils	Universities	(Association of Indigenous Pharmaceutical Manufacturers); (the Orange Drug Company)		Healing Forest Conservancy		Shaman Pharmaceuticals, INC.

Actors										
No.	Case-study	source country government	NGO	community	research institution/ botanical garden	company	user country government	NGO	research institution/ botanical garden	company
11	ICBG		Eventually an NGO	Eventually communities	Eventually universities/ traditional healer association	Eventually pharmaceutical company	- US National Institute of Health - National Science Foundation - US Agency for International Development (funding)		currently five "academic principal investigators" from US Universities	Eventually a US-based pharmaceutical company (in 4 of the 5 cases)
12	UC Davis								- University of California at Davis - International Rice Research Institute (based in Philippines, not linked to US) - Stanford University	Two unnamed agricultural biotechnology companies that have licence for the gene XA21 from UC Davis
13	Yellowstone	- US Department of Interior - Yellowstone National Park	- World Foundation for Environment and Development - The Edmonds Institute; - The International Center for Technology Assessment			Diversa Corporation				
14	NCI	• Calandolide: Government of Sarawak, Malaysia  • Topotecan:-				Calandolide: joint venture Medichem Sarawak Pharmaceuticals Topotecan: suppliers of natural compounds from China, India, Brazil			Calandolide: initially University of Illinois at Chicago Tpatecan: several United States universities and research institutes	Calandolid: Medichem Topotecan: Smith Kline Beecham

Actors										
No.	Case-study	source country government	NGO	community	research institution/ botanical garden	company	user country government	NGO	research institution/ botanical garden	company
15	Cartel	Government of Ecuador	CARE-Ecuador; EcoCiencia	Various communities					- Inter-American Development Bank-Consejo Nacional de Desarrollo Programme on Environmental Capacity Building; - University of Illinois-Chicago	

Annex IV

A CALL FOR CASE-STUDIES ON BENEFIT SHARING

Indicative Outline for Case-Studies on benefit-sharing arrangements  
under the Convention on Biological Diversity (in accordance with  
Decisions III/11, III/14, III/15, and III/18)

DRAFT

Introduction

Under various decisions of the third meeting of the Conference of the Parties, governments, international agencies, research institutions, representatives of indigenous and local communities and non-governmental organizations were invited to submit case-studies to the Executive Secretary on different thematic areas and cross-cutting issues. This includes case-studies related to:

(i) agricultural biodiversity:

Decision III/11, paragraphs 10 and 11 and annex 3, calls for case-study experiences addressing the conservation and sustainable use of agricultural biological diversity, as well as pollinators and soil micro-organisms.

(ii) local and indigenous communities:

Decision III/14, paragraph 3, calls for case-studies, *inter alia*, on interactions between traditional and other forms of knowledge relating to conservation and sustainable use of biological diversity; the influence of current laws and policies on knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity; and incentive measures.

(iii) access to and benefit-sharing of genetic resources

Decision III/15, paragraph 2 (a), requests the Executive Secretary to include in his background note case-studies on access to genetic resources, including the preparation and implementation of measures for access to genetic resources. This includes national, regional and sectoral legislative, administrative and policy measures and guidelines.

(iv) incentive measures leading to benefit-sharing

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Decision III/18, paragraph 7 invites Parties to submit case-studies to the Secretariat on incentive measures; this includes incentive measures leading to benefit sharing. According to these decisions of the third meeting of the Conference of the Parties the case-studies are neither confined to certain ecosystems nor to genetic resources. The types of areas and cross-cutting issues from which the Executive Secretary would like to collect case-studies include, therefore, a whole range of different issues addressed by the Convention, inter alia: benefit-sharing arising out of the use of genetic resources. This includes, inter alia, uses for food and agriculture, forestry and fisheries, including for non-food purposes, e.g. chemicals and fibres, biological control agents; pharmaceutical use of genetic resources, including medicines based on biochemicals, phytomedicines, cosmetics, health products; other biotechnological uses. It includes genetic resources from all provenances, e.g. local and indigenous communities, private individuals, protected areas, ex situ facilities; national, regional, sectoral or local policy and law regarding access to genetic resources aiming at benefit-sharing; conservation and sustainable use of agricultural biological diversity; other sectors illustrating experiences of benefit sharing from the use of the components of biological diversity; knowledge, innovations and practices of local and indigenous communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity; measures for the conservation and sustainable use of biological diversity providing incentives for benefit sharing; intellectual property rights and/or including traditional resource rights providing for benefit sharing with indigenous and local communities.

The Secretariat would therefore be interested in receiving case-studies from a wide range of ecosystems; coastal and marine, inland waters and wetlands, agricultural and forestry, mountainous areas and arid and semi-arid areas, grass and rangelands. The Secretariat would also be interested in receiving studies which demonstrate not only specific relationships between two or more stakeholders but can also contain experiences related to national and regional or sectoral measures in policy and law. This call for case-studies for examples of the sharing of benefits is intended to harmonize the various calls for such case-studies from the Conference of the Parties. It is hoped that by providing a common framework for all case-studies, it will facilitate, inter alia: an understanding of the interlinkages between the various activities being undertaken to implement the decisions of the Conference of the Parties; identification of systematic or institutional lessons which arise from the case-studies in one area but which may be relevant for other areas; develop a core set of case-studies which demonstrate the multifaceted nature of many of the issues raised by the Convention; and a focusing and harmonizing for the specific case-studies. Due to the scope of the decisions by the Conference of the Parties with respects to case-studies, this call for case-studies on equitable sharing of benefits is not simply based on those type of activities which demonstrate the third objective of the Convention, namely the equitable sharing of benefits arising from the utilization of genetic resources. The Secretariat for the purposes of this exercise would be happy to receive examples which demonstrate a range of benefits arising from activities which went beyond the use of genetic resources. As a result, this call should not be viewed as an interpretation of the third objective of the Convention, but rather as an effort to make the work of the Convention process more effective. The aim of the following outline for case-studies is to provide guidance on the types of information to be included in the preparation and presentation of case-

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studies. The outline will facilitate the analysis and comparison of the different cases and will thus enable Governments and relevant regional and international organizations and bodies to draw on the findings and lessons learned with a view to formulating conclusions and developing recommendations for future action. The deadline for the completion of the case-studies should be the end of 1997, to enable the Secretariat to prepare a document presenting the consolidated experiences for consideration by the fourth meeting of the Conference of the Parties, with a view to providing guidance to Parties on the implementation of benefit-sharing arrangements. Furthermore, the case-studies will be disseminated through the clearing-house mechanism.

#### Indicative outline for case-studies on benefit-sharing arrangements

To the extent possible case-studies should be short, succinct summaries of experiences of 15-20 pages (5,000 to 10,000 words). A case-study should focus on the planned/actual benefit-sharing arrangements and their outcomes, the reasons for the outcome and the lessons learned. A reasonable amount of footnotes is welcomed, as long as they provide useful sources for further information. If possible, please provide a hard copy and an electronic version (by floppy disk or via e-mail). It is proposed that case-studies should follow, to the extent possible, the proposed structure outlined below. However, as there will be structural differences between those case-studies related to policy and law and those describing concrete activities, such as the bioprospecting arrangements with local or indigenous communities or the specific management of a protected area for those arrangements, not all sections of the questionnaire will be applicable to every case-study. The outline is therefore meant to be an indicative one. If an author of a case-study feels it being useful to include facts or conclusions not covered by the outline, she or he might adjust the outline accordingly.

#### 1. Overview (1 - max. 3 pages)

Summary of the case-study including

(a) Main actors involved; short description of the different stakeholders, i.e. who was/is involved in the arrangements leading to benefit sharing (both providers and beneficiaries): Governments - national level and/or regional/local authorities; universities and research/training institutes; private company/entrepreneurs; non-profit-making associations/NGOs; local and/or indigenous communities/individuals;

(b) The ecosystem, species and genetic resources concerned;

(c) The type of benefit-sharing arrangements and the expected results. What kind of arrangements/partnership/relationship is the basis for action. This can be for instance a short-term or long-term arrangement; consist in a written and/or verbal contract/ agreement/ understanding (including umbrella agreements as well as specific arrangements); they might be individual, communal, or public agreements; it could also consist in the national, regional or local legislation or policy for genetic resource use.

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(d) The time-frame addressed;

(e) Its relevance to the Convention ( e.g. which objective(s)/Article(s)), and to the decisions of the COP and/or to the recommendations of the SBSTTA.

2. Description of the context (1-3 pages)

Description of the status of the ecosystem, the species and the genetic diversity relevant to the activities and benefit-sharing arrangements presented in the case-study. This should include a brief description of the situation regarding:

(a) The biological resources in question, including threats, pressures and trends as well as underlying causes, use and management;

(b) The physical environment in which the biological resources are located, including the factors mentioned under (a);

(c) The institutional and organizational structure of local communities and concerned institutions, including their decision-making processes (as far as those communities or institutions are not stakeholders in the benefit-sharing arrangement);

(d) Where a legal or policy measure is the subject of the case-study, the relevant regional, national and/or local framework should be described.

3. Purpose/objectives of the benefit-sharing arrangements (1-2 pages)

A description of the reasons and objectives for the different actors to have entered into the benefit-sharing arrangements or to have set up the legal and policy measures. This section should include, inter alia:

(a) The primary motivations/objective. For instance financial and/or employment, access to genetic resources (including systems of protection and property rights), access to knowledge, innovations and practices (including information exchange, improved understanding and awareness), access to research and training (acquisition of knowledge and skills), scientific and technical cooperation, commercialization/trade, environmental protection;

(b) Whether the arrangements contribute to more general long-term objectives such as social and economic development, livelihood security and well being, food security, trade, environmental protection;



(c) Where possible, the identification of whether the underlying motivation can be attributed to one or more of the objectives of the Convention (conservation, sustainable use and/or equity) and/or to specific obligations of the Convention i.e. decisions and recommendations.

4. Process for establishing the arrangements (1-2 pages)

A brief description of how the arrangements were established and negotiated:

(a) To what extent did the different stakeholders participate in the negotiations regarding the benefits;

(b) What enforcement/compliance measures, if any, were included;

(c) To what extent did the different partners have the necessary skills for negotiating and bargaining (knowledge, information, access, bargaining skills).

5. Content and implementation of the arrangements (4-6 pages)

Description of the activities relevant to the implementation of the benefit sharing arrangements, including, inter alia,

(a) The different inputs, contributions, actions and responsibilities, rights and obligations of each stakeholder/actor (the providers and the beneficiaries). The contributions could include, for example: research assistance; samples/accessions of plant/animal/microbial genetic resources; information and/or knowledge, i.e. of the ecosystem/genetic resources; health care, welfare; money, capital, markets, employment; food supply; environmental protection.

(b) The different benefits that each stakeholder derived from the arrangements. Include how these benefits were identified and assessed (indicators and process). The identified benefits arising out of the arrangements in relation to the objectives of the Convention could include: direct/indirect; short-term/long-term: monetary/non-monetary; individual/public (cross-reference where appropriate with section 4).

(c) The mechanisms for sharing benefits. Describe the modalities and mechanisms for transferring/sharing-out the benefits including: directly or indirectly (for instance through a trust fund); time specific or over time; how do they reach the different partners, i.e. mechanism of distribution in the community or in the nation State; how are they utilized to further benefit the stakeholders;

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(d) Where the case-study relates to measures in policy and legislation, how will compliance with the new regulations be ensured? Which institutions will be responsible for the control or administration of the measures?

6. Policy, legislative and administrative context (2 pages)

(a) How does the legislation and policy environment of the country influence the results and findings of the case-study, including application of national and community laws?

(b) Which specific regulations and/or policies were helpful and why?

(c) What specific policy, social, economic, cultural and environmental constraints have been identified and which need to be addressed at different levels. The assessment should consider, inter alia, the following areas: access legislation, education, information, land tenure, intellectual property rights, traditional resource rights, administrative procedure, taxation, trade, investment, policies;

(d) Where the case-study is itself an example of policy or legal measures, this section could include reference to other relevant policies or legal or administrative issues that may influence the impact of the described case-study.

7. Impact on conservation (1-2 pages)

This section should include:

(a) What kind of impact does the activity have (actual and or potential) on the conservation of biological diversity: on genetic and species diversity; on the ecosystem in general; on most important (e.g., keystone, indicator, economic or cultural) species;

(b) How was the impact identified and assessed (indicators, process)?

8. Policy relevant conclusions: lessons learned and replicability (2 pages)

This section should analyse:

(a) Lessons learned. How would you assess the case-study with regard to the actual/potential effectiveness of the benefit-sharing arrangements? Identify both negative and positive aspects which determine its success or failure. Do you consider that the benefits were shared in a fair and equitable way? On what evaluation are you basing your assessment? Identify the most important constraints to and opportunities for the identification and adoption of economically, socially and culturally sound benefit-sharing arrangements to promote the conservation and sustainable use of biological diversity;

(b) Transferability of the experience. Assess whether the case-study could be considered representative and could be replicated. If so, what would you propose should be done differently now if there were the opportunity to replicate the experience: with the same/other actors; in the same environment/elsewhere; with the same/different genetic resources. In addition specify what information is available and what further research may be needed to improve the case-study and to develop proposals for further replication. What are the minimum institutional, ecological and socio-economic/market requirements that would have to be met to allow the experience to be replicated?

(c) Possible policy advice for implementation. Outline what policy conclusions and recommendations can be drawn from the case-study.

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